BUILDING CODE OF AUSTRALIA (BCA) ASSESSMENT FOR

Change of BCA use/classification of Shed dwelling to Tourist accommodation

At 310 Pinebrush Road, Glen Martin, NSW 2321 (Lot: 31, DP: 733190)

Prepared by Perception Planning Pty Ltd on behalf of Danny Woodland

10 December 2021

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EXECUTIVE SUMMARY

Generally, structures such as a shed can be converted to a habitable structure. The amount of work to convert such a structure should be thoroughly considered before starting. Common upgrades which are required consist of making the structure more rigid and less prone to movement and live load movement (requiring upgrades to the frame structure), and waterproofing of the external fabric and upgrades to control water within the building fabric such as condensation management and wet area waterproofing. The associated structural engineer's report from DRB consulting engineers details a number of structural elements of the structure which require attention to be compliant with the relevant Australian standards for dwelling construction. These are mostly related to the framing of the structure, with a footing on the eastern side of the building also requiring enlargement or replacement for compliance.

Appropriate facilities are installed, and appropriate lighting and ventilation requirements are catered for.

The following items should be noted, however do not constitute a full and comprehensive BCA assessment of the building:

i. Rectification of the noted structural items in the recommendations section of the associated DRB engineering report.

ii. Confirmation that window installations meet the requirements of AS 2047 for use in a habitable structure (see AS2047 and Part 3.6 – Glazing).

iii. Confirmation of smoke alarm installation and compliance regarding to hard wiring and emergency lighting (See part 3.7.5 – Smoke Alarms and Evacuation Lighting)

iv. Upgrading of the guttering downpipes and general site drainage may be required depending on BASIX requirements

TERMS & ABBREVIATIONS

BCA	Building Code of Australia
BTA	Bushfire threat assessment
Fire Source Feature	the far side of a boundary of a **road**; the rear or side boundary of an allotment or the external wall of another building on the same allotment.
FRL	Fire Resistance Level
Habitable Room	Means a room used for normal domestic activities and includes; bedrooms, living room, lounge room, sewing room, study, playroom, family room, home theatre and sunroom; *but excludes* a bathroom, laundry, W.C pantry walk in wardrobe, corridor, hallway lobby or the like.
NCC	National Construction Code
WAF	Wet area flashing- installed flashing to protect structural components from corrosion or rot from moisture ingress

LIST OF FIGURES AND TABLES

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1.0 INTRODUCTION

This report is an assessment of the plans and an inspection for use of the existing shed dwelling development as tourist accommodation to determine if existing construction shown generally complies with the (NCC/BCA) Building Code of Australia 2019. Plans for the use were assessed against the Deemed-to-Satisfy (DTS) Provisions of the BCA. The sections of the BCA addressed are generally limited to the items required to be addressed by this class of building and is based off a non-intrusive, visual inspection of the property.

The assessment predominately relates to the BCA/NCC 2019 and NSW Environmental Planning and Assessment legislation current at the time. The assessment relates specifically to the building the subject of this report and therefore should not be construed to apply to any other building.

The assessment is based on a review of the plans mentioned below and a visual inspection only and no intrusive or destructive inspections have taken place to determine existing construction parameters.

Prepared by: Ecodimensions

Project number: 2122121

Drawing numbers: 1 through 6

Dated: Sept'21

Andrew Ashton
Senior Building Consultant

1.1 SITE DETAILS AND ANALYSIS

The site is located at 310 Pinebrush Road, Glen Martin, NSW 2321 and is legally identified as Lot: 31/DP: 733190 (the site) (FIGURE 1). The site has a total area of 3.679ha and is accessible from Pinebrush Road. The site is zoned RU1: Primary Production.

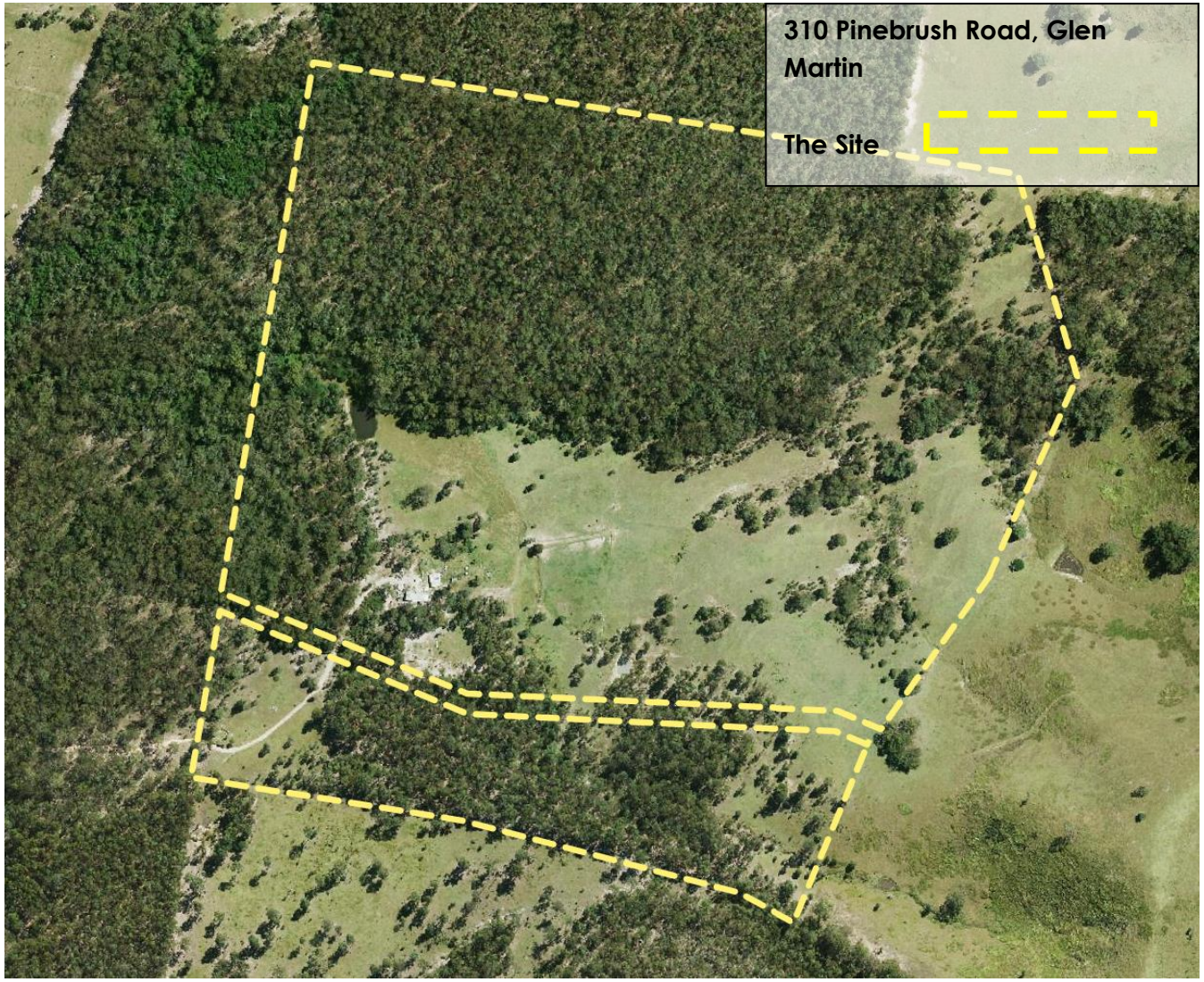
1.2 PROPERTY ZONING

The site of the proposed development is zoned RU1: Primary Production.

1.3 DESCRIPTION OF BUILDING

Location:	310 Pinebrush Rd, Glen Martin NSW
Current use of Building:	Shed
Proposed Use	Dwelling
NCC/ BCA Use Classification:	1a [A6.1]
Site soil classification:	M *(assumed- clay present on site)*
Wind classification:	N2 *(Assessed against AS4055)*

FIGURE 1 – Locality Map *(Source: NSW Planning Portal)*



2.0 NCC/BCA ASSESSMENT

The following table provides an assessment of the building against the relevant parts of the (NCC/BCA) Building Code of Australia 2019;

Table 1 – NCC/BCA Assessment

BCA Clause	Description	Assessment Comments	
Section 1- Governing Requirements			
Part A6 Building classification			
A6.1	Building Classification	Proposed classification is a class 1a (Dwelling)	*Note*
Section 3- Acceptable Construction			
Part 3.0 Structural Provisions			
3.02	Resistance to actions	The resistance of a building or structure must be greater than the most critical action effect resulting from different combinations of actions, where- (a) the most critical action effect on a building or structure must be determined in accordance with 3.0.3 and the general design procedures contained in AS/NZS 1170.0; and (b) the resistance of a building or structure is determined in accordance with 3.0.4. The associated structural engineers report from DRB consulting engineers notes that most structural provisions are compliant with the exception of those mentioned in the recommendations section of their report.	*Compliance subject to recommendations in associated engineering report*
3.03	Determination of individual actions	The magnitude of individual actions must be determined in accordance with the following: Permanent actions; imposed actions, wind and earthquake actions; the actions considered must include, the nature of the action, the nature of the building, the importance level (Table 3.03a defines this structure as important level 2) The determination should be assessed against AS1170.1, AS1170.2, AS1170.3, AS1170.4, AS4055 as appropriate and include but not limited to- Liquid pressure action and ground water action; and rainwater action (including ponding action); and earth pressure action; and differential movement; and time dependent effects (including creep and shrinkage); and thermal effects; and ground movement caused by swelling, shrinkage or freezing of the subsoil; and	*Note*

		(a) landslip or subsidence; and siteworks associated with the building or structure; and construction activity actions.	
3.04	Determination of structural resistance of materials and forms of construction	The following requirements, or any combination of them, must be used to determine the structural resistance of materials and forms of construction as appropriate: Part 3.1, Part 3.2 (or AS3600) (AS5216 as required), Part 3.3, Part 3.4 (AS2327, AS1664.1, AS1664.2 as required), Part 3.5, Part 3.6, Part 3.9 (AS1170.1 as required), Part 3.10 (AS4505 as required)	*Note*
3.05		Structural software used on computer aided design of a building must comply with this clause and use criteria based of the DTS provisions of the Housing provisions volume of the NCC.	*Note*
Part 3.1 Site Preparation			
3.1.1.1	Unretained bulk earthworks- site cut	No site works governed by this clause.	*N/A*
3.1.1.2	Un-retained bulk earthworks- fill	No site works governed by this clause	*N/A*
Part 3.1.2 Earth retaining structures			
3.1.2.0		No retaining wall proposed as part of this application nor were any observed on site	*N/A*
Part 3.1.3 Drainage			
3.1.3.2	Drainage requirements	Compliance with 3.1.3.3, 3.1.3.4 and 3.1.3.5 required. See these clauses for more information	*Does not comply requires work*
3.1.3.3	Surface water drainage	The surface surrounding the structure should fall 50mm over the first 1m away from the building	*Generally Complies*
3.1.3.4	Subsoil drainage	No Subsoil drainage installed	*N/A*
3.1.3.5	Stormwater drainage	Stormwater is connected to the stormwater system of the adjacent existing dwelling. BASIX requirements are likely to impose the requirement of a stormwater tank.	*Can Comply* *BASIX requirements to determine*

Part 3.1.4 Termite risk management			
3.1.4.2	Requirements of termite management systems	The current structure has most structural elements composed of timber, with steel cladding. Any component used to achieve the structural rectifications outlined in the associated engineering report from DRB consulting engineers must be of steel or naturally resistant timber in accordance with Appendix C of AS3660.1, a preservative treated timber in accordance with Appendix D of AS3660.1 or an alternative termite treatment system complying with AS3660 must be installed	*See notes*
3.1.4.3	Termite Management Systems	Where a termite management system is required it must be selected appropriate to the below table, comply with AS3660.1 or be tested in accordance with AS3660.3 Section 5, have a durable notice installed (in accordance with the following clause) and where a chemical treatment is used, the chemical must be included on the appropriate authorities' pesticides register.	

Table 3.1.4.1 Acceptable termite management systems and components

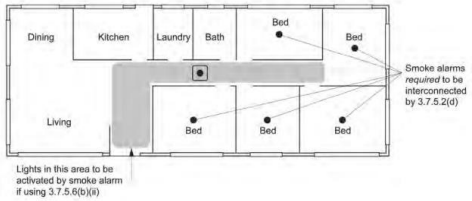
Building element	Termite management system or component options
Concrete slab-on-ground: Slab perimeter or *external wall* perimeter	Slab edge exposure Sheet material Granular material Chemical
Concrete slab-on-ground: Penetrations/control joints/area beneath the slab (see Note)	Sheet material Granular material Chemical
Suspended floors	Sheet material Granular material Chemical
Attachments to buildings	Termite management system to the attachment Inspection zone between attachment and building

Note to Table 3.1.4.1: The entire area beneath the slab must be treated when the slab-on-ground is not designed and constructed in accordance with AS 2870 or AS 3600.

3.1.4.4	Durable notice	When works are completed to meet other requirements relating to frame components, a durable notice (sticker) must be installed into the meterbox, noting the method of termite protection employed.	*Can comply*
Part 3.2 Footings and slabs			
		Concrete slab is in place. No further concrete works are proposed as part of this application. The associated engineering report from DRB	*Can Comply,*

		notes that eastern end pad footings require enlargement or replacement to comply with AS 2870. ***Note 1:*** *Vapour barriers are required as part of a class 1a structure to prevent rising damp implications. While systems can be retrofitted to meet this requirement, it was noted onsite inspection that there is evidence of vapour barrier installation. While this does not confirm the proper and complete installation (only a destructive inspection could go partway in determining) it does however provide a good indication that a vapour barrier is likely to exist.*	*Works required in accordance with engineering report*
Part 3.3- Masonry			
		No masonry utilised in the structure	*N/A*
Part 3.4- Framing			
Part 3.4.1 Sub-floor ventilation			
3.4.1.2	Sub-floor ventilation	No sub-floor – Slab on ground	*N/A*
Part 3.4.2 Steel Framing			
3.4.2.1		Any steel framing must comply with AS 4600 or the 'NASH' standard and the frame material requires to have a yield stress of not less than 250MPa. The associated engineering report from DRB mentions the steel framing present in the shed structure and notes no changes in order for compliance.	*Complies*
Part 3.4.3 Timber Framing			
3.4.3.0	Acceptable Construction Manuals	The associated engineering report from DRB consulting engineers mentions several requirements for the existing roof framing to be compliant with AS1684. Elements requiring attention include the hardwood rafters, purlin section roof beam, wall batten spacing, and various fixings and tie-downs.	*Can Comply,* *Works required in accordance with engineering report*
Part 3.4.4 Structural Steel Members			
3.4.4	Application	Performance Requirement P2.1.1 is satisfied for structural steel sections if they are designed and constructed in accordance with one of the following: (a) Steel structures: AS 4100. (b) Cold-formed steel structures: AS/NZS 4600.	*Complies*

		The associated engineering report from DRB mentions the structural steel members present in the structure and notes no changes in order for compliance.	
Part 3.5- Roof and wall cladding			
Part 3.5.1 Roof Cladding			
3.5.1.0	Acceptable construction manuals	Metal roofing must comply with AS1562.1. Upgrades to the structural roof members may require the sheet/s to be removed the (re)installing of sheets should be confirmed with AS1562.1 for habitable structures. This would include upgrades to flashing of roof penetrations.	*Can comply*
Part 3.5.2 Gutters and downpipes			
3.5.2.1	Application	The roof drainage system is connected to a stormwater drainage system that complies with Part 3.1.2. (see comments Part 3.1.2) ***Note 1:*** *overflows during heavy rain should be diverted away from the building*	*Complies*
3.5.2.5	Downpipes-size and installation	Downpipes must not serve more than 12m of gutter length for each downpipe. Note: it was noted on site that only 1 downpipe per gutter was in place. While this may serve the purpose for the current structure and ease collection of stormwater to the water tanks, it does not comply. The downpipes and stormwater system must either comply with the requirements of this clause or AS3500.3 or AS3500.5.	*Complies* *Can comply with redesign and reworking of stormwater system. Should be redesigned in accordance with suggestions in Part 3.1.3*
Part 3.5.5 Metal Wall Cladding			
3.5.5.0	Metal Wall Cladding	Metal wall cladding must be designed and installed in accordance with AS1562.1 Associated engineering report from DRB consulting engineers confirms general compliance and does not identify the cladding of the structure as needing rectification for compliance.	*Complies*
Part 3.6- Glazing			
3.6.0	Acceptable construction manuals	All windows in external walls should be confirmed to comply with AS2047 *Some of the current window installation/s can be seen in images 1, 2, 3, 4 and 5*	*Compliance unable to be confirmed. Requires certification (or similar) from*

			window manufacturer/ installer that windows comply with AS2047
Part 3.7- Fire Safety			
Part 3.7.2 Fire Separation of external walls			
3.7.2.2	External walls of class 1 buildings	Walls less than 900mmm require fire protection. Walls on structure are in excess of this distance from all boundaries.	*Complies*
Part 3.7.5 Smoke Alarms and evacuation lighting			
3.7.5.2	Smoke alarm requirements	Smoke alarms must be installed in a class 1a/ 1b buildings and must comply with AS3786 and be hard wired	*Note*
3.7.5.4	Location - Class 1b buildings	In a Class 1b building, smoke alarms must be located in- (a) every bedroom; and (b) every corridor or hallway associated with a bedroom, or if there is no corridor or hallway, in an area between the bedrooms and the remainder of the building; and (c) each other storey. **Diagram c Class 1b building where multiple bedrooms are served by a hallway**  **Legend for Figure 3.7.5.1 Diagram c:** ● Smoke alarm ⊡ Smoke alarm with evacuation lighting (as *required* by 3.7.5.6(b)(i))	*Can comply.* *Confirm locations and hard wiring/ compliance with AS3786.*
3.7.5.5	Installation of smoke alarms	Smoke alarms required by 3.7.5.3 (not included as this is a Class 1a dwelling requirement only) and 3.7.5.4 must be installed on or near the ceiling, in accordance with the following: (a) Where a smoke alarm is located on the ceiling it must be- (i) a minimum of 300 mm away from the corner junction of the wall and ceiling; and (ii) between 500 mm and 1500 mm away from the high point and apexes of the ceiling, if the room has a sloping ceiling. (b) Where (a) is not possible, the smoke alarm may be installed on the wall, and located a minimum of 300 mm and a	*Note*

		maximum of 500 mm off the ceiling at the junction with the wall.	
3.7.5.6	Lighting to assist evacuation – Class 1b buildings	In a Class 1b building, a system of lighting must be installed to assist evacuation of occupants in the event of a fire, and— (a)be activated by the smoke alarm required by 3.7.5.4(b); and (b) consist of— (i) a light incorporated within the smoke alarm; or (ii) the lighting located in the corridor, hallway or area served by the smoke alarm.	*Can comply; Installation required*
Part 3.8- Health and amenity			
Part 3.8.1 Wet areas and external water proofing			
3.8.1.2	Wet areas	Wet areas (when installed) must be in compliance with Table 3.8.1.1 an AS3740. Wet area flashing is assumed to be in place where appropriate; presence of WAF is difficult to determine once tiles/wet areas are constructed. ***Note 1:*** *Linings must comply with the table and wet area flashing (WAF) must be installed complying with AS3740. (installer of WAF can supply associated compliance certificates)*	*Can comply; Subject to completion of works* *(See figures 6 and 7)* *See adjacent notes*
Part 3.8.2 Room Heights			
3.8.2.2	Heights of rooms and other spaces	Heights of rooms and other spaces (see Figure 3.8.2.1) must be not less than- (a) in a habitable room excluding a kitchen - 2.4 m; and (b) in a kitchen - 2.1 m; and (c) in a corridor, passageway or the like - 2.1 m; and (d) in a bathroom, shower room, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like - 2.1 m;	*Complies*
Part 3.8.3 Facilities			
NCC/BCA Vol.1 – Part D3.1 Access for people with a disability			
NCC/BCA Vol. 1 – D3.1	General building access requirements	*Class 1b (a) Dwellings located on one allotment Note 1 and used for short-term holiday accommodation, consisting of-* *(i) 4 to 10 dwellings- access requirement to and within 1 dwelling*	*N/A; See note 1*

		Note 1: As the short-term holiday accommodation in this clause refers to 4-10 dwellings and the proposal is only for 2 dwellings to be used in this way; this clause does not apply and is provided for information and clarity only	
3.8.3.2	Required facilities	A class 1 building (dwelling) must be provided with; a kitchen sink and facilities for the prep and cooking of food; a bath or shower; clothes washing facilities- comprising of at least one washtub and space in the same room for a washing machine; a toilet and washbasin (for exclusive handwashing). *See figures 6, 7, 8, 9 and 10*	*Complies*
3.8.3.3	Construction of Sanitary compartments	The door to a fully enclosed sanitary compartment must- (a) open outwards; or (b) slide; or (c) be readily removable from the outside of the compartment, unless there is a clear space of at least 1.2 m, measured in accordance with Figure 3.8.3.3, between the closet pan within the sanitary compartment and the doorway.	*Complies*
Part 3.8.4 Light			
3.8.4.2	Natural lighting	All habitable rooms should be provided with natural light consisting of a provision of not less than 10% of the floor area of the room.	*Complies*
3.8.4.3	Artificial lighting	Sanitary compartments, bathrooms, shower rooms, airlocks and laundries must be provided with artificial lighting if natural light in accordance with the relevant provisions of 3.8.4.2 is not available— (a) at a rate of not less than one light fitting per 16 m2 of floor area; or (b) in accordance with AS/NZS 1680.0.	*Complies*
Part 3.8.5 Ventilation			
3.8.5.2	Ventilation requirements	Ventilation must be provided to a habitable room, sanitary compartment, bathroom, shower room, laundry and any other room occupied by any person with an openable portion of not less than 5% of the floor area. *Note 1: as most windows are 50% openable if the requirements of 3.8.4.2 are met then the requirements for natural ventilation are also satisfied*	*Complies*

3.8.5.3	Location of sanitary compartments	Sanitary compartments must not open directly into a kitchen or pantry unless- (a) access is by an airlock, hallway, or other room; or (b) the sanitary compartment is provided with an exhaust fan or other means of mechanical exhaust ventilation.	*Complies*
Part 3.8.6 Sound Insulation			
3.8.6.2	Sound insulation requirements	Only required where two or more class 1 structures are adjacent each other	*N/A*
Part 3.8.7 Condensation management			
		(a) Where a pliable building membrane is installed in an external wall, it must— (i) comply with AS/NZS 4200.1; and (ii) be installed in accordance with AS 4200.2; and (iii) be a vapour permeable membrane for climate zones 6, 7 and 8; and (iv) be located on the exterior side of the primary insulation layer of wall assemblies that form the external envelope of a building. (b) Except for single skin masonry or single skin concrete, where a pliable building membrane is not installed in an external wall, the primary water control layer must be separated from water sensitive materials by a drained cavity. ***Note 1:*** *While there was evidence of vapour barriers on site upon inspection, compliance is assumed as non-destructive tests cannot determine full compliance.*	*Assumed Compliance*
Part 3.9- Safe movement and access			
Part 3.9.1 Stair Construction			
3.9.1.2	Stairway Construction	A stairway must be designed to take loading forces in accordance with AS/NZS 1170.1 and must have— between 2 and 18 risers per flight. Stairways must have goings, risers, and a slope relationship quantity in accordance with Table 3.9.1.1. The engineer's report associated with this BCA report confirms general compliance with AS1170.1, and details no works for the	*Complies*

		stairway in the shed structure to be compliant.	

Table 3.9.1.1 Riser and going dimensions (mm)

Stair type	Riser (R) (see Figure 3.9.1.4 below)		Going (G) (see Figure 3.9.1.4 below)		Slope relationship (2R+G)	
	Max	Min	Max	Min	Max	Min
Stairs (other than spiral)	190	115	355	240	700	550
Spiral	220	140	370	210	680	590

Part 3.9.1 Stairway and ramp construction			
3.9.1.2	Barriers to prevent falls	A continuous barrier must be provided along the side of a trafficable surface, such as— i. a stairway, ramp or the like; and ii. a floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like; and iii. a roof top space or the like to which general access is provided; and iv. any delineated path of access to a building, where it is possible to fall 1 m or more measured from the level of the trafficable surface to the surface beneath	*Complies* *See 3.9.2.2*
3.9.1.4	Slip-resistance	The requirements for slip-resistance treatment to stair treads, ramps and landings are as follows: (a) Treads must have— (i) a surface with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586; or (ii) a nosing strip with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586. (b) The floor surface of a ramp must have a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586. (c) Landings, where the edge leads to the flight below, must have— (i) a surface with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586, for not less than 190 mm from the stair nosing; or (ii) a nosing strip with a slip-resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586.	*Assumed compliance* *Testing in accordance with AS 4586 required to determine compliance.*

		Table 3.9.1.3 Slip-resistance classification **Application** / **Dry surface conditions** / **Wet surface conditions** Ramp not steeper than 1:8 / P4 or R10 / P5 or R12 **Application** / **Dry surface conditions** / **Wet surface conditions** Tread surface / P3 or R10 / P4 or R11 Nosing or landing edge strip / P3 / P4	
3.9.2 Barriers and handrails			
3.9.2.2	Construction of barriers to prevent falls	Barriers implemented to prevent falls from the stairs within the shed structure are generally complaint, with the exception of the non-compliant openings. Barriers for the stairway leading to the loft space must be made compliant with 3.9.2.3 (c); such that a 125mm sphere cannot pass through the barrier.	*Can Comply,* *Works required.*
Part 3.10- Ancillary provisions and additional construction requirements			
Part 3.10.1 High Wind Areas			
		The site is not considered a high wind area outside the scope of that considered within the BCA	*N/A*
Part 3.10.2 Earthquake Areas			
		Most domestic structures are generally considered resistant to earthquakes as the loads catered for within wind resistance are generally considered adequate for earthquake resistance. AS1170.4 can offer additional information in this regard and could be considered as part of the engineering certification suggested elsewhere in the body of this report.	*N/A*
Part 3.10.3 Flood Hazard Area			
		The siting of the structure is not identified as a flood hazard area	*N/A*
3.10.5 Construction in Bushfire Prone Areas			
3.10.5.0	Application	Performance Requirement P2.7.5 is satisfied for— (a) a Class 1 building; or (b) a Class 10a building or deck associated with a Class 1 building, located in a designated bushfire prone area if it is constructed in accordance with— (c) AS 3959; or (d) NASH Standard – Steel Framed Construction in Bushfire Areas.	*Complies;* *See associated Bushfire report*

Part 3.12- Energy efficiency			
		Energy efficiency for habitable structures in NSW is managed through the BASIX system. A BASIX certificate and modelling will be required to satisfy this requirement	*Information only Requires BASIX certificate*

The following attachments are provided under separate cover:

ATTACHMENT 1 – Site images

Attachment 1

Image 1: Northern window installation

Image 2: Southern window installation in kitchen area

Image 3: Southern window installation

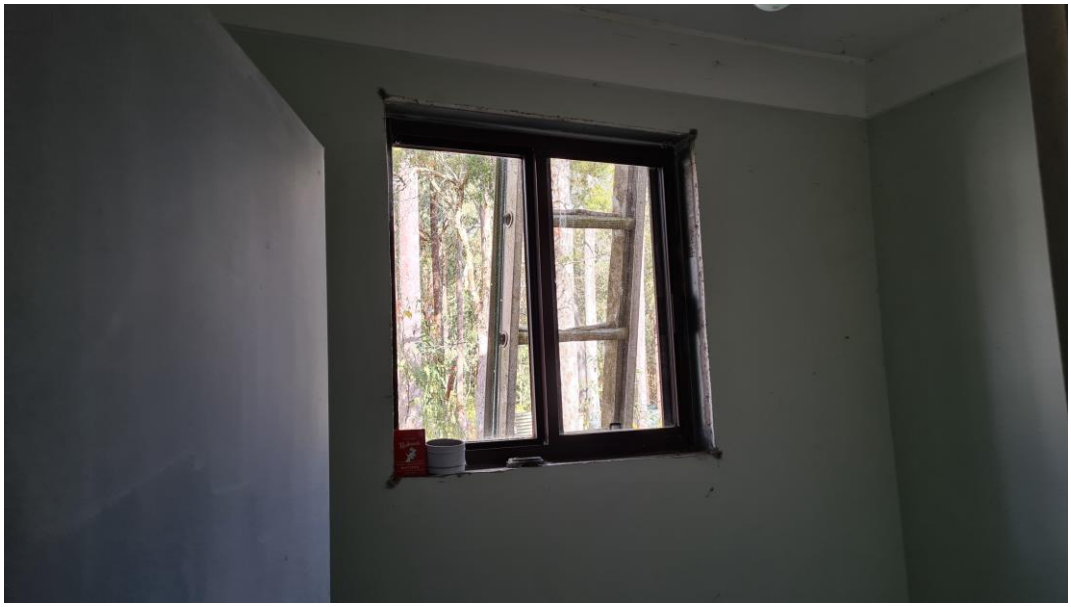


Image 4: Southern window installation

Image 5: Northern bedroom window installation

Image 6: WC facilities

Image 7: Shower facilities

Image 8: Kitchen sink and facilities

Image 9: Kitchen facilities and benchtop

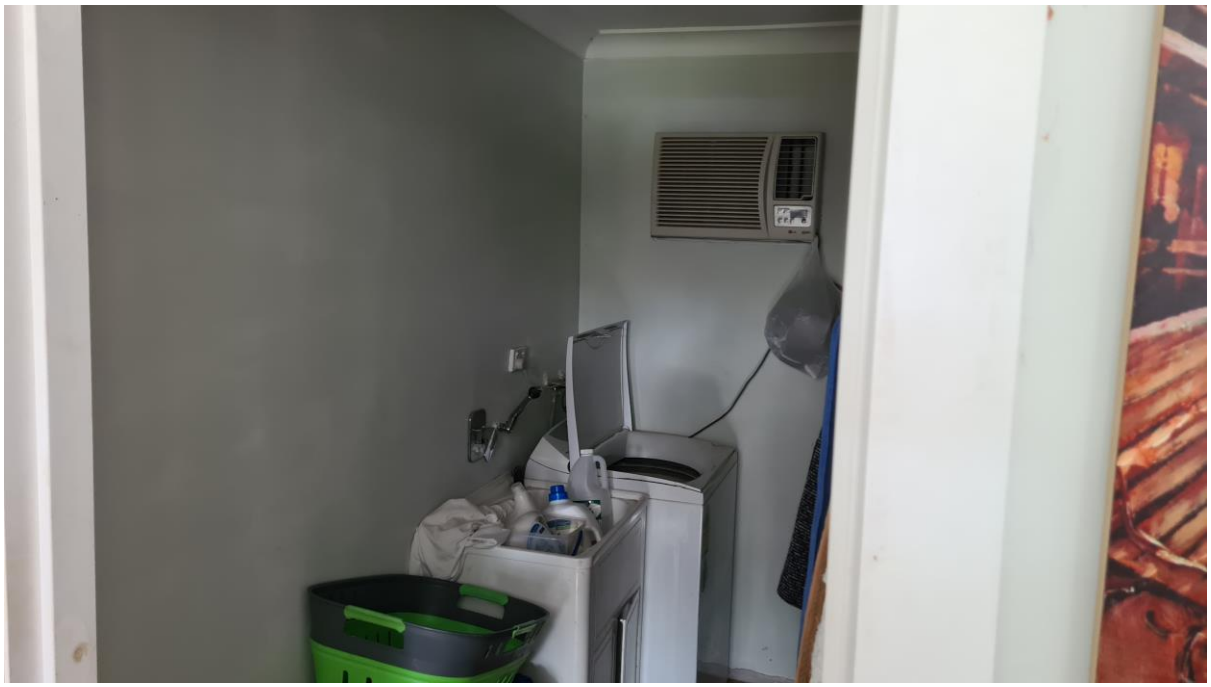


Image 10: Laundry washtub and washing machine

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