NCC BCA 2019 SECTION J JV3 ASSESSMENT

NEWPORT SURF LIFE SAVING CLUB RENEWAL

PREPARED FOR NORTHERN BEACHES COUNCIL

DATE: 04TH SEPTEMBER 2020

OUR REFERENCE: 200308-B

ENGINEER: WILLY TANGTRA

Author	**Willy Tangtra**	
Reviewed by	**Dean Gorman**	
REVISION	**DATE**	**DESCRIPTION**
A	13th August 2020	Development Application
B	4th September 2020	Drawing list updated

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INTRODUCTION

GENERAL

The objective of NCC BCA 2019 Volume 1 Section J is to reduce greenhouse gas emissions by efficiently using energy. This report has been prepared to show how the proposed refurbishment 394 Barrenjoey Road, Newport, can meet the requirements of the NCC BCA 2019 Volume 1 Section J. By incorporating the recommendations of this report the building and its services can be capable of efficiently using energy. This report shall be read in conjunction with the Australian Building Codes Board (ABCB) National Construction Code (NCC) 2019 Volume 1.

Section J compliance is only required for all new building work including fabric and services. The new building work should not reduce the existing building's level of energy efficiency.

All existing construction will not need to be upgraded to Section J requirements. Only the fabric (glazing and walls) on the envelope that is new need comply with this report. Where the new work provides access to the existing roof cladding, wall cladding or wall lining, insulation should be added where practical to comply with this Part.

PROJECT DESCRIPTION

The project is a refurbishment to a two-storey existing building.

- **Figure 1: Proposed site plan**

BUILDING CLASSIFICATION

Class 5

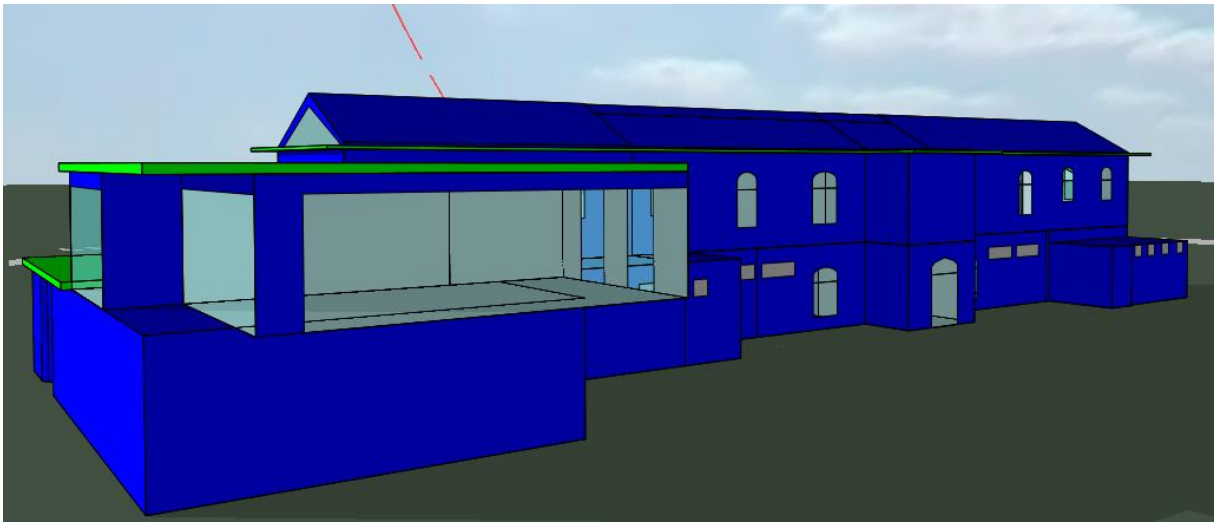
CLIMATE ZONE

Zone 5

ARCHITECTURAL DOCUMENTATION

The following architectural documentation from **Adriano Pupilli Architects** was used for this assessment;

Job No.	Drawing No.	Drawing Title	Rev	Date
NSC	004	Demolition Plan	A	02/09/2020
NSC	005	Existing Ground Floor Plan	A	02/09/2020
NSC	006	Existing First Floor Plan	A	02/09/2020
NSC	007	Existing Roof Plan	A	02/09/2020
NSC	008	Existing Section	A	02/09/2020
NSC	009	Existing Elevations	A	02/09/2020
NSC	010	Proposed Ground Floor Plan	A	02/09/2020
NSC	011	Proposed First Floor Plan	A	02/09/2020
NSC	012	Proposed Roof Plan	A	02/09/2020
NSC	013	Proposed Section	A	02/09/2020
NSC	014	Proposed Elevations	A	02/09/2020
NSC	015	Schedules of Colours and Materials	A	02/09/2020



IES Model of Newport Surf Life Saving Club

PERFORMANCE REQUIREMENTS

JP1 ENERGY USE

A building, including its services, must have features that facilitate the efficient use of energy appropriate to—

a. the function and use of the building and services; and
b. the level of human comfort required for the building use; and
c. solar radiation being –
    i. utilised for heating; and
    ii. controlled to minimise energy for cooling; and
d. the energy source of the services; and
e. the sealing of the building envelope against air leakage; and
f. for a conditioned space, achieving an hourly regulated energy consumption, average over the annual hours of operation, of not more than –
    i. for a Class 6 building, 80 kJ/m^2.hr; and
    ii. for a Class 5, 7b, 8 or 9a building other than a ward area, or a Class 9b school, 43 kJ/m^2.hr; and
    iii. for all other building classifications, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, 15kJ/m^2.hr

All existing construction will not need to be upgraded to Section J requirements. Only the fabric (glazing and walls) on the envelope that is new need comply with this report. Where the new work provides access to the existing roof cladding, wall cladding or wall lining, insulation should be added where practical to comply with this Part.

JP1 is verified using verification method JV3 – Verification using a reference building.

INTERPRETATION

The following are some useful explanations of terms used throughout this report. These descriptions are taken from the NCC BCA.

Envelope , for the purposes of Section J, means the parts of a building's fabric that separate a conditioned space or habitable room from—

a. the exterior of the building; or
b. a non- conditioned space including—
    i. the floor of a rooftop plant room, lift-machine room or the like; and
    ii. the floor above a carpark or warehouse; and
    iii. the common wall with a carpark, warehouse or the like.

Conditioned space means a space within a building, including a 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 its temperature controlled by air-conditioning.

Air-conditioning means a service that actively cools or heats the air within a space, but does not include a service that directly

a. cools or heat cold or hot rooms; or
b. maintains specialised conditioned for equipment or processes, where this is the main purposed of the service.

Habitable Room means a room used for normal domestic activities, and—

a. includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but
b. excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Total R-Value (m^2.K/W), for the purposes of Volume One, means the sum of the R-Values of the individual component layers in a composite element including any building material, insulating material, airspace, thermal bridging and associated surface resistances.

Total System Solar Heat Gain Coefficient (SHGC), for the purposes of Volume One, means the fraction of incident irradiance on a wall-glazing construction or a roof light that adds heat to a building's space.

Total System U-Value (W/m^2.K), for the purposes of Volume One, means the thermal transmittance of the composite element allowing for the effect of any airspaces, thermal bridging and associated surface resistances.

BUILDING ENVELOPE

The building envelope is shaded in blue as per Figure 2 and 3 below.

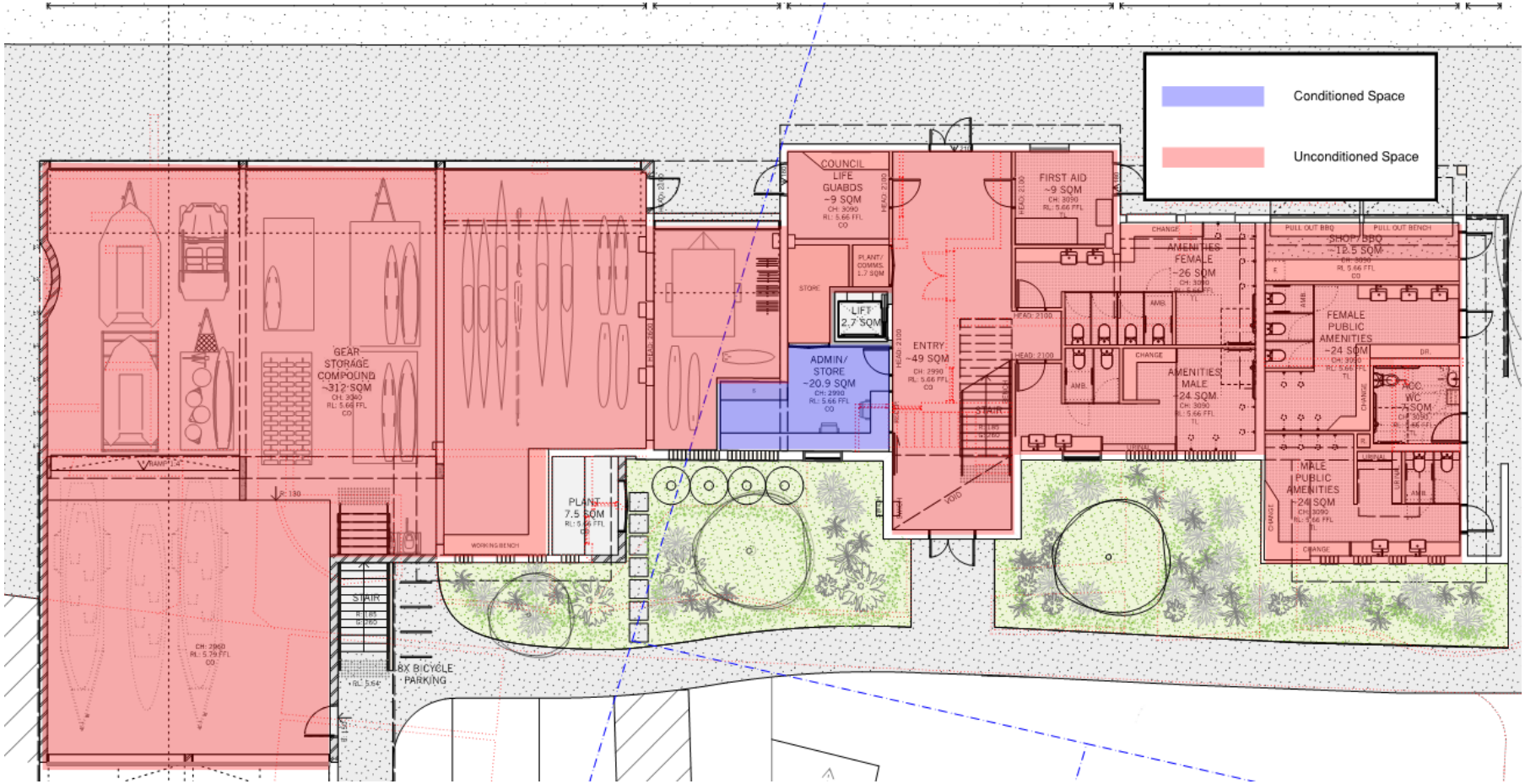


Figure 2 – Ground Floor Envelope Details

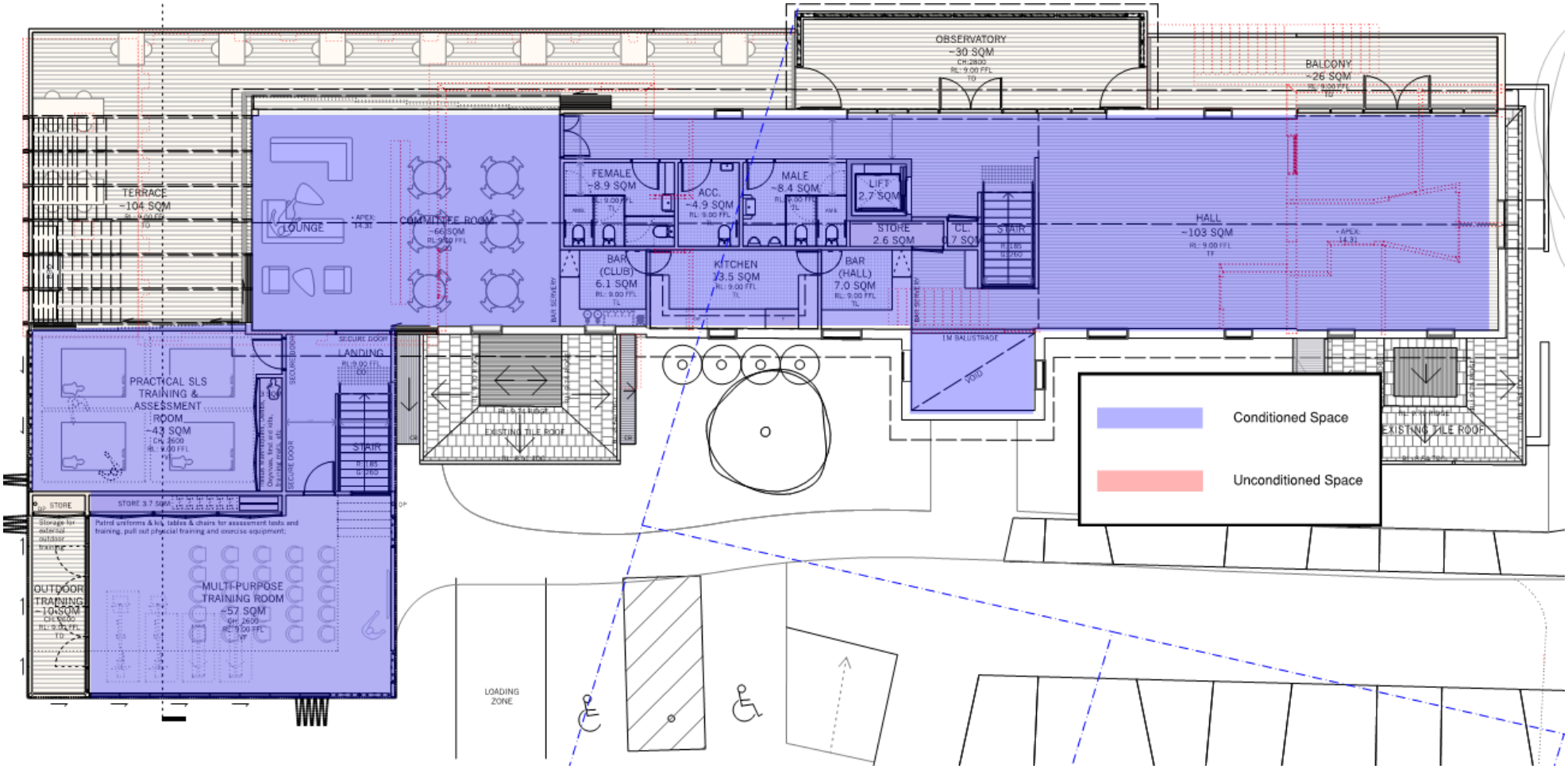


Figure 3 – Level 1 Envelope Details

COMPLIANCE SUMMARY

Performance Requirements JP1 is verified when it is determined that the annual greenhouse gas emission of the proposed building with its services is not more than the annual greenhouse gas emission of a reference building when—

(i) the proposed building is modelled with the proposed services

(ii) the proposed building is modelled with the same services as the reference building

Compliance is achieved when Criteria 1 and 2 are both met.

JV3 Criteria 1 – Result A < Result C

JV3 Criteria 2 – Result B < Result C

A – Energy Consumption of Proposed Building Fabric and Proposed Services

B – Energy Consumption of Proposed Building Fabric and Deemed to Satisfy Services

C – Energy Consumption of Deemed to Satisfy Fabric and Deemed to Satisfy Services

RESULTS

Scenarios	**Annual Electrical Energy Consumption (MWh)**	**Annual GHG Emission (kgCO2)**
A	80.5758	74,258
B	80.5758	74,258
C	81.7987	75,385
Criteria 1	A < C	✓
Criteria 2	B < C	✓
JV3 Compliance Achieved		

In accordance with Table 3a of Section J in BCA 2019 Volume 1, the greenhouse gas emission factors for electricity energy source in NSW is given as 256 kgCO_2-e /GJ. Using this factor, the amount of greenhouse gas emission annually is calculated.

The reference building modelled with DTS fabric and services as per JV specification is simulated to consume total electrical energy of **81.7987 MWh** annually which is equivalent to emission of **75,385 kg CO_2** annually.

The proposed building design shall include services that are at least as efficient as the BCA DTS services. The computer simulation has assumed worst case scenario where the proposed services performs as efficient as the DTS services. A **3kW PV system** has also been incorporated in the modelling to help offset the energy consumption of the building. The PV system is calculated to generate **3.858 MWh** of electricity annually. The PV panel will be installed on the new metal roof above the training rooms (See Figure 4).

The proposed building modelled with the same DTS services and help of PV system consume total electrical energy of **80.5758 MWh** annually which is equivalent to emission of 74,258 **kgCO2** annually.

The proposed building has achieved compliance with Performance Requirements JP1 as the values for A and B are less than C.

COMPLIANCE REQUIREMENTS

Building Element	Proposed Building
Roof and Ceiling	**Total R3.7** – New Metal Roof **Total R3.7** – New Tiled Roof **No Additional Insulation required** – Existing Tiled Roof
Roof Colour (Solar Absorptance)	**SA** ≤ 0.7 – New roof
Roof Lights	**N/A** – None
External Walls	**Total R2.8** – New FC Cladded Masonry Wall **Total R2.8** – New Masonry Wall
External Walls (Solar Absorptance)	**SA** ≤ 0.6 **–** New external walls
Internal Walls	**Total R1.8** – Concrete walls adjacent to lifts (See Appendix B for details)
Floors	**No insulation required –** Concrete slab on ground **No insulation required –** Suspended slab over air **No insulation required –** Suspended slab over basement
Glazing (all)	**All New Glazing** **U-Value 4.5, SHGC – 0.50** (Aluminium Framed Single Glazed with Low E Coating) **Note:** U-Value must be less than or equal to the above
Services	DTS compliant systems

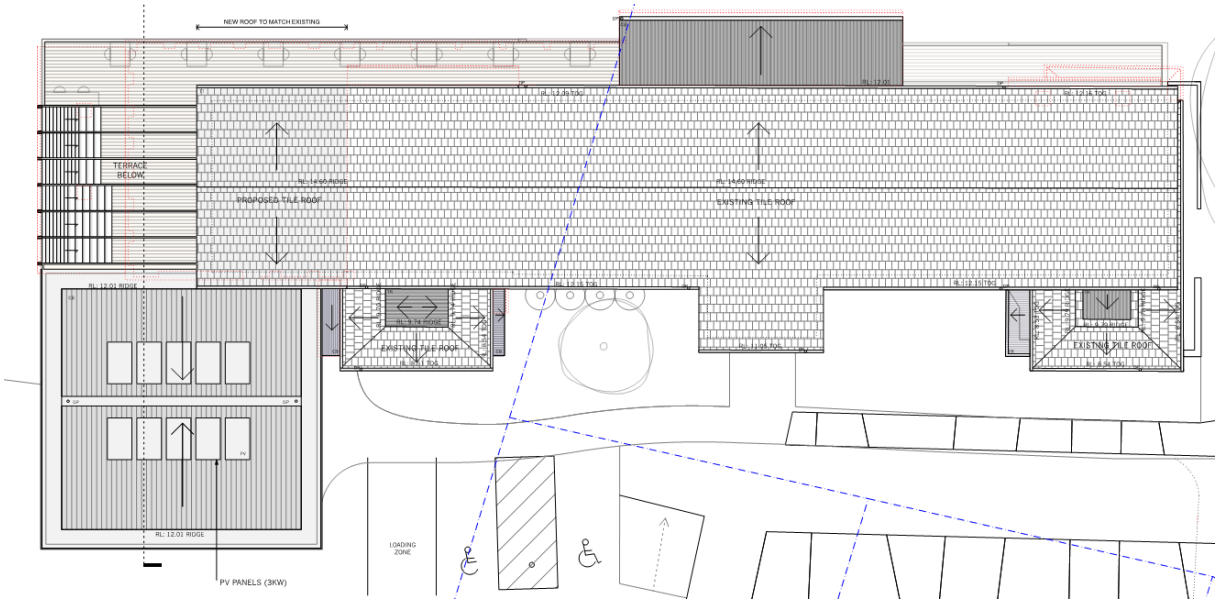


Figure 4 Proposed Roof plan with PV panel shown

FABRIC R-VALUE ASSESMENT

Roof and Ceiling – Metal Roof		
Layer	**Layer Description**	**R Value**
1	Outdoor Air Film (3m/s)	0.04
2	Metal Roof	0.00
3	**120mm Foil Faced blanket installed within Roof Spacer System.**	**2.60**
4	Reflective Unventilated Airspace	0.84
5	13mm Plasterboard	0.08
6	Indoor Air Film (still air)	0.16
Roof and Ceiling Construction Total		3.72
Minimum Total R-value Required		**3.70**

*Possible insulation: Anticon Blanket with Ashgrid Roof System or approved equivalent

Roof and Ceiling – Tiled Roof		
Layer	**Layer Description**	**R Value**
1	Outdoor Air Film (3m/s)	0.04
2	Terracota tiles	0.02
3	**120mm Foil Faced blanket installed within Roof Spacer System.**	**2.60**
4	Reflective Unventilated Airspace	0.84
5	13mm Plasterboard	0.08
6	Indoor Air Film (still air)	0.16
Roof and Ceiling Construction Total		3.74
Minimum Total R-value Required		**3.70**

*Possible insulation : Anticon Blanket with Ashgrid Roof System or approved equivalent

New External Wall – FC Cladded Masonry Wall		
Layer	**Layer Description**	**R-Value**
1	Outdoor Air Film (7m/s)	0.03
2	Fibre Cement Cladding	0.03
3	Airspace (non-reflective and unventilated)	0.17
4	110mm Brick	0.14
5	Airspace (non-reflective and unventilated)	0.17
6	13mm Plasterboard	0.08
7	Indoor Air Film (still air)	0.12
Wall Construction Total		**0.74**
Additional Insulation Needed		**2.06**
Minimum Total R-Value required		**2.80**

New External Wall – Masonry Wall		
Layer	**Layer Description**	**R-Value**
1	Outdoor Air Film (7m/s)	0.03
2	110mm Brick	0.14
3	Airspace (non-reflective and unventilated)	0.17
4	13mm Plasterboard	0.08
5	Indoor Air Film (still air)	0.12
Wall Construction Total		**0.54**
Additional Insulation Needed		**2.26**
Minimum Total R-Value required		**2.80**

Proposed Internal Wall – Concrete Wall adjacent to Lift Shaft		
Layer	**Layer Description**	**R-Value**
1	Indoor Air Film (still air)	0.12
2	13mm Plasterboard	0.08
3	200mm Concrete	0.14
4	Indoor Air Film (still air)	0.12
Wall Construction Total		**0.46**
Additional Insulation Needed		**1.34**
Minimum Total R-Value required		**1.80**

ENERGY SIMULATION INPUTS

GENERAL

The annual energy consumption in MWh has been calculated using the BCA 2019 JV3 Verification using a reference building method. The simulation software used was IES Virtual Environment version 2019.0.1.0 in accordance with Australian Building Codes Board (ABCB) Protocol for Building Energy Analysis Software.

The inputs used for the proposed and deemed to satisfy fabric and services was as per the following and JV3 (d). Further data inputs and resultant outputs from the IES simulation are available upon request.

DEEMED TO SATISFY FABRIC

Building Element	Reference Building Deemed-to-Satisfy
Roof and Ceiling	**Total R3.7 –** All roof
Roof (Solar Absorptance)	0.45 (as per BCA Specification JV3)
Roof Lights	**N/A** – None
External Walls	**Total R2.5** – All external walls
External Walls (Solar Absorptance)	**0.6** – New external walls (as per BCA Specification JV3)
Internal Walls	**Total R1.8 –** All internal walls to lift shafts
Floors	**Total R2.0** – Suspended Concrete Slab over ground floor
Glazing (all)	Refer to Appendix A for DTS 2019 Façade Results

DEEMED TO SATISFY SERVICES

AIR CONDITIONING

The air conditioning systems used in the energy simulation calculation follow the Deemed to Satisfy requirements of BCA 2019 Section J5;

Full Load

Cooling EER: 3.05 (minimum MEPS)

Heating EER: 3.05 (minimum MEPS)

Internal Design Conditions

Summer: 26.0°C

Winter: 18.°C

LIGHTING

The lighting density used in the energy simulation calculation follows the Deemed to Satisfy requirements of BCA 2019 Section J6.

OCCUPANCY AND EQUIPMENT

As per JV Specification requirements for Class 5 buildings.

PROPOSED FABRIC

Building Element	Proposed Building
Roof and Ceiling	**Total R3.7** – New Metal Roof **Total R3.7** – New Tiled Roof **No Additional Insulation required** – Existing Tiled Roof
Roof Colour (Solar Absorptance)	**SA** ≤ 0.7 – New roof
Roof Lights	**N/A** – None
External Walls	**Total R2.8** – New FC Cladded Masonry Wall **Total R2.8** – New Masonry Wall
External Walls (Solar Absorptance)	**SA** ≤ 0.6 **–** New external walls
Internal Walls	**Total R1.8** – Concrete walls adjacent to lifts (See Appendix B for details)
Floors	**No insulation required –** Concrete slab on ground **No insulation required –** Suspended slab over air **No insulation required –** Suspended slab over basement
Glazing (all)	**All New Glazing** **U-Value 4.5, SHGC – 0.50** (Aluminium Framed Single Glazed with Low E Coating) **Note:** U-Value must be less than or equal to the above
Services	DTS compliant systems

PROPOSED SERVICES

AIR CONDITIONING

The air conditioning systems used in the energy simulation calculation follow the Deemed to Satisfy requirements of BCA 2019 Section J5;

Full Load

Cooling EER: 3.05 (minimum MEPS)

Heating EER: 3.05 (minimum MEPS)

Internal Design Conditions

Summer: 26.0°C

Winter: 18.0°C

LIGHTING

The lighting density used in the energy simulation calculation follows the Deemed to Satisfy requirements of BCA 2019 Section J6.

OCCUPANCY AND EQUIPMENT

As per JV Specification requirements for Class 5 buildings.

ENERGY SIMULATION RESULTS

Result	Heating (MWh)	Cooling (MWh)	Fans (MWh)	Lighting (MWh)	Equipment (MWh)	PV Elec (MWh)	Total (MWh)
A – Annual Energy Consumption of **Proposed** Building Fabric and **Proposed** Services	27.562	7.6502	3.0601	15.9609	30.2006	-3.858	80.5758
B – Annual Energy Consumption of **Proposed** Building Fabric and **Deemed to Satisfy** Services	27.562	7.6502	3.0601	15.906	30.2006	-3.858	80.5758
C – Annual Energy Consumption of **Deemed to Satisfy** Fabric and **Deemed to Satisfy** Services	23.8534	8.417	3.3668	15.906	30.2006	-	81.7987

FURTHER COMPLIANCE REQUIREMENTS

As part of the JV3 compliance, the following Deemed to Satisfy requirements are still applicable.

PART J1 - BUILDING FABRIC

J1.1 APPLICATION OF PART

The Deemed to Satisfy provisions of Part J1 Building Fabric apply to building elements forming the envelope of the building.

J1.2 THERMAL CONSTRUCTION - GENERAL

a. Where required, insulation must comply with AS/NZS 4859.1 and be installed so that it—
   i. 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
   ii. forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
   iii. does not affect the safe or effective operation of a service or fitting.

b. Where required, reflective insulation must be installed with—
   i. the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and
   ii. the reflective insulation closely fitted against any penetration, door or window opening; and
   iii. the reflective insulation adequately supported by framing members; and
   iv. each adjoining sheet of roll membrane being—
      A. overlapped not less than 50 mm; or
      B. taped together.

c. Where required, bulk insulation must be installed so that—
    i. 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
    ii. 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.

d. Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in Specification J1.2.

e. The required Total R-value and Total System U-value, including allowance for thermal bridging, must be –
    i. calculated in accordance with AS/NZS 4859.2 for roof or floor; or
    i. determined in accordance with Specification J1.5a for wall-glazing construction; or
    ii. determined in accordance with Specification J1.6 or Section 3.5 CIBSE Guide A for soil or sub-floor spaces.

PART J3 – BUILDING SEALING

J3.1 APPLICATION OF PART

If the air conditioning or ventilation system provides sufficient outside air to pressurize the space and prevent infiltration then **Part J3 is not applicable.**

By not applying Part J3 outside air infiltration will occur whenever the ventilation systems are not operating and will put additional load on the air conditioning systems during start up. It is our recommendation to apply the deemed to satisfy provisions of Part J3 to satisfy the intent of Section J.

The deemed to satisfy provisions of Part J3 Building Sealing apply to building elements forming the envelope of the building. The envelope of the building is the fabric and elements that separates the conditioned spaces to the exterior of the building. See Figure 2 and 3 for building envelope details.

J3.2 CHIMNEYS AND FLUES

Not applicable

J3.3 ROOF LIGHTS

Not applicable

J3.4 WINDOWS AND DOORS

a. A door, openable window or the list must be sealed when forming part of the envelope

b. The requirements of (a) do not apply to a window complying with AS2047, a fire door or smoke door, or a roller shutter, roller shutter grille or other security door or device installed only for out-of-hours security.

c. A seal to restrict air filtration for the bottom edge of door, must be a draft protection device and 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.

d. Any 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—
    i. where the conditioned space has a floor area of not more than 50m^2; or
    ii. where a café, restaurant, open front shop or the like has—

(a) a 3m deep unconditioned zone between the main entrance, including an open front, and the conditioned space; and

(b) at all other entrances to the café, restaurant, open front shop or the like, self-closing doors.

e. A loading dock entrance, if leading to a conditioned space, must be fitted with a rapid roller door or the like.

J3.5 EXHAUST FANS

All exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space or a habitable room.

J3.6 CONSTRUCTION OF CEILINGS, WALLS AND FLOORS

a. 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 (b) when forming part of the envelope.

b. Construction required by (a) must be enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions or sealed at junctions and penetrations with close fitting architrave, skirting, or cornice or expanding form, rubber compressible strip, caulking or the like.

c. The requirements of (a) do not apply to openings, grilles and the like required for smoke hazard management.

PART J8 – FACILITIES FOR ENERGY MONITORING

J8.1 APPLICATION OF PART

The deemed to satisfy provisions of Part J8 Facilities for Energy Monitoring apply to this building.

J8.2 ***

This clause has deliberately been left blank.

J8.3 FACILITIES FOR ENERGY MONITORING

a. The building must have the facility to record the consumption of gas and electricity.
b. Not applicable
c. Not applicable

CONCLUSION

This report demonstrates an assessment based on the JV3 Verification using a reference building. Compliance with JP1 is confirmed by demonstrating that the annual greenhouse gas emissions of the proposed building do not exceed the reference building.

The reference building modelled with DTS fabric and services as per JV specification is simulated to consume total electrical energy of **81.7987 MWh** annually which is equivalent to emission of **75,385 kg CO_2** annually.

The proposed building design shall include services that are at least as efficient as the BCA DTS services. The computer simulation has assumed worst case scenario where the proposed services performs as efficient as the DTS services. A **3kW PV system** has also been incorporated in the modelling to help offset the energy consumption of the building. The PV system is calculated to generate **3.858 MWh** of electricity annually.

The proposed building modelled with the same DTS services and help of PV system consume total electrical energy of **80.5758 MWh** annually which is equivalent to emission of **74,258 kgCO2** annually.

The proposed building has achieved compliance with Performance Requirements JP1 as the greenhouse gas emission for the proposed fabric are less than DTS .

By incorporating the recommendations of this report, Newport Surf Life Saving Club, can achieve compliance with the NCC BCA 2019 Volume 1 Section J Verification method.

APPENDIX A – DTS 2019 FACADE RESULT

Façade

Report

Calculator

Project Summary

Date
13/08/2020

Name
Willy Tangtra

Company
Greenview Consulting

Position
ESD Engineer

Building Name / Address
Newport Surf Life Saving Club
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 5 - office building

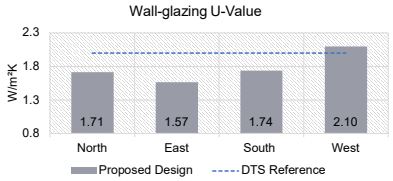
Storeys Above Ground
1

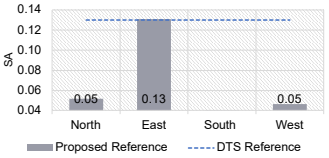
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

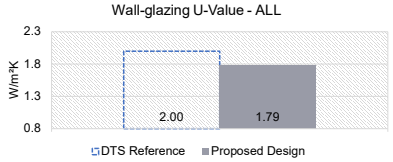
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	1.71	1.57	1.74	2.10	1.79
Solar Admittance	0.05	0.13	0.04	0.05	
AC Energy Value					12

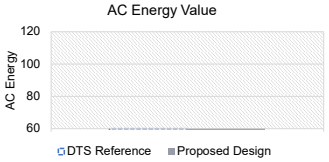
Method 1





Method 2

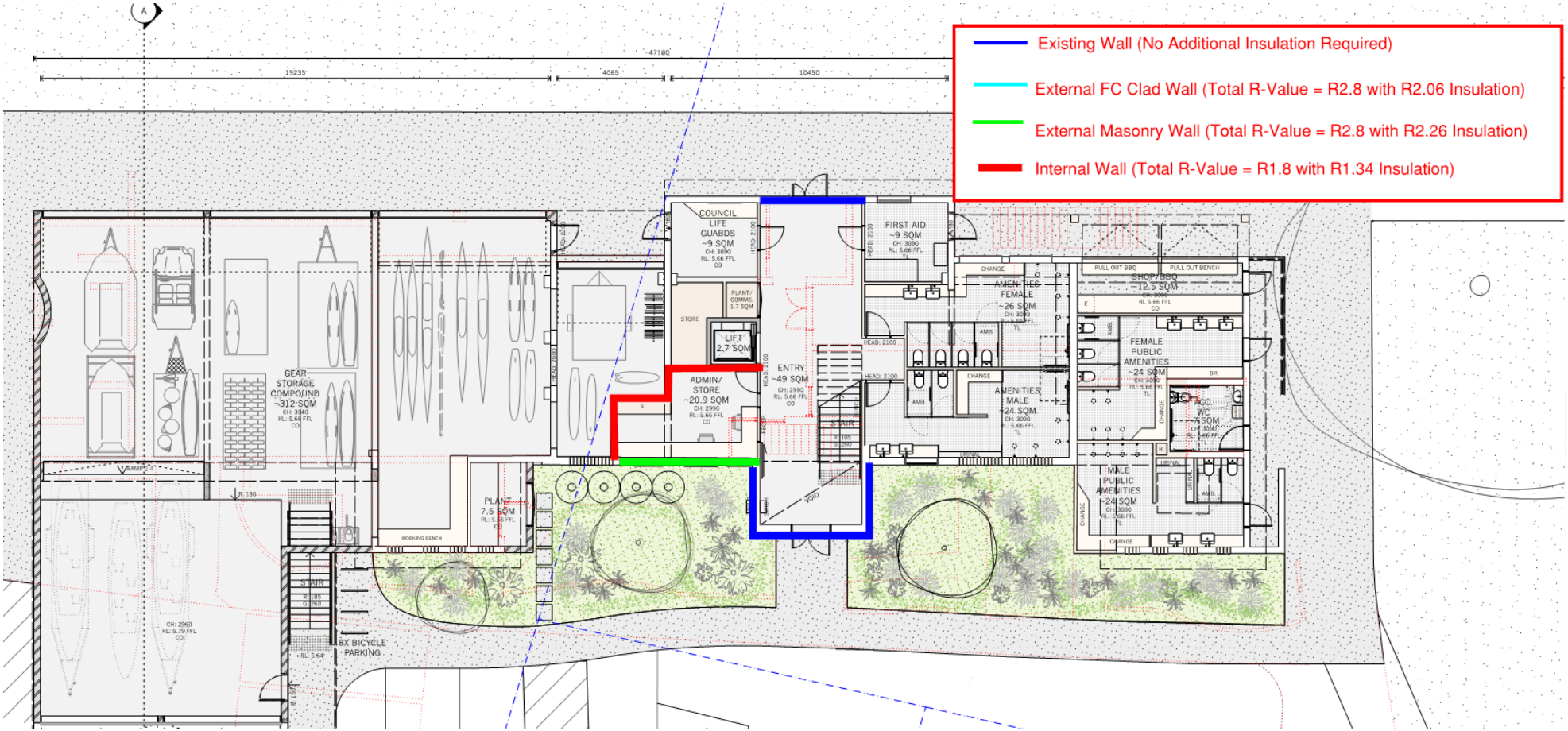


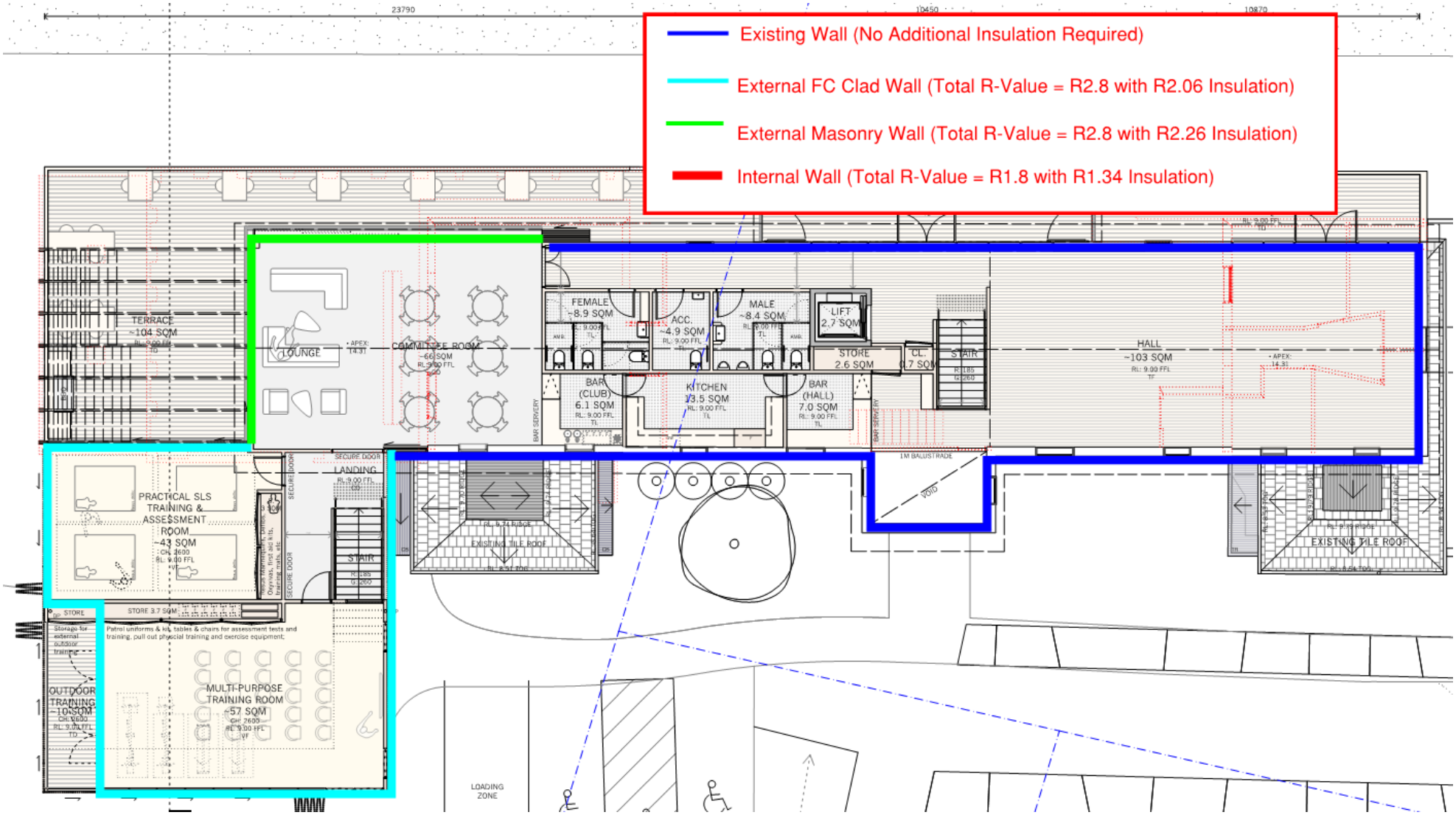


Project Details

	North	East	South	West
Glazing Area (m²)	27.04	16.9	6.25	22.62
Glazing to Façade Ratio	82%	73%	34%	83%
Glazing References	MPR North + SLS North +	SLS East +	MPR South +	MPR West +
Glazing System Types	Sliding Door + Fixed +	Sliding Door + Fixed +	Fixed +	Fixed +
Glass Types	Double Glazed Unit - double low-E coating +	Double Glazed Unit - double low-E coating +	Single glazing +	Double Glazed Unit - double low-E coating +
Frame Types	Aluminium +	Aluminium +	Aluminium +	Aluminium +
Methodology	WERS (Default module size)			
Average Glazing U-Value (W/m².K)	2.00	2.00	4.37	2.45
Average Glazing SHGC	0.18	0.18	0.32	0.16
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m²)	5.875	6.3	12.31	4.64
Wall Types	Wall +	Wall +	Wall +	Wall +
Methodology	0			
Wall Construction	FC +	FC +	FC +	FC +
Wall Thickness	110 +	110 +	110 +	110 +
Average Wall R-value (m²K/W)	2.49	2.49	2.49	2.49
Solar Absorptance	0.5	0.5	0.5	0.5

APPENDIX B – PROPOSED BUILDING INSULATION MARKUP




Existing Wall (No Additional Insulation Required)
External FC Clad Wall (Total R-Value = R2.8 with R2.06 Insulation)
External Masonry Wall (Total R-Value = R2.8 with R2.26 Insulation)
Internal Wall (Total R-Value = R1.8 with R1.34 Insulation)
TERRACE ~104 SQM
LOUNGE
COMMITTEE ROOM ~66 SQM
FEMALE ~8.9 SQM
ACC. ~4.9 SQM
MALE ~8.4 SQM
LIFT 2.7 SQM
STORE 2.6 SQM
CL. 0.7 SQM
STAIR
HALL ~103 SQM
BAR (CLUB) 6.1 SQM
KITCHEN 13.5 SQM
BAR (HALL) 7.0 SQM
BAR SERVERY
1M BALUSTRADE
VOID
EXISTING TILE ROOF
LANDING
SECURE DOOR
PRACTICAL SLS TRAINING & ASSESSMENT ROOM ~43 SQM
STORE 3.7 SQM
MULTI-PURPOSE TRAINING ROOM ~57 SQM
OUTDOOR TRAINING ~104SQM
LOADING ZONE