

TRIAL

TINY HOUSE

CONSTRUCTION

GUIDE 2021



AUSTRALIAN
TINY HOUSE
ASSOCIATION

TINY HOUSE CONSTRUCTION GUIDE



The Tiny House Construction Guide recognises Tiny Houses on Wheels (THOW) and Tiny Houses on Skids (THOS) as habitable dwellings.

The Tiny House Construction Guide (the Guide) sets out minimum requirements for the design and construction of THOW and THOS. The Appendices relate to siting and moving of the tiny houses with illustrations to support tiny house builders and occupants.

The Guide refers to the relevant provisions of the Building Code of Australia Volume 2.

The Guide will be promoted by ATHA to tiny house builders, do it yourself builders, aspiring tiny house occupants, association members and non-members to encourage safe and structurally sound construction practice, and assist where local authority approvals are being sought.

Throughout 2021, ATHA will be encouraging builders and do it yourself builders to review and apply the Guide to their design and construction and provide feedback to ATHA on usability, understanding and interpretation. User feedback will be formally collated as qualitative data to inform future revisions of the Guide.

ATHA will also be looking for Tiny House Builder members to pledge that they will trial the Guide in their building of tiny houses.

ATHA acknowledges and sincerely thanks the ATHA Tiny House Builder members for their valuable contribution and effort, in developing the Trial Tiny House Construction Guide.

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TABLE OF CONTENTS

Introduction	5
1. Definitions	5
2. Tiny House foundation	6
3. Tiny house connection	6
4. Site Preparation	6
5. Framing	6
5.1 Sarking	7
5.2 Timber Framing	7
5.3 Structural Steel Members.....	7
6. Sheet roofing.....	7
7. Gutters and Downpipes	7
8. Wall cladding.....	7
9. Structural Flooring.....	8
10. Glazing and windows	8
11. Fire precautions	8
12. LP Gas Systems	9
13. Room heights and sizes.....	9
14. Room facilities	9
15. Stair construction.....	9
15.1 Stair width	9
15.2 Stairway External	10
15.3 Stairway internal.....	10
15.4 Landing platforms.....	10
15.5 Thresholds	10
15.6 Barriers to prevent falls	10
16. Energy efficiency.....	10
17. Management of wastewater on site.....	11
18. Appendix.....	11
18.1 Before you site the tiny house.....	11
18.2 Siting and setback.....	11
18.3 Termite management Timber decks and garden materials should be designed to ensure the termite activity can be observed and managed. 18.4 Preparing a tiny house for transport	11

18.5 Living tiny in bushfire prone area 12

18.6 Moving the tiny house on site 12

18.7 Toilet waste 12

18.8 Stairs 13

TRIAL

INTRODUCTION

ATHA has developed this Trial Tiny House Construction Guide to promote safe and structurally sound tiny houses on wheels within Australia. This Guide has alignment to elements to the Building Code of Australia Vol 2 and US Appendix Q for tiny houses on foundations, whilst including building responses to address the unique nature of THOWs.

Please read this Guide together with the Building Code of Australia Vol 2 2019, which can be downloaded from the Australian Building Codes Board. <https://ncc.abcb.gov.au/ncc-online/NCC>

1. DEFINITIONS

Tiny House

The Australian Tiny House Association (ATHA) defines that a tiny house is a moveable dwelling suitable for permanent residential use, with self-contained amenities and services and the option to be grid connected.

A tiny house can be:

- A Moveable Tiny House is a transportable structure with the ability to be moved.
- A Tiny House on Wheels (THOW) is constructed on a trailer designed to road legal dimensions, which can be moved.

Landing platform

A landing provided as the top step of a stairway to access a platform.

Bed platform

A bed platform is a space above the main floor level that is not enclosed as a room.

Bushfire attack level (BAL)

As per AS 3959 (2009). Bushfire Attack Level is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.

Going

The horizontal dimension from the front to the back of a tread less any overhang from the next tread or landing above.

Landing

An area at the top or bottom of a flight or between two flights.

Riser

The height between consecutive treads and between each landing and continuous tread.

2. TINY HOUSE FOUNDATION

Tiny house trailers must be designed and constructed in accordance with **Vehicle Standards Bulletin VSB1** for trailers not greater than 4.5 tonnes aggregate trailer mass. Or where greater than 4.5 tonnes must be designed by a Structural Engineer.

Tiny house skids must be certified by a Structural Engineer.

3. TINY HOUSE CONNECTION

The connection of a tiny house to the trailer or skid must be certified by a Structural Engineer. This includes:

- Connection of wall frames to chassis
- Connection of roof frames/trusses
- Connection of flooring/floor structure to chassis

4. SITE PREPARATION

Stormwater drainage – Where a stormwater drainage system is required – must be undertaken in accordance with BCA Vol 2 Clause 3.1.3.5 to the satisfaction of the appropriate authority.

Subfloor Ventilation – must comply with BCA Clause 3.4.1.2 sub sections (a) and (b) when a perimeter skirt or enclosure of the subfloor is constructed.

5. FRAMING

Structural drawings prepared by manufacturer / supplier must be certified by a Structural Engineer inclusive of the following components **where relevant and applicable to** –

- Timber and/or Steel Framing Schedule;
- Structurally Insulated Wall and Roofing Panel Schedule;
- Alternative framing solutions subject to engineering certification;
- Bracing & Tie-down details; and
- In accordance with certified computations of a Structural Engineer.

5.1 SARKING

Where sarking is required for structural framing this must be installed in accordance with BCA Vol 2 Clause 3.5.2.4. and an anti-ponding device must be provided in accordance with BCA Vol 2 Clause 3.5.2.5, where appropriate.

5.2 TIMBER FRAMING

Refer to Structural drawings and as per BCA Vol 2 Clause 3.4.3.

5.3 STRUCTURAL STEEL MEMBERS

Where structural steel members are used in combination with timber framing they must be designed and constructed in accordance with one of the following:

- (a) Steel structures: AS 4100.
- (b) Cold-formed steel structures: AS/NZS 4600.
- (c) NASH standard 'Residential and Low-Rise Steel Framing' part 2.
- (d) Refer to item 5.

6. SHEET ROOFING

Sheet roofing must be installed in accordance with certified computations of a Structural Engineer and must be undertaken in accordance with BCA Vol 2: 3.5.1.2, 3.5.1.3, 3.5.1.4, 3.5.1.6 and 3.5.1.7 where relevant.

Where eaves are required eave linings should be installed as per BCA Vol 2 Clause 3.5.4.5.

7. GUTTERS AND DOWNPIPES

Where gutters and downpipes are installed the drainage must be designed to drain away from the tiny house and not to be discharged onto adjoining property. Positioning of gutters and downpipes need to comply with VSB1 maximum width of a THOW is required.

8. WALL CLADDING

Timber cladding must be installed in accordance with BCA Vol 2 Clause 3.5.4.2, where appropriate.

Wall cladding boards must be fixed in accordance with manufacturers specifications.

Fibre-cement, hardboard, and structural plywood sheet wall cladding must be installed in accordance with BCA Vol 2 Clause 3.5.4.4, where appropriate.

Flashings to wall openings must be undertaken in accordance with BCA Vol 2 Clause 3.5.4.6, where appropriate.

Metal cladding must be designed and constructed in accordance with AS 1562.1

Alternative cladding solutions as per manufacturers specifications.

9. STRUCTURAL FLOORING

Structural flooring as per the BCA Vol 2 Clause 3.4.3.0 AS1860.2; or

Alternative flooring materials (as per manufacturer's instructions); or

Hardwood ply (As per Engineering certification); or

Composite (As per Engineering certification).

10. GLAZING AND WINDOWS

All windows and glazing for external walls must be in accordance with BCA Vol 2 Clause 3.6.0 designed in accordance with AS2047 .

The window supplier must be provided with engineering requirements for the location and windspeed to provide suitable glazing as directed by Engineer requirements.

Where secondhand windows are used they are required to meet AS1288 and be suitable for the location and windspeed to be confirmed with engineering requirements.

Where glazing is installed in areas where there is high potential for human impact this glazing must be in accordance with BCA Vol 2 Clause 3.6.4.

It is recommended that external glazing is toughened or laminated glass or in accordance with the application intended.

Where skylights, roof lights and windows are greater than 2.0m from the external ground they must be restricted to an opening of no greater than 125mm.

11. FIRE PRECAUTIONS

Tiny Houses must be fitted with:

- A 10 year photo-electric smoke alarm that is either connected to 240 volt with a 9 volt lithium battery backup, or off grid to a 9 volt lithium battery; and
- Dry powder fire extinguisher; and
- Gas ventilation as per AS 5601-2004 with an option of a fitted carbon monoxide reader.

Installation of smoke alarms should be in accordance with BCA Vol 2 Clause 3.7.5.5.

Where a free-standing fireplace is installed the fireplace and the installation of the fireplace and flue must comply with AS/NZS 2918.

NB Should the tiny house be moved, then this will trigger the upper section to be removed prior to transport. (Refer to fire installers in your State)

12. LP GAS SYSTEMS

All LP Gas systems and appliances must be installed and ventilated in accordance with AS5601-2004 Section 6

13. ROOM HEIGHTS AND SIZES

Bathroom ceiling height to be no less than 2.0m.

Kitchen ceiling height to be no less than 2.0m.

Storage loft as required for its intended use.

14. ROOM FACILITIES

A Tiny House, when used as a dwelling, must be provided with –

- a kitchen sink and facilities for the preparation and cooking of food;
- a bath or shower;
- a toilet; and
- a washbasin.

A door leading onto a sanitary compartment should either open outwards, slide, bifold or removable, unless a clear space of 1.2m is provided in front of the toilet.

Natural lighting must be provided into all habitable spaces. Windows must have an aggregate light transmitting area of not less than 10% of the floor area of the space.

Where a sanitary compartment opens onto a food preparation area, the compartment must be provided with an exhaust fan discharging to the exterior.

Cooking appliances using combustible fuels must have an exhaust system discharging to the exterior. External venting for kitchens is good practice in all cases to reduce the risk of condensation and the build-up of odours.

15. STAIR CONSTRUCTION

15.1 STAIR WIDTH

Stairways accessing lofts shall not be less than 432mm clear width at or above the handrail. The width below the handrail shall be no less than 508mm. See Appendices for detailed drawings.

15.2 STAIRWAY EXTERNAL

External stairs to comply with BCA Vol 2 Clause 3.9.1.2 and

- (a) Not more than 18 and not less than 2 risers in each flight

15.3 STAIRWAY INTERNAL

Internal stair must be designed to take loading forces in accordance with AS/NZS 1170.1 and is recommended to have:

- (b) Goings (G), risers (R) and a slope relationship quantity (2R+G) in accordance with Table 1.

Table 1

Stair design	Riser		Going		Slope relationship (2R+G)	
	Max	Min	Max	Min	Max	Min
Stairs	310mm	115mm	355mm	220mm	975mm	470mm

15.4 LANDING PLATFORMS

Landings for external access are to be constructed in accordance with BCA Vol 2 Clause 3.9.1.5.

Internal landings shall be constructed as a landing platform with a minimum of 500mm by 500mm area.

15.5 THRESHOLDS

Where the threshold of an external doorway is more than 230mm above the adjoining surface it must incorporate steps in accordance with BCA Vol 2 Clause 3.9.1.6.

15.6 BARRIERS TO PREVENT FALLS

Balustrade if used to comply with BCA Vol 2 Clause 3.9.2.3.

16. ENERGY EFFICIENCY

It is understood that if the THOW does not have heating and cooling in the construction then it is unconditioned space and as a result does not require an energy rating for the building fabric, IF a building permit was sought.

To provide a degree of energy efficiency in the tiny home the following is recommended:

- Walls to have a total R value 2.0
- Roof to have a total R value 4.0
- Subfloor to have a total R value 1.0

- External glazing to be 4mm thickness
- For greater efficiency consider Low e glass

17. MANAGEMENT OF WASTEWATER ON SITE

A wastewater management guide for tiny houses is being developed to compliment the Construction Guide.

18. APPENDIX

18.1 BEFORE YOU SITE THE TINY HOUSE

Contact your local council and provide them with all certificates that have been issued for the safe construction of the tiny house, including photos of construction and the completed tiny house.

Ascertain if a local law or planning permit is required for the tiny house and apply for this.

Ascertain how wastewater and stormwater management is required to be managed in accordance with the responsible authority.

Ensure you understand the amenity values of the area and maintain these expectations with car parking, garden, noise generation etc.

Provide details on composting and incinerator toilets to your local council Health Department for approval.

18.2 SITING AND SETBACK

All tiny house owners shall familiarise themselves with their site and the local planning regulations which apply.

Proximity to boundary setback will be determined by local council planning controls, with consideration to privacy of adjoining neighbours.

18.3 Termite management

TIMBER DECKS AND GARDEN MATERIALS SHOULD BE DESIGNED TO ENSURE THE TERMITE ACTIVITY CAN BE OBSERVED AND MANAGED. 18.4 PREPARING A TINY HOUSE FOR TRANSPORT

- Moving a large structure with a high centre of gravity takes considerable skill and should only be undertaken by a driver who is competent with manouvering of and towing a large structure.
- Ensure you use a towing vehicle with a towing capacity that matches the structure to be towed.
- Ensure all loose objects within the tiny house are secured or removed prior to transport on a road.
- Remove gas bottles and check secure connection of roof installed solar panels.
- Test all the electrics for lights and indicators are working as legally required for transport.
- Lock all doors and windows and remove flyscreens if not well secured.
- If roof gutters protrude beyond the allowable transportable width then remove the gutter and downpipes prior to transport.
- Ensure the tyres are inflated correctly for the load and they are road worthy.

- Check electric breaking systems are working correctly inclusive of battery charged.
- Secure all safety chains from trailer to vehicle.
- Do a test drive with the tiny house before committing to the journey and ensure everything is working and connected correctly.

18.5 LIVING TINY IN BUSHFIRE PRONE AREA

Seek advice from the local authority to confirm certification / compliance is required.

In the event of a bushfire threatening your tiny house, it is recommended to assess your ability to safely prepare the transport of your tiny house, before you consider hitching it up for movement onto the road, where it could potentially block valuable egress routes. Tiny House dwellers should consider installing bushfire sprinklers, supported by sufficient water supply and a reliable pump to suppress the fire around the house, but this is not a guarantee of protection of your tiny house and human life.

18.6 MOVING THE TINY HOUSE ON SITE

Site inspection of the site should be undertaken prior to transport of the tiny house to site.

An inspection should include but not limited to:

- Site preparation for levels
- Location of services eg water, electricity
- Location for the discharge of wastewater
- Clearance to overhead services, overhanging branches, trees, gates and fence lines
- Condition of the vehicle surface being used
- Clearance for moving onto site, decoupling and exiting the site safely

18.7 TOILET WASTE

Depending on the type of toilet that is being used in the tiny house (eg composting, incinerator or water using toilet) the waste must be managed in accordance with the local authority regulations.

Give consideration that a AS approved toilet shall be required.

18.8 STAIRS

Diagrams of stair designs that demonstrate how Section 15.3 Table 1 could be interpreted.

STAIR 1

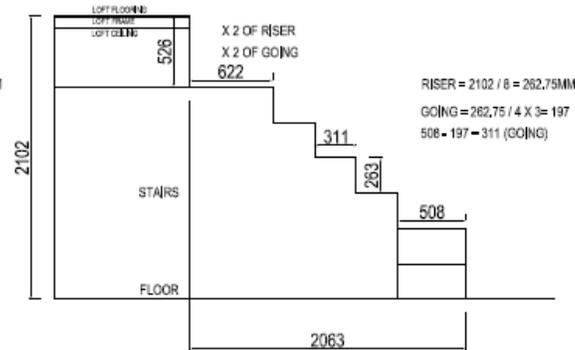
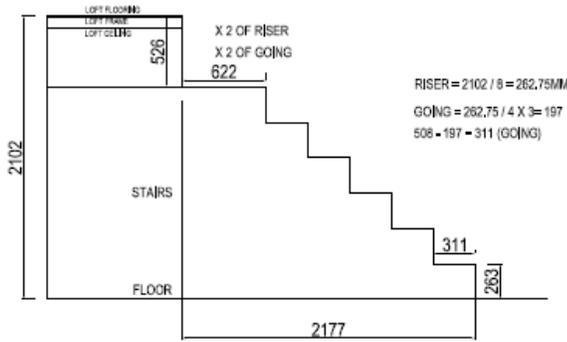
STAIR 2

STRAIGHT STAIRS / 8 STEPS / LANDING

WITH 90 DEGREE BOTTOM TREAD / 8 STEPS / LANDING

MINIMUM LOFT CEILING HEIGHT FROM TOP OF LANDING

MINIMUM LOFT CEILING HEIGHT FROM TOP OF LANDING



STAIR 3

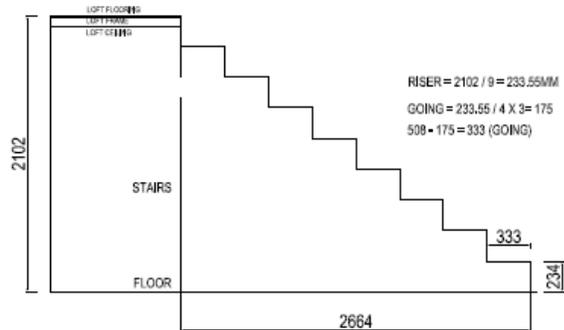
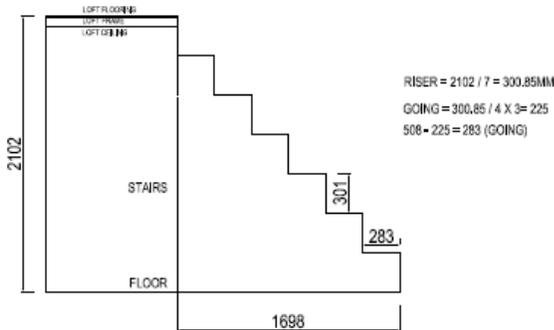
STAIR 4

STRAIGHT STAIRS / 7 STEPS

STRAIGHT STAIRS / 7 STEPS

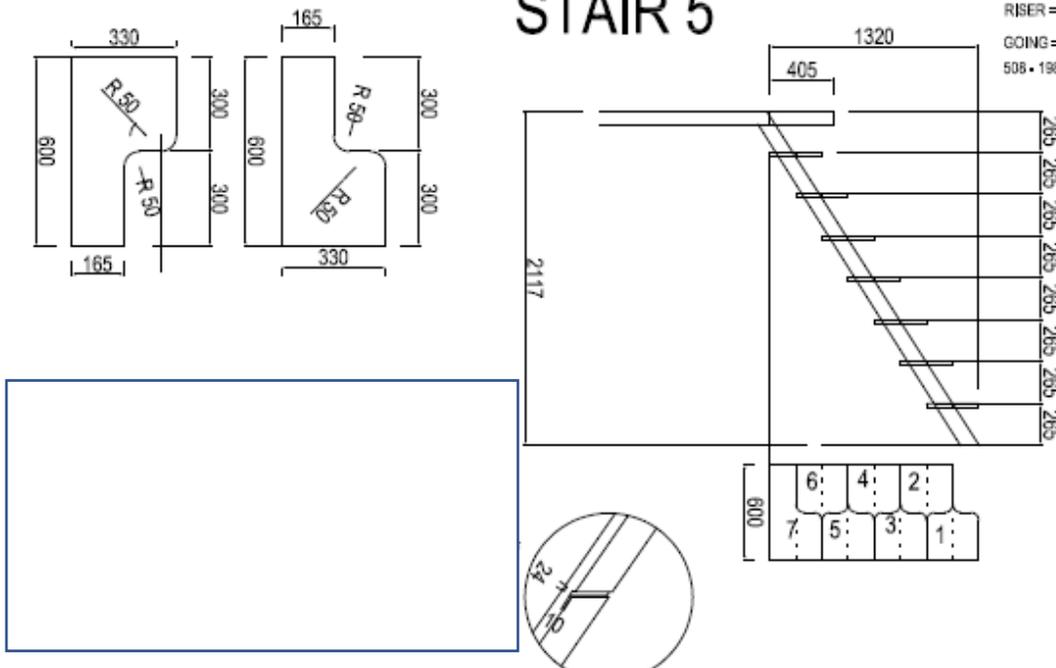
MINIMUM LOFT CEILING HEIGHT FROM TOP OF LANDING

MINIMUM LOFT CEILING HEIGHT FROM TOP OF LANDING



STAIR 5

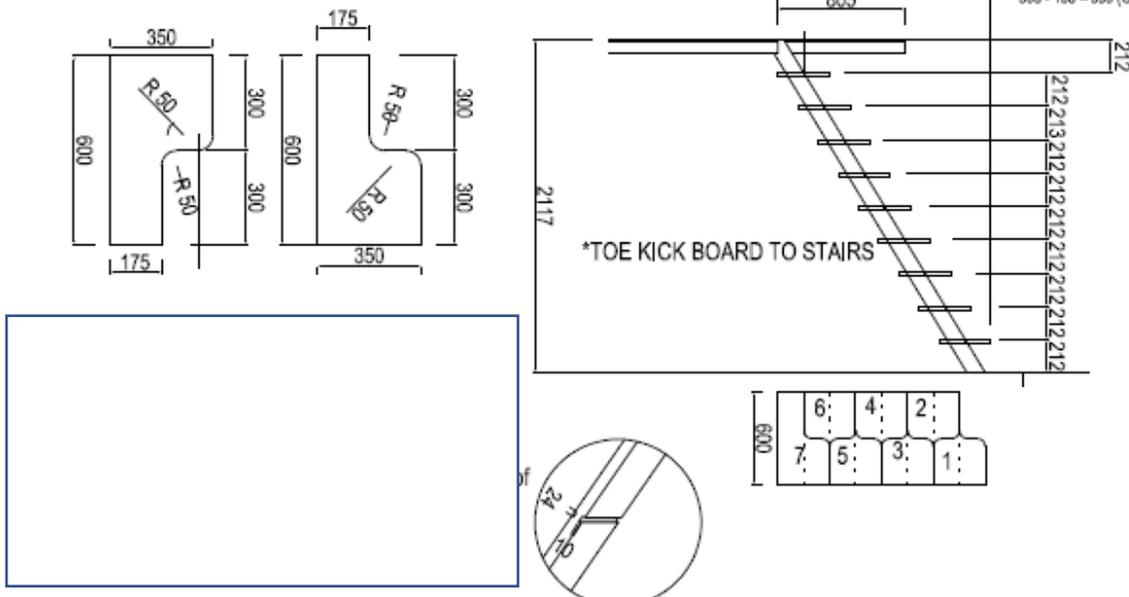
RISER = $2117 / 8 = 265\text{MM}$
 GOING = $265 / 4 \times 3 = 198$
 $508 - 198 = 310$ (GOING) MINIMUM



*10mm check out for tread to stringer.

STAIR 6

RISER = $2117 / 10 = 212\text{MM}$
 GOING = $211 / 4 \times 3 = 158$
 $508 - 158 = 350$ (GOING) MINIMUM



*10mm check out for tread to stringer.