



CONSULTING ENGINEERS

## BCA COMPLIANCE ASSESSMENT – GEEBUNG LODGE THREDBO

<b>To:</b>	Geebung Lodge Thredbo	<b>Date:</b>	29 September 2023
<b>Attention:</b>	Gemma Wawn	<b>Project Ref:</b>	3025
<b>From:</b>	James Alexander	<b>Revision:</b>	Rev A
<b>Project:</b>	Upgrades to Geebung Lodge Thredbo		
<b>Purpose:</b>	BCA Compliance Assessment of existing ski lodge for DA submission.		

### 1.0 INTRODUCTION

This Building Code of Australia 2022 (BCA) assessment report has been prepared to accompany a Development Application for minor upgrade works to the existing ski lodge at Thredbo known as Geebung. The upgrade work comprise the replacement of existing single glazed windows with thermally efficient double-glazed units to the majority of the building, and the upgrade of the communal bathroom located on the lower level.

This report documents the findings of the BCA assessment inspection of the whole lodge undertaken on the 12th of September 2023 and desktop review of the existing building drawings provided and listed below. Where it is deemed more cost effective or practical, a recommendation will be made to address any identified non-compliance via a Performance-based Fire Engineered Upgrade Strategy.

### 2.0 BASIS OF REPORT

This report is based upon the following information provided:

- Architectural drawings of the original building prepared by Lightfoot, Stanley, Hanlon Architects 81.27 Drawing 1 dated January 1983.
- Architectural drawings for the development works, as follows, prepared by TZ Design under project 337 all dated 28/6/2022.

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337-02-C	Level 1 Floor Plan
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001-00	L1 Bathroom - Conceptual Design

The assessment has been undertaken on the following basis:

- The site inspection undertaken was strictly a visual based site inspection only with no invasive or destructive works undertaken to determine compliance with the BCA.
- The performance of any installed fire and life safety system was not tested or witnessed during site inspection. It has been assumed that where these systems are installed, they are installed in accordance with the relevant standards and codes applicable at the time of original approval/installation.
- It has been assumed that no additional fire engineering reports apply to the building and all buildings and extensions have been undertaken in accordance with due process at the time of original approval and construction.

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### 3.0 BUILDING PARTICULARS

<b>DESCRIPTION OF BUILDING:</b>	<p>The building is largely a split level three storey ski lodge constructed using masonry external and internal walls, concrete floors and timber framed and sheet metal roof. The building is constructed on a steep slope meaning access to the lodge occurs on the upper levels of the lodge.</p>  <p><i>Figure 1 - view from Bobuck Lane.</i></p>
<b>TYPE OF CONSTRUCTION:</b>	<p>Type A Construction</p>
<b>RISE IN STOREYS:</b>	<p>3</p>
<b>STOREYS CONTAINED:</b>	<p>3</p>
<b>BCA CLASSIFICATION:</b>	<p>Class 3 ski lodge providing accommodation for a maximum of 20 people.</p>
<b>APPROXIMATE FIRE COMPARTMENT SIZE:</b>	<p>BCA Table C2.2 Maximum size of fire compartments does not have a maximum size for class 3.</p>
<b>POTENTIAL FIRE SOURCE FEATURES:</b>	<ul style="list-style-type: none"> <li>• <b>North</b> – rear boundary 4.5m to 5.4m</li> <li>• <b>East</b> – side allotment boundary 2.3m</li> <li>• <b>West</b> – side allotment boundary 2.3m</li> <li>• <b>South</b> – greater than 6m to far side of Bobuck Lane</li> </ul>  <p><b>Figure 1: Site location (courtesy of NSW e-Planning spatial viewer)</b></p>

#### 4.0 LIMITATIONS


This report does not assess or include the following:

- Does not provide concessions, Performance Solutions or exemptions from the requirements of the BCA, other than any directly identified in the Executive Summary of this report.
- Reporting on hazardous materials, OH&S matters or construction site contamination.
- Assessment of any structural elements or geotechnical matters relating to the building, including any structural or other assessment of the existing fire-resistant levels of the building other than the items raised specifically within this memorandum.
- Assessment of any fire services operations (including hydraulic, electrical or other systems).
- Assessment of plumbing and drainage installations, including stormwater.
- Assessment of mechanical plant operations, electrical systems or security systems.
- Heritage significance.
- Consideration of energy or water authority requirements.
- Consideration of local planning policies.
- Environmental, planning or heritage issues.
- Requirements of statutory authorities.
- Pest inspection or assessment of building damage caused by pests.
- Assessment of Sections B, G, H, D4 and J of the BCA.
- This report is not a Part 4A compliance certificate under the Environmental Planning & Assessment Act 1979 or Regulation 2000.

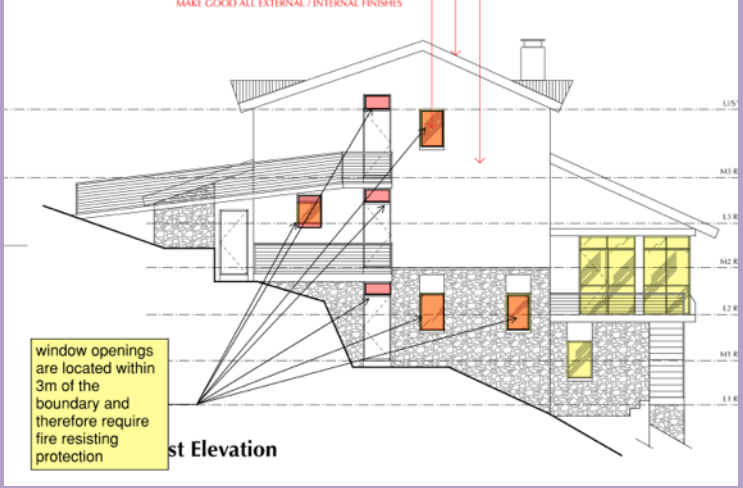
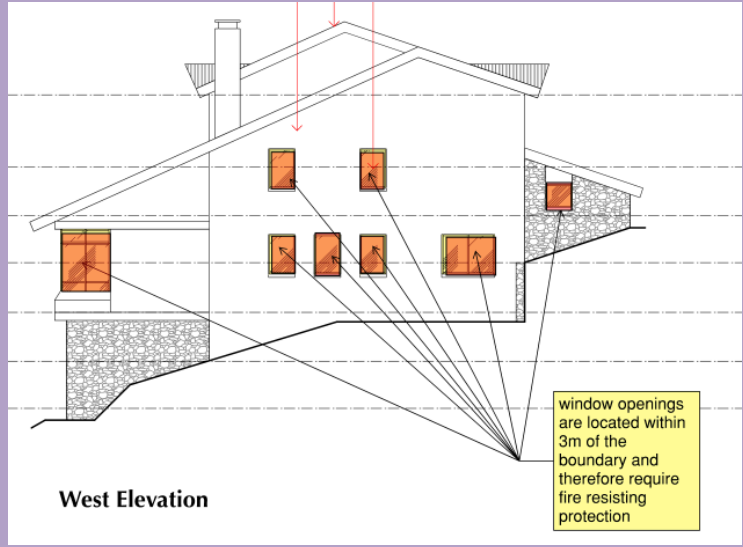
#### 5.0 BCA ASSESSMENT


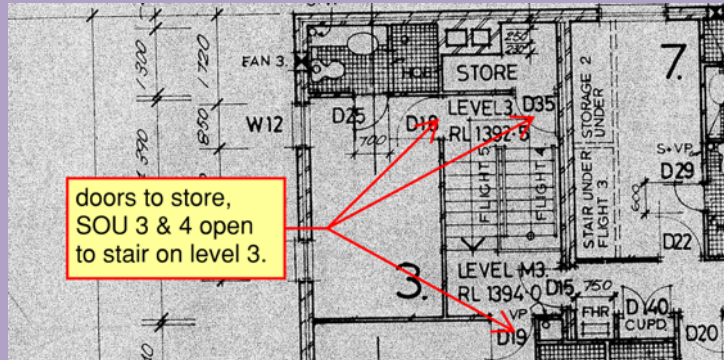
The following is an assessment of the critical and pertinent clauses of the BCA for the existing building and development works.

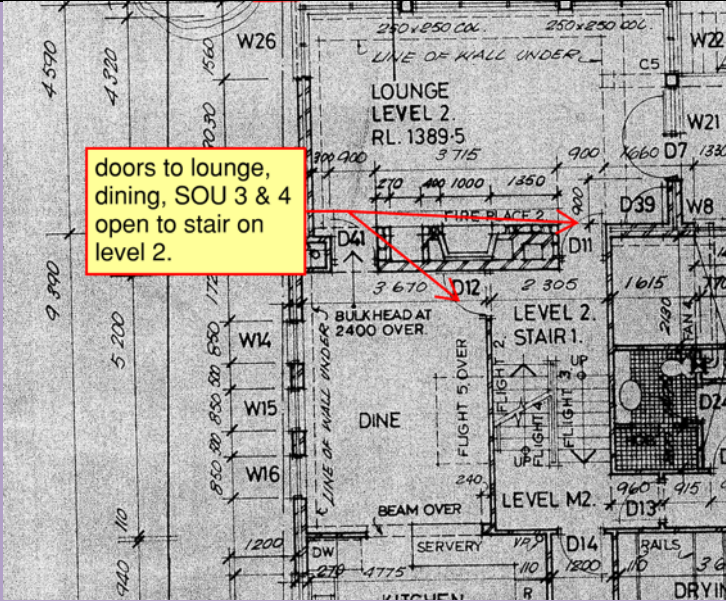
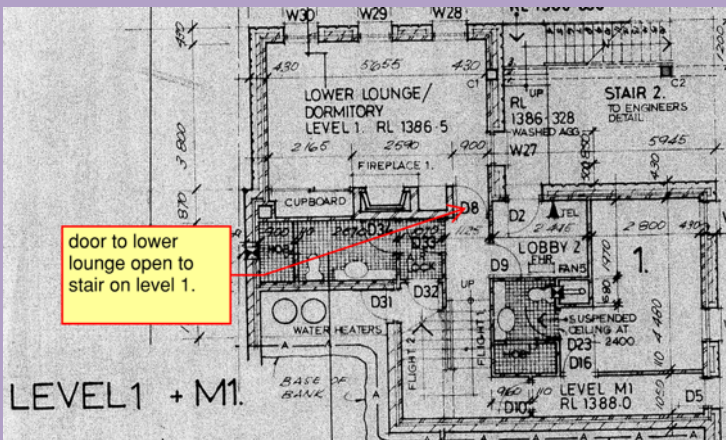
BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
<b>BCA CLAUSE C2D2</b>  <b>SPECIFICATION 5 – FIRE RESISTING CONSTRUCTION</b>	The building is currently a three storey Type A residential ski lodge located on the site. The building is class 3 throughout.	In general, the building is located at between 2.3m and greater than 3m from the boundary fire source features. The external walls are double brick cavity walls and rendered internally and therefore likely to achieve the required FRLs.
	<b>External Wall:</b> The external walls (both existing and proposed) are required to achieve the following Fire Resistance Level (FRL) for load bearing walls: <ul style="list-style-type: none"> <li>• Less than 1.5m: 90/90/90</li> <li>• 1.5m to 3m: 90/60/60</li> <li>• Greater than 3 m: 90/60/30</li> </ul> Non-load bearing external walls are required to achieve the following Fire Resistance Levels: <ul style="list-style-type: none"> <li>• Less than 1.5m: -/90/90</li> <li>• 1.5m to less than 3m: -/60/30</li> <li>• 3m or more: -/-/-</li> </ul>	
	<b>Floors:</b> The floors are concrete and therefore are likely to achieve the required FRL. The proposed works do affect the floors.	
	<b>Roof:</b> The roof is not required to achieve a Fire Resistance Level as the building is a Class 3 building.	

BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
<b>BCA CLAUSE D2D10 AND D2D14 – NON-COMBUSTIBLE BUILDING ELEMENTS AND ATTACHMENTS</b>	<p>In a building of Type A Construction, the external walls, floor framing of lift pits are required to be of non-combustible construction.</p> <p>Any ancillary attachments are also required to be of non-combustible construction.</p>  <p><b>Figure 4: Masonry external walls.</b></p>	<p>The external walls are masonry and therefore compliant as non-combustible.</p> <p>There were no obvious combustible attachments.</p> <p>The proposed windows are aluminium framed and therefore comply.</p>
<b>BCA CLAUSE C2D11 AND SPECIFICATION 7 – FIRE HAZARD PROPERTIES</b>	<p>Carpets, floor and wall linings of all areas to be certified to comply with Spec C1.10 and sarking to comply with Spec C1.10a.</p> <p>All new linings and materials are required to comply with BCA Clause C2D11 and Specification 7.</p>	<p>The new works are external only and hence compliance with this clause is not required unless required by the Consent Authority.</p>
<b>BCA CLAUSE C3D7 - VERTICAL SEPARATION OF OPENINGS IN EXTERNAL WALLS</b>	<p>Spandrel separation is compliant.</p>	<p>Complies. The living room windows can be replaced without causing a spandrel non-compliance.</p>
<b>BCA CLAUSE C4D3 – PROTECTION OF OPENINGS</b>	<p>If the distance between an opening and the fire-source feature to which it is exposed to is less than: 3m from a side or rear boundary of the allotment, 6m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level or 6m from another building on the allotment that is not a Class 10.</p> <p>The external wall openings to the east and west boundaries are located at 2.3m from the side allotment boundaries and</p>	<p>Protection is required to all windows located on the east and west boundaries given they are the subject of the development works.</p> <p>A performance solution can be</p>

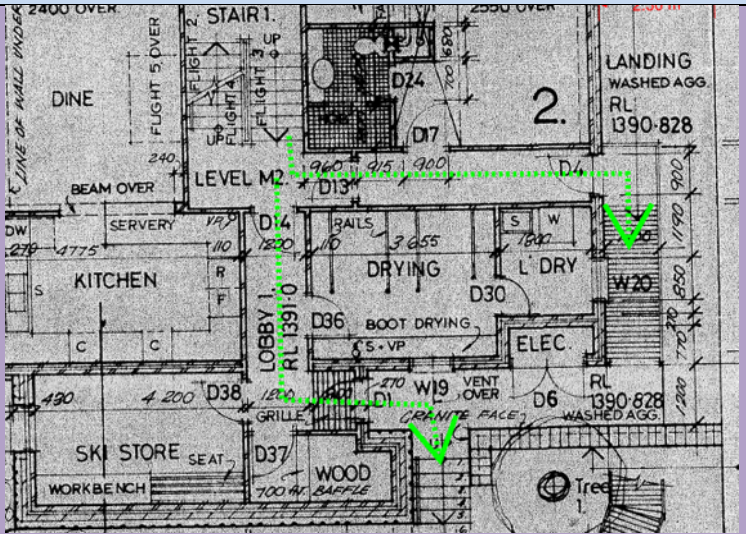


BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
	<p>therefore protection in accordance with this clause is required. Protection is not installed in accordance with C4D5.</p>  <p>Figure 5 – eastern elevation openings requiring protection</p>  <p>Figure 6 - western elevation openings requiring protection</p>	<p>prepared to permit a reduction in protection from that required by C4D5.</p>
<p><b>BCA CLAUSE C4D12 - BOUNDING CONSTRUCTION CLASS 2, 3 AND 4 BUILDINGS</b></p>	<p>The internal walls and floors and ceilings which form the bounding construction to the SOUs are generally Type A compliant given they are masonry.</p> <p>The bounding walls are load bearing and therefore required to achieve 90/90/90. The walls are single skin masonry and therefore may, depending upon the height achieve the FRL.</p> <p>The doors to the SOUs and other rooms in the bounding walls are required to be -/60/30 self closing fire doors.</p>	<p>The doors to the SOU's are tagged as being -/60/30 fire doors.</p> <p>The doors from the living room, dining room etc which open to the stair are not fire doors and therefore are required to be addressed via the fire engineered performance solution.</p>



BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
	 <p><b>Figure 7 - -/60/30 fire doors to SOUs but glass doors to common areas</b></p>	
<p><b>BCA CLAUSE C4D13 – OPENINGS IN FLOORS AND CEILING FOR SERVICES</b></p> <p><b>C4D15 – OPENINGS FOR SERVICE INSTALLATIONS</b></p>	<p>The service must be served by a shaft that will not reduce the fire performance of the building element it penetrates, or the service required to be protected in accordance with BCA Clause C4D15.</p> <p>Access to the service penetrations for sanitary plumbing and drainage and other services such as electrical cabling and hot and cold water was not available.</p>	<p>It is unlikely that protection is provided but the proposed works will not cause a non-compliance with this clause given the works are limited to window replacements.</p>
<p><b>BCA CLAUSE D2D3 NUMBER OF EXITS</b></p> <p><b>BCA D2D4 – WHEN FIRE-ISOLATED STAIRWAYS ARE REQUIRED</b></p> <p><b>BCA CLAUSE D2D5 – EXIT TRAVEL DISTANCES</b></p> <p><b>BCA CLAUSE D2D12 – TRAVEL BY FIRE ISOLATED STAIRS</b></p>	<p>In a building under 25m, one exit is required to be provided per level, distance of travel to this exit or point of choice to two exits is required to be within 6m.</p> <p>Where a stair is required as an exit, and it connects more than two levels in a class 3 building it is required to be contained in a fire isolated shaft and discharge directly to open space.</p> <p>Doors to sole occupancy units and other rooms are not permitted to open directly into a fire isolated stair.</p>  <p><b>Figure 8 - doors are not permitted to open directly into a fire isolated stair.</b></p>	<p>Each level is provided with two exits and therefore travel distance to the exits complies.</p> <p>The internal stair is a required exit, and it connects more than two levels but is not contained in a shaft and hence does not comply.</p> <p>Doors to storerooms, living areas, kitchen and SOUs open directly into the stair which is not permitted.</p> <p>The stair discharges within the building and not directly to open space.</p> <p>These non-compliances will need to be addressed in a fire safety upgrade strategy developed for the building.</p>

BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
	 <p>doors to lounge, dining, SOU 3 &amp; 4 open to stair on level 2.</p> <p>Figure 9- doors are not permitted to open directly into a fire isolated stair.</p>  <p>door to lower lounge open to stair on level 1.</p> <p>Figure 10 - doors are not permitted to open directly into a fire isolated stair.</p> <p>A fire isolated stair must discharge at ground level directly to open space and not within the building such that a person is required to pass through a fire affected room or level to evacuate.</p>	




BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
	 <p>Figure 11 – discharge from the fire stair is through non-fire isolated corridors.</p>	
<p><b>BCA CLAUSE D2D7 – HEIGHTS OF EXITS, PATHS OF TRAVEL TO EXITS AND DOORWAYS</b></p> <p><b>BCA CLAUSE D2D8 WIDTH OF EXITS AND PATHS OF TRAVEL TO EXITS</b></p>	<p>In a required exit or path of travel to an exit —</p> <ul style="list-style-type: none"> <li>• The unobstructed height throughout must be not less than 2m, except the unobstructed height of any doorway may be reduced to not less than 1980mm.</li> <li>• The unobstructed width of each exit or path of travel to an exit, except for doorways, must be not less than 1m.</li> </ul>	<p>Compliance is generally achieved, throughout.</p>
<p><b>BCA CLAUSE D3D18 – HEIGHTS OF BARRIERS</b></p> <p><b>BCA CLAUSE D3D20 – BARRIER CLIMABILITY</b></p>	<p>The height of a barrier required by BCA Clause D3D17 is required to be a minimum of 1m. The external deck and stair balustrades are generally compliant.</p>	<p>The balustrade to the new enlarged deck is shown as compliant on the architectural drawings provided.</p>



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	 <p><b>Figure 12: Existing balustrades comply</b></p> <p>The internal stair balustrades do not comply. The gaps exceed 125mm and the height of the balustrade is less than 1m at the landings.</p>  <p><b>Figure 13: Existing internal stair balustrades do not comply</b></p>	
<b>BCA CLAUSE D3D26 OPERATION OF LATCH</b>	<p>Doors in the path of travel to an exit or exit doors must be fitted with single downward action level door handles.</p> <p>Round knob type handles were identified to a number of doors.</p>	<p>Knob handles are to be replaced with lever door handles.</p>




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<b>BCA CLAUSE D3D29 PROTECTION OF OPENABLE WINDOWS</b>	Windows serving bedrooms must not open further than 125mm if the openable portion is within 2m of the floor level.	Note for new window installations. Details to be shown on CC drawings.
<b>BCA PART D4 – ACCESS FOR PERSONS WITH A DISABILITY</b>	Access is required to the “affected part” in accordance with the Access to Premises Standard. The affected part window replacements and hence not relevant to access.	This report does not assess the existing building for access compliance.
<b>BCA CLAUSE E1E2 – FIRE HYDRANTS</b>	A fire hydrant system is required to serve the entire building as it exceeds 500m <sup>2</sup> and is in the alpine areas. Fire Hydrant coverage provided in accordance with AS2419.1-2021 where flow and pressure achieves 10L/S at minimum 150kPa  Notably, AS2419.1-2021 is a new adoption Australian Standard within BCA 2022.	The building is served by a street hydrant system which has been tested to provide the required flow and pressure and is within 70m of the most disadvantaged point of the building.
<b>BCA CLAUSE E1D11 – WHERE SPRINKLERS ARE REQUIRED: ALL CLASSIFICATIONS</b>	Sprinklers are not required given the building less than 4 stories.	No action required for CC.
<b>BCA CLAUSE E2D6 BUILDINGS NOT MORE THAN 25M IN EFFECTIVE HEIGHT: CLASS 3 BUILDINGS AND. G4D7 – FIRE FIGHTING SYSTEMS.</b>	A manually operated (manual call point) automatic smoke detection and alarm system complying with Specification 20 must be provided within a Class 3 building in the alpine areas.  The building is three storeys and hence the smoke detection system is required to be monitored in accordance with S20C8.  The building is provided with an AS 1670.1 system. The proposed works do not require any alterations to this system given they are external.	Certification of smoke detection system required prior to issue of OC.  The FIP is not provided with an ASE and therefore not connected to a fire dispatch centre.



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BCA CLAUSE	COMPLIANCE ISSUE	DESIGN RECOMMENDATION
		Upgrade of system will be required as part of fire safety upgrade strategy.
<b>PARTS F1 – F3 – HEALTH AND AMENITY</b>	<p>Assessment of the external wall system/building envelope and the associated provisions of BCA Section F.</p> <p>The external walls are to prevent rainwater from entering the building via the installation of the new cladding.</p> <p>The new cladding arrangement must not introduce damp to rise from the ground into the external walls via compliance with F1D6.</p>	Confirmation required from architect with respect to the flashing systems to the window installations. to compliance with F1P2.
<b>BCA CLAUSE F4D4 – FACILITIES IN CLASS 3 TO 9 BUILDINGS</b>	<p>In a Class 3 building, the following facilities are required, within a sole occupancy unit or direct access to them:</p> <ul style="list-style-type: none"> <li>• A bath or shower; and</li> <li>• A closet pan; and</li> <li>• A washbasin.</li> </ul> <p>These are provided however the proposed development works do not include any changes to class 3 SOUs and therefore the requirements of the above clause are not relevant.</p>	Not part of the CC works.
<b>BCA CLAUSE F5D2 – HEIGHTS OF ROOMS AND OTHER SPACES</b>	A minimum of 2.4m ceiling height is required to be provided in accordance with BCA Clause F5D2. The raked ceilings complied.	This appears generally compliant however not part of CC works.
<b>BCA CLAUSE NSW F6D6 – VENTILATION OF ROOMS</b>  <b>BCA CLAUSE F6D7 – NATURAL VENTILATION.</b>	<p>A habitable room, office, shop, factory, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must achieve natural ventilation complying with BCA Clause F6D7 or a mechanical ventilation or air-conditioning system complying with AS1668.2 and AS/NZ3666.1.</p> <p>Natural ventilation must consist of opening, windows, doors or other devices which can be opened achieving an area not less than 5% of the floor area of the room required to be ventilated.</p> <p>The openings must open to a suitably size court or space open to the sky, an open verandah, carport or an adjoining room in accordance with BCA Clause F6D8.</p> <p>The new windows serving the habitable rooms will provide sufficient light and ventilation.</p>	Compliance achieved for habitable rooms via new window installations.
<b>PART F7 – SOUND SEPARATION</b>	This part applies to Class 3 portions. The existing bounding construction may not achieve the required sound insulation requirements, but the bounding walls are not part of the proposed external works.	The existing construction is assumed to comply with the prescriptive requirements.
<b>G4D3- EXTERNAL DOORS</b>	Exit doors in alpine areas are required to open inward and have a corresponding sign. The new exit door from the living	Install open inward signs are to be noted on the architectural

	room is to be fitted with an "OPEN INWARDS" sign in accordance with this clause.	drawing for the exit door to the enlarged deck.
<b>G4D4 – EMERGENCY LIGHTING</b>	Emergency lighting to be installed in every stairwell, in every public corridor leading to an exit and externally above every door leading to open space. An emergency light is to be installed over the new exit door to the deck in accordance with AS 2293.1-2018.	Emergency lighting was identified over the
<b>G4D5 – EXTERNAL TRAFFICABLE STRUCTURES</b>	<p>The existing stairs and ramps must be capable of shedding snow, to this end it was identified that they had been constructed of web forge decking panels.</p> <p>Where the decks for a path of travel to an exit, they also must be capable of shedding snow.</p>  <p><b>Figure 2 - stairs and ramps are grid mesh.</b></p>	Ramps stairs are generally compliant with this clause.
<b>G4D7- FIRE FIGHTING SERVICES AND EQUIPMENT</b>	<p>The building must have the following –</p> <ul style="list-style-type: none"> <li>(a) A manually operated fire alarm system with call points complying with AS 1670.1</li> <li>(b) Fire hydrants installed in accordance with AS2419.1</li> <li>(c) Fire hose reels</li> </ul>	<p>A detection system and hose reel system were observed onsite, and confirmation is required for compliance with AS 1670.1 and AS2441.</p> <p>Hydrant coverage was observed from the street hydrant system.</p>
<b>G4D8 - FIRE ORDERS</b>	Fire Orders were not identified in the building. These are to be installed in a prominent location on each level of the building	Fire Orders are to be prepared and posted in building as part of the fire safety upgrade strategy.



## 6.0 CONCLUSION

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The above inspection and compliance memorandum has identified items which are required to be addressed or rectified by way of a Performance-Based Fire Safety Upgrade Strategy Report. The recommendations above outline methods of achieving compliance with the current Building Code of Australia 2022 or where required by way of a Fire Engineered Upgrade Strategy given the non-compliant issues identified are incorporated into the existing structure.

We trust this assessment report is suitable for your purposes however, if you have any queries or wish to discuss, please contact the undersigned.

Regards,

**J<sup>2</sup> CONSULTING ENGINEERS**



**James Alexander**

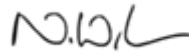
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