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## **NCC Section J Compliance Report**

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### **Alberg Ski Lodge Alterations & Addition Charlotte Pass NSW**

**Prepared by:**  
**Gradwell Consulting** ABN 68 872 791 784  
**Sustainability Consultants**  
**PO Box 819**  
**Bowral NSW 2576**  
**t: 1800 11 24 25**  
**e: [info@gradwellconsulting.com](mailto:info@gradwellconsulting.com)**  
**w: [www.gradwellconsulting.com](http://www.gradwellconsulting.com)**

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## Design Statement

Pursuant to the provisions of Clause A2.2 of the National Construction Code, we affirm that we have assessed this design as presented and (provided the measures noted herein are executed in the design and built deliverables) it is our opinion that the design meets the requirements of NCC 2019 Volume One Amendment 1 Section J.

## Document Control

Revision	Date	Description
1	20 February 2023	Preliminary results (email)
2	18 March 2023	Draft for review
3	24 June 2023	Reduced glazing
Final	7 July 2023	Issued

## J0 Section J Overview

### J0.1 Background on Energy Efficiency

In response to concerns over global warming, the Australian Government announced in July 2000 that agreement had been reached with industry and State and Territory Governments to reduce greenhouse gas emissions from buildings.

Given the importance of the energy performance of buildings to overall national greenhouse gas emissions performance, the Australian Building Codes Board (ABCB) and the Australian Greenhouse Office signed a Memorandum of Understanding to jointly develop the BCA Energy Efficiency Provisions.

The Energy Efficiency Project was endorsed under the National Framework for Energy Efficiency (NFEE), an agreement between all Australian Governments established to improve energy efficiency. The objective of NFEE is to unlock the significant economic potential associated with increased implementation of energy efficiency technologies and processes to deliver a least cost approach to energy efficiency in Australia.

### J0.2 Introduction

This report describes the compliance of the proposed building with the energy efficiency requirements as specified by Section J of Volume One of the National Construction Code of Australia 2019 Amendment 1 and NSW Subsection J(B) as allowed by NCC 2022 during the transitional period up to 1 October 2023.

Note: all references to NCC 2019 in this report refer to NCC 2019 Amendment 1.

This review is based on a Deemed-To-Satisfy (DtS) solution as defined by NCC 2019 Volume One Part J0 for a Class 2 to 9 building, other than the sole-occupancy units of a Class 2 building or a Class 4 part of a building.

The report is based on the details supplied on the drawings by Brooks Project Architects (refer to Appendix IV) and additional information received from the client.

### J0.3 Building Class

The building is assessed as Class 3 (guest house).

### J0.4 Climate Zone

The site is Climate zone 8.

### J0.5 Assessor Qualifications

This assessment has been undertaken by David Gradwell, Principal of Gradwell Consulting. David has a Bachelor of Engineering Degree (Civil, Honours) from the University of Queensland and is a former Member of the Institute of Engineers Australia.

He has extensive experience in Section J assessments including computer modelling of residential buildings (NatHERS) and commercial buildings using programs such as BERS Pro, DesignBuilder and EnergyPlus.

## J1 Building Fabric

### J1.1 Application of Part

This part applies to the new or altered building elements forming the thermal envelope which is the boundary between the conditioned area and the adjacent non-conditioned areas. Refer to Appendix I for drawing(s) showing the external wall envelope (in green); non-external wall envelope (in blue); roof/ceiling envelope; and floor envelope as assessed.

### J1.2 Thermal Construction General

Where required, insulation must comply with AS/NZS 4859.1. It is important that the building is constructed in a manner that achieves a thermally effective building envelope. Clause J1.2 contains a broad range of requirements that apply to insulating the building fabric. Test reports complying with the appropriate Standard may be required to confirm insulation levels.

#### J1.2 (a) Integrity of the Insulating

Installation must be installed so that the insulation 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 forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and not affect the safe or effective operation of a service or fitting.

#### J1.2 (b) Installation of Reflective Insulation

Any reflective insulation must be installed with the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and be close fitting to any penetration, door or window opening; and be adequately supported by framing members; and each adjoining sheet of roll membrane must be overlapped not less than 50 mm or taped together.

#### J1.2 (c) Installation of Bulk Insulation

Bulk insulation must be installed so that 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 in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, overlap the wall be not less than 50 mm.

#### J1.2 (d) Thermal Properties

Roof, ceiling and floor materials and associated surfaces are deemed to have the thermal properties listed in NCC 2019 Volume One Specification J1.2.

#### J1.2 (e) Thermal Bridging

The required Total R-Value and Total System U-Value must include allowances for thermal bridging in accordance with NCC 2019 Volume One J1.2(e).

### J1.3 Roof and Ceiling Construction

The new roof and ceiling are part of the envelope and must achieve a Total R-Value of 4.8 for an upward direction of heat flow; and the solar absorptance of the upper surface of the roof must not be more than 0.45 in accordance with NCC 2019 Volume One J1.3.

The following table describes a possible roof/ceiling system:

<b>Envelope Roof</b>	Required Total R- Value	Achieved Total R- Value	Construction Example
balcony	R4.8	R4.8	Waterproofing / 190mm CLT / 165 mm glasswool R3.0 / 10 mm plasterboard

### J1.4 Roof Lights

Not applicable if there are no roof lights in the new/altered thermal envelope.

### J1.5 Walls and Glazing

New or altered walls and glazing (wall-glazing construction) that form part of the thermal envelope (shown in green and blue on the diagrams in Appendix I) must achieve a Total System U-Value of 0.9 or less (Building Class 3 in Climate Zone 8).

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 wall-glazing construction, R3.8 in accordance with NCC 2019 Volume One Table J1.5a (Building Class 3 in Climate Zone 8).

The solar admittance of externally facing wall-glazing construction (shown in green on the diagrams in Appendix I) must not be greater than 0.08 in accordance with NCC 2019 Volume One Table J1.5bc (Building Class 3 in Climate Zone 8).

The Total System U-Value and solar admittance of wall-glazing construction must be calculated in accordance with NCC 2019 Volume One Specification J1.5a.

Compliance is based on Method 2. Refer to Appendix II for thermal performance calculations and assumptions.

The following table describes a possible wall system:

Envelope Wall	Achieved Total R-Value	Construction Example
External wall	R4.1	100 mm CLT / 140 mm timber studs @ 450 mm centres with 140 mm glasswool R4.0 / 13 mm plasterboard

Thermal bridging has been calculated using the Knauf Kompli system.

The achieved Total R-Value is based on information published on the manufacturer's website that takes thermal bridging into account. Gradwell Consulting takes no responsibility for the accuracy of this information.

The following table summarises the glazing specifications:

Level	Orientation	Uw	SHGCw	Typical window
Ground	North	$\leq 5.8$	$\leq 0.25$	Single lowE glazing with grey glass

The typical window is for guidance only as specifications vary by manufacturer.

Indicative window performance details are available from <http://www.wers.net/>

Note: the Uw and SHGCw specification is for the window including glass and frame.

Shading is due to the shading (eaves, awnings, louvres, blinds and other projections) shown on the drawings.

## J1.6 Floors

A floor that is part of the thermal envelope and does not have an in-slab heating or cooling system must achieve a Total R-Value of R2.0 for a downward direction of heat flow in accordance with NCC 2019 Volume One Table J1.6 (Climate Zone 8).

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.

The insulation for a concrete slab-on-ground must be-

- (a) 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.

The following table describes a possible floor system:

Envelope Floor	Required Total R- Value	Achieved Total R- Value	Construction Example
Above entry level	R2.0	R2.6	19 mm particleboard / airspace / 115 mm glasswool R2.0 / 10 mm plasterboard



## J3 Building Sealing

### J3.1 Application of Part

This part applies to the elements forming the envelope other than-

- (a) a building in climate zones 1, 2, 3, and 5 where the only means of ai-conditioning is by using an evaporative cooler; or
- (b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or
- (c) a building or space where mechanical ventilation required by Part F4 provides sufficient pressurisation to prevent infiltration; or
- (d) parts of the building that cannot be fully enclosed (NSW J3.1(d)).

### J3.2 Chimneys and flues

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

### J3.3 Roof Lights

Not applicable as there aren't roof lights.

### J3.4 Windows and doors

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

### J3.5 Exhaust fans

- (a) An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving-
  - (i) a conditioned space; or
  - (ii) a habitable room in climate zones 4, 5, 6, 7 or 8.

### J3.6 Construction of roofs, walls and floors

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

### J3.7 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 & 8.

## J5 Air Conditioning and Ventilation Systems

It is understood that the mechanical services consultant or supplier will confirm Part J5 compliance. Hence the following is for general information only.

### J5.2 Air Conditioning System Control

- (a) An air-conditioning system –
  - (i) must be capable of being deactivated when the building or part of a building served by that system is not occupied; and
  - (ii) when serving more than one air-conditioning zone or area with different heating or cooling needs, must –
    - (A) thermostatically control the temperature of each zone or area; and
  - (iii) 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.
  - (iv) when deactivated, must close any motorised outside air or return damper that is not otherwise being actively controlled.
- (b) 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.
- (c)
  - (i) A time switch must be provided to control –
    - (A) an air-conditioning system of more than 2 kW<sub>r</sub>; and
    - (B) a heater of more than 1 kW<sub>heating</sub> used for air-conditioning.
  - (ii) The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.
  - (iii) The requirements of (i) and (ii) do not apply to –
    - (A) 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
    - (B) a conditioned space where air-conditioning is needed for 24 hour continuous use.

### J5.3 Mechanical Ventilation Systems

- (a) 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 –
  - (i) be capable of being deactivated when the building or part of a building served by that system is not occupied; and
- (b) 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.

- (c) Carpark exhaust systems – Carpark exhaust systems must have a control system in accordance with –
  - (i) 4.11.2 of AS 1668.2; or
  - (ii) 4.11.3 of AS 1668.2.
- (d) Time switches –
  - (i) A time switch must be provided to control a mechanical ventilation system with an air flow rate of more than 1000 L/s.
  - (ii) The time switch must be capable of switching electric power on and off at variable pre-programmed times and on variable pre-programmed days.
  - (iii) The requirements of (i) and (ii) do not apply to –
    - (A) a mechanical ventilation system that serves –
      1. only one sole-occupancy unit in a Class 2 or 3 building; or
      2. a Class 4 part of a building; or
      3. only one sole-occupancy unit in a Class 9c building; or
    - (B) a building where mechanical ventilation is needed for 24 hour occupancy.

#### J5.4 Fan systems

These requirements are unlikely to apply to a simple mechanical ventilation and air-conditioning system. For other than simple systems, refer to the NCC for the requirements for fans, ductwork and duct components that form part of an air-conditioning system or mechanical ventilation system.

#### J5.5 Ductwork insulation

These requirements are unlikely to apply to a simple mechanical ventilation and air-conditioning system. For other than simple systems, refer to the NCC for the requirements for fans, ductwork and duct components that form part of an air-conditioning system or mechanical ventilation system.

#### J5.6 Ductwork sealing

These requirements are unlikely to apply to simple air-conditioning systems such as packaged air conditioners, split systems, and variable refrigerant flow air-conditioning equipment complying with MEPS. For other than simple systems, refer to the NCC for the requirements for ducting and fittings in an air-conditioning system.

#### J5.7 Pump systems

These requirements are unlikely to apply to simple air-conditioning systems such as packaged air conditioners, split systems, and variable refrigerant flow air-conditioning equipment complying with MEPS. For other than simple systems, refer to the NCC for the requirements for pumps and pipework that form part of an air-conditioning system.

#### J5.8 Pipework insulation

These requirements do not apply to simple air-conditioning appliances such as packaged air conditioners, split systems, and variable refrigerant flow air-conditioning equipment complying with MEPS. Refer to the NCC for the requirements for ducting and fittings in other parts of the air-conditioning system.

### J5.9 Space heating

- (a) A heater used for air-conditioning or as part of an air-conditioning system must be-
  - (i) a solar heater; or
  - (ii) a gas heater; or
  - (iii) a heat pump heater; or
  - (iv) a heater used reclaimed heat from another process such as reject heat from a refrigeration plant; or
  - (v) an electric heater if-
    - (A) the heating capacity is not more than-
      - 1. 10 W/m<sup>2</sup> of the floor area of the conditioned space in climate zone 1; or
      - 2. 40 W/m<sup>2</sup> of the floor area of the conditioned space in climate zone 2; or
      - 3. the value specified in Table J5.9 where reticulated gas is not available at the allotment boundary; or
    - (B) the annual energy consumption for heating is not more than 15 kWh/m<sup>2</sup> of the floor area of the conditioned space in climate zones 1, 2, 3, 4 and 5; or
    - (C) the in-duct heater complies with J5.2(a)(ii)(C); or
  - (vi) any combination of (i) to (v).
- (b) An electric heater may be used for heating in 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.
- (c) A fixed heating or cooling appliance that moderates the temperature of an outdoor space must be configured to automatically shut down when-
  - (i) there are no occupants in the space served; or
  - (ii) a period of one hour has elapsed since the last activation of the heater; or
  - (iii) the space served has reached the design temperature.

### J5.10 Refrigerant chillers

An air-conditioning system refrigerant chiller must comply with MEPS. Refer to the NCC for the requirements for refrigerant chillers.

### J5.11 Unitary air-conditioning equipment

Unitary air-conditioning equipment including packaged air-conditioners, split systems, and variable refrigerant flow systems must comply with MEPS. If their capacity is greater than or equal to 65 kW<sub>r</sub>, a minimum energy efficiency ratio applies in accordance with J5.11.

### J5.12 Heat rejection equipment

Refer to the NCC for the requirements for heat rejection equipment.

## J6 Artificial Lighting and Power

It is understood that the electrical services consultant or supplier will confirm Part J6 compliance. Hence the following is for general information only.

Section J6.2(b) applies to the artificial lighting in the building.

Refer to Appendix III – Lighting Calculator.

Based on the assumptions in the lighting calculator, the aggregate permissible lighting Illumination Power Load (IPL) is 355 W. Provided the aggregate design Illumination Power Load is less than this amount, then the design complies. The design IPL is 330 W based on the design assumptions in the lighting calculator (refer to the brown cells).

These requirements do not apply to emergency lighting provided in accordance with NCC 2019 Volume One Part E4; signage and display lighting within cabinets and display cases that are fixed in place; lighting for accommodation within the residential part of a detention centre; a heater where the heater also emits light such as in bathrooms; and lighting of a specialist process nature; lighting of performances such as theatre or sporting; 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; and lighting installed solely to provide photosynthetically active radiation for indoor plant growth on green walls or the like.

Note that while Section J specifies maximum Illumination Power Load, NCC 2019 Volume One Part F4.4 and AS/NZS 1680.0 specify minimum levels of illumination.

### J6.3 Interior artificial lighting and power control

All artificial lighting of a room or space must be individually operated by a switch or other control device or a combination of both.

An occupant activated device, such as a room security device, a motion detector in accordance with NCC 2019 Volume One Specification J6, 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-conditioning, local exhaust fans and bathroom heater when the sole-occupancy unit is unoccupied.

A switch or other control device must be in a visible position in the room or space being switched or in an adjacent room or space from where 90% of the lighting being switched is visible; and for other than a single functional space such as an auditorium, theatre, swimming pool, sporting stadium or warehouse – not operate lighting for an area of more than 250 m<sup>2</sup> if in a Class 5 building or a Class 8 laboratory; or not operate lighting for an area of more than – 250 m<sup>2</sup> for a space of not more than 2000 m<sup>2</sup>; or 1000 m<sup>2</sup> for a space of more than 2000 m<sup>2</sup>, if in a Class 3, 6, 7 or 8 (other than a laboratory) or 9 building.

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 not more than 250 m<sup>2</sup> must be controlled by a time switch in accordance with NCC 2019 Volume One Specification J6; or an occupant sensing device such as a security key reader that registers a person entering and leaving the building; or a motion detector in accordance with Specification J6. These requirements do not apply to artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as a patient care area in a Class 9a building or in a Class 9c building; or a plant room or lift motor room; or a workshop where power tools are used; or a heater where the heater also emits light such as in bathrooms.

In a Class 5, 6 or 8 building of more than 250 m<sup>2</sup>, 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 – the room containing the natural lighting zone is less than 20 m<sup>2</sup>; or the room's natural lighting zone contains less than 4 luminaires; or 70% of the luminaires in the room are in the natural lighting zone.

Artificial lighting in a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp, must be controlled by a motion detector in accordance with NCC 2019 Volume One Specification J6.

Artificial lighting in a foyer, corridor and other circulation spaces of more than 250 W within a single zone and adjacent to windows, must be controlled by a daylight sensor or dynamic lighting control device in accordance with NCC 2019 Volume One Specification J6.

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 NCC 2019 Volume One Specification J6.

The above do not apply to emergency lighting in accordance with NCC 2019 Volume One Part E4 and where artificial lighting is needed for 24 hour occupation such as for a manufacturing process, parts of a hospital, an airport control tower or within a detention centre.

#### J6.4 Interior decorative and display lighting

Any interior decorative and display lighting must be controlled separately from other artificial lighting and by a manual switch for each area other than when the operating times of the displays are the same in a number of areas in which case they may be combined. Where the display lighting exceeds 1kW, a time switch in accordance with NCC 2019 Volume One Specification J6 is required.

Window display lighting must be controlled separately from other display lighting.

#### J6.5 Exterior Artificial Lighting

Exterior artificial lighting attached to or directed at the facade of the building must be controlled by a daylight sensor or a programmable time switch.

When the total lighting load exceeds 100W, LED must be used for 90% of the total lighting load; or must be controlled by a motion detector in accordance with NCC 2019 Volume One Specification J6. This does not apply to emergency lighting in accordance with NCC 2019 Volume One Part E4 or lighting around a detention centre.

The used for decorative purposes such as facade and signage lighting must have a separate time switch in accordance with NCC 2019 Volume One Specification J6. Such a time switch must be capable of switching on and off electric power at variable pre-programmed times and on variable pre-programmed days. It must also be capable of limiting the period the system is switched on to between 30 minutes before sunset and 30 minutes after sunrise is determined or detected including any pre-programmed period between these times; and being overridden by a manual switch or a security access system for a period of up to 30 minutes, after which the time switch must resume control.

#### J6.6 Boiling water and chilled water storage units

Power supply to any new boiling water or chilled water storage unit must be controlled by a time switch in accordance with NCC 2019 Volume One Specification J6. Such a time switch must be capable of being overridden by a manual switch or a security access system that senses a person's presence, overrides for a period of up to 2 hours, after which if there is no further presence detected, the time switch must resume control.

#### J6.7 Lifts

Lifts must be configured to ensure artificial lighting and ventilation in the car are turned off when it is unused for 15 minutes; and achieve the idle and standby energy performance level in NCC 2019 Volume One Table 6.7a; and achieve the energy efficiency class in Table 6.7b or if a dedicated goods lift, energy efficiency class D in accordance with ISO 25745-2.

#### J6.8 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.



## J7 Hot Water Supply

### J7.2 Heated Water Services

Any 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.

### J7.3 Swimming Pool Heating and Pumping

Not applicable as there isn't a swimming pool.

### J7.4 Spa Pool Heating and Pumping

Not applicable as there isn't a spa pool.

## J8 Facilities for Energy Monitoring

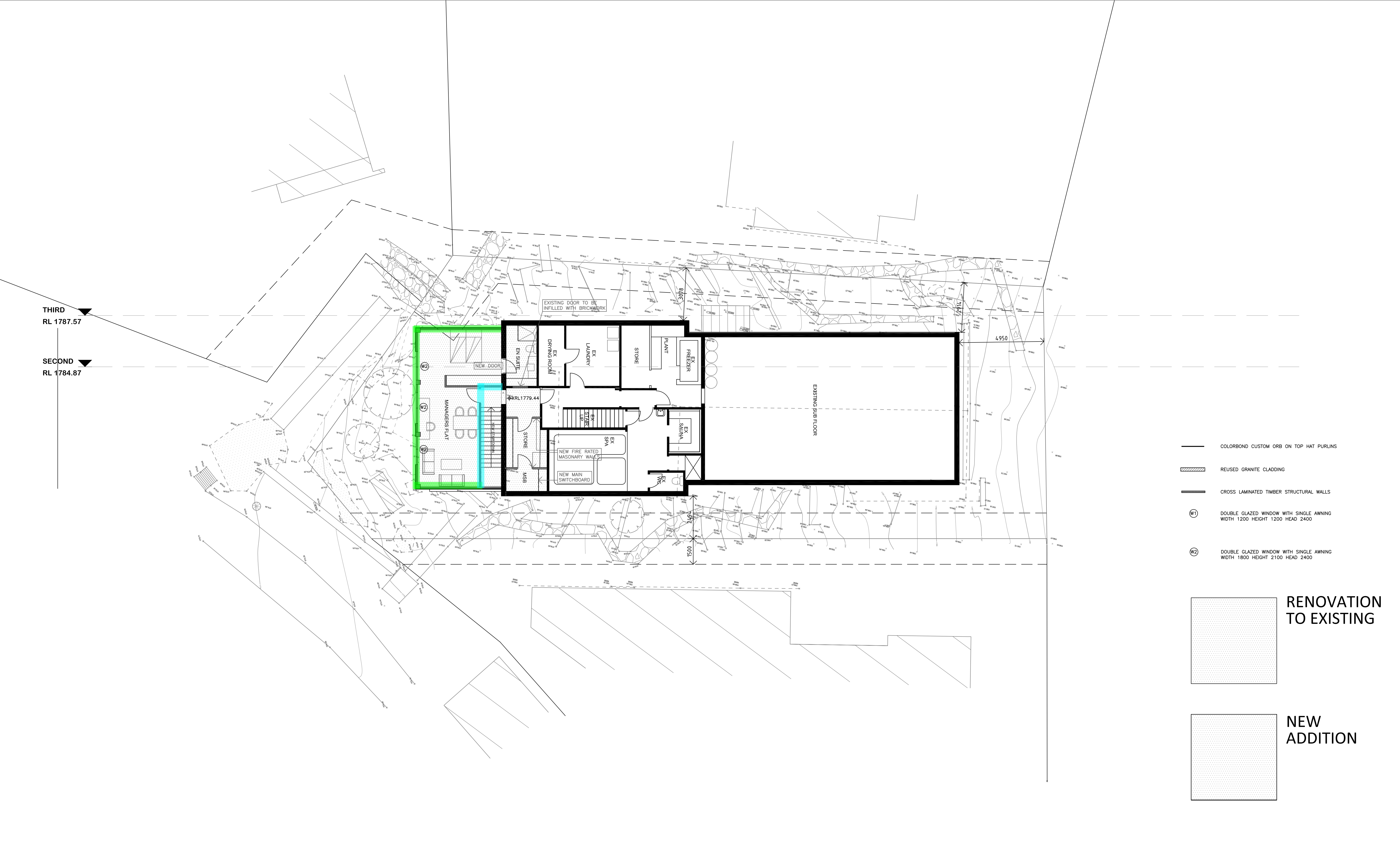
### J8.3 Facilities for energy monitoring

- (a) A building with a floor area of more than 500 m<sup>2</sup> must have an energy meter configured to record the time-of-use consumption of gas and electricity.
- (b) A building with a floor area of more than 2,500 m<sup>2</sup> must have energy meters configured to enable individual time-of-use energy consumption data recording, in accordance with (c), of the energy consumption of –
  - (i) air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
  - (ii) artificial lighting; and
  - (iii) appliance power; and
  - (iv) central hot water supply; and
  - (v) internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and
  - (vi) other ancillary plant.
- (c) Energy meters required by (b) must be interlinked by a communication system that collates the time-of-use energy consumption data to a single interface monitoring system where it can be stored, analysed and reviewed.
- (d) The provisions of (b) do not apply to a Class 2 building with a floor area of more than 2,500 m<sup>2</sup> where the total area of the common areas is less than 500 m<sup>2</sup>.

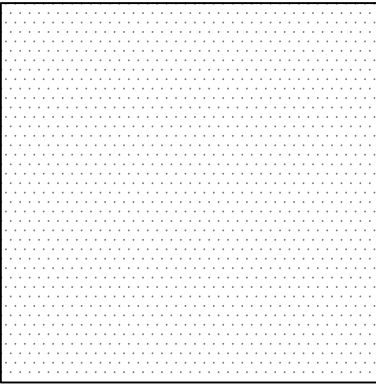
## **Appendices**

- I Thermal Envelope
- II Building Facade Calculations
- III Lighting Calculations
- IV Architectural Drawings

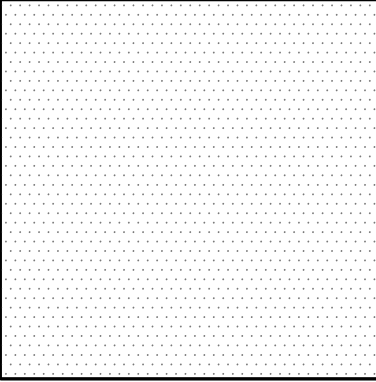
## **Appendix I – Thermal Envelope**



- COLORBOND CUSTOM ORB ON TOP HAT PURLINS
- REUSED GRANITE CLADDING
- CROSS LAMINATED TIMBER STRUCTURAL WALLS
- W1 DOUBLE GLAZED WINDOW WITH SINGLE AWNING  
WIDTH 1200 HEIGHT 1200 HEAD 2400
- W2 DOUBLE GLAZED WINDOW WITH SINGLE AWNING  
WIDTH 1800 HEIGHT 2100 HEAD 2400

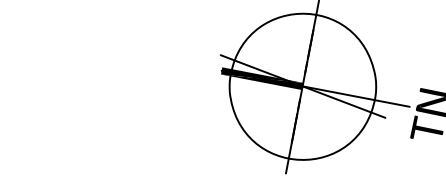


RENOVATION  
TO EXISTING



NEW  
ADDITION

B	19.01.22	PRELIMINARY DA ISSUE
A	14.03.22	PRELIMINARY DA ISSUE
ISSUE	DATE	AMENDMENT



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LOT 103 DP 1242013  
CHARLOTTE PASS NSW 2624

CLIENT  
ARLBERG SKI CLUB LIMITED

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CHARLOTTE PASS NSW

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W: www.arlbergskiclub.org.au  
P: 0419161648  
A.B.N. 36 001 720 707

TITLE  
FLOOR PLAN  
GROUND FLOOR

SCALE: 1:100(A1)  
DATE: 01.01.21  
REF : BPAARLBERG

Sk2b

## **Appendix II – Building Facade Calculations**

## Project Summary

**Date**  
24/06/2023

**Name**  
David Gradwell

**Company**  
Gradwell Consulting

**Position**  
Principal

**Building Name / Address**  
Alberg Ski Lodge  
Charlotte Pass (BP39)

**Building State**  
NSW

**Climate Zone**

Climate Zone 8 - Alpine

**Building Classification**

Class 3 - other

**Storeys Above Ground**  
4

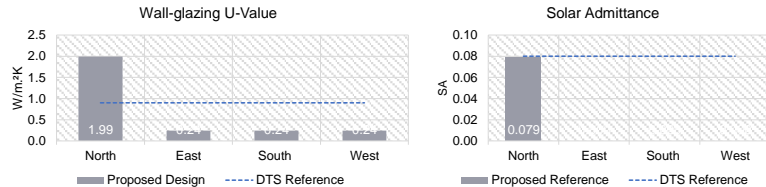
**Tool Version**  
1.2 (June 2020)

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

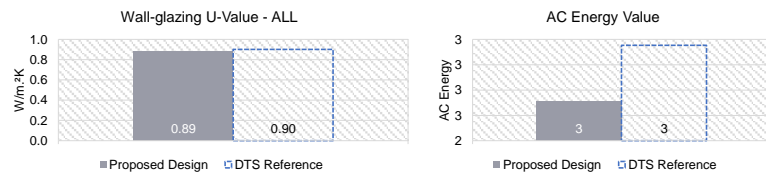
Compliant Solution =    
Non-Compliant Solution =  

	North	East	Method 1 South	West	Method 2 All
Wall-glazing U-Value (W/m².K)	1.99	0.24	0.24	0.24	0.89
Solar Admittance	0.08				
AC Energy Value					3

Method 1



Method 2



## Project Details

	North	East	South	West
Glazing Area (m²)	8.1	0	0	0
Glazing to Façade Ratio	31%	0%	0%	0%
Glazing References	GT01a			
Glazing System Types	0			
Glass Types	0			
Frame Types	0			
Average Glazing U-Value (W/m².K)	5.80			
Average Glazing SHGC	0.25	0.00	0.00	0.00
Shading Systems	Device	Device	Device	Device
Wall Area (m²)	17.66	13.72	16.52	13.72
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Rmin	Rmin	Rmin	Rmin
Wall Thickness	0	0	0	0
Average Wall R-value (m².K/W)	4.10	4.10	4.10	4.10
Solar Absorptance				

## **Appendix III – Lighting Calculations**

## LIGHTING DESIGN CHECK CALCULATOR FOR USE WITH CLAUSE J6.2(B),NCC 2019 VOLUME ONE

Building name/description

Albreg Ski Lodge Extension Charlotte Pass (BP39)

Building class

3

Room Description	Classification (Table J6.2b)	Maximum IPD (W/m <sup>2</sup> ) from Table J6.2	Height of highest ceiling (m)	Width (m) if rectangular	Length (m) if rectangular	Perimeter (m) unless rectangular	Area (m <sup>2</sup> )	Room Aspect Ratio	Room Size Adjustment Factor	Lowest IPD Adjust Factor for control from Table J6.2b (if applic)	2nd lowest IPD Adjust Factor for control from Table J6.2b (if applic)	Combined Control IPD Adjustment Factor	Permissible IPD (W/m <sup>2</sup> )	Illumination Power Load (W)	Design Luminaire Circuit (W)	Design Number of Circuits	Design Power Load (W)	Overage: Design less Allowance (W)
Managers Flat	Dormitory of a Class 3 building used for	4.00	2.1			28.2	36.8	0.62	0.71	1.00	1.00	1.00	5.66	208.2	30.0	6	180.0	-28.2
Ensuite	Toilet, locker room, staff room, rest room	3.00	2.1	1.7	3.5		6.0	0.27	0.59	1.00	1.00	1.00	5.08	30.2	30.0	1	30.0	-0.2
Store	Storage	1.50	2.1			13.5	9.7	0.34	0.61	1.00	1.00	1.00	2.44	23.7	30.0	1	30.0	6.3
Corridor	Corridors	5.00	2.1	1.9	1.7		3.2	0.21	0.57	1.00	1.00	1.00	8.75	28.3	30.0	1	30.0	1.7
Stair	Corridors	5.00	2.1	1.3	5.8		7.5	0.25	0.58	1.00	1.00	1.00	8.56	64.5	30.0	2	60.0	-4.5

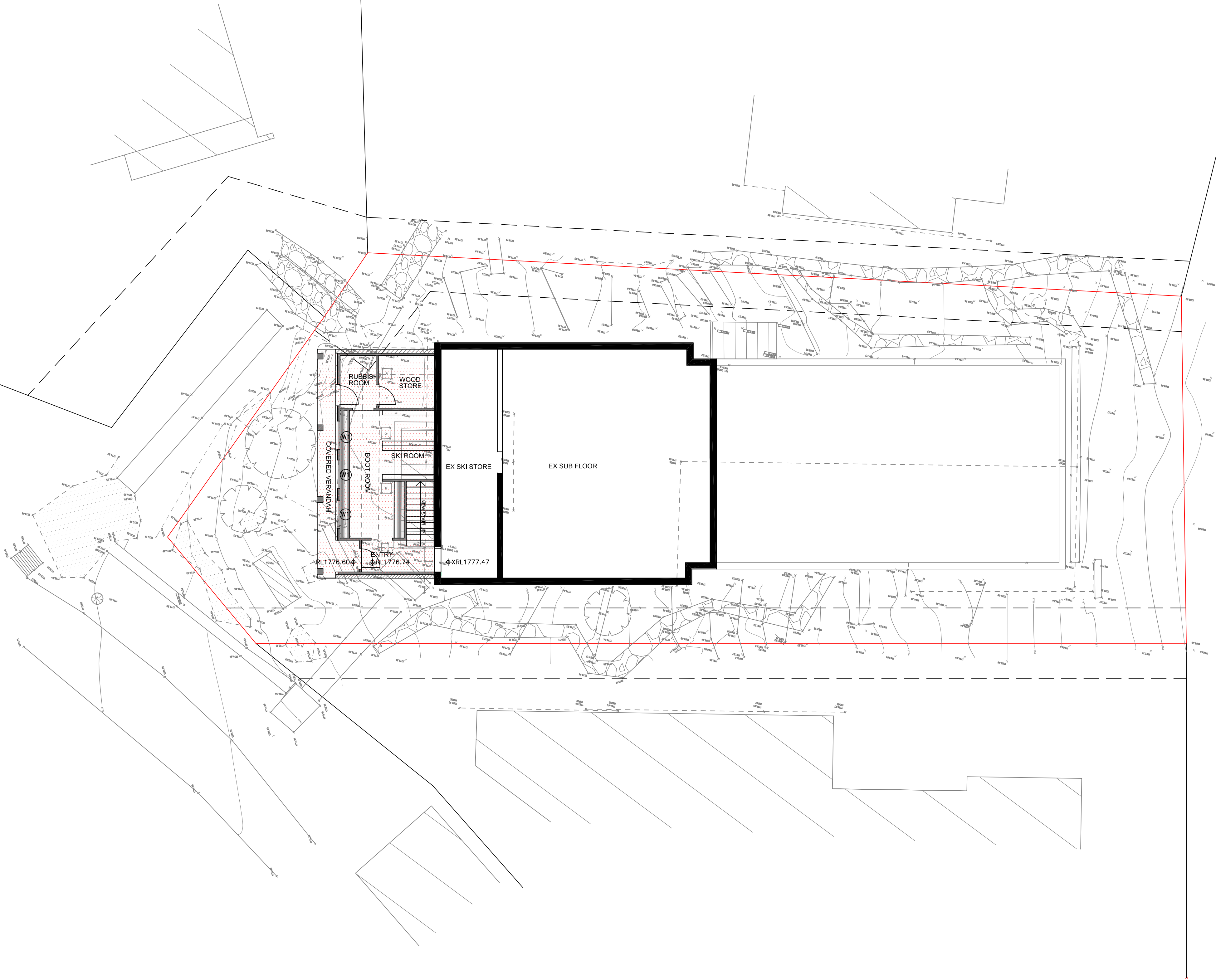
Note: IPD is Illumination Power Density (Watts per square meter)

Total Area (m <sup>2</sup> )	63.2
Aggregate design illumination power load (W)	330.0
Aggregate permissible illumination power load (W)	354.9

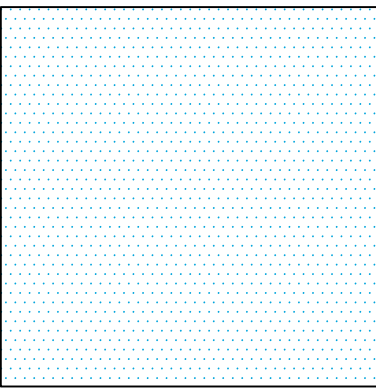
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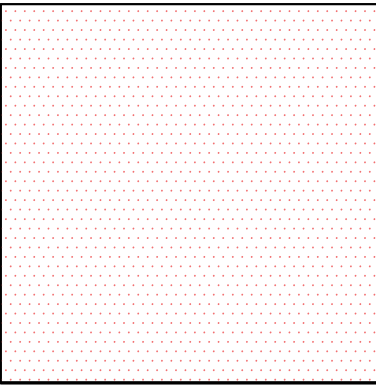
## **Appendix IV - Architectural Drawings**



- COLORBOND CUSTOM ORB ON TOP HAT PURLINS
- REUSED GRANITE CLADDING
- CROSS LAMINATED TIMBER STRUCTURAL WALLS
- (W1) DOUBLE GLAZED WINDOW WITH SINGLE AWNING  
WIDTH 1200 HEIGHT 1200 HEAD 2400

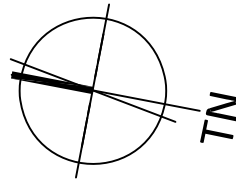


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**CLIENT**  
ARLBERG SKI CLUB LIMITED

# ARLBERG SKI LODGE

## CHARLOTTE PASS NSW

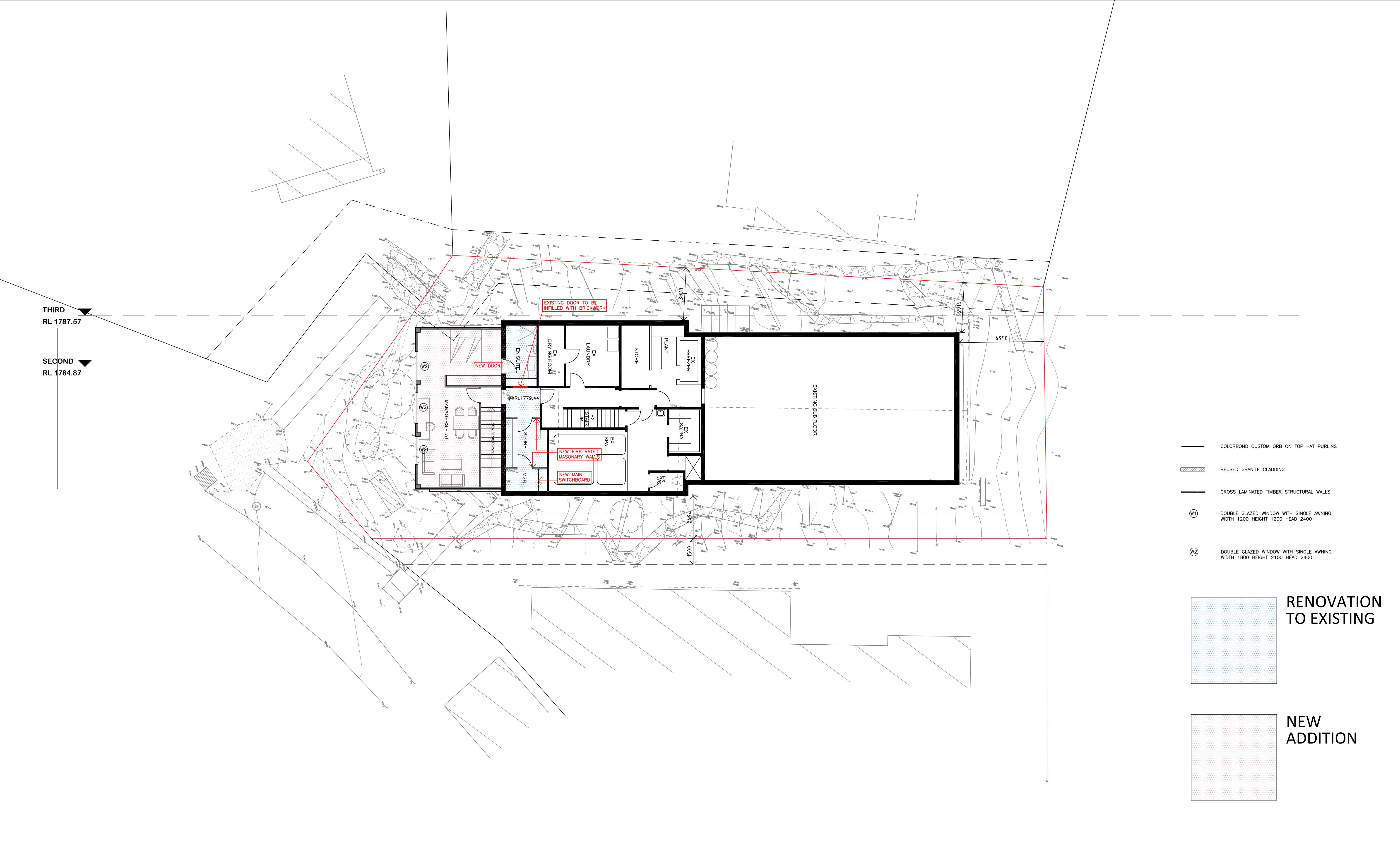
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**TITLE**  
FLOOR PLAN  
ENTRY LEVEL

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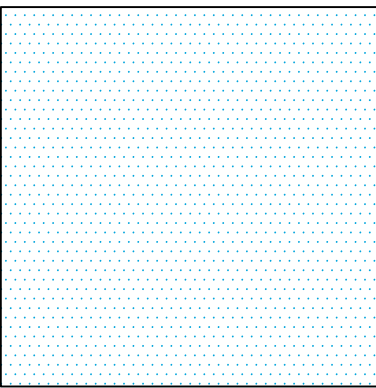
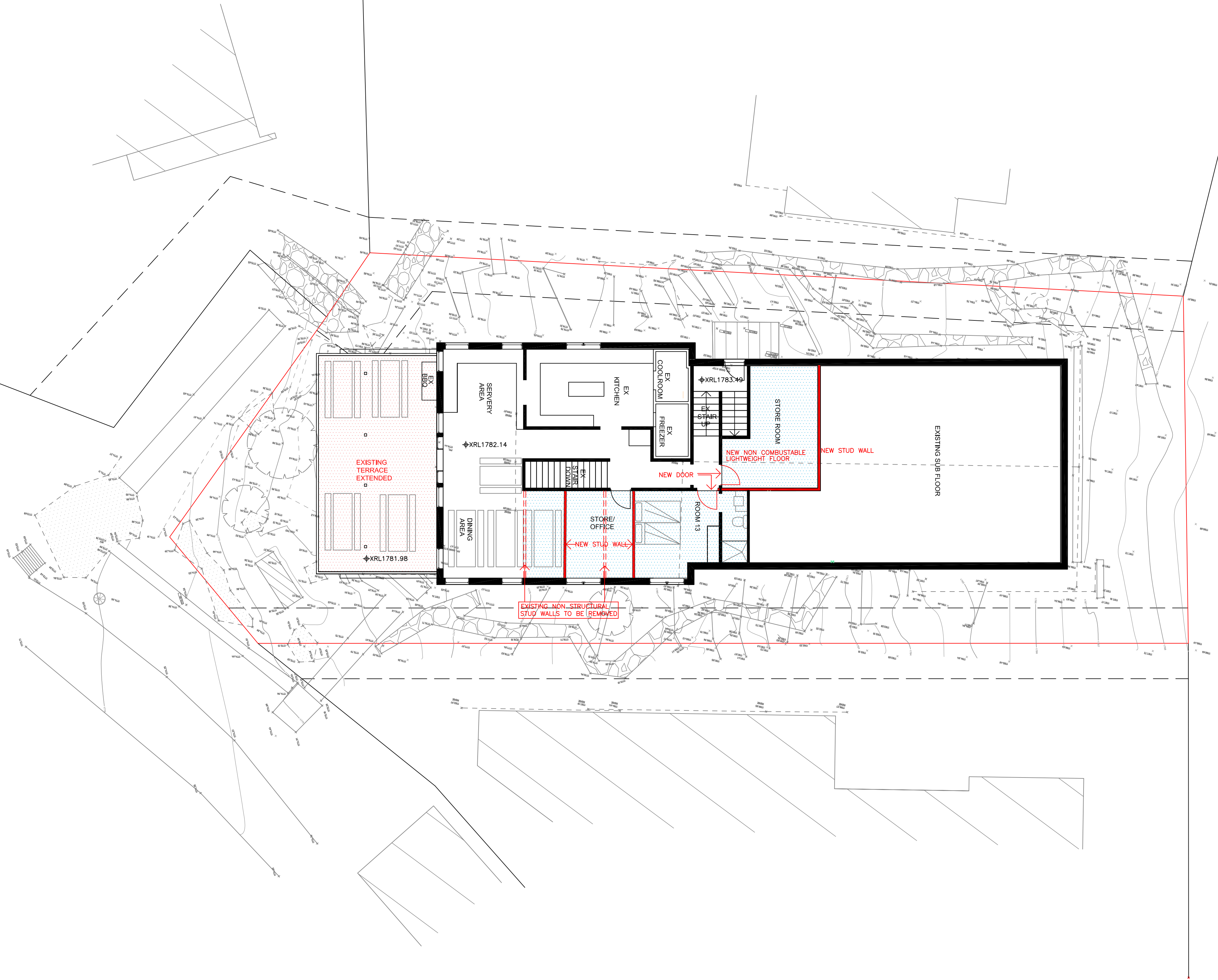
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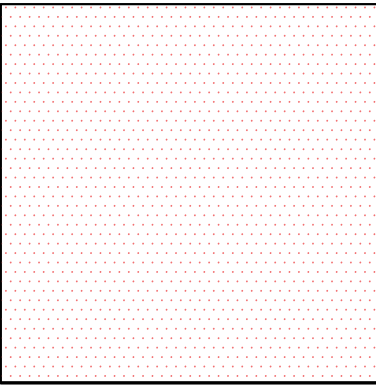


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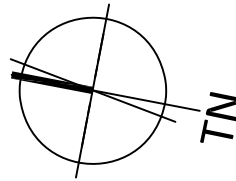


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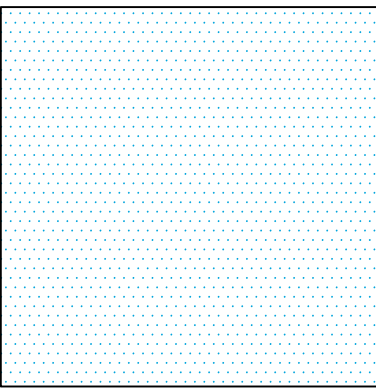
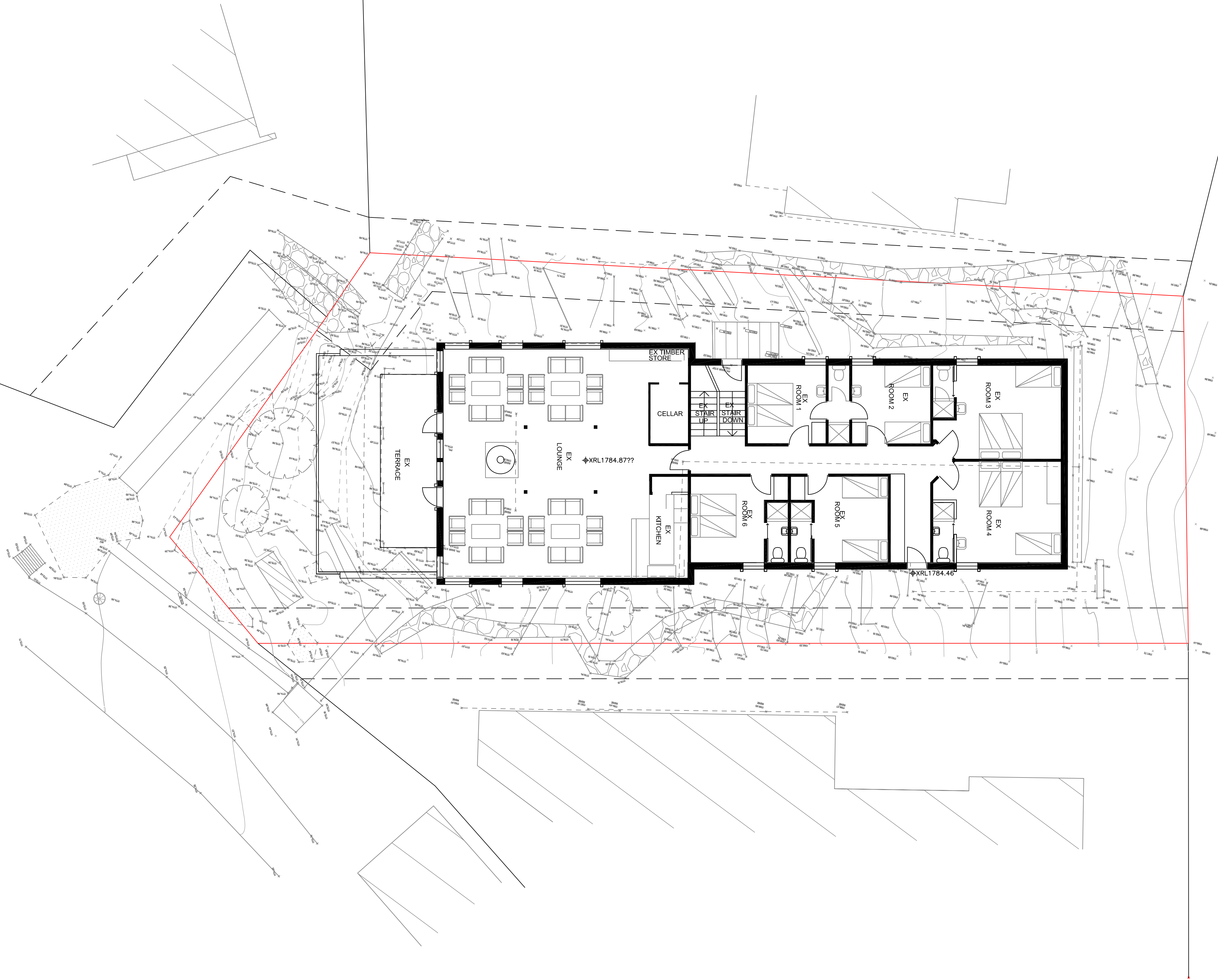
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TITLE  
FLOOR PLAN  
FIRST FLOOR

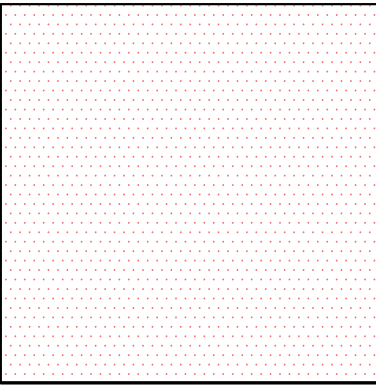
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Sk3b



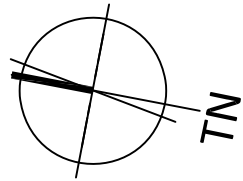


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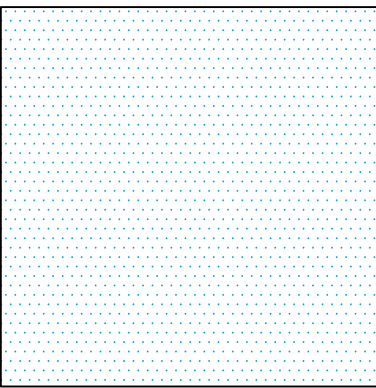
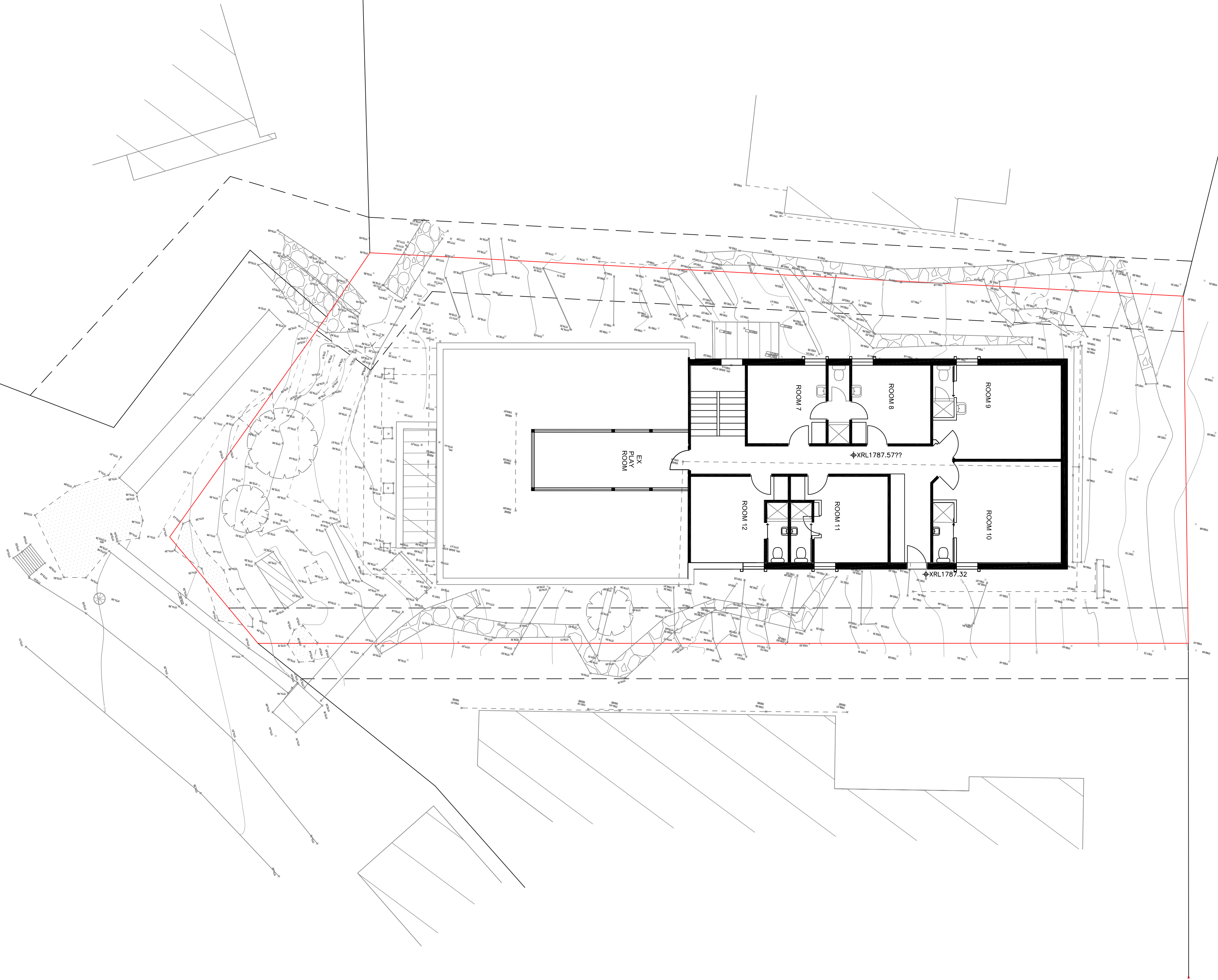
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**TITLE**  
FLOOR PLAN  
SECOND FLOOR

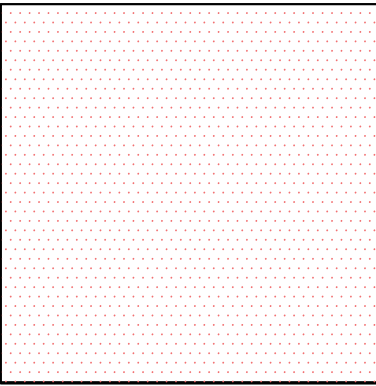
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Sk4b



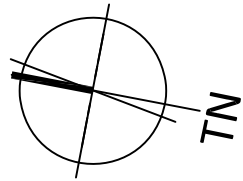


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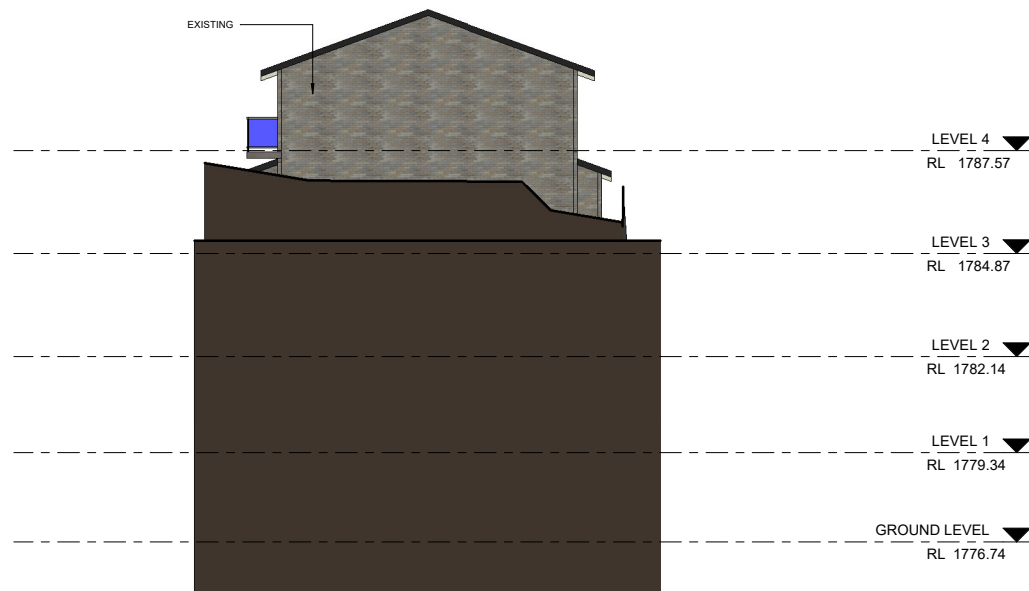
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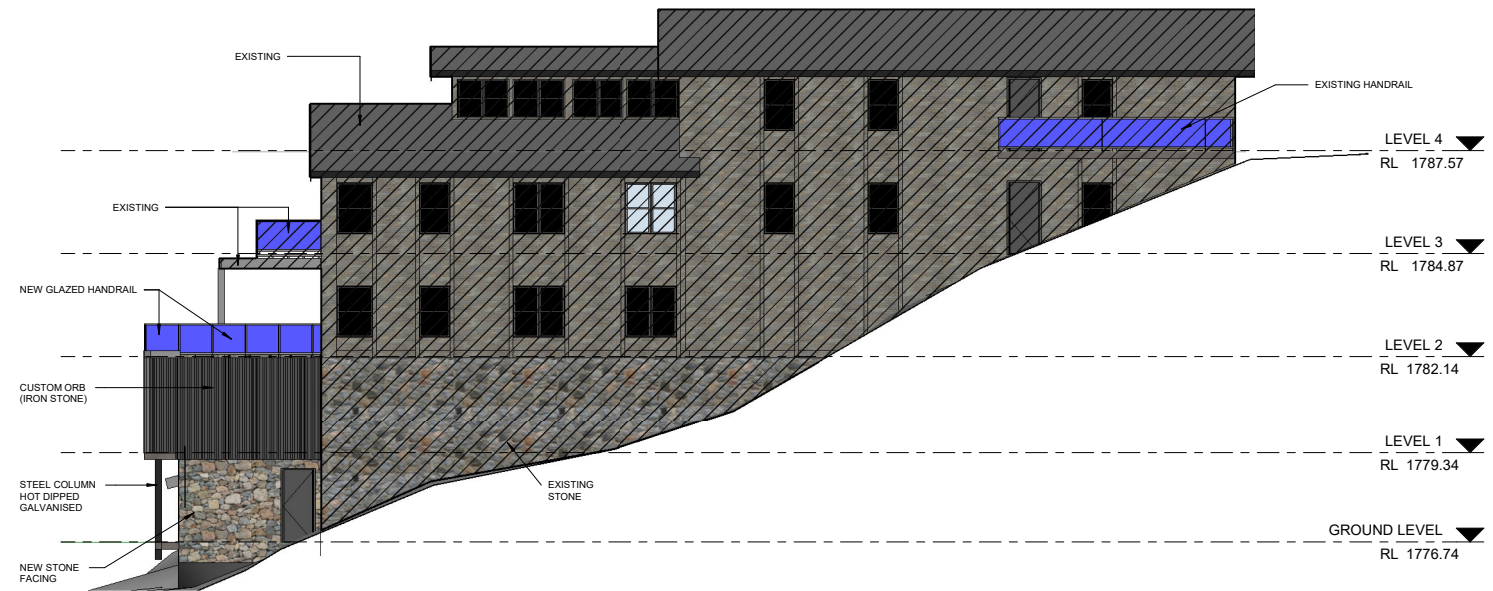
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FLOOR PLAN  
THIRD FLOOR

SCALE: 1:100(A1)  
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Sk5b



1 SOUTH ELEVATION  
1 : 100



2 WEST ELEVATION  
1 : 100



3 NORTH ELEVATION  
1 : 100



4 EAST ELEVATION  
1 : 100

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TITLE  
ELEVATION

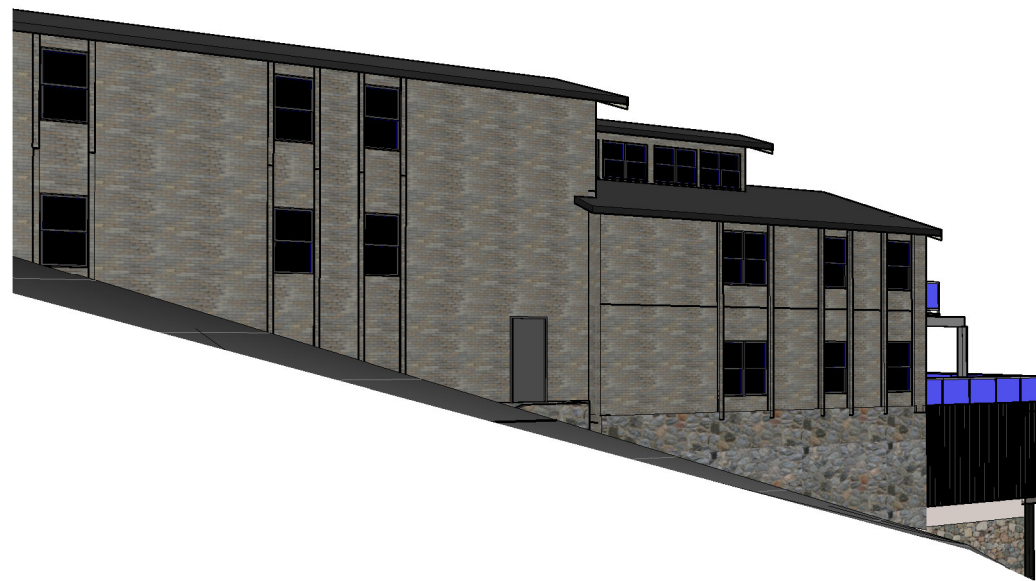
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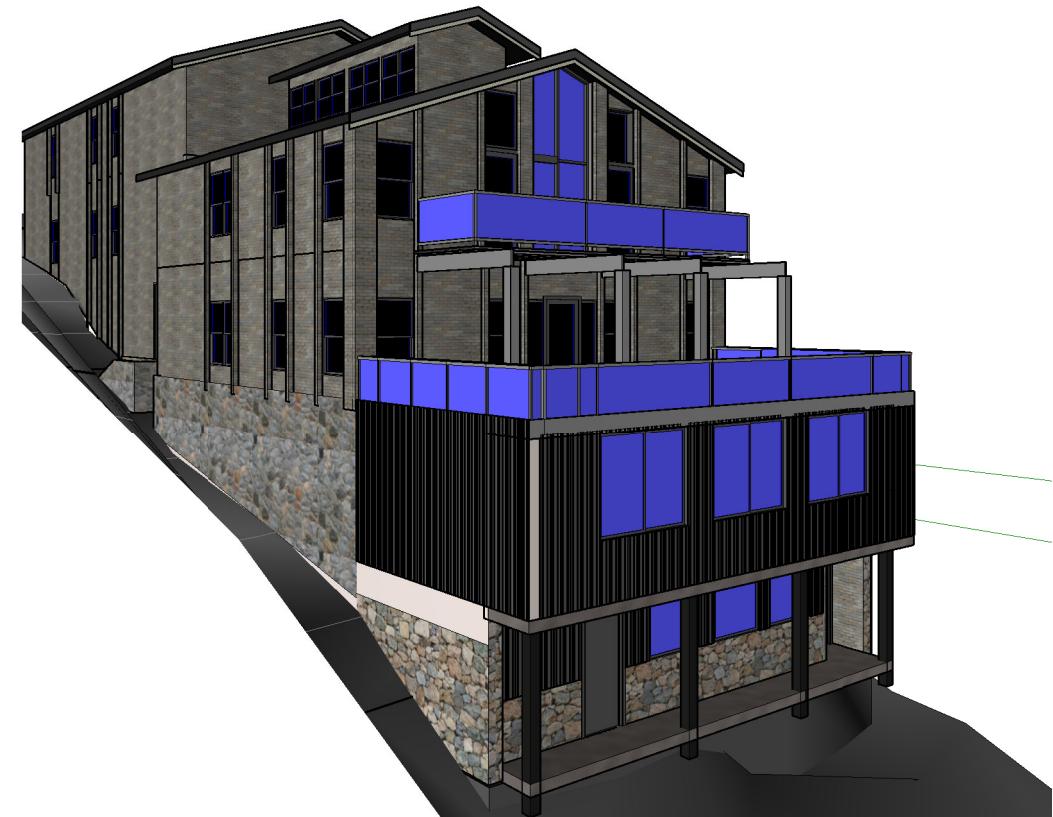
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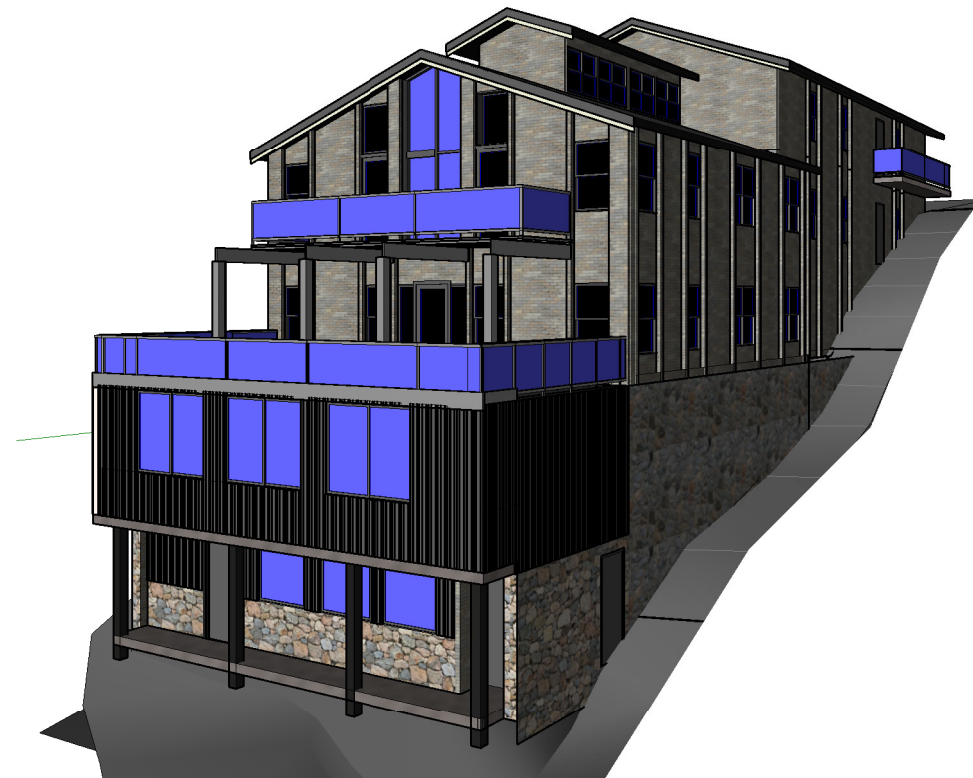




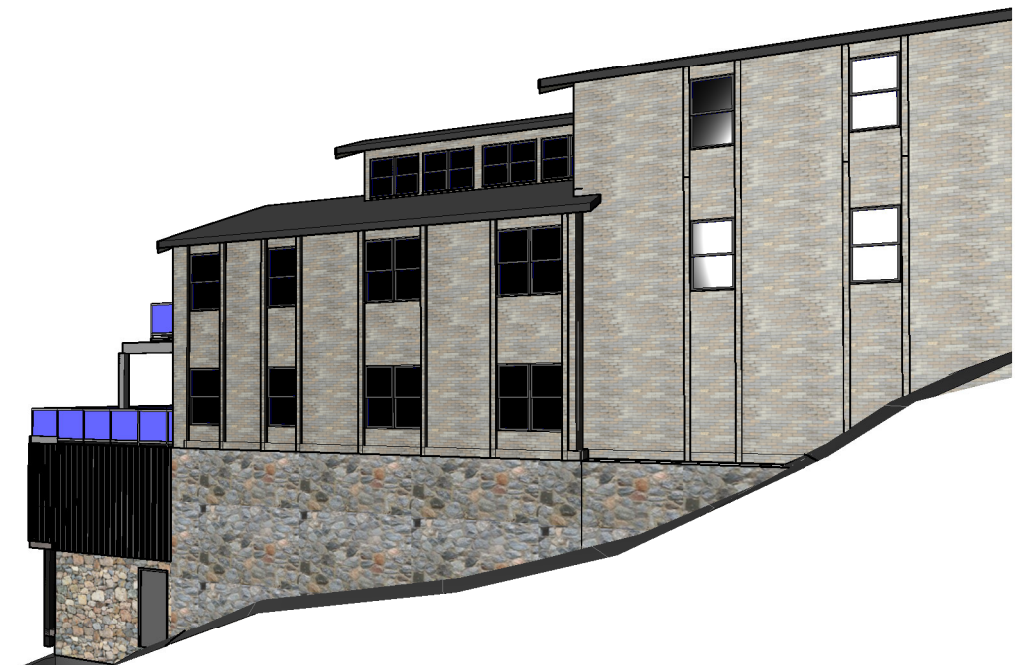
1 3D View 1



2 3D View 2



3 3D View 3



4 3D View 4

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