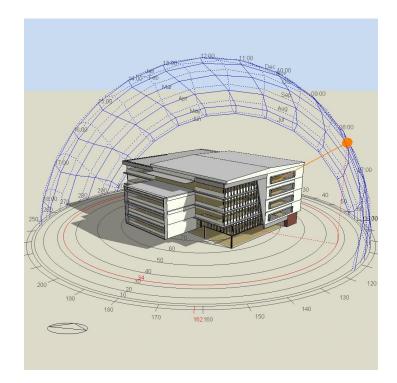


209 Robina Town Centre Drive – Building 3 Base Building

NCC 2019 BCA Volume One Amendment 1 Section J - JV3 Energy Efficiency Report



CBA Project no.	078-74
Revision	2
Date of issue	24 TH NOVEMBER 2020
Prepared by	RUSSELLJOHNSON
Signed	RA

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1

Table of Contents

EXECUTIVE SUMMARY
Building Fabric Thermal Performance3 Estimated Annual Energy Consumption3
INTRODUCTION
GENERAL INFORMATION
Building Classification.4Climate Zone.4Reference Documentation.4Modelling Software.5Disclaimer.5
JV3 MODELLING
Modelling Variables.5Roof Construction.5Wall and Glazing Construction.5Floor Construction.6Other elements.6
SIMULATION RESULTS
CONCLUSION
APPENDICES
Appendix A) Building Simulation Outputs

EXECUTIVE SUMMARY

This report has been prepared for Graystone for the proposed TAFE Building 3 at 209 Robina Town Centre Drive, Robina. The intention of this report is to verify that the building can achieve the NCC energy efficiency requirements without the need to insulate the suspended floor slab.

The alternate verification method JV3 has been utilised to confirm that the annual energy usage of the proposed building does not exceed that of a deemed to satisfy (DTS) reference building.

Below is a list of modelling variables used to achieve the proposed buildings energy performance.

Building Fabric Thermal Performance

Insulation has been added to the proposed building fabric as follows;

- Roof 100mm foil faced insulation with a material R-value of **R2.5**
- External walls 90mm insulation with a material R-value of **R2.5**
- Floors Not insulated

Glazing performance;

- Entry to Main Foyer Total System performance U-Value 6.5 SHGC 0.71 (6mm Clear Glass)
- All other External glazing Total System performance U-Value 4.7 SHGC 0.38 (6mm Evantage Grey Low E#2)

Estimated Annual Energy Consumption

Reference Building 1,168,443 kWhrs

Proposed Building 1,124,834 kWhrs

INTRODUCTION

This report has been prepared for the proposed TAFE building 3 at 209 Robina Town Centre Drive, Robina.

The intention of this report is to verify that the building meets the performance requirements of the NCC 2019 Section J Energy Efficiency provisions.

The JV3 verification method has been utilised in order to eliminate the need to insulate the suspended floor slabs.

GENERAL INFORMATION

Building Classification

The building classification is expected to be Class 9b (school building).

Climate Zone

The building is in the City of Gold Coast which falls within climate zone 2.

Reference Documentation The information contained within this report has been based on the following;

Nettleton Tribe Architects drawings Project 11306 001 Site Plan 053 Ground Plan Overall 105 Ground Plan 106 Level 1 Plan 107 Level 2 Plan 108 Level 3 Plan 109 Level 4 Plan 110 Roof Lower Plan 111 Roof Upper Plan 153-154 Wall Types 201-204 Building Elevations 301-302 Building Sections 303-319 Façade Sections 401 Proposed Building Sections 1 402 Proposed Building Sections 2

Cushway Blackford & Associates Mechanical services drawings Project 078-74 MWD01 Site Plan, Legend, Schedules, Details & Notes MWD04 Ground Floor Air Conditioning and Mechanical Ventilation Layout MWD05 Level 1 Air Conditioning and Mechanical Ventilation Layout MWD06 Level 2&3 Air Conditioning and Mechanical Ventilation Layout MWD07 Level 4 Air Conditioning and Mechanical Ventilation Layout MWD08 Roof Plan Air Conditioning and Mechanical Ventilation Layout

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4

Modelling Software

The energy modelling software used to determine the annual energy consumption of both the proposed building and the DTS reference building was Design Builder Version 6.1.6.005

Disclaimer

The JV3 verification method uses specific criteria outlined in the BCA which may not be representative of the true building operation and is intended for comparison purposes only. The results of the energy simulations contained within this report are for Section J compliance only.

JV3 MODELLING

The JV3 verification method compares a DTS reference building with the proposed building to confirm whether the proposed building is capable of achieving the same level of energy efficiency as a DTS building.

Modelling Variables

The variables used in the energy modelling consist of construction elements such as roof, floor and wall construction as well as the glazing performance, while the building services were kept constant.

Roof Construction

The reference building uses roof construction that has a total R-value of **R3.7** and a solar absorptivity of 0.45 in accordance with NCC Clause J1.3.

The proposed building uses the following roof types;

Roof 1

2.5° metal roof sheet (surfmist) with a solar absorptivity of 0.4, 100mm foil faced roof insulation with a material R-value of **R2.5**, roof space, and a suspended plasterboard ceiling with a total roof construction R-Value of **R4.1**.

Roof 2

200mm concrete with a solar absorptivity of 0.6, 100mm foil faced insulation on the underside with a material R-value of **R2.5**, roof space, and a suspended plasterboard ceiling with a total construction R-value of **R4.2**.

Wall and Glazing Construction

The reference building uses a solar absorptivity of 0.6 for the envelope walls in accordance with NCC Specification JVb 2b). The DTS Wall and Glazing thermal performance coefficients were calculated using the wall and glazing calculator (refer Appendix B) and are as follows; Wall **U-value 0.28** Glazing **U-value 4.82** Glazing **SHGC 0.51**

The envelope walls of the proposed building consist of the following;

Wall type 1 (A7)

FC sheeting with a solar absorptivity of 0.6, a 35mm air gap, 20mm reflective airgap, 90mm insulation with a material R-value of **R2.5** and a 13mm internal plasterboard lining with a total R-value of **R3.5**.

Wall type 2 (A11)

Face brick with a solar absorptivity of 0.6, a 20mm reflective air gap, 90mm insulation with a material R-value of **R2.5** and a 13mm internal plasterboard lining with a total R-value of **R3.4**.

Wall Type 3 (SG01)

Spandrel glazing, 35mm air gap, 90mm insulation with a material R-value of **R2.5**, a 64mm steel stud with plasterboard lining with a total R-value of **R3.0**.

Wall Type 4 (SG01 above ceiling level) Spandrel glazing, 90mm insulation with a material R-value of **R2.5**, with a total R-value of **R2.5**.

The glazing for the proposed building consists of;

- Entry to Main Foyer Total System performance U-Value 6.5 SHGC 0.71 (6mm Clear Glass)
- All other External glazing Total System performance U-Value 4.7 SHGC 0.38 (6mm Evantage Grey Low E#2)

Floor Construction

The reference building uses floor insulation to achieve a total floor construction R-value of **R2.0** in accordance with NCC J1.6 Table J1.6. This occurs on ground floor and the first and second floor slabs where they overhang the conditioned space below.

The proposed building uses no insulation however it uses carpet and achieves a total system R-Value of **R0.5**

Other elements

Other modelling variables such as such as external shading, lighting, power, ventilation and infiltration, temperature set points, and air conditioning systems etc were kept constant.

SIMULATION RESULTS

The proposed building (1,124,834 kWhrs/annum) used less energy/annum than the DTS Reference Building (1,168,443 kWhrs/annum).

CONCLUSION

The energy modelling shows that the proposed building design can achieve the same and slightly better annual energy usage results as a DTS reference building.

It is therefore confirmed that using the BCA JV3 verification method, the proposed TAFE building 3 at 209 Robina Town Centre Drive, Robina meets the performance requirements of Section J.

APPENDICES

Appendix A) Building Simulation Outputs

DTS Building Summary

Program Version:EnergyPlus, Version 8.9.0-40101eaafd, YMD=2020.10.01 14:58

Tabular Output Report in Format: HTML

Building: Building

Environment: ROBINA BUILDING 3 (01-01:31-12) ** Brisbane QLD AUS RMY WMO#=94578

Simulation Timestamp: 2020-10-01 14:58:48

Report: Annual Building Utility Performance Summary

For: Entire Facility

Timestamp: 2020-10-01 14:58:48

Values gathered over 8760.00 hours

Site and Source Energy

	Total Energy [kWh]	Energy Per Total Building Area [kWh/m2]	Energy Per Conditioned Building Area [kWh/m2]
Total Site Energy	1168443.56	177.39	210.02
Net Site Energy	1168443.56	177.39	210.02
Total Source Energy	2287701.32	347.31	411.20
Net Source Energy	2287701.32	347.31	411.20

Site to Source Energy Conversion Factors

	Site=>Source Conversion Factor
Electricity	3.167
Natural Gas	1.084
District Cooling	1.056
District Heating	3.613
Steam	0.250
Gasoline	1.050
Diesel	1.050
Coal	1.050
Fuel Oil #1	1.050
Fuel Oil #2	1.050
Propane	1.050
Other Fuel 1	1.000
Other Fuel 2	1.000

Building Area

	Area [m2]
Total Building Area	6586.89
Net Conditioned Building Area	5563.47
Unconditioned Building Area	1023.41

Proposed Building Summary

Program Version:EnergyPlus, Version 8.9.0-40101eaafd, YMD=2020.10.06 16:57

Tabular Output Report in Format: HTML

Building: Building

Environment: ROBINA BUILDING 3 (01-01:31-12) ** Brisbane QLD AUS RMY WMO#=94578

Simulation Timestamp: 2020-10-06 16:57:26

Report: Annual Building Utility Performance Summary

For: Entire Facility

Timestamp: 2020-11-03 13:30:32

Values gathered over 8760.00 hours

Site and Source Energy

	Total Energy [kWh]	Energy Per Total Building Area [kWh/m2]	Energy Per Conditioned Building Area [kWh/m2]
Total Site Energy	1124834.08	173.32	205.23
Net Site Energy	1124834.08	173.32	205.23
Total Source Energy	2234539.50	344.31	407.71
Net Source Energy	2234539.50	344.31	407.71

Site to Source Energy Conversion Factors

	Site=>Source Conversion Factor
Electricity	3.167
Natural Gas	1.084
District Cooling	1.056
District Heating	3.613
Steam	0.250
Gasoline	1.050
Diesel	1.050
Coal	1.050
Fuel Oil #1	1.050
Fuel Oil #2	1.050
Propane	1.050
Other Fuel 1	1.000
Other Fuel 2	1.000

Building Area

	Area [m2]
Total Building Area	6489.95
Net Conditioned Building Area	5480.77
Unconditioned Building Area	1009.18

Temperature Range Check and Thermal Comfort Report

Site Name: Robina Building 3, Building Name: Building 3, Location Template: GOLD COAST SEAWAY, Weather File: AUS_OLD_BRISBANE_RMY Report generated: 13/10/2020 12:14:40 PM

Building level activity settings:

Winter clothing level: 1, Summer clothing level: 0.5, Metabolic Rate: RJ office work, Comfort Radiant Temperature Weighting: 1 - Zone Averaged

Section J Temperature Range Check. Target temperature range: 21 - 24 degrees.

All zones pass	temperature check	- Building : PASS

Block	Zore	Floor Area (m*)	Fraction Total Floor Area	Building Class	Operation Hours (2 0.2 fractional occupancy)	Operation Hours T below 21	Operation Hours T between 21 and 24	Operation Hours T above 24	Praction Operation Hours T between 21 and 24	Zone temperatur meets Section J target (greater than 98 % Operation Hours between 21 and 24)
Ground Filser	FOU-G.3 and 4	236.3	0.04	Class 9b school	2349	0	2349	0	1.000	PASS
Ground Floor	PCU-G.5 and 6	394.5	0.05	Class 9b school	2349	D	2349	٥	1.000	PASS
Ground Fleer	POU-G.8	86.5	0.01	Class 9b school	2349	0	2349	a	1.000	PASS
Ground Floor	POU-6.9	27.8	0.0	Class 9b school	2349	D	2349	a	1.000	PASS
Ground Floor	POU-G.1	89.3	0.01	Class 9b school	2349	D	2342	0	1.000	PASS
Bround Floor	POU-8.7	133.7	0.02	Class 9b school	2349	0	2349	0	1.000	PA58
Ground Fleer	F00-0.2	78.2	0.01	Class 9b scheel	2349	0	2349	0	1.000	PA88
Level 1	FOU-1.4	61.1	0.01	Class 9b school	2349	0	2349	0	1,000	PASS
Lovel 1	POUH.11	35.5	0.01	Class 9b school	2349	0	2349	a	1.000	PASS
Lavel 1	POUH.4	92.1	0.01	Class 9b school	2349	D	2349	a	1.000	PASS
Level 1	PCU-1.10	101.9	0.02	Class 9b school	2349	1	2348	a	1.000	PASS
Level 1	FOU-12	106.1	9.02	Class 9b school	2349	0	2349	0	1.000	PAS8
Level 1	FOUL18	88.6	0.01	Class 96 school	2349	0	2349	0	1.000	PASS
Level 1	FOU-1.9	108.2	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 1	POU-1.5	92.1	0.01	Class 9b school	2349	0	2349	0	1,000	PASS
Level 1	FOU-1.7	115.0	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 1	FOU-1.6	90.9	0.01	Class 9b school	2349	D	2349	0	1.000	PASS
Level 1	POU-1.8	115.7	0.02	Class 9b school	2349	1	2348	0	1.000	PASS
Level 3	FOU-3.3	109.3	9.02	Class 5b school	2349	D	2349	đ	1.000	PAS8
avel 3	FCU-8.12	188.2	¢.02	Class 66 school	2349 2349	0	2349	0	1.000	PASS PASS
evel 3	FOU-3.2	112.3	0.02	Class 9b school	2349	0	2349	~	1.000	PASS
lovel 3	POU-3:11 POU-3:14	136.9	0.01	Class 9b school	2349	0	2349	a a	1.000	PASS
Level 3 Lovel 3	PGU-3.14	91.0	0.01	Class 9b school Class 9b school	2349	0	2349	0	1.000	PASS
Level 3	POU-3.9	91.0 101.9	0.01	Class 9b school	2349	0	2349	0	1.000	PASS
Level 3	FCU-3.9	191.9	0.02	Class 96 school	2349	6	2349	0	1.000	PASS PASS
Level 3	FCU-3.0	1182.5	9.02 9.02	Class 56 school	2349	0	2349	0	1.000	PASS
Level 3	FQU-3.5	118.5	0.02	Class 9b school	2349	0	2349	a	1.000	PA88
Lavel 3	FOU-3.13	133.9	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 3	POU-3.4	107.5	0.02	Class Sb school	2349	0	2349	a	1.000	PASS
Level 3	POU-3.6	84.0	0.01	Class 9b school	2349	D	2349	a	1.000	PASS
Level 3	FELAT	84.0	0.01	Class 9b school	2349	0	2342	a	1.000	PASS
Level 2	FCU-2.14	87.7	0.01	Class 9b school	2349	0	2349	0	1.000	PASS
Level 2	FOUR1	91.0	0.01	Class 9b scheel	2349	0	2349	0	1.000	PASS
avel 2	FCU-2.9	101.9	0.02	Class 9b school	2349	D	2349	0	1,000	PASS
Lovel 2	F0U-2.11	143.6	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 2	F0J-2.2	112.3	0.02	Class 9b school	2349	D	2343	a	1.000	PASS
Level 2	POU-2.3	109.3	0.02	Class 9b school	2349	D	2349	0	1.000	PASS
Level 2	PCU-2.12	141.5	0.02	Class 9b school	2349	0	2342	0	1.000	PASS
Level 2	FOU-2.7	84.0	9.01	Class 9b school	2349	0	2349	0	1.000	PAS8
Level 2	FOUR28	102.2	9.02	Class 9b school	2349	0	2349	0	1.000	PASS
Javel 2	FCU-2:10	140.2	9.02	Class 9b school	2349	0	2349	0	1.000	PASS
Lovel 2	FOU-2.6	84.0	0.01	Class 9b school	2349	D	2349	a	1.000	PASS
Level 2	FCU-2.5	102.5	0.02	Class 9b school	2349	D	2349	a	1.000	PASS
Level 2	POU-2.13	141.5	0.02	Class 9b school	2349	D	2349	0	1.000	PASS
Level 2	FCU-2.4	107.5	9.02	Class 9b school	2349	D	2349	a	1.000	PA58
Level 4	FCU-4.3	108.4	9.02	Class 9b school	2349	0	2349	0	1.000	PA88
Jevel 4	FOU4.4	147.6	9.02	Class 9b school	2349	0	2349	0	1.000	PASS
Javel 4	FOUH4.12	28.9	0.01	Class 9b school	2349	2	2347	a	0.999	PASS
avel 4	POUH/I	91.0	0.01	Class 9b school	2349	0	2349	a	1.000	PASS
avel 4	PCU-4.9	116.5	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
	P0042	102.2	0.02	Class 9b school	2349		2349	0	1.000	PASS

Level 4	PCU-4.8	113.6	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 4	F0U-4.11	114.5	9.02	Class 9b school	2349	0	2349	a	1.000	PA58
Level 4	FCU-4.10	113.9	9.02	Class 9b school	2349	0	2349	0	1.990	PASS
Level 4	FOUH.7	113.7	0.02	Class 9b school	2349	2	2347	0	0.999	PASS
Lovel 4	FCUH4.6	199.5	0.03	Class 9b school	2349	D	2349	a	1.000	PASS
Level 4	FCU-4.5	85.7	0.01	Class 9b school	2349	D	2349	٥	1.000	PASS

Section J PMV Thermal Comfort Check. Target PMV range: -1.0 to +1.0

More than 95% (100.0%) of floor area passes PMV check - Building : PASS

Block	Zaes	Floor Area (m*)	Fraction Total Floor Area	Building Chass	Operation Hours (2 0.2 fractional occupancy)	Operation Hours PMV below -1	Operation Hours PMV between -1 and 1	Operation Hours PMV above 1	Praction Operation Hours PMV between -1 and 1	Zone PMV meets Section J target (greater than 38 %) Operation Hours between -1 and 1)
Ground Floor	FOU-GL3 and 4	236.3	0.04	Class 9b school	2349	1	2348	a	1.000	PASS
Ground Floor	FCU-G.5 and 6	394.5	0.05	Class 9b school	2349	5	2344	0	0.998	PASS
Ground Floor	PCU-0.8	86.5	0.01	Class 9b achool	2349	7	2342	0	0.997	PASS
Ground Floer	FOLIG	27.8	9.00	Class 9b school	2349	10	2339	a	0.995	PASS
Ground Floor	FCU-8.1	88.3	9.01	Class 9b school	2349	é.	2343	0	0.997	PASS
	FQU-8.7	133.7	0.02		2349	2	2342	0	0.997	PASS
Ground Fleer Ground Fleer	FOUR POUR POUR POUR POUR POUR POUR POUR P	78.2	9.02	Class 9b school Class 9b school	2349	/ r	2342	9	0.997	PASS
						5		~		
Level 1	PCU-1.4	61.1	0.01	Class 9b school	2549	D	2349	0	1.000	PASS
Lovel 1	PQU-1.11	35.5	0.01	Class 9b school	2349	3	2345	a	0.999	PASS
Level 1	POU-1.1	92.1	9.01	Class 9b school	2349	5	2344	a	0.998	PASS
Level 1	FOU-1.10	101.9	9.02	Class 9b school	2349	8	2346	0	0.999	PA58
Level 1	FOU-12	108.1	9.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 1	FOU-1.9	88.6	0.01	Class 9b school	2349	0	2349	a	1.000	PASS
Level 1	FOU-1.3	108.2	9.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 1	POU-1.5	92.1	0.01	Class 9b school	2349	0	2349	a	1.000	PASS
Level 1	POU-1.7	115.0	0.02	Class 9b school	2349	19	2330	a	0.992	PASS
Level 1	PCU-1.6	90.9	0.01	Class 9b school	2349	0	2349	0	1.000	PASS
Level 1	FCU-18	115.7	0.02	Class 96 school	2349	19	2330	a	0.992	PASS
Level 3	FOU-5.3	108.3	9.02	Class 96 school	2349	ñ	2349	0	1.000	PASS
Level 3	FOUR12	133.2	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
						0		-		
Lovel 3	F0U-3.2	112.3	0.02	Class 9b school	2349	D	2349	a	1.000	PASS
Level 3	POU-3.11	135.3	0.02	Class 9b school	2349	D	2349	a	1.000	PASS
Level 3	PCU-3.14	38.9	0.01	Class 9b school	2349	D	2349	a	1.000	PASS
Level 3	FOU-3.1	91.0	0.01	Class 9b school	2349	D	2349	a	1.000	PA58
Level 3	FCU-3.9	101.9	9.02	Class 9b school	2349	1	2348	0	1.000	PA58
Level 3	FCU-3.8	118.1	0.02	Class 9b school	2349	0	2349	0	1,000	PAS8
Level 3	FCU-8.10	132.5	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Lovel 3	FOU-3.5	118.5	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 3	FCU-3.13	133.9	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 3	PCU-3.4	107.5	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 3	FCU-3.6	84.0	0.01	Class 9b school	2349	1	2348	a	1.000	PASS
Level 3	FOU-8.7	84.0	0.01	Class 9b school	2349	1	2348	0	1.000	PASS.
Level 2	FCI32.14	37.7	0.01	Class 9b school	2349	0	2349	ů.	1.000	PASS
Level 2	POU-2:1	91.0	0.01	Class 9b school	2349	0	2349	9	1.000	PASS
Level 2	POU-2.9	101.9	0.02	Class to school	2349	0	2349	9 0	1.000	PASS
					2349			0		PASS
Lovel 2	POU-2:11	143.6	0.02	Class 9b school		D	2349	-	1.000	
Lovel 2	POU-2.2	112.3	0.02	Class 9b school	2349	D	2349	a	1.000	PASS
Level 2	POU-2.3	109.3	9.02	Class 9b school	2340	D	2342	a	1.990	PASS
Level 2	FCU-2.12	141.5	0.02	Class 96 school	2349	0	2349	0	1.000	PAS8
Level 2	F0U-2.7	84.0	0.01	Class 9b school	2349	0	2349	0	1.000	PAS8
Level 2	FCU-2.8	102.2	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Lovel 2	PCU-2:10	140.2	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Lovel 2	POU-2.6	84.0	0.01	Class 9b school	2349	D	2349	a	1.000	PASS
Level 2	POU-2.5	102.5	0.02	Class 9b school	2349	D	2342	a	1.000	PASS
Level 2	FOU-2.18	141.5	9.02	Class 96 school	2349	0	2349	a	1.000	PAS8
Level 2	F0J-2.4	107.5	9.02	Class 9b scheel	2349	0	2349	0	1.000	PASS
Level 4	POUH4.3	163.4	0.02	Class 9b school	2349	0	2349	0	1.000	PASS
Level 4	FCU-4.4	147.6	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Level 4	F0U-4.12	38.9	0.01	Class 9b school	2349	12	2337	0	0.995	PASS
Lavel 4	FOUA1	91.0	0.01	Class 9b school	2349	12	2337	a	0.925	PASS
Level 4	P0043	116.5	0.02	Class 9b school	2349	12 D	2349	0	1.000	PA55
Level 4	P0U42	102.2	0.02	Class 9b school	2349	0	2349	0	1.000	PA58
Level 4	FCU-4.8	113.6	0.02	Class 9b school	2349	0	2349	0	1.000	PAS8
Level 4	FOUH4.11	114.5	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
	F0UH4:10	113.9	0.02	Class 9b school	2349	0	2349	a	1.000	PASS
Lovel 4										
Lovel 4 Lovel 4	F0U-4.7	113.7	0.02	Class 9b school	2349	15	2334	a	0.234	PASS
	PCU-4.7 PCU-4.6	113.7	0.02	Class 9b school Class 9b school	2349 2349	15 D	2234 2349	a a	0.994	PASS PASS

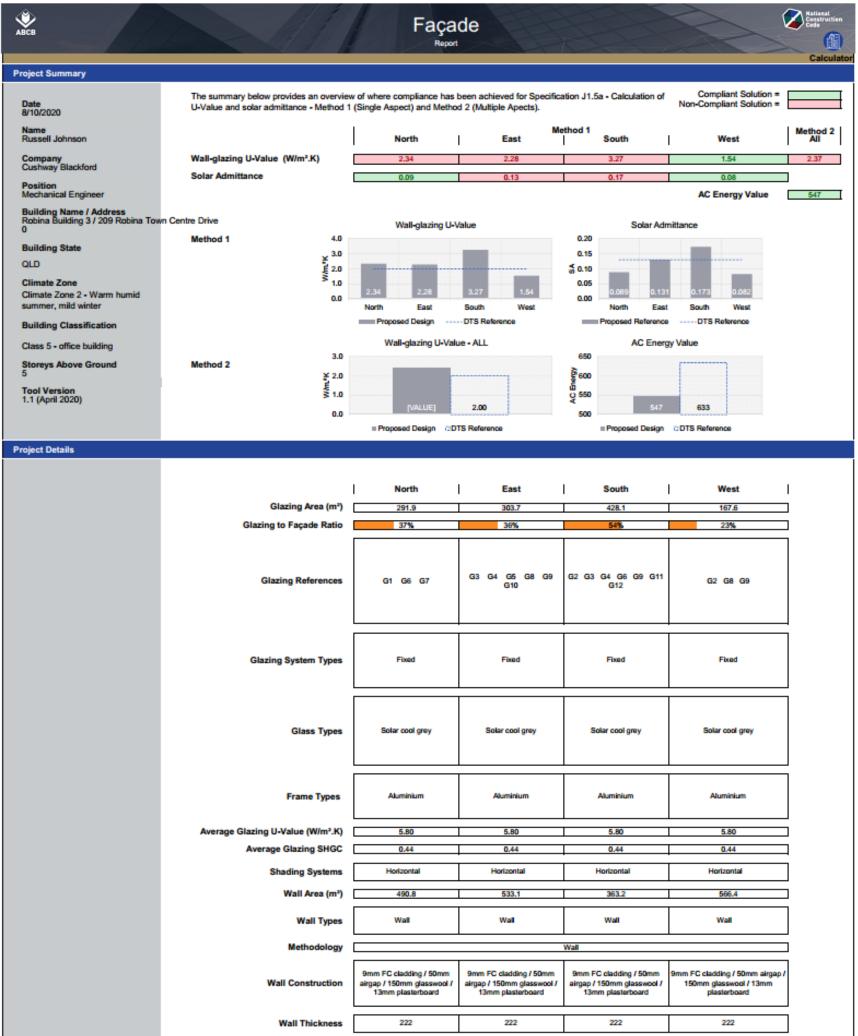
Appendix B) Wall and Glazing Calculator Output Façade

ÅBCB			User Input		açade ing Areas + Results Inguis Required	User Dropdown		Calculator
Results	<u>=</u>				Class 5 - office building		Climate Zone 2 - Warm humid summer,	mild winter
			Method 1				Method 2	
	Wall-glazing U-Valu			Solar Admittance		Wall-glazing U-Value - ALL	AC Energy	Value
4.0			0.200		3.00		1000	
¥ 3.0 1.0	•		0.150		ž 2.00		000 B	······
₹20	0		 \$ 0.100 0.050				U U	
0.0	0 254 228	3.27 1.54	0.000		0.002	2.37 2.00	4 547	633
		South West DTS Reference	No	rth East South opcosed Design DTS I	West Reference	Proposed Design CDTS Reference	e = Proposed Design	DTS Reference
Wall Gla	zing Area							
							Compliant Solution = Non-Compliant Solution =	
	1							
North	Glazing Reference	Height (m)	Width (m)	Glazing Area (m [#])	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m ^e)
1	G1			35.8	S1	A7	490.8	527
2	C 8			151.5	85			152
3	G7			104.6	36			105
4								0
5								Û
÷ •								Û
			Result	Target				
	Wall-glazing U-V		2.34	2.00	Glazing Area (m*)	291.9	Average Glazing U-Value (W/m*.K)	5.80
	50	lar Admittance	0.089	0.130	Wall Area (m [*]) Glazing to Façade Ratio	490.8	Average Glazing SHGC Average Wall R-Value (m*.K/W)	0.44
East	Glazing Reference	Height (m)	Width (m)	Glazing Area (m [#])	Shading Reference	Wall Reference	Wall Area (m ^a)	Total Area (m [#])
1	63			4.3	83	A7	533.1	537
2	64			42.7				43
3	65			43.5	84			44
4	C8			85.2	87			85
5	00			119.9	810			120
6	G10			8.1	89			8
			Result	Target				
÷.	Wall-glazing U-V		2.28	2.00	Glazing Area (m*)	303.7	Average Glazing U-Value (W/m*.K)	5.80
	50	lar Admittance	0.131	0.130	Wall Area (m ^a) Glazing to Façade Ratio	533.1	Average Glazing SHGC Average Wall R-Value (m ^s .K/W)	0.44
South	Glazing Reference	Height (m)	Width (m)	Glazing Area (m*)	Shading Reference	Wall Reference	Wall Area (m ^a)	Total Area (m ^a)
1	62			12.2	\$2	A7	363.2	375
2	63			56.6	83			57
3	64			35.4				
4	68							35
5				94.5	\$5			95
6	09			153.9	812			95 154
-	G11			153.9 27.5	812 89			95 154 28
7				153.9	812			95 154 28 48
7	G11			153.9 27.5	812 89			95 154 28 48 0
7 8 9	G11			153.9 27.5	812 89			95 154 28 48 0
10	G11			153.9 27.5	812 89			95 154 28 48 0 0
10 11	G11			153.9 27.5	812 89			95 154 28 48 0 0 0 0
10 11 12	G11			153.9 27.5	812 89			95 154 28 48 0 0 0 0 0 0
10 11 12 13	G11			153.9 27.5	812 89			95 154 28 48 0 0 0 0 0 0 0 0
10 11 12 13 14	G11			153.9 27.5	812 89			95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15	G11			153.9 27.5	812 89			95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14			Result	153.9 27.5 48	S12 S9 S11			95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16	G11 G12 G	l	3.27	153.9 27.5 48	S12 S9 S11 S11 Glazing Area (m ^s)		Average Glazing U-Value (W/m [*] .K)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15	G11 G12 G	lar Admittance		153.9 27.5 48	S12 S9 S11	428.1 428.2 545	Average Glazing U-Value (W/m ^s .K) Average Glazing SHGC Average Wall R-Value (m ^s .KW)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16	G11 G12 CONTRACTOR CONTRACTOR CONTECTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONT	lar Admittance	3.27 0.173	153.9 27.5 48 	S12 S9 S11 Glazing Area (m ⁹) Glazing to Façade Ratio	363.2 54%	Average Glazing SHGC Average Wall R-Value (m*.K/W)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16	G11 G12 G12 G12 Glazing Reference	alue (Wim ^s .K)	3.27	153.9 27.5 48 	S12 S9 S11 Glazing Area (m ⁴) Wall Area (m ⁴)	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16	G11 G12 G12 Wali-glazing U-V Sol Glazing Reference G2	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5	S12 S9 S11 Glazing Area (m ⁴) Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 54%	Average Glazing SHGC Average Wall R-Value (m*.K/W)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West	G11 G12 G12 Wali-glazing U-V Sol Glazing Reference G2	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5	S12 S9 S11 Glazing Area (m ⁴) Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 5.80 0.44 3.58 Total Area (m*) 581 85 68 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 West 1 2	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 •••••••••••••••••••••••••••••••••	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 •••••••••••••••••••••••••••••••••	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0
10 11 12 13 14 15 16 •••••••••••••••••••••••••••••••••	G11 G12 G12 U Wall-glazing U-V Sol Glazing Reference G2 G8	lar Admittance	3.27 0.173	153.9 27.5 48 Target 2.00 0.130 Glazing Area (m ⁴) 14.5 85.3	S12 S9 S11 Glazing Area (m ⁴) Glazing to Façade Ratio Shading Reference	363.2 545 Wall Reference	Average Glazing SHGC Average Wall R-Value (m*.K/W) Wall Area (m*)	95 154 28 48 0 0 0 0 0 0 0 0 0 0 0 0 0

14								Û
15								Û
16								Ó
			Result	Target				
_	Wall-glazing U-V		1.54	2.00	Glazing Area (m ^a)	167.6	Average Glazing U-Value (W/m*.K)	5.80
÷	50	lar Admittance	0.082	0.130	Wall Area (m*)	568.4	Average Glazing SHGC Average Wall R-Value (m*.K/W)	0.44
					Glazing to Façade Ratio	237	Average wail R-value (m-R/W)	330
Referen	nce Building							
	Include shading?	As Proposed	0					
	Glazing to Facade Ratio	Wall U-Value		Shading Multiplier	SHGC	Wall U-Value (W/m*.K)	Method 2 Glazing U-Value (W/m*.K)	SHGC
North	37%	(W/m*.K) 0.28	(Wîm*.K) 4.89	0.543	0.64	0.28	4.82	0.51
East	36%	0.28	5.02	0.819	0.44			
		0.28	3.46	0.727	0.33			
South	54%			0.721				
West	23%	0.28	5.80	0.818	0.70			

11

Proj. 078-74



Average Wall R-value (m ² .K/W)	3.58	3.58	3.58	3.58
Solar Absorptance	0.0 0.05 0.5 0.7	00.0050503		
Solar Absorptance	0.6 0.65 0.5 0.7	0.6 0.65 0.5 0.7	0.6 0.65 0.5 0.7	0.6 0.65 0.5 0.7

12



Knisco Reference No: 206390

4 July 2022

Document Register/Transmittal

RE: FORM 11 – CERTIFICATE OF OCCUPANCY

Please find attached the Form 11 – Certificate of Occupancy for the completed building works for the project described below.

PROJECT DESCRIPTION:				
Project Name: TAFE QLD Robina				
Site Address:	209 Robina Town Centre Drive			
	(also known as 94 Laver Drive)			
	Robina QLD 4226			
Real Property Description:	Lot 2 on SP309298			
	(also known as Lot 3 on SP309357)			
Local Government Area: Gold Coast City Council				
Applicant Name:	TAFE Queensland (Simon Pritchard)			

Please find attached the following documents:

- Form 11 Certificate of Occupancy
- QFES compliant inspection / testing report for Special Fire Services
- Installation / Inspection certificates (Form 12), and other applicable documentation relied upon
- A list of fire safety installations applicable to the building

Occupation of Building / Building Owners Responsibility

The following matters apply to the use and/or occupation of the building:

- 1. The building owner must ensure the Form 11 Certificate of Occupancy is displayed as near as practical to the building's main entrance as required by Section 108A of the Queensland Building Act 1975.
- 2. Fire Safety Systems for the building must be maintained in accordance with relevant statutory legislation and applicable Australian Standards. Fire Safety Systems to the building may include:

KNISCO

Structural features

- Fire dampers
- Fire doors
- Penetrations through fire-rated construction
- Structural fire protection
- Systems required to have a fire-resistance level

Fire protection system

- Fire detection and alarm systems
- Sprinklers
- Stairwell pressurisation systems

Firefighting equipment

- Portable fire extinguishers
- Fire hose reels
- Fire hydrant system including booster pump

Occupant safety features

- Emergency lighting
- Exit door hardware
- Exit signs
- Fire doors

If you have any queries, please do not hesitate to contact Knisco on (07) 3852 2080.

Form 11 Certificate/Interim Certificate of Occupancy



A Form 11 must be completed to fulfil the requirements prescribed in section 102(2) and 103 of the *Building Act 1975* for a Certificate of Occupancy.

A Form 11 must also be completed to fulfil the requirements prescribed in section 104 of the *Building Act* 1975 for an Interim Certificate of Occupancy.

1. Type of certificate Indicate the type of Certificate of Occupancy being issued.	Certificate of Occupancy
Interim Certificate: Issued pending the carrying out of the inspection, when due to a building's location, it is not practicable for a building certifier to inspect a building to decide if it has been substantially completed.	Date Interim Certificate of Classification will expire <i>(if applicable)</i>
2. Owner details	Name (natural person or company)

Z. Owner details	Name (natural person or company)
If the applicant is a company, a contact person must be shown	Alceon Group No 27 Pty Ltd as Trustee for the Acuity Business Park Trust

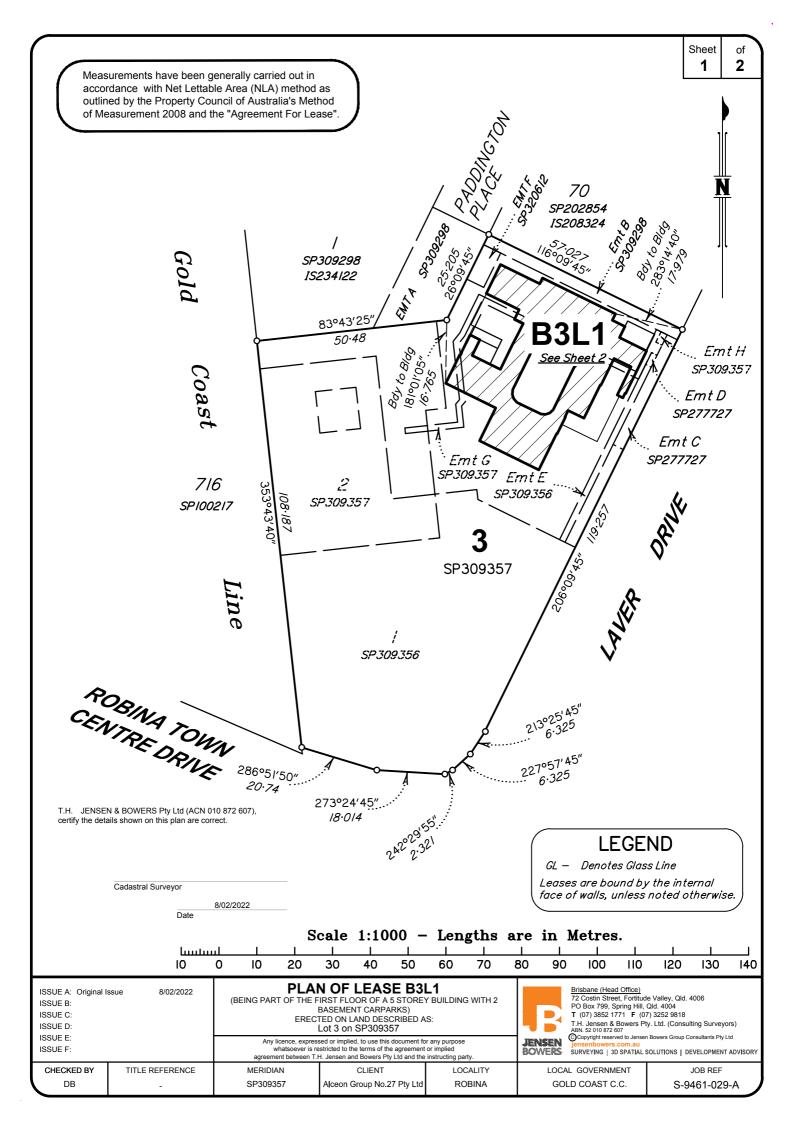
3. Property description	Street address (include number, street, suburb/locality and postcode)			
The description must identify all land the subject of the application.	209 Robina Town Centre	Drive (also known as 94 Lav	er Drive)	
The lot and plan details (e.g. SP/RP)	Robina	State: 0	QLD Postcode: 4226	
are shown on title documents or a	Lot and plan details (attach	list if necessary)		
rates notice.	Lot 2 on SP309298 (also known as Lot 3 on SP309357)			
If the plan is not registered by title, provide previous lot and plan details.	Local government area the I	and is situated in		
	Gold Coast City Council			

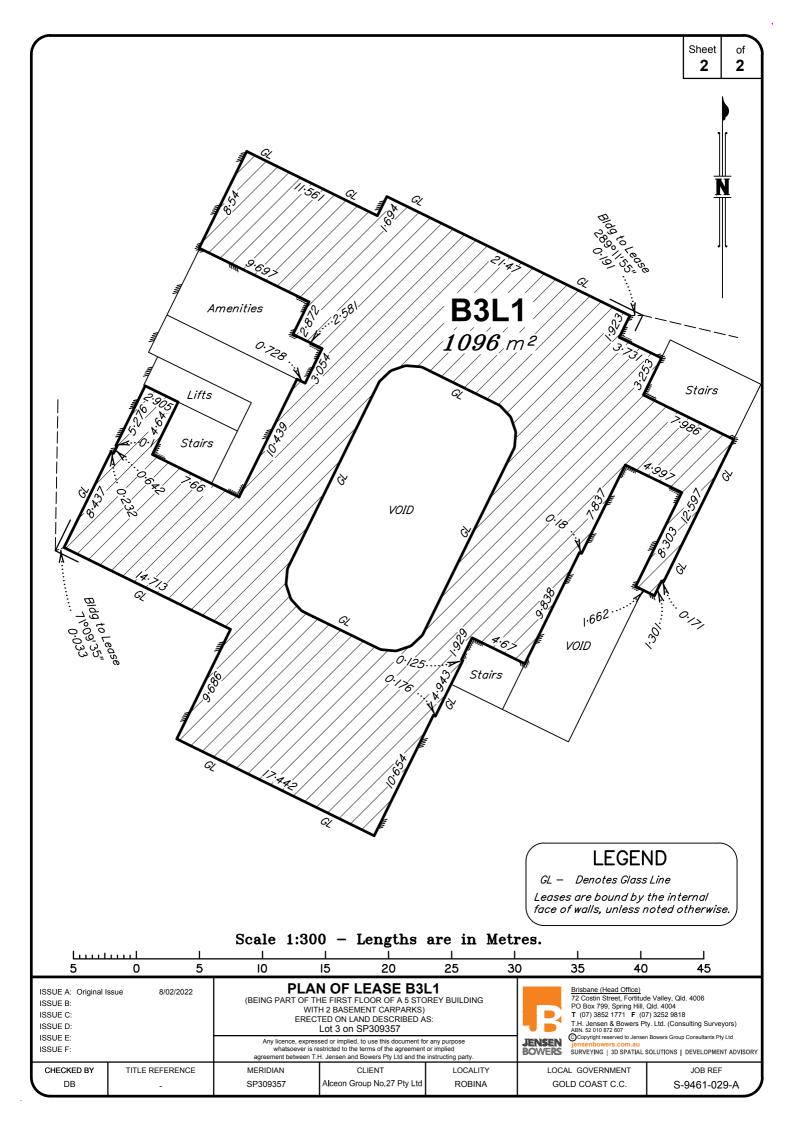
4. Classification	Part of building/description	Class of building/part
The building or part thereof described is classified as follows in accordance with Part A6 of the Building Code of Australia having regard to the use for which it was designed, built or	Educational Fitout of Ground Level to Level 4 Only	Class 9b
adapted. If a part of the building is classified differently to another part, state the part to which each		
classification relates.		

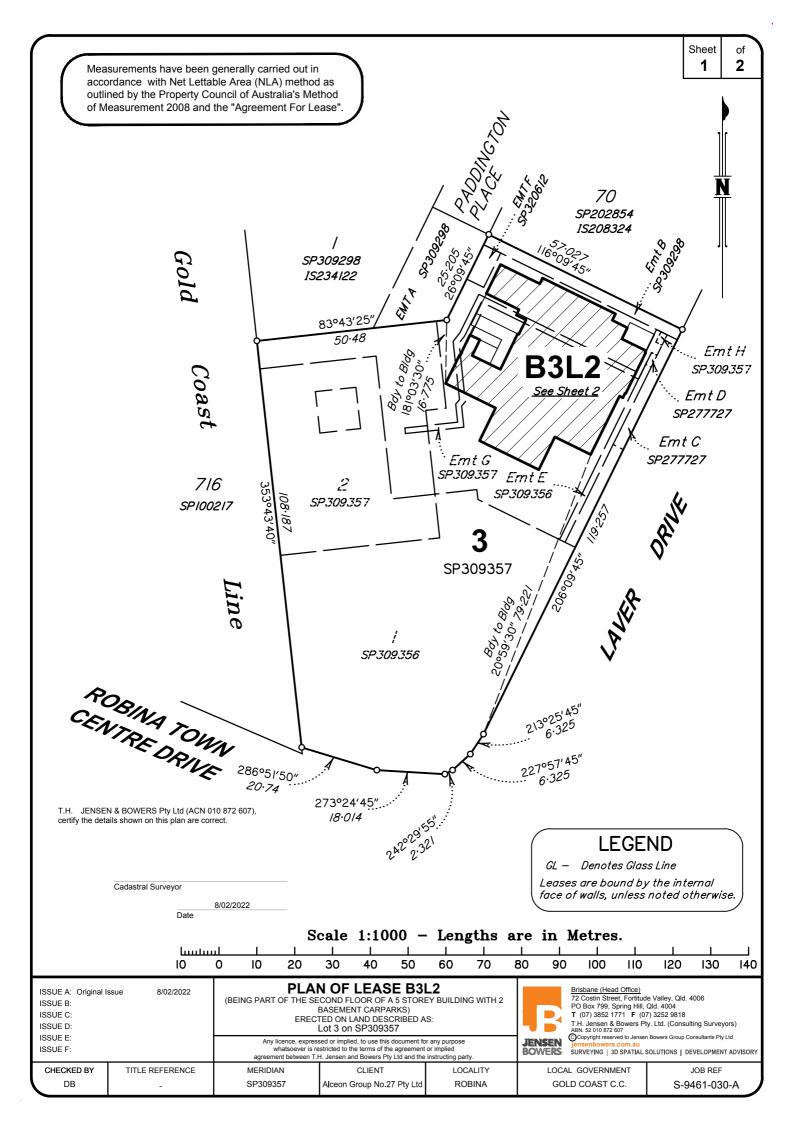
5. Maximum number of people	Maximum population	Part of building
permitted If applicable, state the maximum number of people permitted in the building and the portion it applies to.	As per the deemed-to-satisfy provisions of the National Construction Code Volume 1 – Building Code of Australia and as per DA Condition 4 (608 students and 89 staff).	Ground Level to Level 4

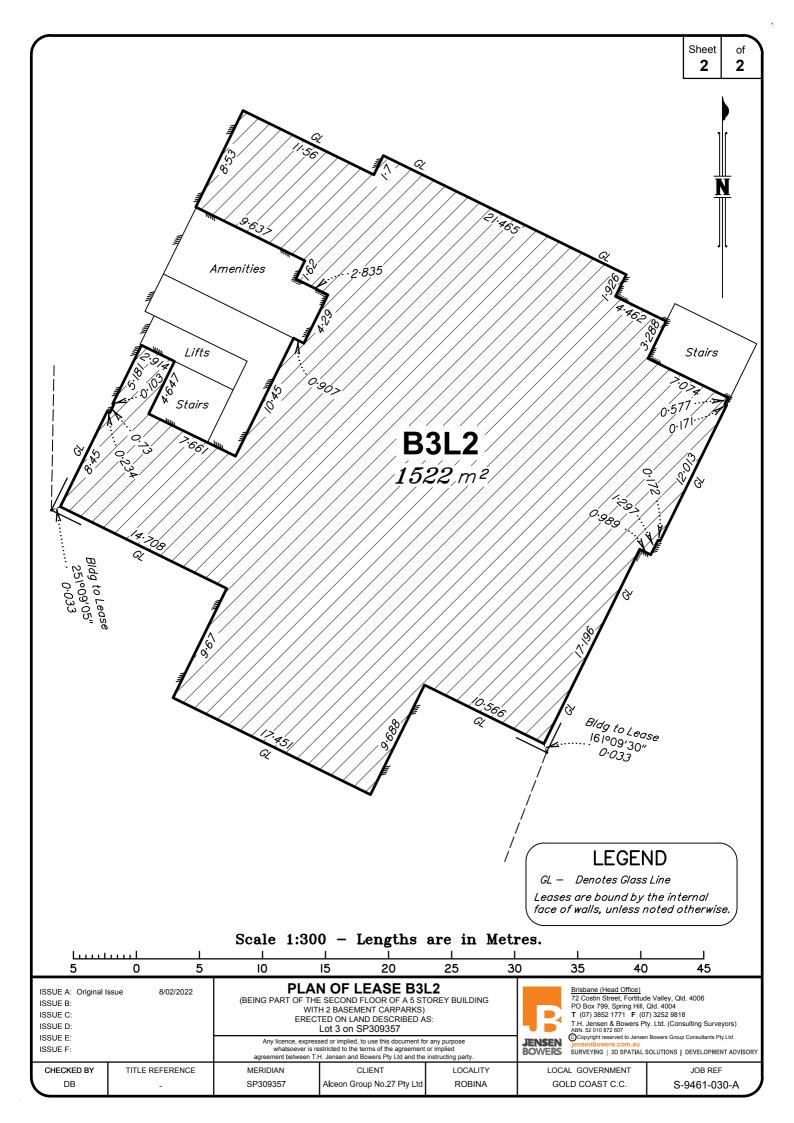
6. Restriction on the use or	Restrictions			
occupation of the building	The following restrictions apply to the use or occupation of the building:			
If the building work uses a performance solution and or a deem- to-satisfy solution within the meaning of the Building Code of Australia or the Queensland Development Code, restricting the use or occupation of the building, state the restriction.	A subsequent Form 11 Certificate of Occupancy will be required to cover the installation of the operable walls on Level 4 and any new balustrade panels once installed. NOTE: The installation of the wallpaper within the fire stairs and fitout corridors is not part of this Building Approval and Certificate of Occupancy reference number 206390.			
For example, a limitation on the use of finishes with the fire hazard properties as defined under the Building Code of Australia				
7. Performance solutions	Performance solution requirements			
If the building work uses a performance solution and or a deem-	The following systems and procedures form pa	part of the performance solution:		
to-satisfy solution within the meaning of the Building Code of Australia or the Queensland Development Code, restricting the use or occupation of the building, state the restriction.	This portion of the building is subject to a Pe Performance Requirement of the Building Co Report reference 21-1-4FQ96 Revision 1 da Engineers relates to the following:	code of Australia. Fire Engineering Assessment		
For example, a limitation on the use	Description	DTS Clause Performance Requirement		
of finishes with the fire hazard properties as defined under the Building Code of Australia	Extended travel up to 21m to a point of choice for egress from the utility room within the Beauty Room 2 on Level 1 in lieu of the required 20m.	D1.4 DP4, EP2.2		
	Extended travel up to 23m to a point of choice for egress from the training Kitchen 2 on Level 4 in lieu of the required 20m.	D1.4 DP4, EP2.2		
	 The ongoing management of the building is to take under consideration the conditions forming part of the following Development Permit for Building Works: Knisco Development Solutions (Stage 1) – reference 206390 dated 09 November 2021; Knisco Development Solutions (Stage 2) – reference 206390 dated 22 February 2022; and Knisco Development Solutions (Stage 3) – reference 206390 dated 22 June 2022. Any modification to the building must take into consideration these conditions / recommendations. Advice from a suitably qualified fire safety engineer may be required to determine building code compliance is maintained. 			
8. Building certifier	Name of building certifier (in full)	Licence number		
If the building certifier is a company, a contact person must be shown.	Knisco Development Solutions Pty Ltd	A707057		

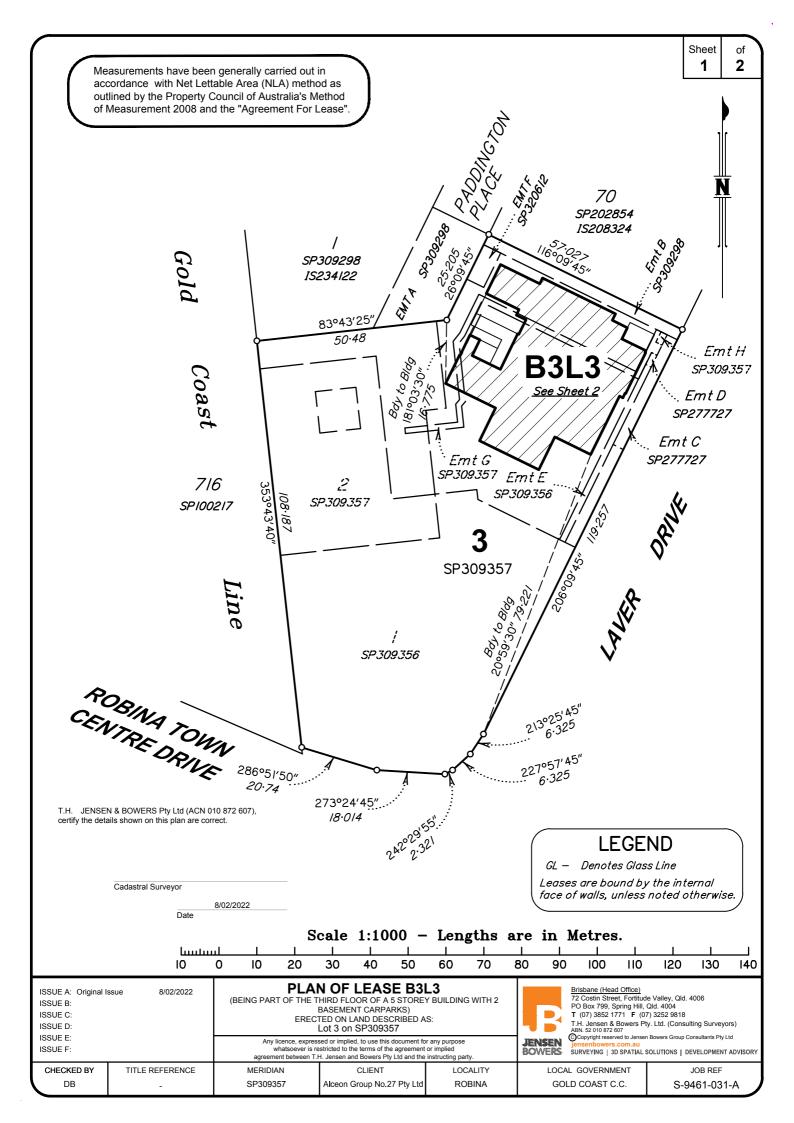
If the building certifier is a company, a contact person must be shown.	Knisco Development Solutions Pty Ltd (Cameron McLean)		A707057
	Signature	Date	Building Approval Reference Number
	M	4/07/2022	206390

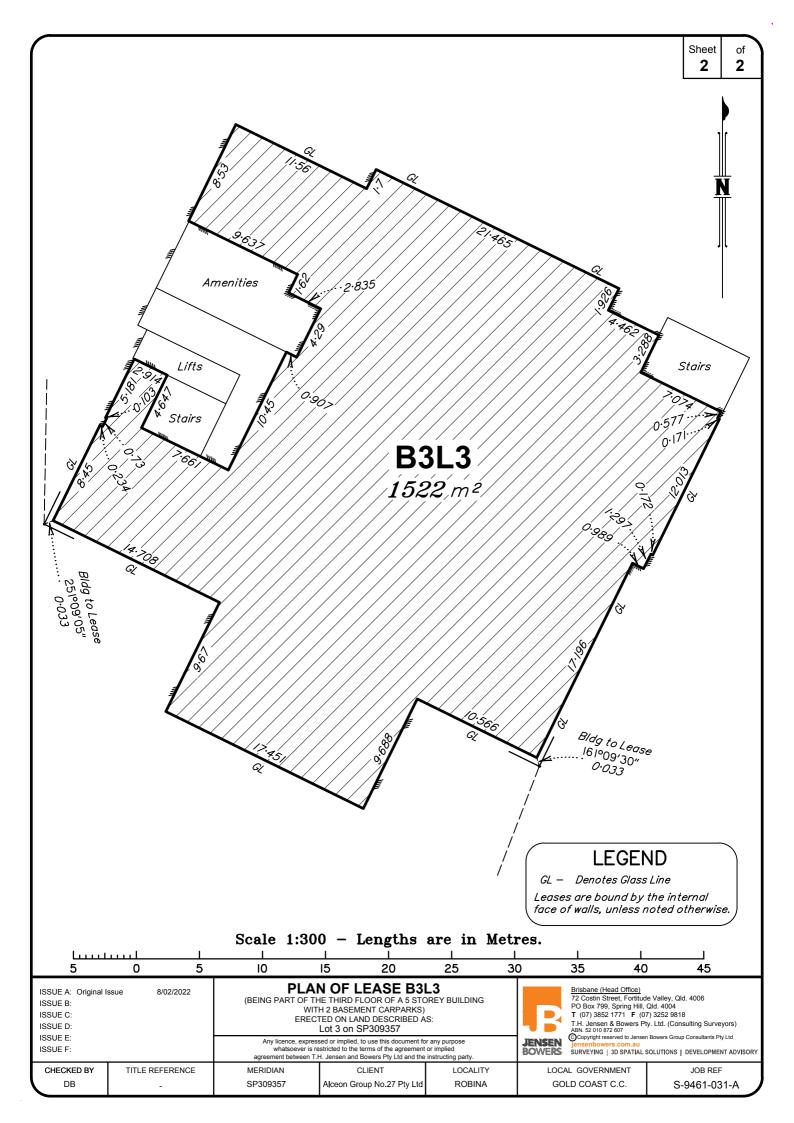


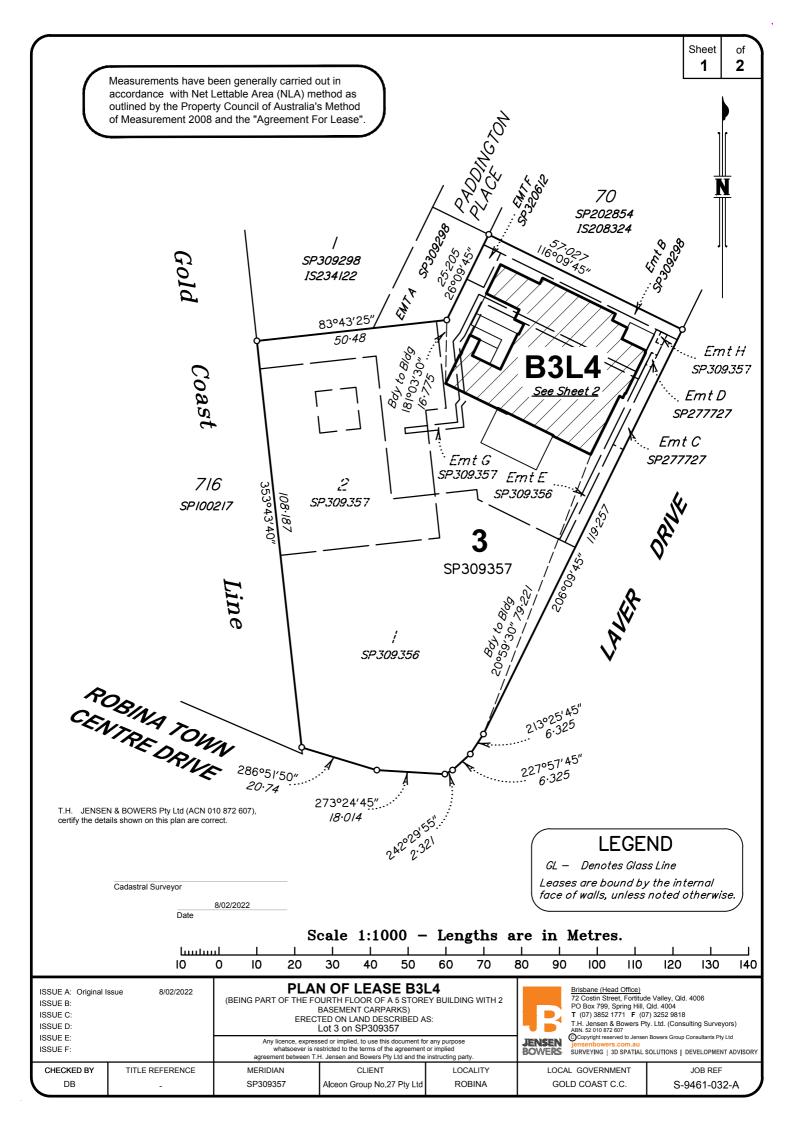


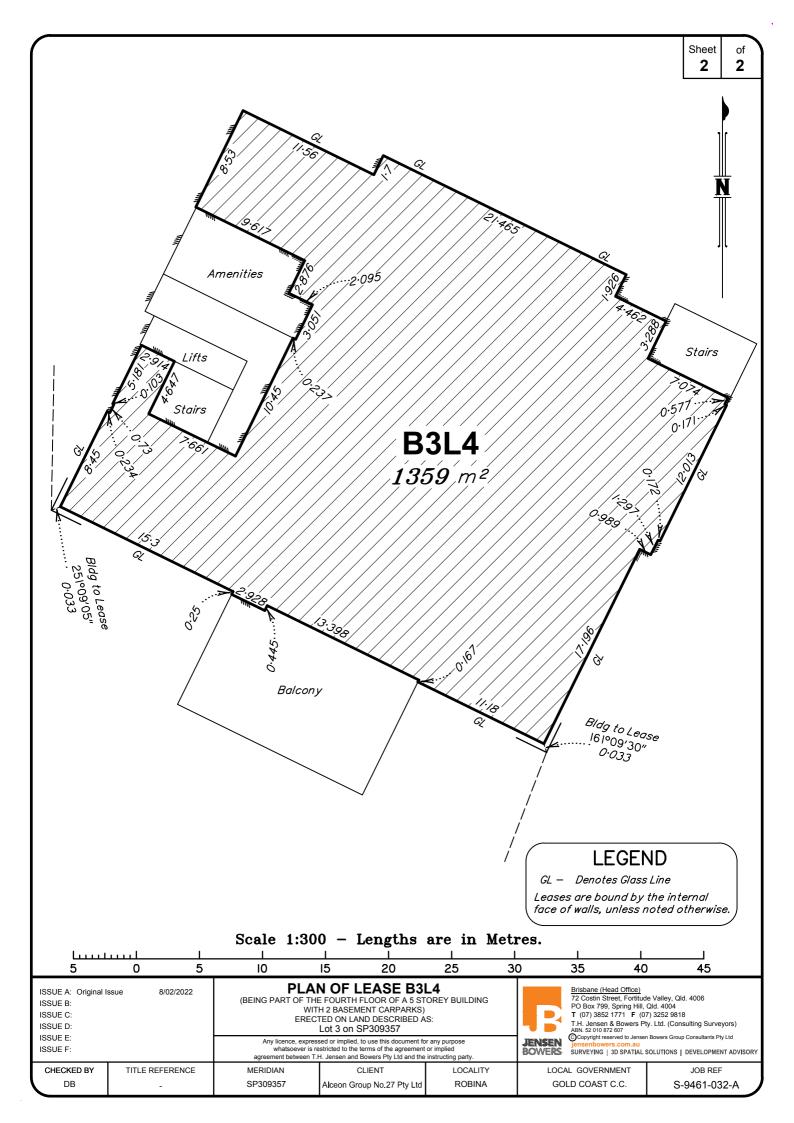


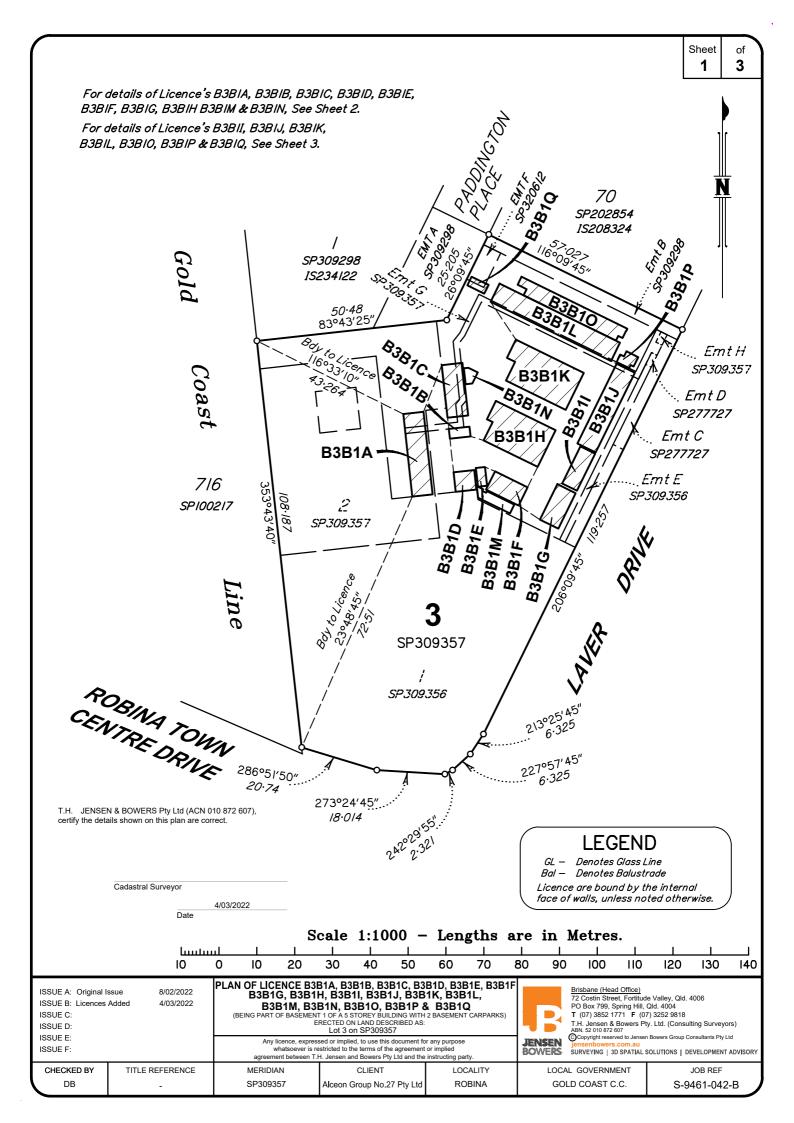












Sheet of 2

