NCC BCA Section J Energy Efficiency J1V3 – Verification Using a Reference Building Compliance Report.

394 Gooda Creek Road, Murrumbateman NSW, Yass Valley Council, Australia, 2582

Project Address: 394 Gooda Creek Road, Murrumbateman NSW, Yass Valley Council, Australia, 2582,

PROJECT NO: 2331

Project Client: Chris Heyward

Prepared By: Powerhaus Engineering

Date of Report: 19/05/2025

Conclusion

The proposed class 9B Building has been shown to comply to NCC 2022 Volume 1 – Section J for Energy Efficiency through performance solution (building fabric) using **J1V3 – Verification using a reference building** the remaining applicable requirements need to be designed and built in accordance with the legislation and standards referenced in this report. This report is limited to Section J of the building code and additional requirements apply not covered in this report.

Prepared by - Powerhaus Engineering

Andrew Pickard

Director

B.Eng (Mech) (Hons) B.Sc.

ACT Building Assessor

(Class A - Energy Efficiency), Lic no 2013432

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Disclaimer

The analysis results are based on specific criteria outlined in the NCC (National Construction Code) and are not a true representation of the building's actual operation. These criteria are intended to allow comparison between the estimated annual energy consumption of a proposed building and that of a reference building, thereby assessing the building's potential for energy efficiency.

Additional requirements, including Specification 33, also apply to this building. This report does not address other aspects of the building code, such as Structural and Health & Amenity considerations. Compliance with these and other elements is not implied or provided in this report. For advice on these additional requirements, please consult relevant experts.

Definition of terms

Complies – indicates the documents as assessed, demonstrate compliance has been achieved with the documented design.

Envelope – The building envelope, for the purpose of section J, is defined as the building's fabric that separates 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 car park or warehouse; and

iii) The common wall with a car park or warehouse or the like, other than a non-conditioned space through which conditioned air is being exhausted or relieved such as an internal corridor, cleaner's room, chemical storage room or exhaust riser.

Deemed-To-Satisfy – means provisions which are deemed to satisfy the Performance Requirements. The performance requirements, for the purpose of section J, are the performance values and descriptions that are outlined within each of the applicable clauses and associated specifications within section J.

1. Building elements that do not form part of the building envelope and which are not required to meet the performance requirements of Section J cannot be used in the assessment. For example, façade areas of non-conditioned space are not included in Wall-Glazing Construction performance assessment.

The building thermal specifications within this report apply to the prospective future conditioned areas of the buildings only. If there are no conditioned areas, the specifications do not apply.

This report/energy analysis should be read in conjunction with all relevant plans and specifications and any supplementary regulatory information as nominated further within the body of this report. As a further guide to the building thermal performance requirements, the architect is required to incorporate NCC 2022 Section J prescriptive requirements (where applicable).

1 Introduction

1.1 Intention of Section J of the NCC

This report applies specifically to the proposed building design and sets out the proposed design parameters by which the building will demonstrate design compliance with National Construction Code (NCC) Section J – Energy Efficiency provisions. Compliance is achieved by adhering to:

- The Governing Requirements of the NCC
- The Performance Requirements

We understand that the project aims to meet the Performance Requirements set out in Section J Energy Efficiency – JP1 Energy Use by:

1. Confirming compliance with Section J of the NCC 2022 via a Performance Solution, Deemed-to-Satisfy Solution, or a combination of both.
2. Demonstrating that the Performance Solution complies with the relevant Performance Requirements through a Verification Method provided in the NCC. This project uses the alternative verification method for building fabric assessment: J1V3 – Verification using a reference building.
3. Ensuring that in addition to the modelling requirements of J1V3, the building complies with the Specification 33/34 – Additional Requirements.

1.2 Performance requirements

Performance requirements are categorised into four segments:

J1P1 - Energy Use

A building, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, including its services, must have features that facilitate the efficient use of energy appropriate to:

- The function and use of the building
- The level of human comfort required for the building use
- Solar radiation being:
    - Utilised for heating
    - Controlled to minimize energy for cooling
- The energy source of the services
- The sealing of the building envelope against air leakage
- For a conditioned space, achieving an hourly regulated energy consumption, averaged over the annual hours of operation, of not more than:
    - For a Class 9B building, 80 kJ/m².hr
    - For a Class 5, 7b, 8 or 9a building other than a ward area, or a Class 9b school, 43 kJ/m².hr
    - For all other building classifications, 15 kJ/m².hr

J1P2 - Thermal Performance of a Sole-Occupancy Unit of a Class 2 Building or a Class 4 Part of a Building - not applicable.

J1P3 - Energy Usage of a Sole Occupancy Unit of a Class 2 Building or a Class 4 Part of a Building - not applicable.

J1P4 - Renewable Energy and Electric Vehicle Charging

A building must have features that facilitate the future installation of on-site renewable energy generation and storage and electric vehicle charging equipment.

1.3 Verification J1V3 - Verification using a reference building

(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:

- 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:
    - The proposed building is modelled with the proposed services
    - The proposed building is modelled with the same services as the reference building
    - 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
    - The building complies with the additional requirements in Specification 33

(2) The annual greenhouse gas emissions of the proposed building may be offset by:

- Renewable energy generated and used on site
- Another process such as reclaimed energy, used on site

(3) The calculation method used for (1) and (2) must comply with:

- ANSI/ASHRAE Standard 140
- Specification 34 (See Appendix)

J1V3 Modelling Process

Alternative Verification Method J1V3 (Verification using a reference building) is an alternative method of design compliance when proposed building designs prevent compliance with the descriptive deemed-to-satisfy provisions. In accordance with the alternative verification method J1V3, a design is deemed to be compliant with the provisions of Section J when it is determined that the estimated annual energy consumption of a proposed building with its services is not more than that of the estimated annual energy consumption of a reference building when:

- The proposed building is modelled with the proposed services
- The proposed building is modelled with the same services as the reference building

In accordance with the alternative verification methodology, modelling must be performed using the same software for each scenario. This report utilizes EnergyPlus™ (version 9.2.0+), a whole-building Building Energy Modelling engine (BEM), for all simulation modelling. Inputs are based on the above criteria and an analysis undertaken using the J1V3 verification method, to demonstrate NCC 2022 compliance. EnergyPlus™ complies with the requirements for simulation software set out in Clause J1V3(3).

2 Project information

2.1 Scope

The scope of this project is to assess Section J requirements for the proposed works to 394 Gooda Creek Road, Murrumbateman NSW, Yass Valley Council, Australia, 2582

2.2 Project details

Project name	394 Gooda Creek Road, Murrumbateman NSW, Yass Valley Council, Australia, 2582
Drawing number reference	PROJECT NO: 2331
Client	Chris Heyward
Site address	394 Gooda Creek Road, Murrumbateman NSW, Yass Valley Council, Australia, 2582
Building class and use	Class 9B
Applicable BCA	NCC_2022_Volume_One
Climate zone	NCC Climate Zone 6
Performance Requirements	J1P1 NCC 2022
Assessment process	J1V3 Verification using a reference building
Software for analysis	Speckel (Energy Plus)

3. J1V3 Energy Modelling

3.1 Requirements

Refer to Verification J1V3 Verification using a reference building definition of the J1V3 modelling process requirements.

3.2 Calculation Inputs

Standard modelling parameters and profiles used as per Specification 34 Modelling parameters for J1V3 – Refer to the Appendix

3.3 Modelling and Standard Inputs

Energy plus provides various calculations in line with the NCC Code 2019 - V1 – Section J Energy Efficiency. These calculations represent an accurate Performance Solution against the Performance Requirements – JP1 Energy Use. A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of assessment methods.

The standard inputs are kept constant throughout all energy models based on NCC Specification JV simulation requirements (JVb Modelling parameters and JVc Modelling Profiles, refer to Appendix).

3.4 Specification J1V3 – Modelling Parameters

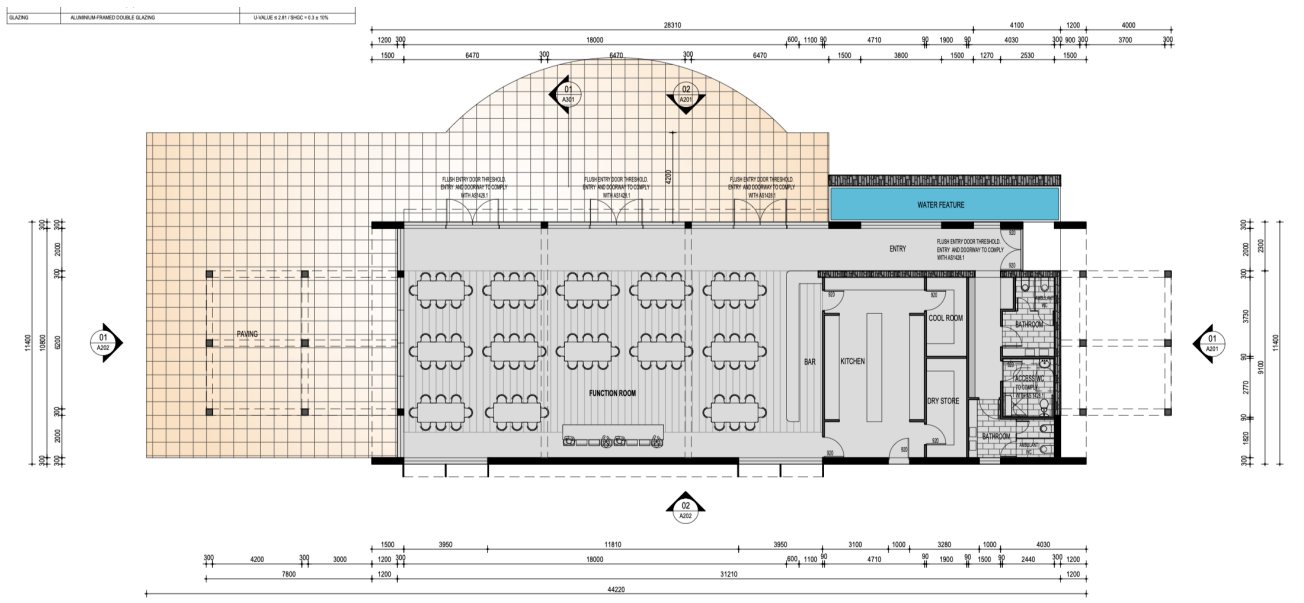
This specification within the NCC contains the required modelling profiles as referenced in subclause 3(c)(vii) of Specification J1V3 (refer to **Specification 34 Modelling parameters for J1V3** NCC 2022 in the appendix).

3.5 Energy Usage Summary

The proposed class 9B building –has been shown to comply to NCC 2022 Volume 1 – Section J for Energy Efficiency by assessment (building fabric) using **J1V3 – Verification using a reference building**. The proposed building has been shown to meet the performance requirements of JP1 using a performance method model created utilising the *EnergyPlus™ (Ver9.2.0+)* BEM calculation engine. The simulated annual energy demand for the proposed building is less the deemed-to-satisfy reference building.

3.6 Drawings

Figure 1: Proposed Floor Plan



3.7 Building Details

This report is valid if the proposed building is constructed with the minimum values as show below.

Building Element	Construction Details	Thermal PerformanceR Value
Roof / Ceiling	Metal sheeting + R1.3 blanket + air gap + Class 4 vapour permeable membrane + R4 timber framing	R 5.51
External Walls	Metal cladding + air gap + Class 4 vapour permeable membrane + 10mm thermal break strips + R2.5 in metal stud + plasterboard	R 2.02
Internal Walls	Plasterboard + metal stud + R2.0 + plasterboard	R 2.4
Floors	Concrete slab + 30mm (R1) XPS to underside	R 2.09
Glazing	Aluminium-framed double glazing	U-value ≤ 2.81 / SHGC = 0.3 ± 10%

Walls

Total System R-values of all walls include the effects of thermal bridging, which are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (J1.2 Thermal construction — General (e)) or are stated values.

For the purpose of the Reference Building, the wall total system R-value of the wallglazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification and J1.5a Calculation of U-Value and solar admittance.

Windows

Total system U-values of all windows include the effects of thermal bridging at the frame, which are calculated in accordance with ISO 15099, as per J1.2 Thermal Construction — General (e).

For the purpose of the Reference Building, the glazing total system U-value and solar admittance of the wall-glazing construction has been calculated in accordance with J1.5 Walls and Glazing and Specification J1.5a Calculation of U-Value and solar admittance.

Floors

Total system R-values of all floors include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2, NZ 4214:2006 and Section 3.5 of CIBSE Guide A (J1.2 Thermal construction — general (e)) or are stated values

For the purpose of the Reference Building, the floor total system R-value has been assumed in accordance with J1.6 Floors.

All elements to be designed and constructed in accordance with:

- Part J4 Building Fabric
- Building Sealing Part J5 – As applicable
- Other relevant elements of the NCC

J5D3 Chimneys and flues – Must be designed and constructed inline with DTS requirements

J5D4 Roof lights - – Must be designed constructed inline with DTS requirements

J5D5 Windows and doors - Must be designed constructed inline with DTS requirements

J5D6 Exhaust fans Must be designed constructed inline with DTS requirements

J5D7 Construction of ceilings, walls and floors Must be designed constructed inline with DTS requirements

J5D8 Evaporative coolers Must be designed constructed inline with DTS requirements

Mechanical and Electrical	Assumptions	Technical Specification/Notes	DTS Requirement Conditioned Envelope
Air-Conditioning	Air conditioning specification not supplied. Selected unit to meet DTS compliance and be shown to use less energy than the modelled HVAC system. Conditioning to Habitable spaces only.		DTS-Compliant as per NCC 2022. Overall proposed energy demand ≤ calculated allowance (refer to section 5.3 for energy use summary)
Infiltration	0.35 Air changes per hours with HVAC on, fresh air rate minimum 7.5 L/s	Minimum fresh air rate of 7.5 L/s per person.	
Lighting	8W/m2	Standard assumption unless design specifies otherwise.	
Equipment	15W/m2	Standard assumption unless design specifies otherwise.	
Air Velocity	0.1m/s	Standard assumption unless design specifies otherwise.	
Clothing	0.7	Standard assumption unless design specifies otherwise.	
Thermostat Set Points	Heating 20 Deg - Cooling 24 Deg	Aligned with Section J NCC 2022 comfort expectations.	
Occupancy Profile	As per Class 9B	Reference profiles applied in accordance with building classification and use.	

Assumptions and Limitations

Parts J3, J5, J6, J7, J8 and J9 are not part of this assessment.

Specification 33 Additional requirements - General is only met for provisions (a) General Thermal Construction and (b) for Floor Edge Insulation. All other provisions (c - n) are not part of this assessment.

Specification 34 Modelling parameters for J1V3 S34C1 Scope, S34C2 Reference building and S34C3 Proposed building and reference building have been used to form the basis of the Method of Assessment.

S34C4 Services Proposed and Reference Building is not part of this assessment as the minimum performance requirements of the services are not included.

4 Compliance with Parts J1-J9

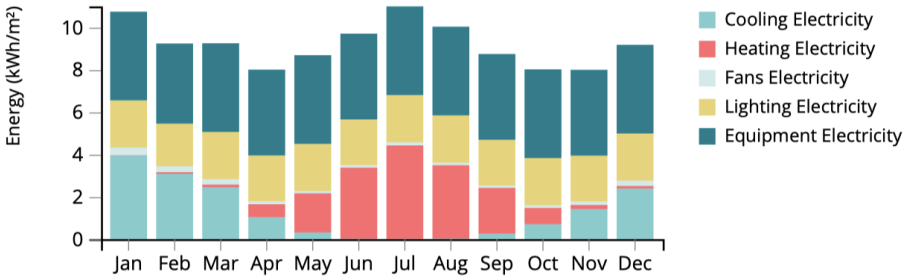
This section provides a analysis of the building's compliance with the energy efficiency requirements specified in Parts J1 to J9 of the NCC. The following sections outline how the proposed building demonstrated by compliance with J1V3 Verification method and related deemed to satisfy requirements.

4.1 J1P1 to J1P4

Proposed

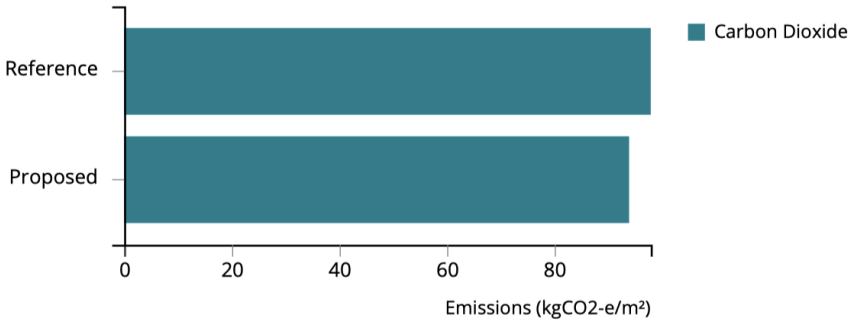
Building Meters

Proposed



Meter	Energy (kWh)	Energy (kWh/m²)	Peak (kW)	Time
Cooling Electricity	4910.85	15.65	8.73	10 Feb 16:00
Heating Electricity	5407.15	17.23	12.05	15 Sep 06:15
Fans Electricity	663.62	2.11	0.52	7 Jun 06:15
Lighting Electricity	8248.24	26.28	1.51	1 Jan 10:15
Equipment Electricity	15465.45	49.27	2.82	1 Jan 10:15

To meet the acceptance criteria, annual Supplied Energy emissions must be less than **97.94** kgCO2-e/m². Based on a treated floor area of 313.87 m², the simulated building achieved **93.92** kgCO2-e/m², **meeting** the acceptance criteria.



Thermal Comfort

To meet the acceptance criteria, **95** % of total area across the assessed (conditioned) zones must meet the conditions:

zone thermal comfort (pmv) is between -1.0 and 1.0 PMV
for at least 98 % of hours
when above 20 % occupancy

A total area of 313.87 m² across 9 zones were assessed, where zones of **100.00** % area achieved the conditions, **meeting** the acceptance criteria.

Level	Zone	Area (m²)	Assessed (Hrs)	Pass (Hrs)	Ratio	Pass
1	9. WC	6.27	2920	2920	100.00	✓
1	6. Bathroom 2	8.28	2920	2920	100.00	✓
1	5. Dry Store	8.46	2920	2920	100.00	✓
1	8. Cool Room	6.78	2920	2920	100.00	✓
1	2. Kitchen	38.92	2920	2920	100.00	✓
1	7. Bathroom	7.74	2920	2920	100.00	✓
1	4. Hallway	8.91	2920	2920	100.00	✓
1	3. Entry	19.81	2920	2906	99.52	✓
1	1. Function Room	208.69	2920	2905	99.49	✓
					Pass	✓

4.2 Part J2 Energy Efficiency

This Part sets out the application of the *Deemed-to-Satisfy Provisions* in Parts J3 to J9.

4.3 Part J3 Elemental provisions for a sole-occupancy unit of a Class 2 building or a Class 4 part of a building

Only applicable to Class 2 buildings (residential apartments) and Class 4 parts of buildings (caretaker's residences in commercial buildings).

4.4 Part J4 Building Fabric - DTS provisions

Not applicable – compliance demonstrated via J1V3 Performance Solution.

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J1. It sets out provisions for the building envelope including roofs, ceilings, roof lights, walls, glazing and floors.

All applicable elements to be designed and constructed in accordance with Part J4 Building Fabric – – Refer to Appendix for prescriptive requirements and further details

J4D3 Thermal construction — general - – Must be designed and constructed inline with DTS requirements

J4D4 Roof and ceiling construction – Must be designed and constructed inline with DTS requirements

J4D5 Roof lights – Must be designed and constructed inline with DTS requirements if applicable

J4D6 Walls and glazing – Must be designed and constructed inline with DTS requirements if applicable

J4D7 Floors – Must be designed and constructed inline with DTS requirements

4.5 Part J5 Building sealing

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J5. It sets out provisions for the sealing of a building's glazing, doors, exhaust fans and the like in order to increase thermal comfort for occupants and reduce the energy consumption of any installed air-conditioning systems.

All applicable elements to be designed and constructed in accordance with Part J5 Building Sealing – – Refer to Appendix for prescriptive requirements and further details

J5D3 Chimneys and flues – Must be designed and constructed inline with DTS requirements if applicable

J5D4 Roof lights - – Must be designed constructed inline with DTS requirements

J5D5 Windows and doors - Must be designed constructed inline with DTS requirements

J5D6 Exhaust fans Must be designed constructed inline with DTS requirements

J5D7 Construction of ceilings, walls and floors Must be designed constructed inline with DTS requirements

J5D8 Evaporative coolers Must be designed constructed inline with DTS requirements

4.6 Part J6 Air-conditioning and ventilation

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J6. It sets out provisions for air conditioning and ventilation.

All applicable elements to be designed and constructed in accordance with Part J6 Building Air conditioning and Ventilation – – Refer to Appendix for prescriptive requirements and further details

J6D3 Air-conditioning system control Must be designed and constructed inline with DTS requirements if applicable

J6D4 Mechanical ventilation system control Must be designed and constructed inline with DTS requirements if applicable

J6D5 Fans and duct systems Must be designed and constructed inline with DTS requirements if applicable

J6D6 Ductwork insulation Must be designed and constructed inline with DTS requirements if applicable

J6D7 Ductwork sealing Must be designed and constructed inline with DTS requirements if applicable

J6D8 Pump systems Must be designed and constructed inline with DTS requirements if applicable

J6D9 Pipework insulation Must be designed and constructed inline with DTS requirements if applicable

J6D10 Space heating Must be designed and constructed inline with DTS requirements if applicable

J6D11 Refrigerant chillers Must be designed and constructed inline with DTS requirements if applicable

J6D12 Unitary air-conditioning equipment Must be designed and constructed inline with DTS requirements if applicable

J6D13 Heat rejection equipment Must be designed and constructed inline with DTS requirements if applicable

4.7 Part J7 Artificial lighting and power

This Part contains Deemed-to-Satisfy Provisions for compliance with Part J1. It sets out provisions for the design and configuration of artificial lighting and power, boiling and chilled water units, lifts and escalators and moving walkways.

All applicable elements to be designed and constructed in accordance with Part 7 Artificial lighting and power – – Refer to Appendix for prescriptive requirements and further details.

J7D3 Artificial lighting Must be designed and constructed inline with DTS requirements if applicable

J7D4 Interior artificial lighting and power control Must be designed and constructed inline with DTS requirements if applicable

J7D5 Interior decorative and display lighting - Must be designed and constructed inline with DTS requirements if applicable

J7D6 Exterior artificial lighting Must be designed and constructed inline with DTS requirements if applicable

J7D7 Boiling water and chilled water storage units Must be designed and constructed inline with DTS requirements if applicable

J7D8 Lifts - Must be designed and constructed inline with DTS requirements if applicable

J7D9 Escalators and moving walkways Must be designed and constructed inline with DTS requirements if applicable

4.8 Part J8 Heated water supply and swimming pool and spa pool plant

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J1. It sets out provisions for ensuring water heaters, swimming pool and spa heaters and pump systems use energy efficiently.

All applicable elements to be designed and constructed in accordance with Part J8 Heated water supply and swimming pool and spa pool plant

– Refer to Appendix for prescriptive requirements and further details

J8D2 Heated water supply – Must be designed and constructed inline with DTS requirements

J8D3 Swimming pool heating and pumping Must be designed and constructed inline with DTS requirements if applicable

J8D4 Spa pool heating and pumping Must be designed and constructed inline with DTS requirements if applicable

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

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J1. It sets out provisions that enable the monitoring of energy use (other than for billing purposes) and facilitate easy retrofit of renewable energy and electric vehicle charging equipment.

All applicable elements to be designed and constructed in accordance with Part J9 Energy monitoring and on-site distributed energy resources

– Refer to Appendix for prescriptive requirements and further details

J9D3 Facilities for energy monitoring - Must be designed and constructed inline with DTS requirements if applicable

J9D4 Facilities for electric vehicle charging equipment - Must be designed and constructed inline with DTS requirements if applicable

J9D5 Facilities for solar photovoltaic and battery systems - Must be designed and constructed inline with DTS requirements if applicable

5 Conclusion

The proposed class 9B building has been shown to comply to NCC 2022 Volume 1 – Section J for Energy Efficiency through performance solution (building fabric) using **J1V3 – Verification using a reference building** the remaining applicable requirements need to be designed and built in accordance with the legislation and standards referenced in this report.

5.1 Prepared by

Powerhaus Engineering

Andrew Pickard

Director

B.Eng (Mech) (Hons)

ACT Building Assessor

(Class A - Energy Efficiency), Lic no 2013432

Appendix A – Prescriptive Requirements

Part J4 Building fabric

J4D3 Thermal construction — general

(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.

J4D4 Roof and ceiling construction

(1)A roof or ceiling must achieve a Total R-Value greater than or equal to—

a. in climate zones 1, 2, 3, 4 and 5, R3.7 for a downward direction of heat flow; and
b. in climate zone 6, R3.2 for a downward direction of heat flow; and
c. in climate zone 7, R3.7 for an upward direction of heat flow; and
d. in climate zone 8, R4.8 for an upward direction of heat flow.

(2)In climate zones 1, 2, 3, 4, 5, 6 and 7, the solar absorptance of the upper surface of a roof must be not more than 0.45.

J4D5 Roof lights

Roof lights must have—

a. a total area of not more than 5% of the floor area of the room or space served; and
b. transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of —
    I. for Total system SHGC, in accordance with Table J4D5; and
    II. for Total system U-Value, not more than U3.9.

Table J4D5 Roof lights – Total system SHGC

Roof light shaft index Note 1	Total area of roof lights up to 3.5% of the floor area of the room or space	Total area of roof lights more than 3.5% and up to 5% of the floor area of the room or space
<1.0	≤ 0.45	≤ 0.29
≥ 1.0 to < 2.5	≤ 0.51	≤ 0.33
≥ 2.5	≤ 0.76	≤ 0.49

J4D6 Walls and glazing

(1)The Total System U-Value of wall-glazing construction, including wall-glazing construction which wholly or partly forms the envelope internally, must not be greater than—

a. for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area, U2.0; and
b. for a Class 3 or 9c building or a Class 9a ward area—
    I. in climate zones 1, 3, 4, 6 or 7, U1.1; or
    II. in climate zones 2 or 5, U2.0; or
    III. in climate zone 8, U0.9.

(2)The Total System U-Value of display glazing must not be greater than U5.8.

(3)The Total System U-Value of wall-glazing construction must be calculated in accordance with Specification 37.

(4)Wall components of a wall-glazing construction must achieve a minimum Total R-Value of—

a. where the wall is less than 80% of the area of the wall-glazing construction, R1.0; or
b. where the wall is 80% or more of the area of the wall-glazing construction, the value specified in Table J4D6a.

(5)The solar admittance of externally facing wall-glazing construction, excluding wall-glazing construction which is wholly internal, must not be greater than—

a. for a Class 2 common area, a Class 5, 6, 7, 8 or 9b building or a Class 9a building other than a ward area, the values specified in Table J4D6b; and
b. for a Class 3 or 9c building or a Class 9a ward area, the values specified in Table J4D6c.

(6)The solar admittance of a wall-glazing construction must be calculated in accordance with Specification 37.

(7)The Total system SHGC of display glazing must not be greater than 0.81 divided by the applicable shading factor specified in S37C7.

Refer to Table J4D6a for minimum wall Total R-Value - Wall area 80% or more of wall-glazing construction area

J4D7 Floors

(1)A floor must achieve the Total R-Value specified in Table J4D7.

(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.

(4)Insulation required by (3) for a concrete slab-on-ground must—

a. be water resistant; and

b. be continuous from the adjacent finished ground level—

I. to a depth not less than 300 mm; or

II. for the full depth of the vertical edge of the concrete slab-on-ground.

Table J4D7 Floors – Minimum Total R-Value

Location	Climate zone 1— upwards heat flow	Climate zones 2 and 3 — upwards and downwards heat flow	Climate zones 4, 5, 6 and 7 — downwards heat flow	Climate zone 8 — downwards heat flow
A floor without an in-slab heating or cooling system	2.0	2.0	2.0	3.5
A floor with an in-slab heating or cooling system	3.25	3.25	3.25	4.75

Part J5 Building Sealing

J5D4 Roof lights

(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

(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 m2; 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

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

(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

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 J6 Air-conditioning and ventilation

This Part contains *Deemed-to-Satisfy Provisions* for compliance with Part J1. It sets out the provisions for the efficiency and control of air-conditioning, space heating and ventilation equipment, the efficiency, sealing and insulation requirements for ductwork systems containing fans, and for the efficiency and insulation of pipework and pump systems.

J6D3 Air-conditioning system control

(1)An air-conditioning system—

a. must be capable of being deactivated when the building or part of a building served by that system is not occupied; and

b. when serving more than one air-conditioning zone or area with different heating or cooling needs, must—

   I. thermostatically control the temperature of each zone or area; and

   II. not control the temperature by mixing actively heated air and actively cooled air; and

   III. limit reheating to not more than–

      1. for a fixed supply air rate, a 7.5 K rise in temperature; and

      2. for a variable supply air rate, a 7.5 K rise in temperature at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased; and

c. which provides the required mechanical ventilation, other than in climate zone 1 or where dehumidification control is needed, must have an outdoor air economy cycle if the total air flow rate of any airside component of an air-conditioning system is greater than or equal to the flow rates in Table J6D3; and

d. which contains more than one water heater, chiller or coil, must be capable of stopping the flow of water to those not operating; and

e. with an airflow of more than 1000 L/s, must have a variable speed fan when its supply air quantity is capable of being varied; and

f. when serving a sole-occupancy unit in a Class 3 building, must not operate when any external door of the sole-occupancy unit that opens to a balcony or the like, is open for more than one minute; and

g. must have the ability to use direct signals from the control components responsible for the delivery of comfort conditions in the building to regulate the operation of central plant; and

h. must have a control dead band of not less than 2°C, except where a smaller range is required for specialised applications; and

i. must be provided with balancing dampers and balancing valves, as required to meet the needs of the system at its maximum operating condition, that ensure the maximum design air or fluid flow is achieved but not exceeded by more than 15% above design at each–

   I. component; or

   II. group of components operating under a common control in a system containing multiple components; and

j. must ensure that each independently operating space of more than 1 000 m2 and every separate floor of the building has provision to terminate airflow independently of the remainder of the system sufficient to allow for different operating times; and

k. must have automatic variable temperature operation of heated water and chilled water circuits; and

l. when deactivated, must close any motorised outdoor air or return air damper that is not otherwise being actively controlled.

2)When two or more air-conditioning systems serve the same space they must use control sequences that prevent the systems from operating in opposing heating and cooling modes.

(3)Time switches — the following applies:

a. A time switch must be provided to control—

   I. an air-conditioning system of more than 2 kWr; and

   II. a heater of more than 1 kWheating used for air-conditioning.

b. The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

c. The requirements of (a) and (b) do not apply to–

   I. an air-conditioning system that serves–

      1. only one sole-occupancy unit in a Class 2, 3 or 9c building; or

      2. a Class 4 part of a building; or

   II. a conditioned space where air-conditioning is needed for 24 hour continuous use.

Table J6D3 Requirement for an outdoor air economy cycle

Climate zone	Total air flow rate requiring an economy cycle (L/s)
2	9000
3	7500
4	3500
5	3000
6	2000
7	2500
8	4000

J6D4 - Mechanical ventilation system control

(1)General — A mechanical ventilation system, including one that is part of an air-conditioning system, except where the mechanical system serves only one sole-occupancy unit in a Class 2 building or serves only a Class 4 part of a building, must—

a. be capable of being deactivated when the building or part of the building served by that system is not occupied; and

b. when serving a conditioned space, except in periods when evaporative cooling is being used–

   I. where specified in Table J6D4, have–

      1. an energy reclaiming system that preconditions outdoor air at a minimum sensible heat transfer effectiveness of 60%; or

      2. demand control ventilation in accordance with AS 1668.2 if appropriate to the application; and

   II. not exceed the minimum outdoor air quantity required by Part F6 by more than 20%, except where–

      1. additional unconditioned outdoor air is supplied for free cooling; or

      2. additional mechanical ventilation is needed to balance the required exhaust or process exhaust; or

      3. an energy reclaiming system preconditions all the outdoor air; and

c. for an airflow of more than 1000 L/s, have a variable speed fan unless the downstream airflow is required by Part F6 to be constant.

(2)Exhaust systems — An exhaust system with an air flow rate of more than 1000 L/s must be capable of stopping the motor when the system is not needed, except for an exhaust system in a sole-occupancy unit in a Class 2, 3 or 9c building.

(3)Carpark exhaust systems — Carpark exhaust systems must have a control system in accordance with—

a. clause 4.11.2 of AS 1668.2; or

b. clause 4.11.3 of AS 1668.2.

(4)Time switches — The following applies:

a. A time switch must be provided to a mechanical ventilation system with an air flow rate of more than 1000 L/s.

b. The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

c. The requirements of (a) and (b) do not apply to—

   I. a mechanical ventilation system that serves–

      1. only one sole-occupancy unit in a Class 2, 3 or 9c building; or

      2. a Class 4 part of a building; or

   II. a building where mechanical ventilation is needed for 24 hour occupancy.

Table J6D4 Required outdoor air treatment

J6D5 Fans and duct systems

(1)Fans, ductwork and duct components that form part of an air-conditioning system or mechanical ventilation system must—

a. separately comply with (2), (3), (4) and (5); or

b. achieve a fan motor input power per unit of flowrate lower than the fan motor input power per unit of flowrate achieved when applying (2), (3), (4) and (5) together.

(2)Fans:

a. Fans in systems that have a static pressure of not more than 200 Pa must have an efficiency at the full load operating point not less than the efficiency calculated with the following formula:ηmin=0.13×ln(p) −0.3min=0.13×ln()−0.3

b. In the formula at (a)—

   I. ηminmin = the minimum required system static efficiency for installation type A or C or the minimum required system total efficiency installation type B or D; and

   II. p = the static pressure of the system (Pa); and

   III. lnln = natural logarithm.

c. Fans in systems that have a static pressure above 200 Pa must have an efficiency at the full load operating point not less than the efficiency calculated with the following formula:ηmin=0.85×(a×ln(P)−b+N)/100min=0.85×(×ln()−+)/100

d. In the formula at (c)–

   I. ηminmin = the minimum required system static efficiency for installation type A or C or the minimum required system total efficiency installation type B or D; and

   II. P = the motor input power of the fan (kW); and

   III. N = the minimum performance grade obtained from Table J6D5a; and

   IV. a = regression coefficient a, obtained from Table J6D5b; and

   V. b= regression coefficient b, obtained from Table J6D5c; and

   VI. lnln = natural logarithm.

e. The requirements of (a), (b), (c) and (d) do not apply to fans that need to be explosion proof.

(3)Ductwork:

a. The pressure drop in the index run across all straight sections of rigid ductwork and all sections of flexible ductwork must not exceed 1 Pa/m when averaged over the entire length of straight rigid duct and flexible duct. The pressure drop of flexible ductwork sections may be calculated as if the flexible ductwork is laid straight.
b. Flexible ductwork must not account for more than 6 m in length in any duct run.
c. The upstream connection to ductwork bends, elbows and tees in the index run must have an equivalent diameter to the connected duct.
d. Turning vanes must be included in all rigid ductwork elbows of 90° or more acute than 90° in the index run except where—
    I. the inclusion of turning vanes presents a fouling risk; or
    II. a long radius bend in accordance with AS 4254.2 is used.

4)Ductwork components in the index run:

a. The pressure drop across a coil must not exceed the value specified in Table J6D5d.
b. A high efficiency particulate arrestance (HEPA) air filter must not exceed the higher of—
    I. a pressure drop of 200 Pa when clean; or
    II. the filter design pressure drop when clean at an air velocity of 1.5 m/s.
c. Any other air filter must not exceed—
    I. the pressure drop specified in Table J6D5e when clean; or
    II. the filter design pressure drop when clean at an air velocity of 2.5 m/s.
d. The pressure drop across intake louvres must not exceed the higher of—
    I. for single stage louvres, 30 Pa; and
    II. for two stage louvres, 60 Pa; and
    III. for acoustic louvres, 50 Pa; and
    IV. for other non-weatherproof louvres, 30 Pa.
e. The pressure drop across a variable air volume box, with the damper in the fully open position, must not exceed—
    I. for units with electric reheat, 100 Pa; and
    II. for other units, 25 Pa not including coil pressure losses.
f. Rooftop cowls must not exceed a pressure drop of 30 Pa.
g. Attenuators must not exceed a pressure drop of 40 Pa.
h. Fire dampers must not exceed a pressure drop of 15 Pa when open.
i. Balancing and control dampers in the index run must not exceed a pressure drop of 25 Pa when in the fully open position.
j. Supply air diffusers and grilles must not exceed a pressure drop of 40 Pa.
k. Exhaust grilles must not exceed a pressure drop of 30 Pa.
l. Transfer ducts must not exceed a pressure drop of 12 Pa.
m. Door grilles must not exceed a pressure drop of 12 Pa.
n. Active chilled beams must not exceed a pressure drop of 150 Pa.

(5)The requirements of (1), (2), (3) and (4) do not apply to—

a. fans in unducted air-conditioning systems with a supply air capacity of less than 1000 L/s; and
b. smoke spill fans, except where also used for air-conditioning or ventilation; and
c. the power for process-related components; and
d. kitchen exhaust systems.

J6D6 Ductwork insulation

(1)Ductwork and fittings in an air-conditioning system must be provided with insulation—

a. complying with AS/NZS 4859.1; and
b. having an insulation R-Value greater than or equal to—
    I. for flexible ductwork, 1.0; or
    II. for cushion boxes, that of the connecting ductwork; or
    III. that specified in Table J6D6.

(2)Insulation must—

a. be protected against the effects of weather and sunlight; and
b. be installed so that it—
    I. abuts adjoining insulation to form a continuous barrier; and
    II. maintains its position and thickness, other than at flanges and supports; and
c. when conveying cooled air—
    I. be protected by a vapour barrier on the outside of the insulation; and
    II. where the vapour barrier is a membrane, be installed so that adjoining sheets of the membrane—
        1. overlap by at least 50 mm; and
        2. are bonded or taped together.

(3)The requirements of (1) do not apply to—

a. ductwork and fittings located within the only or last room served by the system; or
b. fittings that form part of the interface with the conditioned space; or
c. return air ductwork in, or passing through, a conditioned space; or
d. ductwork for outdoor air and exhaust air associated with an air-conditioning system; or
e. the floor of an in-situ air-handling unit; or
f. packaged air conditioners, split systems, and variable refrigerant flow air-conditioning equipment complying with MEPS; or
g. flexible fan connections.

(4)For the purposes of (1), (2) and (3), fittings—

a. include non-active components of a ductwork system such as cushion boxes; and

b. exclude active components such as air-handling unit components.

J6D7 Ductwork sealing

Ductwork in an air-conditioning system with a capacity of 3000 L/s or greater, not located within the only or last room served by the system, must be sealed against air loss in accordance with the duct sealing requirements of AS 4254.1 and AS 4254.2 for the static pressure in the system.

J6D8Pump systems

(1)General — Pumps and pipework that form part of an air-conditioning system must either—

a. separately comply with (2), (3) and (4); or

b. achieve a pump motor power per unit of flowrate lower than the pump motor power per unit of flowrate achieved when applying (2), (3) and (4) together.

(2)Circulator pumps — A glandless impeller pump, with a rated hydraulic power output of less than 2.5 kW and that is used in closed loop systems must have an energy efficiency index (EEI) not more than 0.27 calculated in accordance with European Union Commission Regulation No. 622/2012.

(3)Other pumps — Pumps that are in accordance with Articles 1 and 2 of European Union Commission Regulation No. 547/2012 must have a minimum efficiency index (MEI) of 0.4 or more when calculated in accordance with European Union Commission Regulation No. 547/2012.

(4)Pipework — Straight segments of pipework along the index run, forming part of an air-conditioning system—

a. in pipework systems that do not have branches and have the same flow rate throughout the entire pipe network, must achieve an average pressure drop of not more than—

    I. for constant speed systems, the values nominated in Table J6D8a; or

    II. for variable speed systems, the values nominated in Table J6D8b; or

b. in any other pipework system, must achieve an average pressure drop of not more than—

    I. for constant speed systems, the values nominated in Table J6D8c; or

    II. for variable speed systems, the values nominated in Table J6D8d.

(5)The requirements of (4) do not apply—

a. to valves and fittings; or

b. where the smallest pipe size compliant with (4) results in a velocity of 0.7 m/s or less at design flow

J6D9 Pipework insulation

(1)Piping, vessels, heat exchangers and tanks containing heating or cooling fluid, where the fluid is held at a heated or cooled temperature, that are part of an air-conditioning system, other than in appliances covered by MEPS, must be provided with insulation—

a. complying with AS/NZS 4859.1; and

b. for piping of heating and cooling fluids, having an insulation R-Value in accordance with Table J6D9a; and

c. for vessels, heat exchangers or tanks, having an insulation R-Value in accordance with Table J6D9b; and

d. for refill or pressure relief piping, having an insulation R-Value equal to the required insulation R-Value of the connected pipe, vessel or tank within 500 mm of the connection.

(2)Insulation must—

a. be protected against the effects of weather and sunlight; and

b. be able to withstand the temperatures within the piping, vessel, heat exchanger or tank.

(3)Insulation provided to piping, vessels, heat exchangers or tanks containing cooling fluid must be protected by a vapour barrier on the outside of the insulation.

(4)The requirements of (1) and (2) do not apply to piping, vessels or heat exchangers—

a. located within the only or last room served by the system and downstream of the control device for the regulation of heating or cooling service to that room; or

b. encased within a concrete slab or panel which is part of a heating or cooling system; or

c. supplied as an integral part of a chiller, boiler or unitary air-conditioner complying with the requirements of J6D10, J6D11 and J6D12; or

d. inside an air-handling unit, fan-coil unit, or the like.

(5)For the purposes of (1), (2), (3) and (4)—

a. heating fluids include refrigerant, heated water, steam and condensate; and

b. cooling fluids include refrigerant, chilled water, brines and glycol mixtures, but do not include condenser cooling water.

J6D10 Space heating

(1)A heater used for air-conditioning or as part of an air-conditioning system must be—

a. a solar heater; or

b. a gas heater; or

c. a heat pump heater; or

d. a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or

e. an electric heater if—

I. the heating capacity is not more than—

1. 10 W/m2 of the floor area of the conditioned space in climate zone 1; or

2. 40 W/m2 of the floor area of the conditioned space in climate zone 2; or

3. the value specified in Table J6D10 where reticulated gas is not available at the allotment boundary; or

II. the annual energy consumption for heating is not more than 15 kWh/m2 of the floor area of the conditioned space in climate zones 1, 2, 3, 4 and 5; or

III. the in-duct heater complies with J6D3(1)(b)(iii); or

f. any combination of (a) to (e).

2)An electric heater may be used for heating a bathroom in a Class 2, 3, 9a or 9c building if the heating capacity is not more than 1.2 kW and the heater has a timer.

(3)A fixed heating or cooling appliance that moderates the temperature of an outdoor space must be configured to automatically shut down when—

a. there are no occupants in the space served; or

b. a period of one hour has elapsed since the last activation of the heater; or

c. the space served has reached the design temperature.

(4)A gas water heater, that is used as part of an air-conditioning system, must—

a. if rated to consume 500 MJ/hour of gas or less, achieve a minimum gross thermal efficiency of 86%; or

b. if rated to consume more than 500 MJ/hour of gas, achieve a minimum gross thermal efficiency of 90%.

J6D11 Refrigerant chillers

An air-conditioning system refrigerant chiller must comply with MEPS and the full load operation energy efficiency ratio and integrated part load energy efficiency ratio in Table J6D11a or Table J6D11b when determined in accordance with AHRI 551/591.

J6D12 Unitary air-conditioning equipment

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS and for a capacity greater than or equal to 65 kWr—

a. where water cooled, have a minimum energy efficiency ratio of 4.0 Wr/Winputpower for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power; or

b. where air cooled, have a minimum energy efficiency ratio of 2.9 Wr/Winput power for cooling when tested in accordance with AS/NZS 3823.1.2 at test condition T1, where input power includes both compressor and fan input power.

J6D13 Heat rejection equipment

(1)The motor rated power of a fan in a cooling tower, closed circuit cooler or evaporative condenser must not exceed the allowances in Table J6D13.

(2)The fan in an air-cooled condenser must have a motor rated power of not more than 42 W for each kW of heat rejected from the refrigerant, when determined in accordance with AHRI 460 except for—

a. a refrigerant chiller in an air-conditioning system that complies with the energy efficiency ratios in J6D11; or

b. packaged air-conditioners, split systems, and variable refrigerant flow air-conditioning equipment that complies with the energy efficiency ratios in J6D12.

Part J7 Artificial lighting and power

J7D2 Application of Part

J7D3, J7D4 and J7D6(1)(b) do not apply to a Class 8 electricity network substation.

J7D3 Artificial lighting

(1)In a sole-occupancy unit of a Class 2 building or a Class 4 part of a building—

1. the lamp power density or illumination power density of artificial lighting must not exceed the allowance of—
    a. 5 W/m2 within a sole-occupancy unit; and
    b. 4 W/m2 on a verandah, balcony or the like attached to a sole-occupancy unit; and
2. the illumination power density allowance in (a) may be increased by dividing it by the illumination power density adjustment factor for a control device in Table J7D3b as applicable; and
3. when designing the lamp power density or illumination power density, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and
4. halogen lamps must be separately switched from fluorescent lamps.

(2)In a building other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building—

a. for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum illumination power density in Table J7D3a; and

b. the aggregate design illumination power load in (a) is the sum of the design illumination power loads in each of the spaces served; and

c. where there are multiple lighting systems serving the same space, the design illumination power load for (b) is—

   I. the total illumination power load of all systems; or

   II. where a control system permits only one system to operate at a time based on the highest illumination power load; or determined by the formula H×T/2+P×(100−T/2)*100�×�/2+�×(100−�/2/100

d. In the formula at (c)(ii)—

   I. H� = the highest illumination power load; and

   II. T� = the time for which the maximum illumination power load will occur, expressed as a percentage; and

   III. P� = the predominant illumination power load.

(3)The requirements of (1) and (2) do not apply to the following:

a. Emergency lighting provided in accordance with Part E4.

b. Signage, display lighting within cabinets and display cases that are fixed in place.

c. Lighting for accommodation within the residential part of a detention centre.

d. A heater where the heater also emits light, such as in bathrooms.

e. Lighting of a specialist process nature such as in a surgical operating theatre, fume cupboard or clean workstation.

f. Lighting of performances such as theatrical or sporting.

g. Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.

h. Lighting installed solely to provide photosynthetically active radiation for indoor plant growth on green walls and the like.

(4)For the purposes of Table J7D3b, the following control devices must comply with Specification 40:

a. Lighting timers.

b. Motion detectors.

c. Daylight sensors and dynamic lighting control devices.

J7D4 Interior artificial lighting and power control

(1)All artificial lighting of a room or space must be individually operated by–

a. a switch; or

b. other control device; or

c. a combination of (a) and (b).

(2)An occupant activated device, such as a room security device, a motion detector in accordance with Specification 40, or the like, must be provided in the sole-occupancy unit of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the sole-occupancy unit is unoccupied.

(3)An artificial lighting switch or other control device in (1) must—

a. if an artificial lighting switch, be located in a visible and easily accessed position—
    I. in the room or space being switched; or
    II. in an adjacent room or space from where 90% of the lighting being switched is visible; and
b. for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse—
    I. if in a Class 5 building or a Class 8 laboratory, not operate lighting for an area of more than 250 m2; or
    II. if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building, not operate lighting for an area of more than —
        1. 250 m2 for a space of not more than 2000 m2; or
        2. 1000 m2 for a space of more than 2000 m2.

(4)95% of the light fittings in a building or storey of a building, other than a Class 2 or 3 building or a Class 4 part of a building, of more than 250 m2 must be controlled by—

a. a time switch in accordance with Specification 40; or
b. an occupant sensing device such as—
    I. a security key card reader that registers a person entering and leaving the building; or
    II. a motion detector in accordance with Specification 40.

(5)In a Class 5, 6 or 8 building of more than 250 m2, artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same storey except where—

a. the room containing the natural lighting zone is less than 20 m2; or
b. the room's natural lighting zone contains less than 4 luminaires; or
c. 70% or more of the luminaires in the room are in the natural lighting zone.

(6)Artificial lighting in a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp, must be controlled by a motion detector in accordance with Specification 40.

(7)Artificial lighting in a foyer, corridor and other circulation spaces—

a. of more than 250 W within a single zone; and
b. adjacent to windows,

must be controlled by a daylight sensor and dynamic lighting control device in accordance with Specification 40.

(8)Artificial lighting for daytime travel in the first 19 m of travel in a carpark entry zone must be controlled by a daylight sensor in accordance with Specification 40.

(9)The requirements of (1), (2), (3), (4), (5), (6), (7) and (8) do not apply to the following:

a. Emergency lighting in accordance with Part E4.
b. Where artificial lighting is needed for 24 hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a detention centre.

(10)The requirements of (4) do not apply to the following:

a. Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as—
    I. in a patient care area in a Class 9a building or in a Class 9c building; or
    II. a plant room or lift motor room; or
    III. a workshop where power tools are used.
b. A heater where the heater also emits light, such as in bathrooms.

J7D5 Interior decorative and display lighting

(1)Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—

a. separately from other artificial lighting; and

b. by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and

c. by a time switch in accordance with Specification 40 where the display lighting exceeds 1 kW.

(2)Window display lighting must be controlled separately from other display lighting.

J7D6 Exterior artificial lighting

(1)Exterior artificial lighting attached to or directed at the facade of a building, must—

a. be controlled by—

I. a daylight sensor; or

II. a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and

b. when the total lighting load exceeds 100 W—

I. use LED luminaires for 90% of the total lighting load; or

II. be controlled by a motion detector in accordance with Specification 40; or

III. when used for decorative purposes, such as façade lighting or signage lighting, have a separate time switch in accordance with Specification 40.

(2)The requirements of (1)(b) do not apply to the following:

a. Emergency lighting in accordance with Part E4.

b. Lighting around a detention centre.

J7D7 Boiling water and chilled water storage units

Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification 40.

J7D8 Lifts

Lifts must—

a. be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and

b. achieve the idle and standby energy performance level in Table J7D8a; and

c. achieve—

I. the energy efficiency class in Table J7D8b; or

II. if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.

J7D9 Escalators and moving walkways

Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.05 m/s when unused for more than 15 minutes.

J8 Heated water supply and swimming pool and spa pool plant

J8D2 Heated water supply

A heated water supply system for food preparation and sanitary purposes must be designed and installed in accordance with Part B2 of NCC Volume Three — Plumbing Code of Australia.

J8D3 Swimming pool heating and pumping

(1)Heating for a swimming pool must be by—

a. a solar heater; or
b. a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or
c. a geothermal heater; or
d. a gas heater that—
    I. if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or
    II. if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or
e. a heat pump; or
f. a combination of (a) to (e).

(2)Where some or all of the heating required by (1) is by a gas heater or a heat pump, the swimming pool must have—

1. a cover with a minimum R-Value of 0.05; and
2. a time switch to control the operation of the heater.

(3)A time switch must be provided to control the operation of a circulation pump for a swimming pool.

(4)Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

(5)Pipework carrying heated or chilled water for a swimming pool must comply with the insulation requirements of J6D9.

(6)For the purpose of J8D3, a swimming pool does not include a spa pool.

J8D4 Spa pool heating and pumping

(1)Heating for a spa pool that shares a water recirculation system with a swimming pool must be by—

a. a solar heater; or
b. a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or
c. a geothermal heater; or
d. a gas heater that—
    I. if rated to consume 500 MJ/hour or less, achieves a minimum gross thermal efficiency of 86%; or
    II. if rated to consume more than 500 MJ/hour, achieves a minimum gross thermal efficiency of 90%; or
e. a heat pump; or
f. a combination of (a) to (e).

(2)Where some or all of the heating required by (1) is by a gas heater or a heat pump, the spa pool must have—

a. a cover with a minimum R-Value of 0.05; and

b. a push button and a time switch to control the operation of the heater.

(3)A time switch must be provided to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.

(4)Where required, a time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.

(5)Pipework carrying heated or chilled water for a spa pool must comply with the insulation requirements of J6D9.

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.

J9D3 Facilities for energy monitoring

(1)A building or sole-occupancy unit with a floor area of more than 500 m2 must have energy meters configured to record the time-of-use consumption of gas and electricity.

(2)A building with a floor area of more than 2 500 m2 must have energy meters configured to enable individual time-of-use energy data recording, in accordance with (3), of—

a. air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
b. artificial lighting; and
c. appliance power; and
d. central hot water supply; and
e. internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
f. on-site renewable energy equipment; and
g. on-site electric vehicle charging equipment; and
h. on-site battery systems; and
i. other ancillary plant.

(3)Energy meters required by (2) must be interlinked by a communication system that collates the time-of-use energy data to a single interface monitoring system where it can be stored, analysed and reviewed.

(4)The provisions of (2) do not apply to energy meters serving—

a. a Class 2 building where the total floor area of the common areas is less than 500 m2; or
b. individual sole-occupancy units with a floor area of less than 2 500 m2.

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 m2; or
d. where more than 50% of the roof area is used as a terrace, carpark, roof garden, roof light or the like.

Appendix B Modelling Parameters

Specification 34 Modelling parameters for J1V3

S34C1 This Specification contains the required modelling parameters for J1V31

The annual greenhouse gas emissions must be calculated for the reference building in accordance with the following:

a. The reference building must—
    I. comply with Deemed-to-Satisfy Provisions in Parts J4 to J8; and
    II. have the minimum amount of mechanical ventilation required by Part F6.
b. The external walls must have a solar absorptance of 0.6.
c. The air-conditioning must—
    I. for 98% of the annual hours of operation, achieve temperatures between—
        I. 18°CDB to 25°CDB for conditioned spaces with transitory occupancy; and
        II. subject to (ii), 21°CDB to 24°CDB in all other conditioned spaces; and
    II. if the proposed building has no mechanically provided cooling or has mixed mode cooling, have the same method of control and control set points for non-mechanical cooling as the proposed building.
d. The infiltration rate in each zone must be—
    I. 0.7 air changes per hour throughout all zones when there is no mechanically supplied outdoor air; and
    II. 0.35 air changes per hour throughout all zones at all other times.
e. The artificial lighting must achieve the required maximum illumination power density in Part J7 without applying the control device adjustment factors.
f. Minimum Energy Performance Standards must be applied to services not covered by Parts J6 to J8.

S34C3 Proposed building and reference building

(1)The annual greenhouse gas emissions must be calculated for the proposed building and the reference building using the same—

a. annual greenhouse gas emissions calculation method; and
b. greenhouse gas emissions factors in accordance with (2); and
c. location in accordance with (3); and
d. adjacent structures and features; and
e. orientation; and
f. building form in accordance with (4); and
g. testing standards including for insulation, glazing, water heater and unitary air-conditioning equipment; and
h. fabric and glazing in accordance with (5); and
i. services in accordance with (6) and S34C4.

(2)For the purposes of (1)(b), greenhouse gas emissions factors must be based on either—

a. the factors in Table S34C3; or

b. the current full fuel cycle emissions factors published by the Australian Government, except, where the greenhouse gas intensity of electricity is less than half the greenhouse gas intensity of natural gas—

   I. electricity is to be weighted as 1; and

   II. natural gas is to be weighted as 2.

(3)For the purposes of (1)(c), location must be either—

a. location where the building is to be constructed if appropriate climatic data is available; or

b. the nearest location with similar climatic conditions, for which climatic data is available.

(4)For the purposes of (1)(f), building form must include—

a. the roof geometry; and

b. the floor plan; and

c. the number of storeys; and

d. the location, extent and configuration of ground floors and basements; and

e. the size and location of glazing; and

f. external doors.

(5)For the purposes of (1)(h), fabric and glazing must include—

a. quality of insulation installation; and

b. thermal resistance of air films including any adjustment factors, moisture content of materials and the like; and

c. dimensions of external, internal and separating walls; and

d. internal shading devices, their colour and their criteria for operation.

6)For the purposes of (1)(i), services must include—

a. range and type of services and energy sources, other than renewable energy generated on site; and

b. assumptions and means of calculating the temperature difference across air-conditioning zone boundaries; and

c. floor coverings and furniture and fittings density; and

d. internal artificial lighting illumination levels; and

e. internal heat gains including people, lighting, appliances, meals and other electric power loads; and

f. air-conditioning, including chiller, fan and boiler equipment, system configuration and zones; and

g. profiles for occupancy, air-conditioning, lighting and internal heat gains from people, hot meals, appliances, equipment and heated water supply systems based on—

    I. Specification 35; or

    II. NABERS Energy simulation requirements; or

    III. Green Star simulation requirements; or

    IV. the actual building if

        I. the operating hours per year are not less than 2 500; or

        II. the daily operating profiles are not listed in Specification 35; and

h. supply heated water temperature and rate of use; and

i. infiltration values, subject to (7); and

j. sequencing for water heaters, refrigeration chillers and heat rejection equipment such as cooling towers; and

k. representation of clothing and metabolic rate of the occupants; and

l. control of air-conditioning except—

    I. the reference building must have variable temperature control for chilled and heated water that modulates the chilled water and heated water temperatures as required to maximise the efficiency of the chiller or boiler operation during periods of low load; and

m. if the controls for the proposed building are not adequately specified or cannot be simulated, the sample control specifications in Appendix B of AIRAH-DA28 must be used; and

n. environmental conditions such as ground reflectivity, sky and ground form factors, temperature of external bounding surfaces, air velocities across external surfaces and the like; and

o. number, sizes, floors and traffic served by lifts and escalators.

(7)For the purposes of (6)(i), the intended building leakage at 50 Pa may be converted into a whole building infiltration value for the proposed building infiltration using Tables 4.16 to 4.24 of CIBSE Guide A if all of the following have been specified:

a. Additional sealing provisions to those required by Part J5.

b. An intended building leakage of less than 10 m3/hr.m2 at 50 Pa.

c. Pressure testing to verify achievement of the intended building leakage.

Table S34C3 Greenhouse gas emissions factors (kgCO2-e/GJ)

Energy Source	ACT	NSW	NT	QLD	SA	TAS	VIC	WA
Electricity	-	236	162	254	101	44	279	191
Gas	-	51.53	51.53	51.53	51.53	51.53	51.53	51.53

S34C4 Services — proposed and reference building

For the modelling of services for the purposes of calculating annual greenhouse gas emissions—

a. system demand and response for all items of plant must be calculated on a not less frequent than hourly basis; and

b. energy usage of all items of plant must be calculated with allowances for—

   I. part load performance; and

   II. staging to meet system demand; and

c. energy usage of cooling plant must be calculated with allowances for—

   I. the impact of chilled water temperature on chiller efficiency; and

   II. the impact of condenser water temperature on water-cooled plant efficiency; and

   III. the impact of ambient temperature on air-cooled plant efficiency; and

   IV. the energy use of primary pumps serving individual chillers; and

   V. the energy use of auxiliary equipment, including controls and oil heating for chillers; and

   VI. thermal losses in the chilled water system; and

   VII. the impact of chilled water temperature on thermal losses in the chilled water system; and

d. energy usage of water heating systems for space heating must be calculated with allowances for—

   I. the impact of water temperature on water heater efficiency; and

   II. the energy use of primary or feedwater pumps serving individual water heaters; and

   III. thermal losses in water heating systems; and

   IV. the thermal mass of water heating systems, accounting for thermal losses during periods when the system is not operating; and

e. energy usage of fan and pump systems must be calculated with allowances for—

   I. the method of capacity regulation; and

   II. the use of either fixed or variable pressure control; and

f. energy usage of pump systems must be calculated with allowances for the system fixed static pressure head; and

g. energy usage of auxiliary equipment associated with co-generation and tri-generation systems, including pumps, cooling towers and jacket heaters, must be calculated; and

h. where the energy usage of the heated water supply for food preparation and sanitary purposes or the energy usage of lifts and escalators is the same in the proposed building and the reference building, they may be omitted from the calculation of both the proposed building and the reference building; and

i. energy use of a lift in a building with more than one classification may be apportioned according to the number of storeys of the part for which the annual greenhouse gas emissions and thermal comfort level are being calculated.

Appendix C Architectural Plans

394 GOODA CK ROAD
MURRUMBATEMAN

1
DP1279460

2
DP1247034

3
DP1247034

5
DP1247034

GOODA CREEK ROAD (20.115 WIDE)

CREEK ROAD

EXISTING DAM

NEW DAM

VINEYARD

ACCESSWAY

DRIVEWAY

EXG TREE

WEDDING RECEPTION

BIG COTTAGE

NEW HOUSE - NOT PART OF THIS DA

232.48
80.73
56.02
149740
159160
149760
219.95
76080
573.29
53860
53860
53860
53860
200.87
200.87
85270
77240
136.45

SITE OVERVIEW

LEGEND

- (A) ENTRY POINT FROM ROADWAY & PARKING
- (B) FORMAL GARDENS WITH CEREMONY FACILITIES
- (C) WEDDING RECEPTION MAIN BUILDING
- (D) PHOTO OPPORTUNITY DECK SURROUNDING TREE
- (E) PHOTO OPPORTUNITY EXISTING DAM
- (F) PHOTO OPPORTUNITY ALPACAS
- (G) PHOTO OPPORTUNITY VIEWING PLATFORM/ RUIN
- (H) SERVICED APARTMENT ACCOMMODATION
- (I) EXISTING COTTAGE
- (J) PROPOSED NEW DWELLING (NOT PART OF THIS DA)
- (K) PROPOSED NEW VINEYARD
- (L) NEW CARPARKING
- (M) EXISTING SHED

PROJECT
394 GOODA CREEK RD MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
MASTER PLAN
SITE OVERVIEW

SCALE 1:2000(A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	09.05.25	APPROVED	
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A001	P10		

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P10	ISSUE FOR INFORMATION	AL&CH	09.05.25

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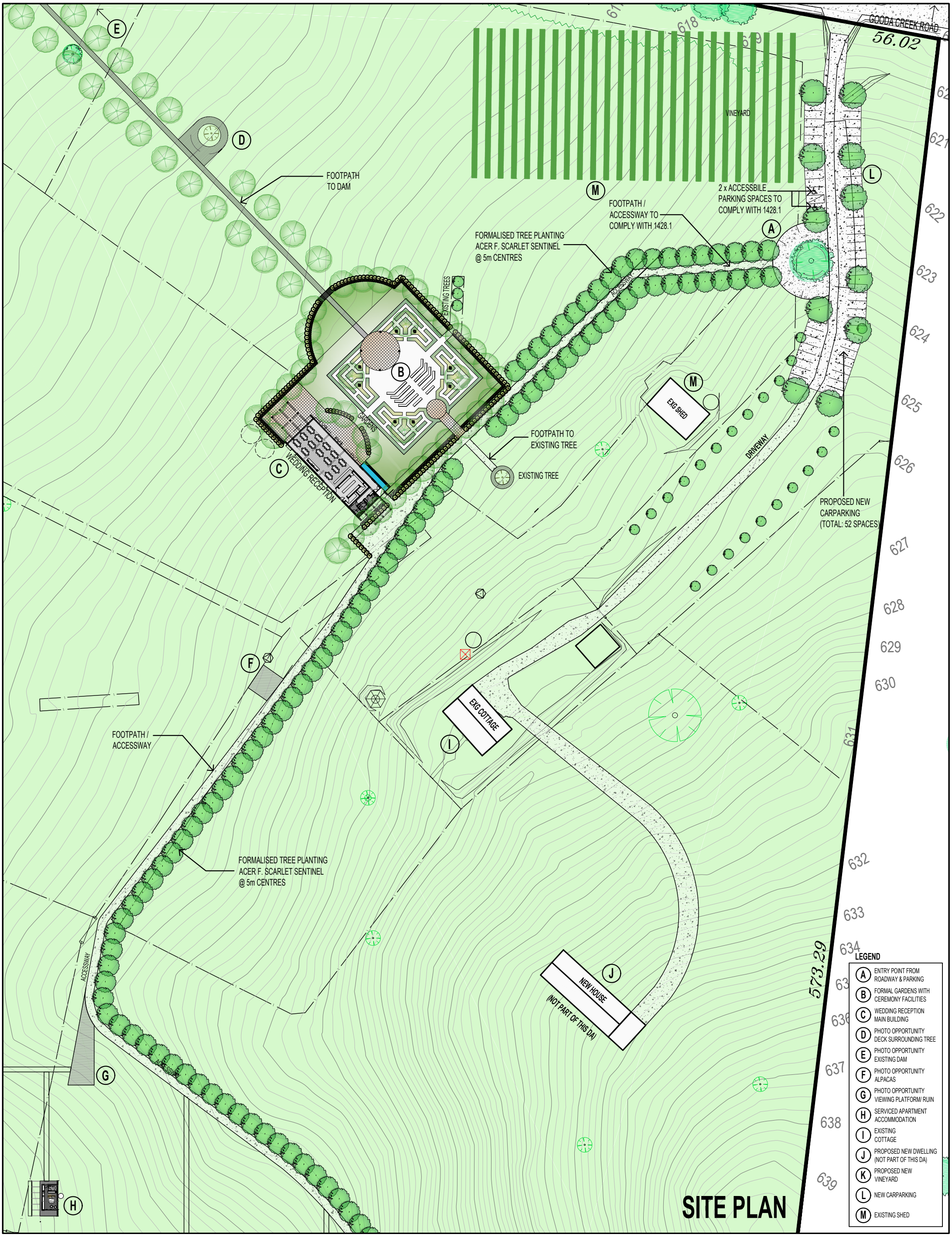

SITE PLAN

PROJECT
394 GOODA CREEK RD MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
SITE PLAN
- FINAL STAGE

SCALE 1:1000(A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
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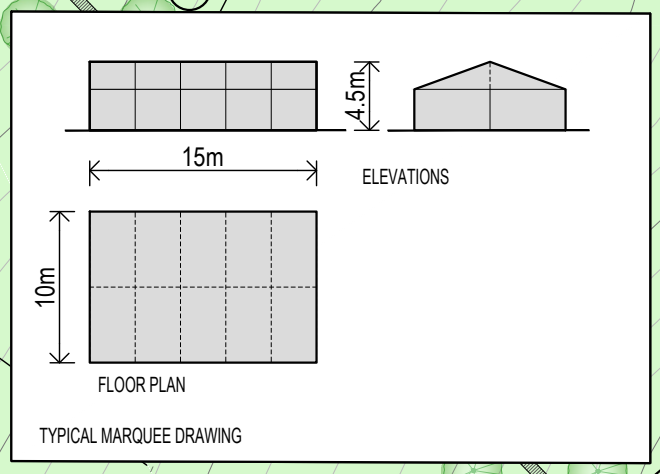

GOODA CREEK ROAD

56.02

VINEYARD

M

L

FOOTPATH TO DAM

152670 TO BOUNDARY

FOOTPATH / ACCESSWAY

A

FORMALISED TREE PLANTING ACER F. SCARLET SENTINEL @ 5m CENTRES

ACCESSWAY

EXISTING TREES

B

GARDENS

1500

162420 TO BOUNDARY

C

WEDDING RECEPTION

PROPOSED INTERIM STAGE MARQUEE EQUAL TO EXTREME MARQUEES TD100 FRAME (10x15m) WITH SIDE WALLS CHURCH WINDOWS

EXG SHED

FOOTPATH TO EXISTING TREE

EXISTING TREE

DRIVEWAY

PROPOSED NEW CARPARKING (TOTAL: 45 SPACES)

F

EXG COTTAGE

I

FOOTPATH / ACCESSWAY

FORMALISED TREE PLANTING ACER F. SCARLET SENTINEL @ 5m CENTRES

ACCESSWAY

G

H

J

NEW HOUSE (NOT PART OF THIS DA)

573.29

618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 636 637 638 639

LEGEND

- A ENTRY POINT FROM ROADWAY & PARKING
- B FORMAL GARDENS WITH CEREMONY FACILITIES
- C WEDDING RECEPTION MAIN BUILDING
- D PHOTO OPPORTUNITY DECK SURROUNDING TREE
- E PHOTO OPPORTUNITY EXISTING DAM
- F PHOTO OPPORTUNITY ALPACAS
- G PHOTO OPPORTUNITY VIEWING PLATFORM/ RUIN
- H SERVICED APARTMENT ACCOMMODATION
- I EXISTING COTTAGE
- J PROPOSED NEW DWELLING (NOT PART OF THIS DA)
- K PROPOSED NEW VINEYARD
- L NEW CARPARKING
- M EXISTING SHED

SITE PLAN

PROJECT
394 GOODA CREEK RD MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
SITE PLAN
- INTERIM STAGE

SCALE 1:1000(A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
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PROJECT DIRECTOR	AL&CH	VERIFIED	
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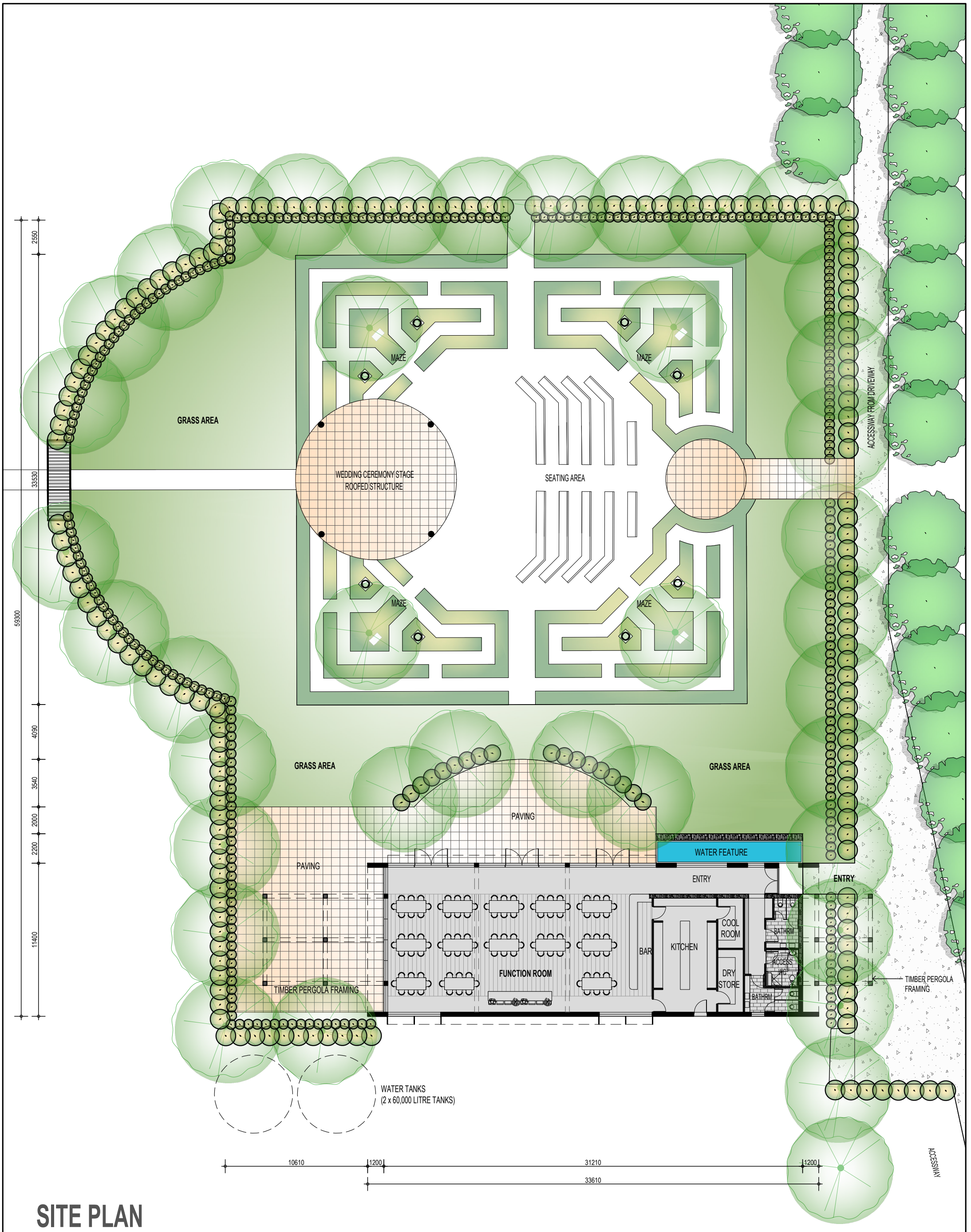

SITE PLAN

PROJECT	**394 GOODA CREEK RD MURRUMBATEMAN**	DRAWING TITLE	SITE PLAN DETAIL
	MASTER PLAN		
CLIENT	**394 GROUP PTY LTD**		
	GOODA CK ROAD MURRUMBATEMAN		
	PROJECT NO: 2331	SCALE	1:250(A3)
		DRAWN	AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	27.03.25	APPROVED	
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A004	P7		

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P4	ISSUE FOR INFORMATION	AL&CH	31.10.24
P5	ISSUE FOR INFORMATION	AL&CH	28.11.24
P6	ISSUE FOR INFORMATION	AL&CH	19.12.24
P7	ISSUE FOR INFORMATION	AL&CH	27.03.25

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TREES
MKP MAGNOLIA KAY PARRIS
MAC MELIA A. CAROLINE
PCC PYRUS C. CLEVELAND
UPT ULMUS P. TODD
ACER F. SCARLET SENTINAL

SHRUBS
BF BUXUS FAULKNER @ 500 CENTRES
CCC CALLISTEMON CAPTAIN COOK @1M CENTRES
LPG LOROPETALUM PLUM GORGEOUS @1M CENTRES
ROP RAPHIOLEPIS ORIENTAL PEARL @700 CENTRES

AVENUE OF ACER F.
SCARLET SENTINAL
@5m CENTRES

PCC

ROP @ 700mm
CENTRES

CCC @ 1m CENTRES

GRASS AREA

AVENUE OF UPT

MKP

MAZE

BF @ 500mm CENTRES
& BEDDING BEGONIA
BORDER

WEDDING CEREMONY STAGE
ROOFED STRUCTURE

SEATING AREA

ACCESSWAY FROM DRIVEWAY

UP-LIT JARDENIERS
ON PLINTHS

BF @ 500mm CENTRES
& BEDDING BEGONIA
BORDER

MAC

LPG x9

PAVING

WATER FEATURE

ENTRY

ENTRY COURTYARD

BAR

KITCHEN

COOL
ROOM

BATHRM

ACCESS
W/C

DRY
STORE

FUNCTION ROOM

TIMBER PERGOLA FRAMING

ACCESSWAY

WATER TANKS
(2 x 60,000 LITRE TANKS)

LANDSCAPE PLAN

PROJECT	394 GOODA CREEK RD MURRUMBATEMAN	DRAWING TITLE	LANDSCAPE PLAN
	MASTER PLAN		
CLIENT	394 GROUP PTY LTD		
	GOODA CK ROAD MURRUMBATEMAN		
	PROJECT NO: 2331	SCALE	1:250(A3)
		DRAWN	AL&CH
PROJECT ARCHITECT	AL&CH	COORD.	
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GRADING PLAN

PROJECT	DRAWING TITLE	PROJECT ARCHITECT AL&CH	COORD.	REV	DESCRIPTION	DRAWN	DATE	NOTES
394 GOODA CREEK RD MURRUMBATEMAN	GRADING PLAN		REVIEWED	P1	ISSUE FOR INFORMATION	AL&CH	31.03.25	All dimensions are in millimetres. All levels are in metres. Do not scale off drawing. All structure to engineers specification. All dimensions, levels and site conditions must be verified by contractor prior to commencement of any work. All work must be carried out in accordance with the current edition of the Building Code of Australia & all relevant Australian Standards.
MASTER PLAN		PROJECT DIRECTOR AL&CH	VERIFIED					
CLIENT		DATE 31.03.25	APPROVED					
394 GROUP PTY LTD		DRAWING NUMBER A006	REVISION P1					
GOODA CK ROAD MURRUMBATEMAN	SCALE 1:500(A3)		NORTH					
PROJECT NO: 2331	DRAWN AL&CH							

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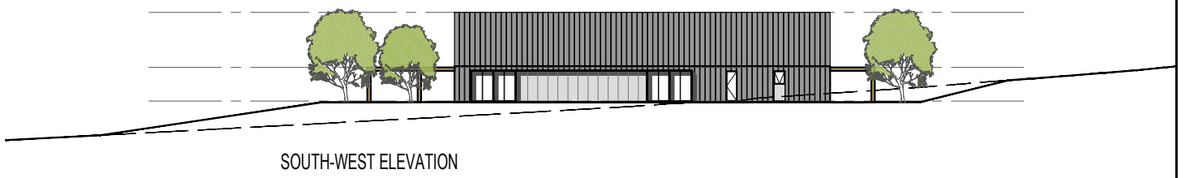
SITE PLAN

SOUTH-EAST ELEVATION

NORTH-EAST ELEVATION

NORTH-WEST ELEVATION



SOUTH-WEST ELEVATION

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
PUBLIC NOTIFICATION PLAN

SCALE: NTS

DRAWN: AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	15.05.25	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A007	P1		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	15.05.25

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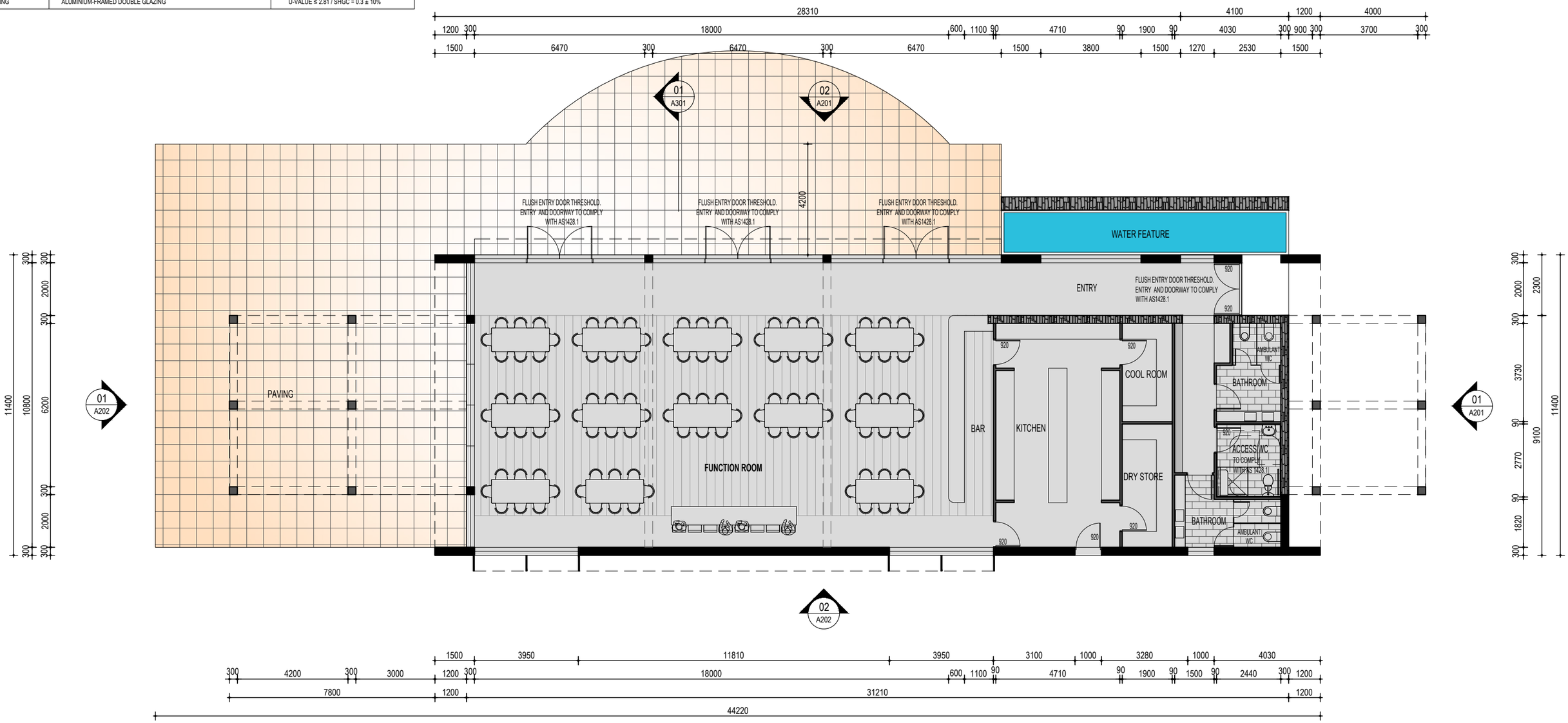
ENERGY COMMITMENTS

BUILDING ELEMENT	CONSTRUCTION DETAILS	SYSTEM THERMAL PERFORMANCE R VALUE
ROOF / CEILING	METAL SHEETING + R1.3 BLANKET + AIR GAP + CLASS 4 VAPOUR PERMEABLE MEMBRANE + R4 TIMBER FRAMING	R 5.51
EXTERNAL WALLS	METAL CLADDING + AIR GAP + CLASS 4 VAPOUR PERMEABLE MEMBRANE + 10MM THERMAL BREAK STRIPS + R2.5 IN METAL STUD + PLASTERBOARD	R2.02
INTERNAL WALLS	PLASTERBOARD + METAL STUD + R2.0 + PLASTERBOARD	R 2.4
FLOORS	CONCRETE SLAB + 30MM (R1) XPS TO UNDERSIDE	R 2.09
GLAZING	ALUMINIUM-FRAMED DOUBLE GLAZING	U-VALUE ≤ 2.81 / SHGC = 0.3 ± 10%



PROJECT	**394 GOODA CREEK RD MURRUMBATEMAN** MASTER PLAN	DRAWING TITLE	FLOOR PLAN
CLIENT	**394 GROUP PTY LTD** GOODA CK ROAD MURRUMBATEMAN	SCALE	1:150 (A3)
PROJECT NO: 2331		DRAWN	AL&CH
PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	15.05.25	APPROVED	
DRAWING NUMBER	A101	REVISION	P5
		NORTH	

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	18.11.24
P2	ISSUE FOR INFORMATION	AL&CH	28.11.24
P3	ISSUE FOR INFORMATION	AL&CH	19.12.24
P4	ISSUE FOR INFORMATION	AL&CH	27.03.25
P5	ISSUE FOR INFORMATION	AL&CH	15.05.25

NOTES
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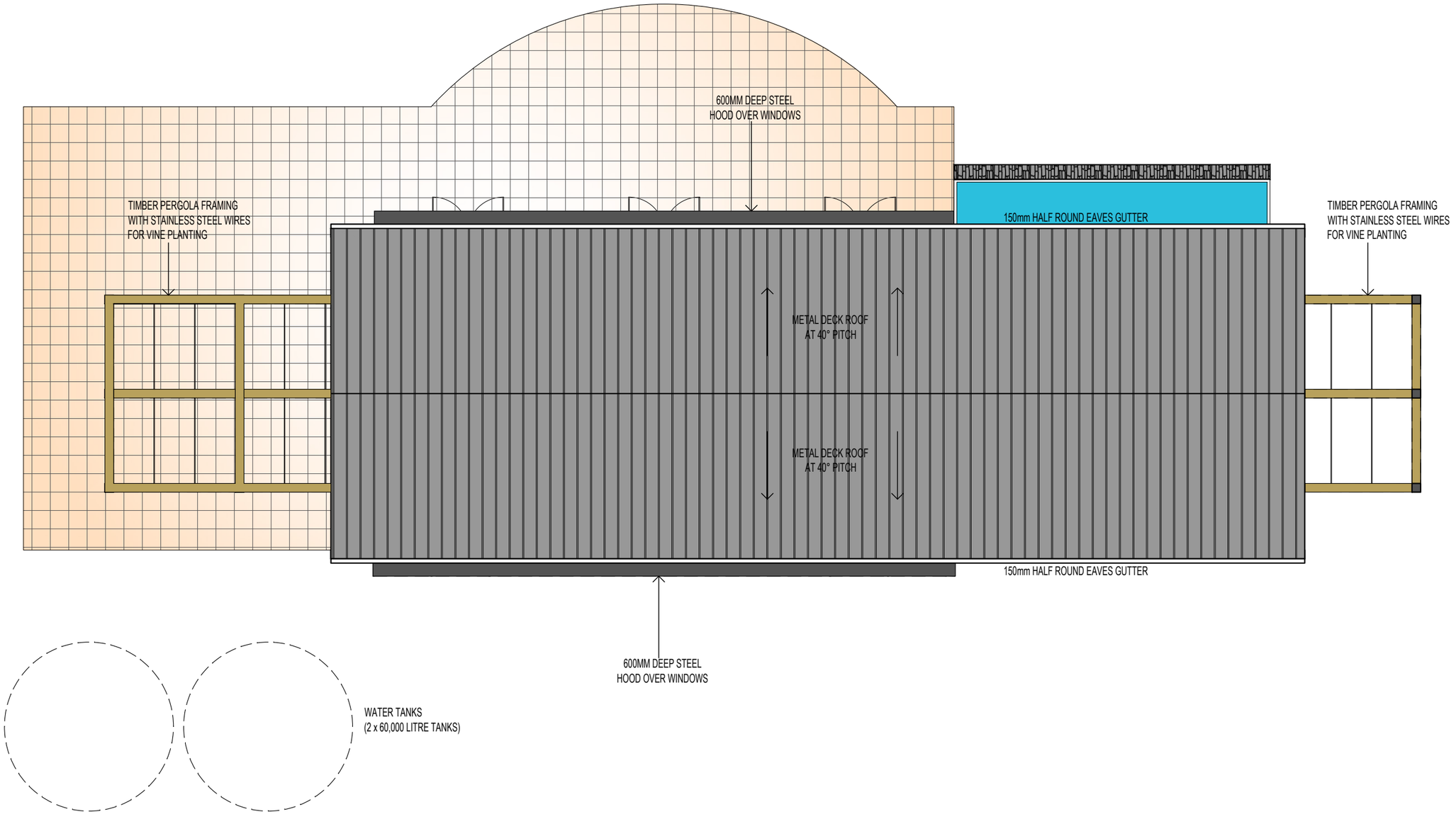

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
ROOF PLAN

SCALE 1:150 (A3)

DRAWN AL&CH

PROJECT ARCHITECT	AL&CH
PROJECT DIRECTOR	AL&CH
DATE	27.03.25
DRAWING NUMBER	A102
REVISION	P3

COORD.	
REVIEWED	
VERIFIED	
APPROVED	
NORTH	

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	28.11.24
P2	ISSUE FOR INFORMATION	AL&CH	19.12.24
P3	ISSUE FOR INFORMATION	AL&CH	27.03.25

NOTES
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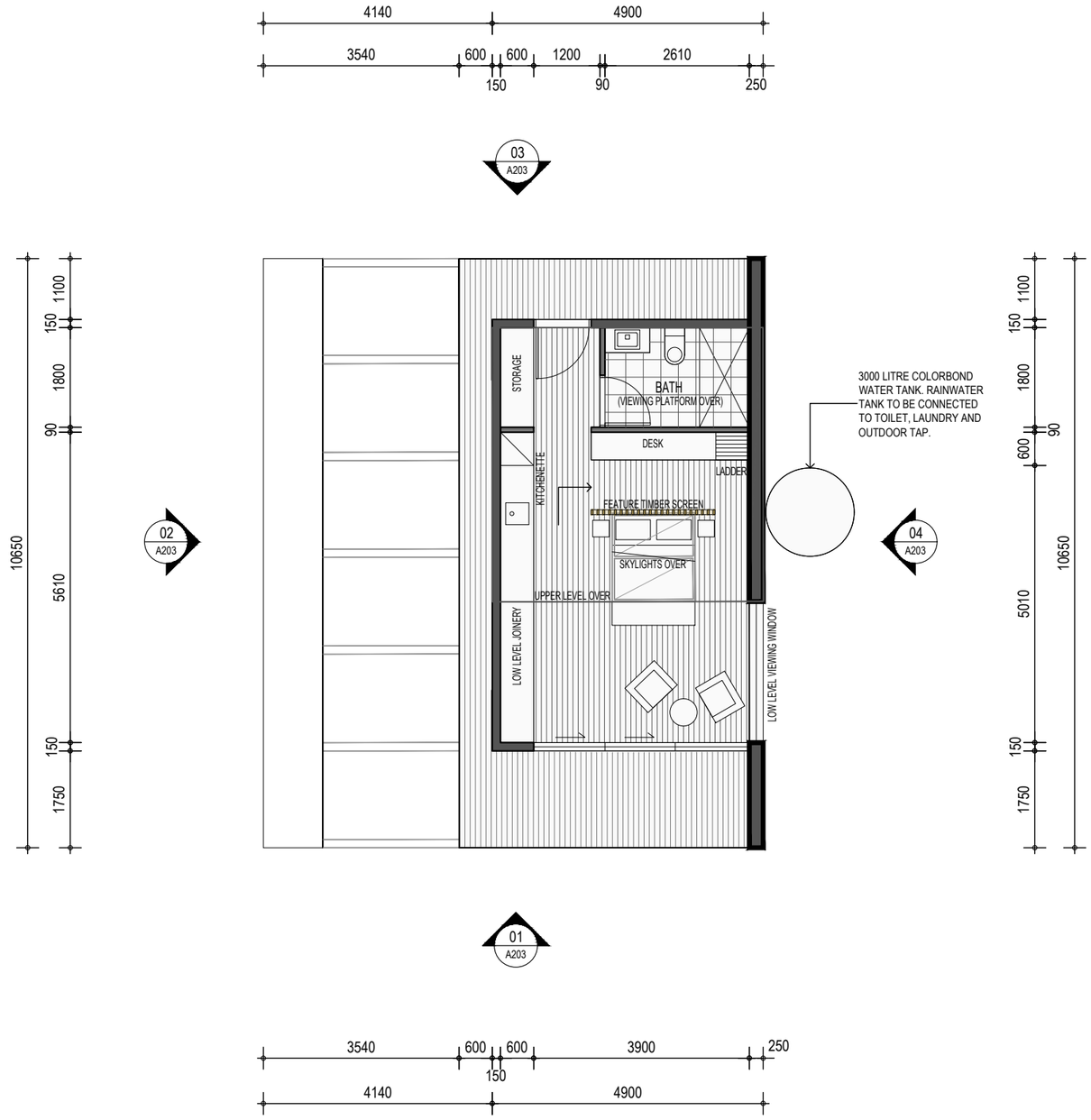

BASIX COMMITMENTS:

LANDSCAPE: THE APPLICANT MUST PLANT INDIGENOUS OR LOW WATER USE SPECIES OF VEGETATION THROUGHOUT 50 SQUARE METRES OF THE SITE

CONSTRUCTION:
FLOOR - CONCRETE SLAB ON GROUND, WAFFLE POD SLAB

UPPER FLOOR - ABOVE HABITABLE ROOMS OR MEZZANINE, PARTICLE BOARD; FRAME: TIMBER - H2 TREATED SOFTWOOD.

EXTERNAL WALL: FRAMED (FIBRE CEMENT SHEET OR BOARDS); FRAME: TIMBER - H2 TREATED SOFTWOOD.
INSULATION TO BE R3.50 (OR R4.00 INCLUDING CONSTRUCTION); FIBREGLASS BATTS OR ROLL + REFLECTIVE FOIL IN THE CAVITY)
WALL COLOUR: DARK (SOLAR ABSORPTANCE 0.71 0.85)

INTERNAL WALL: PLASTERBOARD; FRAME: TIMBER - H2 TREATED SOFTWOOD.
INSULATION: FIBREGLASS BATTS OR ROLL

CEILING AND ROOF - RAKED CEILING / PITCHED OR SKILLION ROOF, FRAMED - METAL ROOF, TIMBER - H2 TREATED SOFTWOOD.
INSULATION: CEILING: 6.4 (UP), ROOF: FOIL/ SARKING ; CEILING: FIBREGLASS BATTS OR ROLL; ROOF: FOIL/SARKING
ROOF COLOUR: MEDIUM (SOLAR ABSORPTANCE 0.48 - 0.59); 0.5 TO ≤ 1.0% OF CEILING AREA UNINSULATED

GLAZING:
SKYLIGHT AREA NOT TO EXCEED 3m²
SKYLIGHTS: ALUMINIUM, DOUBLE CLEAR (U: <=4.2, SHGC: 0.68 - 0.76)

WINDOWS: ALUMINIUM, DOUBLE GLAZED (U-VALUE: <=2.5, SHGC: >0.49)

HOT WATER:
THE APPLICANT MUST INSTALL THE FOLLOWING HOT WATER SYSTEM IN THE DEVELOPMENT, OR A SYSTEM WITH A HIGHER ENERGY RATING: ELECTRIC HEAT PUMP WITH A PERFORMANCE OF 31 TO 35 STC'S OR BETTER.

ALTERNATIVE ENERGY:
THE APPLICANT MUST INSTALL A PHOTOVOLTAIC SYSTEM AS PART OF THE DEVELOPMENT. THE APPLICANT MUST CONNECT THIS SYSTEM TO THE DEVELOPMENT'S ELECTRICAL SYSTEM.
THE PHOTOVOLTAIC SYSTEM MUST CONSIST OF:
PHOTOVOLTAIC COLLECTORS WITH THE CAPACITY TO GENERATE AT LEAST 1 PEAK KILOWATT OF ELECTRICITY, INSTALLED AT AN ANGLE BETWEEN 35 DEGREES AND 45 DEGREES TO THE HORIZONTAL FACING WEST.

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
SERVICED APARTMENT
TYPICAL FLOOR PLAN

SCALE 1:100 (A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	09.05.25	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A103	P3		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	19.12.24
P2	ISSUE FOR INFORMATION	AL&CH	29.01.24
P3	ISSUE FOR INFORMATION	AL&CH	09.05.25

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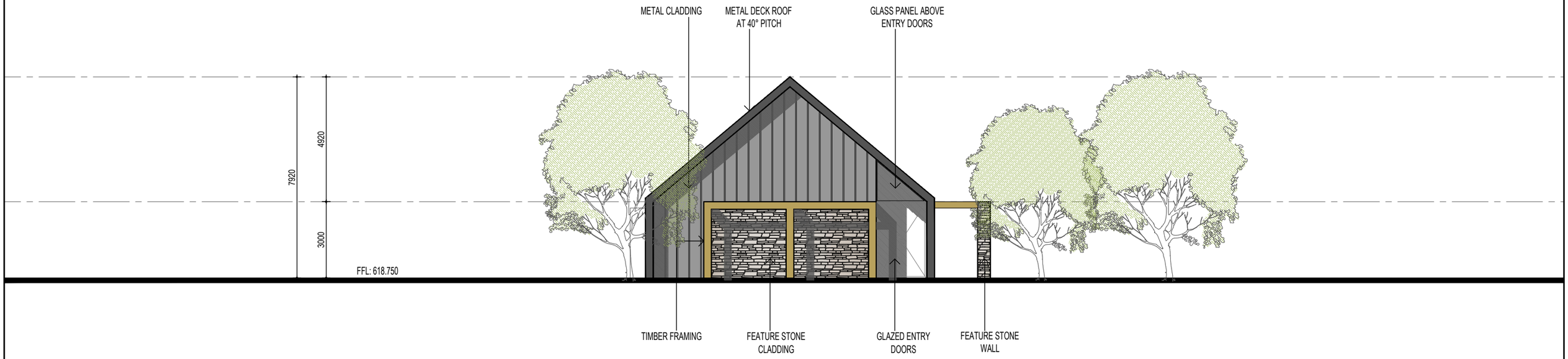

01 SOUTH-EAST ELEVATION

02 NORTH-EAST ELEVATION

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
ELEVATIONS

SCALE 1:150 (A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	28.11.24	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A201	P2		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	18.11.24
P2	ISSUE FOR INFORMATION	AL&CH	28.11.24

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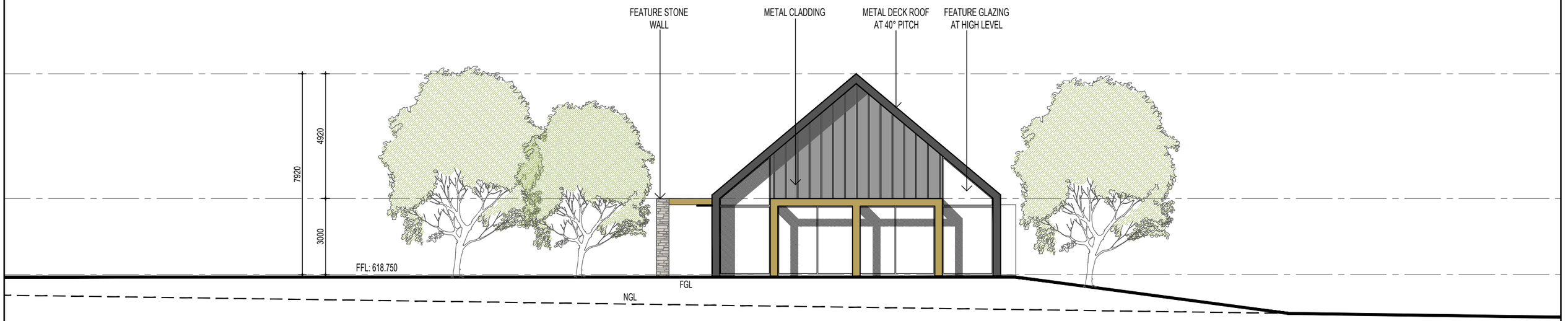
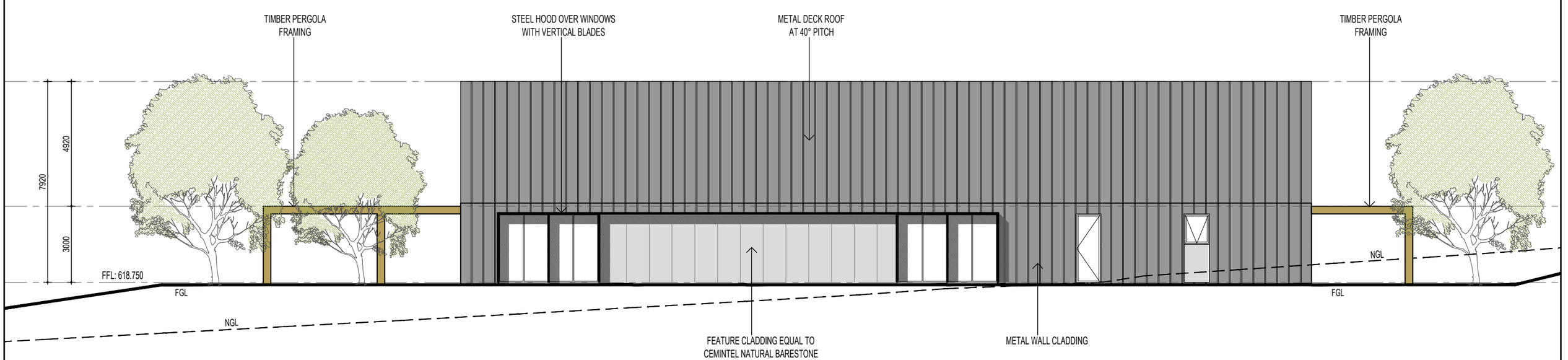


01 NORTH-WEST ELEVATION



02 SOUTH-WEST ELEVATION

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
ELEVATIONS

SCALE 1:150 (A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	19.12.24	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A202	P3		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	18.11.24
P2	ISSUE FOR INFORMATION	AL&CH	28.11.24
P3	ISSUE FOR INFORMATION	AL&CH	19.12.24

NOTES
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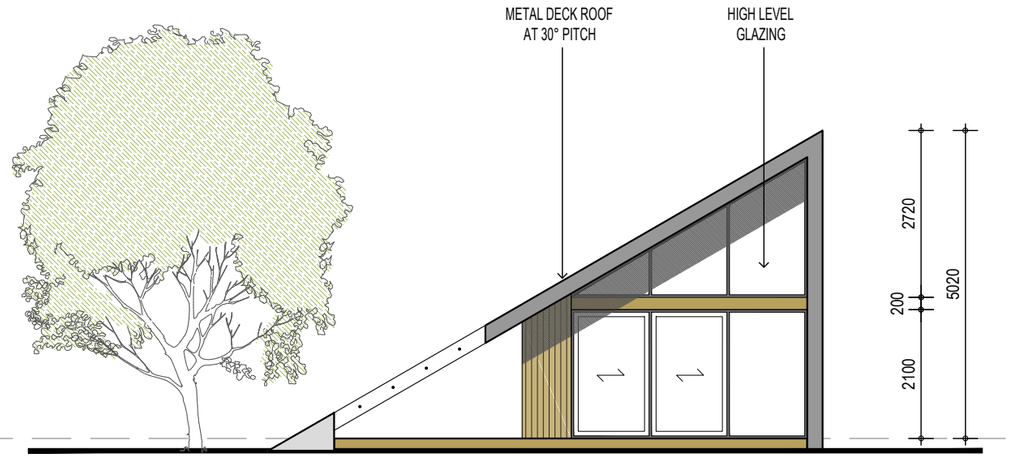
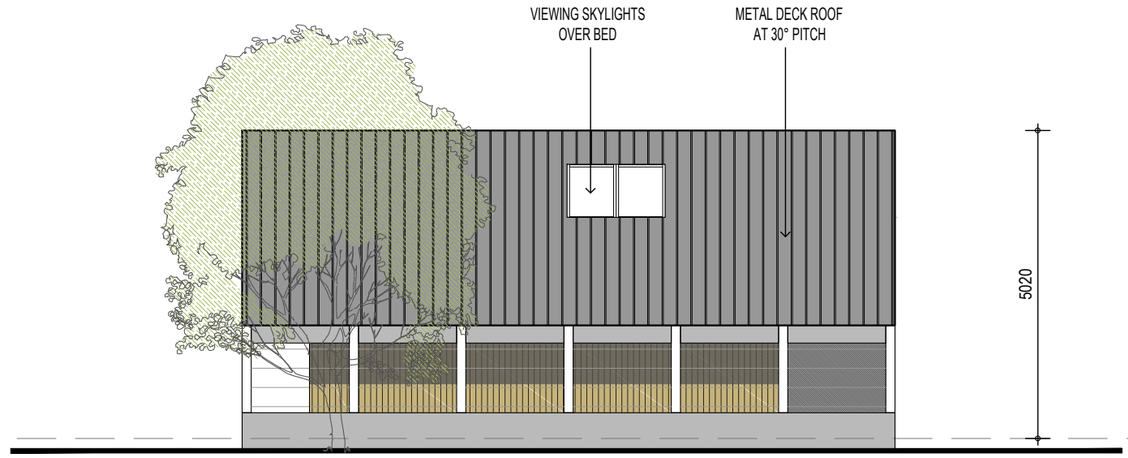
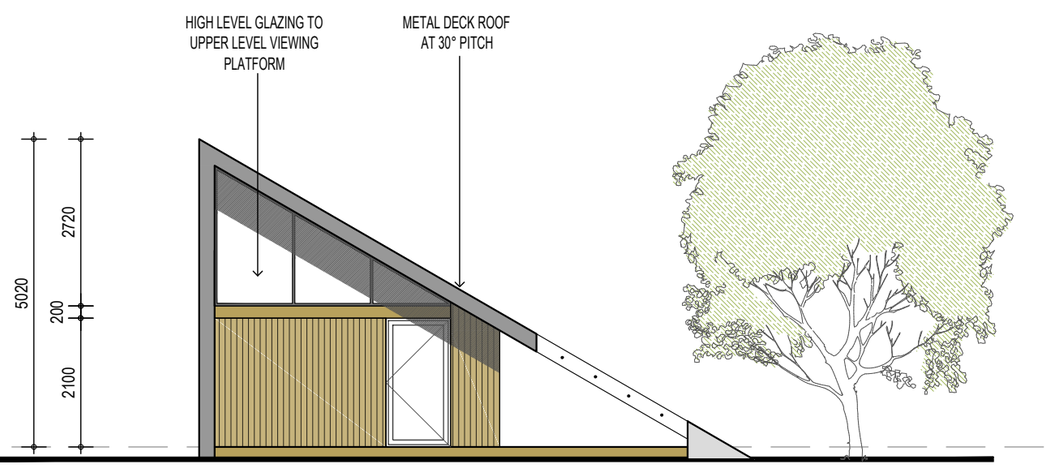


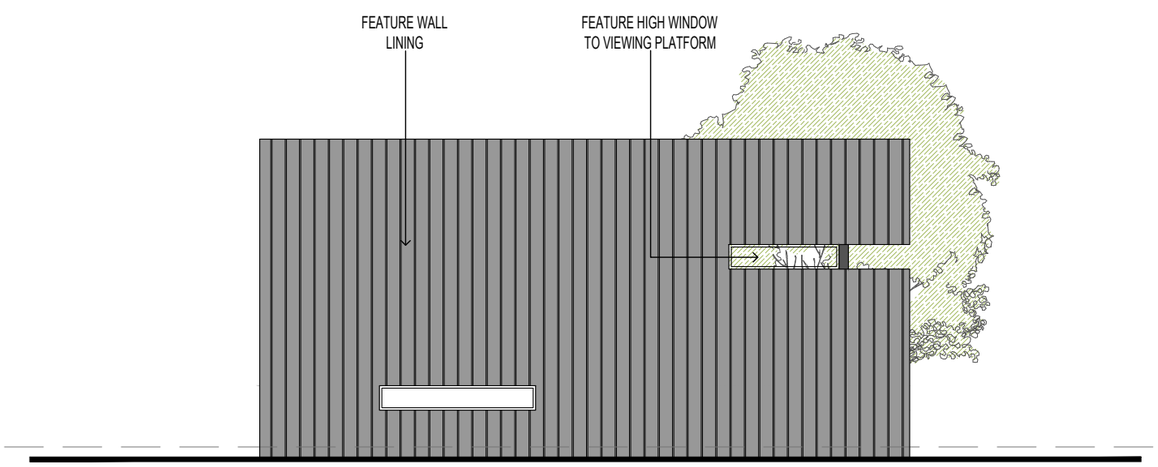
01 SOUTH ELEVATION



02 WEST ELEVATION



03 NORTH ELEVATION



04 EAST ELEVATION

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
SERVICED APARTMENT
TYPICAL ELEVATIONS

SCALE 1:100 (A3)

DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	29.01.25	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A203	P2		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	19.12.24
P2	ISSUE FOR INFORMATION	AL&CH	29.01.24

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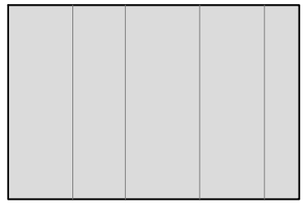
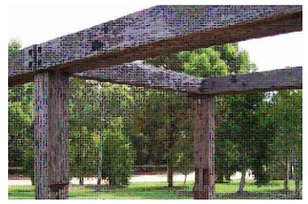
LONGLINE CLADDING & ROOFING
- MONUMENT COLOUR



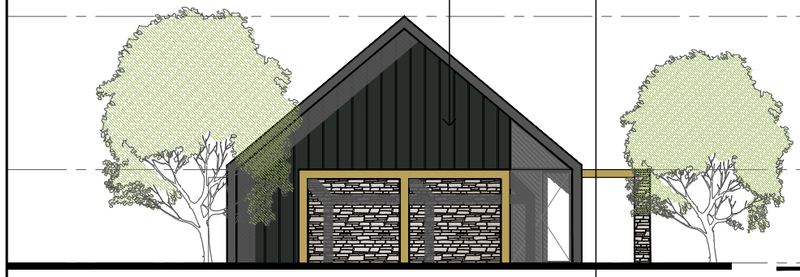
LIGHTWEIGHT VERTICAL CLADDING
- CEMINTEL CLADDING

STONE WALL FINISH
- EQUAL TO ARTISAN STONE, BRIBIE CLADDING

WINDOW FRAMES,
HOODS & AWNINGS
- COLOUR: MONUMENT



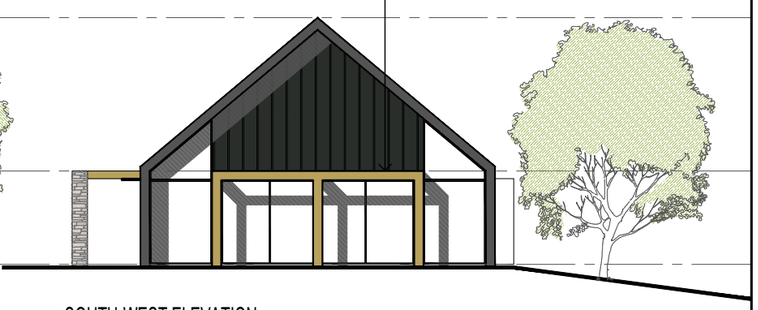
TIMBER PERGOLA FRAMING



SOUTH-EAST ELEVATION

NORTH-EAST ELEVATION

NORTH-WEST ELEVATION



SOUTH-WEST ELEVATION

PROJECT
394 GOODA CREEK RD
MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
MATERIALS & COLOURS SCHEDULE

SCALE: NTS

DRAWN: AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	15.05.25	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A204	P1		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	15.05.25

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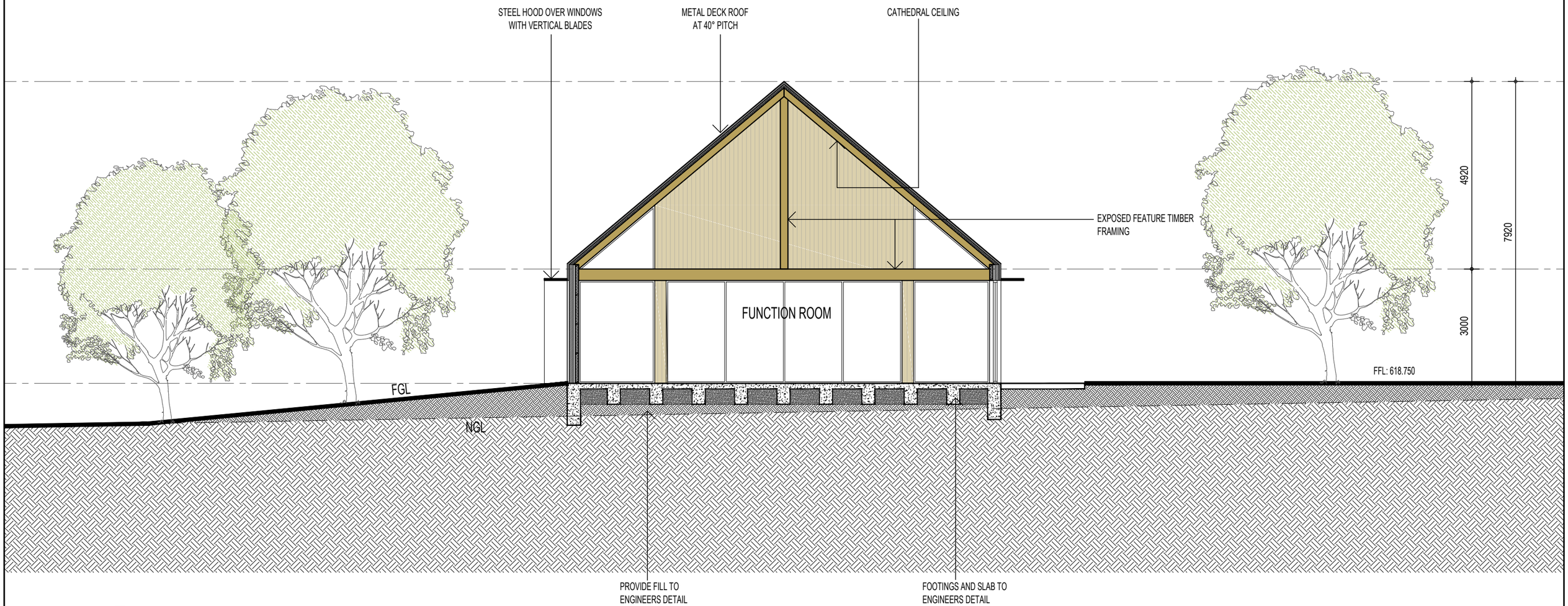
ENERGY COMMITMENTS

BUILDING ELEMENT	CONSTRUCTION DETAILS	SYSTEM THERMAL PERFORMANCE R VALUE
ROOF / CEILING	METAL SHEETING + R1.3 BLANKET + AIR GAP + CLASS 4 VAPOUR PERMEABLE MEMBRANE + R4 TIMBER FRAMING	R 5.51
EXTERNAL WALLS	METAL CLADDING + AIR GAP + CLASS 4 VAPOUR PERMEABLE MEMBRANE + 10MM THERMAL BREAK STRIPS + R2.5 IN METAL STUD + PLASTERBOARD	R2.02
INTERNAL WALLS	PLASTERBOARD + METAL STUD + R2.0 + PLASTERBOARD	R 2.4
FLOORS	CONCRETE SLAB + 30MM (R1) XPS TO UNDERSIDE	R 2.09
GLAZING	ALUMINIUM-FRAMED DOUBLE GLAZING	U-VALUE ≤ 2.81 / SHGC = 0.3 ± 10%



01 SECTION

PROJECT
394 GOODA CREEK RD MURRUMBATEMAN
MASTER PLAN

CLIENT
394 GROUP PTY LTD
GOODA CK ROAD MURRUMBATEMAN

PROJECT NO: 2331

DRAWING TITLE
SECTION

SCALE 1:100 (A3)
DRAWN AL&CH

PROJECT ARCHITECT	AL&CH	COORD.	
		REVIEWED	
PROJECT DIRECTOR	AL&CH	VERIFIED	
DATE	15.05.25	APPROVED	
DRAWING NUMBER	REVISION	NORTH	
A301	P2		

REV	DESCRIPTION	DRAWN	DATE
P1	ISSUE FOR INFORMATION	AL&CH	28.11.24
P2	ISSUE FOR INFORMATION	AL&CH	15.05.25

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