

**COMMUNITY HOUSING REDEVELOPMENT PROGRAM (CHRP)
25 – 27 EASTON AVENUE, SYLVANIA NSW 2224**

**BUILDING CODE OF AUSTRALIA 2019 AMENDMENT 1 VOLUME TWO REPORT
STAGE C**

FEBRUARY 2023

Report prepared for NSW Land and Housing Corporation
 Locked Bag 4009
 Ashfield NSW 1800

Attention: Hammad Osmani

Report prepared by Metro Building Consultancy
 Suite 102 12 Mount Street
 North Sydney NSW 2060

Consultant: Sean Moore

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DOCUMENT ACCEPTANCE

Company	Name	Signed	Date
Metro Building Consultancy	Sean Moore		03/02/2023

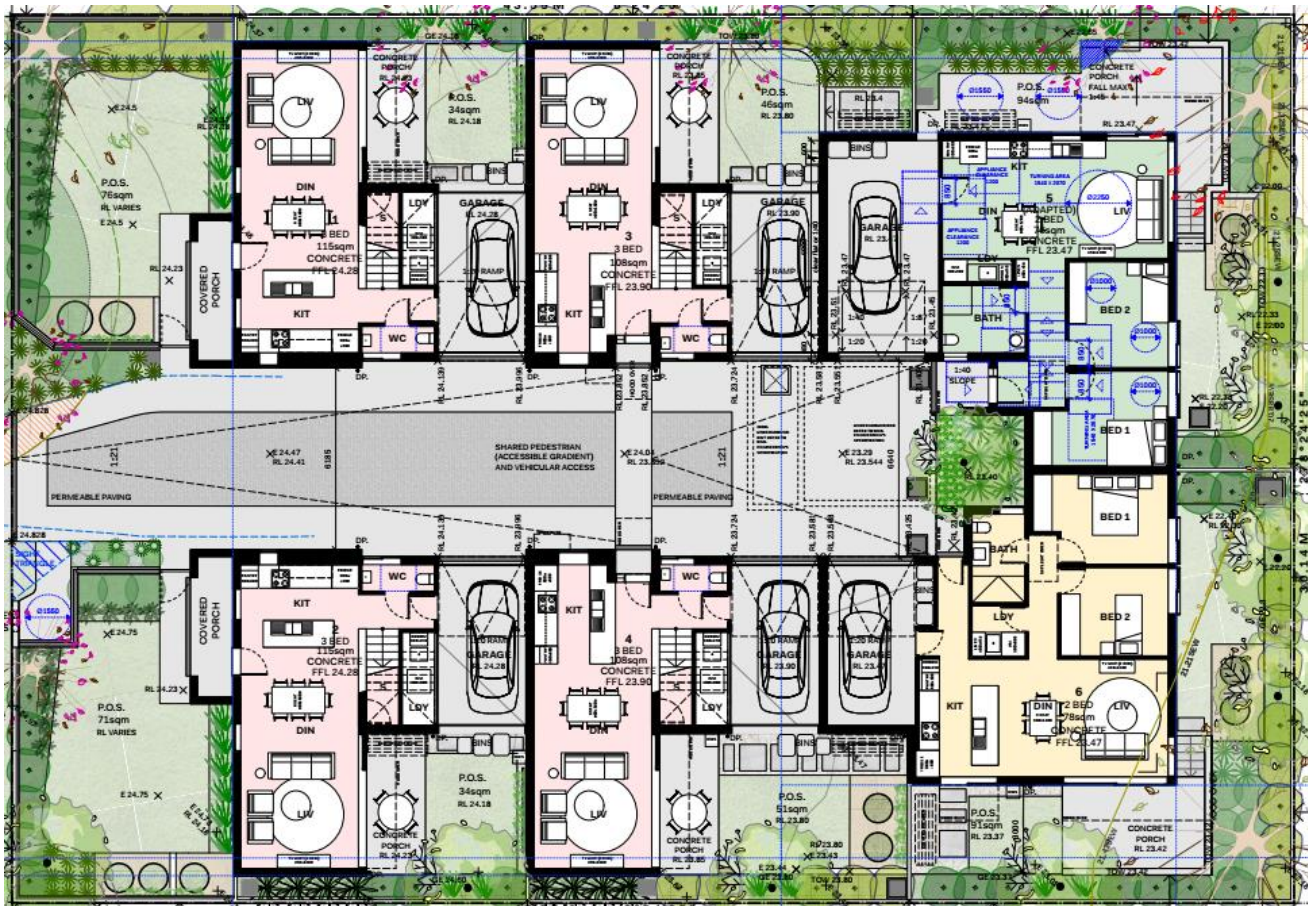
REVISION HISTORY

Description	Prepared by	Revision No.	Date
Revised Pre DA-Report	Sean Moore	R06	03/02/2023
Revised Pre DA-Report	Sean Moore	R05	07/12/2022
Revised Pre DA-Report	Sean Moore	R04	01/12/2021
Stage C – Concept Report	Rebecca Kilty	R03	21/07/2021
Stage B – Pre DA-Report	Annika Green	R02	30/03/2021
Concept Design Report	Annika Green	R01	17/02/2021

Introduction and Documentation

Introduction

NSW Land and Housing Corporation have requested Building Code of Australia advice in relation to the Community Housing Redevelopment Program (CHRP) of new townhouses located at 25 – 27 Easton Avenue, Sylvania NSW 2224. The proposed development comprises of 6 townhouses and associated landscaping.



The information submitted to date has been reviewed for compliance with the Deemed-to-Satisfy provisions of Section 3 – Acceptable Construction and its applicable sub parts, excluding structural provisions of the Building Code of Australia Volume 2 2019 Amendment 1.

The methodology is principally a desktop review of the drawings provided as listed in Appendix A. This report is for the exclusive use of LAHC and cannot be used for any other purpose without prior permission of Metro Building Consultancy. This report is only valid in its entire form.

Application of Building Code of Australia 2019 Amendment 1 Volume 2

This report has been assessed on the adoption of BCA 2019 Amendment 1 Volume 2. Further reviews of the proposed drawings will be carried out prior to the Crown Works Certificate. Applicant to note that if the date of the tender is after 01/05/23 then BCA 2022 will apply and the design will have to be reassessed and updated.

2.0 Building characteristics

The development comprises of 6 townhouses consisting of 2 storeys with varying floor areas. The classification has been classified as Class 1a under the Building Code of Australia.

3.0 Site Preparation

Earthworks

Note that in New South Wales, the requirements of shoring and adequacy of excavation works are purely a requirement for Development Consent only, therefore the requirements of this part are N/A.

Earth Retaining Structures

Where proposed, any earth retaining structure associated with the construction of a building or structure must be designed and constructed in accordance with AS4678. Compliance readily achievable and to be documented as the design progresses. Architect and Structural / Civil Engineer to note where proposed and provide details of compliance prior to the issue of the Crown Works Certificate.

Drainage

All drainage proposed must comply with the requirements of AS/NZS3500.3 or the appropriate Acceptable Construction Practice as described in Part 3.1.3.

Compliance readily achievable and is to be documented as design progresses. Civil / Hydraulic Engineer to note the prescribed requirements and provide details of compliance prior to the issue of the Crown Works Certificate and provide a design certificate referencing compliance with BCA 3.1.3 & AS/NZS3500.3.

Termite Risk Management

Note the requirements of this clause applies to any Class 1 building that is constructed in an area where subterranean termites are known to be a potential risk of attack and where a primary building element of the subject Class 1 is considered to be susceptible to termite attack.

*Note the definition of **primary building element** – a member of a building designed specifically to take part of the building loads and includes roof, ceiling, floor, stairway or ramp and wall framing members designed for the specific purpose of acting as a brace to those members.*

Note the following building elements consisting entirely of, or a combination of any of the following building materials is not considered as being subject to termite attack:

- Steel, aluminium or other like materials
- Concrete
- Masonry
- Fibre-reinforced cement
- Timber – natural termite resistant in accordance with Appendix C of AS 3660.1
- Timber – preservative treated in accordance with Appendix D of AS 3660.1

Termite management systems must be selected in accordance with Table 3.1.4.1 and comply with the requirements of AS 3660.1.

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 <i>external wall</i> 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

Architect to note. Compliance readily achievable and to be documented as the design progresses. Note that a durable notice shall be installed to each townhouse electrical meter box or other prominent location detailing the following information and shall be installed prior to the issue of the BCA Completion Certificate:

- The termite management system used; and
- The date of installation of the system; and
- Where a chemical is used, its life expectancy as listed on the appropriate authority's register label; and
- The installers or manufacturers recommendations for the scope and frequency of future inspections of termite activity.

4.0 Footings and Slabs

Footings and slabs must be designed and installed with one of the following:

- The footing or slab is constructed in accordance with AS2870 except that for the purpose of Clause 5.3.3.1 of AS2870 a damp-proofing membrane is required to be provided.
- Piled footings are designed in accordance with AS 2159.

Compliance readily achievable and to be detailed as the design progresses. Structural Engineer to provide details of the proposed footings and design certification demonstrating compliance prior to the issue of the relevant Crown Works Certificate.

Concrete

Concrete must comply with the following:

- Manufactured to comply with AS 3600; and
 - Have a strength at 28 days of not less than 20 MPa (denoted as N20 grade); and
 - Have a 20mm maximum nominal aggregate size; and
 - Have a nominal 100mm slump
- Water must not be added to the mix to increase the slump to a value in excess of that specified
- Concrete must be placed, compacted and cured in accordance with good building practice

Compliance readily achievable and to be documented as the design progresses. Structural Engineer to note and provide details and design Certification prior to the issue of the relevant Crown Works Certificate.

Steel reinforcement

- Materials used for reinforcing steel must comply with AS 2870 and be –
 - Welded wire reinforcing fabric; or
 - Trench mesh; or
 - Steel reinforcing bars
- Steel reinforcing bars may be substituted for trench mesh in accordance with Table 3.2.3.2
- Minimum laps for reinforcement as shown in Table 3.2.3.1 and Figure 3.2.3.1 must be provided where reinforcing is used

Compliance readily achievable and further details are to be provided as the design progresses. Structural Engineer to note and provide plans of the proposed steel set out plans for review. Additionally Design Certification shall be provided prior to the issue of the relevant Crown Works Certificate.

5.0 Masonry

All masonry is to be designed and constructed in accordance with AS 3700, AS 4773.1 and AS 4773.2 –

Compliance readily achievable and to be documented as the design progresses. Details of all masonry construction, its accessories and the external weatherproofing of masonry is to be provided prior to the issue of the relevant Crown Works Certificate.

6.0 Framing

Steel framing

Where proposed, steel framing if it is designed and constructed in accordance with one of the following:

- Residential and low-rise steel framing:
 - Design: NASH Standard 'Residential and Low-Rise Steel Framing' Part 1
 - Design solutions: NASH Standard 'Residential and Low-Rise Steel Framing' Part 2
- Steel Structures: AS 4100
- Cold formed steel structures: AS/NZS 4600

Timber framing

Where proposed, timber framing shall be designed and constructed in accordance with the following:

- Design of timber structures: AS 1720.1
- Design of nail plates timber roof trusses: AS 1720.5
- Residential timber-framed construction – non-cyclonic areas: AS 1684.2
- Residential timber-framed construction – cyclonic areas: AS1684.3
- Residential timber-framed construction – non-cyclonic areas (simplified): AS1684.4
- Installation of particleboard flooring: AS 1860.2

Compliance readily achievable and to be detailed as the design progresses. Architect to note and confirm the proposed material for framing the townhouses. Design certification shall be provided prior to the issue of the relevant Crown Works Certificate.

7.0 Roof and Wall Cladding

Sheet Roofing

All metal roofing must comply with AS1562.1. Compliance readily achievable. Sarking must comply with AS 4200.1 and be installed with –

- Each adjoining sheet or roll being -
 - Overlapped not less than 150mm; or
 - Taped together; and
- Sarked fixed to supporting members at not more than 300 mm centres; and
- No sags greater than 40 mm in the sarking

Structural Engineer to note and include in the design certification prior to the issue of the relevant Crown Works Certificate.

Anti-ponding device/board

An anti-ponding board must be provided where sarking is installed on –

- Roofs with a pitch less than 20 degrees; and
- Roofs with no eaves overhang, regardless of the roof pitch

Gutters and downpipes shall be designed and installed as per the required acceptable construction manual specified in BCA Clause Part 3.5.3. Hydraulic Engineer to note and provide details of compliance prior to the issue of the relevant Crown Works Certificate.

8.0 Glazing

The following glazed assemblies within the external walls shall comply with the design and construction requirements of AS 2047:

- Windows in an external wall
- Sliding and swinging glazed doors with a frame, including French and bi-fold doors with a frame
- Adjustable louvres
- Window walls with one piece framing

All other window assemblies not covered above shall comply with the design and construction requirements of AS1288 and include:

- All glazed assemblies not within the external wall

- Revolving doors
- Fixed louvres
- Skylights, roof lights and windows in other than the vertical plane
- Sliding and swinging doors without a frame
- Windows constructed on site and architectural one-off windows, which are not design tested in accordance with AS 2047
- Second-hand window, re-used windows and recycled windows
- Heritage windows
- Glazing used in balustrades and sloping overhead glazing

All glazing must be installed in accordance with Part 3.6 of Building Code of Australia Volume Two. Certification from the installer is to be provided prior to the issue of the relevant Crown Works Certificate.

9.0 Fire Safety

Fire hazard properties

The fire hazard properties of materials used in a Class 1 building, including floor or ceiling spaces common with a Class 10 building, must comply with the following:

- Sarking-type materials used in the roof must have a flammability index not greater than 5
- Flexible ductwork used for the transfer of products initiating from a heat source that contains a flame must comply with the fire hazard properties set out in AS 4254.1

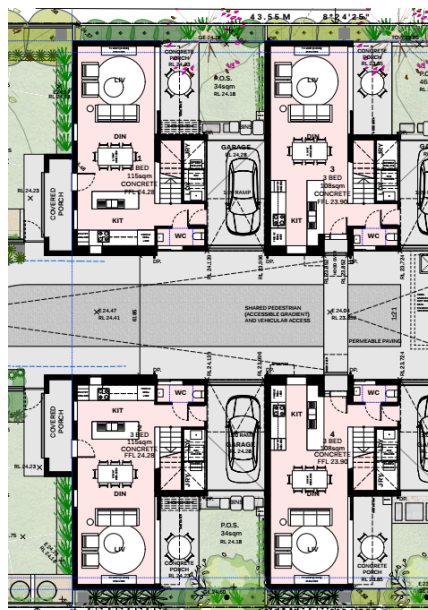
Compliance readily achievable and to be documented as the design progresses. Architect to provide proposed materials for assessment prior to installation on site. Fire hazard indices test data sheets of flexible ductwork and sarking materials are required to be provided prior to the issue of the BCA Completion Certificate.

Fire Separation of external walls

An external wall of a Class 1 building, and any openings in that wall, must comply with 3.7.2.4 if the wall is less than –

- 900mm from an allotment boundary other than the boundary adjoining a road alignment or other public space; or
- 1.8 m from another building on the same allotment other than a Class 10 building associated with the Class 1 building or a detached part of the same Class 1 building.

Architect to note that the external walls to townhouses shown in the below mark-up in red are exactly 900mm from the boundary and there is no construction tolerance allowed for. These walls will need to be measured progressively throughout design and construction noting that where the walls encroach within 900mm to the boundary line they will need to comply with BCA Clause 3.7.2.4 below. A construction tolerance is recommended.



- (a) External walls (including gables) required to be fire-resisting must –
 - (i) Commence at the footings or ground slab, except where the external wall commences above a separating wall complying with clause 3.7.3.2; and
 - (ii) Extend to –
 - (A) The underside of a non-combustible roof covering, except that a wall may terminate not more than 200mm from the underside of a non-combustible roof covering, where the area between the external wall and the underside of the roof covering is sealed with a non-combustible fascia, gutter or flashing; or
 - (B) The underside of a non-combustible eaves lining; and
 - (iii) Be constructed in accordance with (b).
- (b) A wall required by (a) must –
 - (i) Have an FRL of not less than 60/60/60 when tested from the outside; or
 - (ii) Be of masonry-veneer construction in which the external masonry veneer is not less than 90 mm thick; or
 - (iii) Be of masonry construction of not less than 90 mm thick
- (c) Openings in external walls required to be fire resisting must be protected by –
 - (i) Non-operable fire windows or other construction with an FRL of not less than -/60/-; or
 - (ii) Self-closing solid core doors not less than 35mm thick.
- (d) The requirement of (c) do not apply to a window in a non-habitable room that is located adjacent to and not less than 600mm from the boundary of an adjoining allotment or 1200 mm from another building on the same allotment provided that –
 - (i) In a bathroom, laundry or toilet, the opening has an area of not more than 1.2m²; or
 - (ii) In a room other than one referred to in (i), the opening has an area of not more than 0.54m² and –
 - (A) The window is steel-framed, there are no opening sashes and it is glazed in wired glass; or
 - (B) The opening is enclosed with translucent hollow glass blocks
- (e) Subfloor vents, roof vents, weepholes, control joints, construction joints and penetrations for pipes, conduits and the like need not comply with (c).

Allowable encroachments

- (a) An encroachment is any construction between –
 - (i) The external wall of the building and the allotment boundary other than a boundary adjoining a road or other public space; or
 - (ii) The external walls of two buildings on the same allotment; or
 - (iii) The external wall of the building and the vertical projection of an adjoining building on the same allotment.
- (b) Encroachments allowed within 90mm of an allotment boundary or within 1.8m of another building on the same allotment are –
 - (i) Non-combustible fascias, gutter and downpipes; and
 - (ii) Light fittings, electricity or gas meters, aerials or antennas; and
 - (iii) Pergolas, sun blinds or water tanks; and
 - (iv) Unroofed terraces, landings, steps and ramps, not more than 1m in height.
- (c) Encroachments allowed up to but not closer than 450 mm from an allotment boundary or up to but not closer than 900 mm from another allotment or associated encroachments of another building on the same allotment are –
 - (i) Combustible fascias, gutters and downpipes; and
 - (ii) Eaves with non-combustible roof cladding and non-combustible lining; and
 - (iii) Flues, chimneys, pipes domestic fuel tanks, cooling or heating appliances or other services.
- (d) Encroachments allowed between an external wall of a building and the vertical projection of an adjoining building on the same allotment are non-combustibles fascias, gutters and downpipes

Architect to note encroachment allowances.

Separating walls

- (a) A separating wall between Class 1 buildings, or a wall that separated a Class 1 building from a Class 10a building which is not associated with the class 1 building must –
 - (i) Have either –
 - (A) An FRL of not less than 60/60/60; or
 - (B) Be of masonry construction not less than 90 mm thick; and
 - (ii) Commence at the footings or ground slab, except for horizontal projections

- (iii) Extend –
 - (A) If the building has a non-combustible roof covering, to the underside of the roof covering
 - (B) If the building has a combustible roof covering, to not less than 450 mm above the roof covering; and
- (iv) Comply with (b) to (e) as applicable.
- (b) A separating wall of lightweight construction must be tested in accordance with Specification C1.8 of the BCA Volume 1
- (c) A separating wall complying with (a)(iii)(A) –
 - (i) Must not be crossed by timber or other combustible building elements except for roof battens with dimensions of 75 x 50 mm or less, or roof sarking; and
 - (ii) Must have a gap between the top of the wall and the underside of the roof covering packed with mineral fibre or other suitable fire-resisting material.
- (d) Where a building has a masonry veneer external wall, any gap between the separating wall so the external masonry veneer must be –
 - (i) Not more than 50 mm; and
 - (ii) Packed with a mineral fibre or other suitable fire-resistant material with the packing arranged to maintain any weatherproofing requirements
- (e) eaves, verandahs and similar spaces that are open to the roof space and are common to more than one Class 1 dwelling must be separated by a non-combustible vertical lining

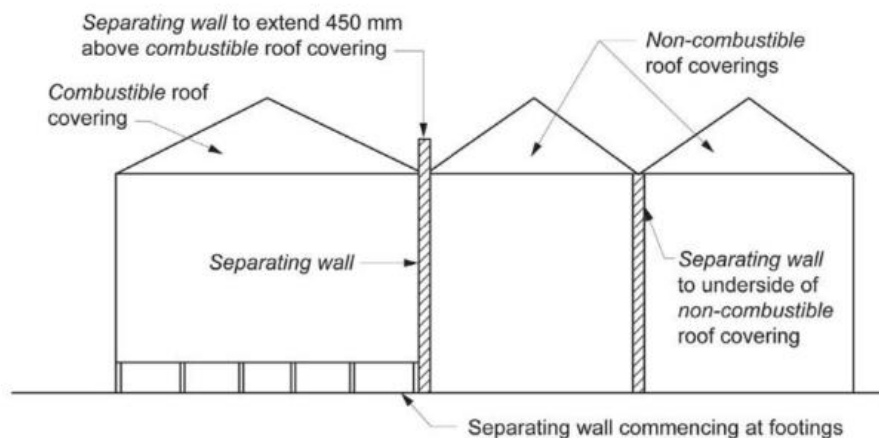
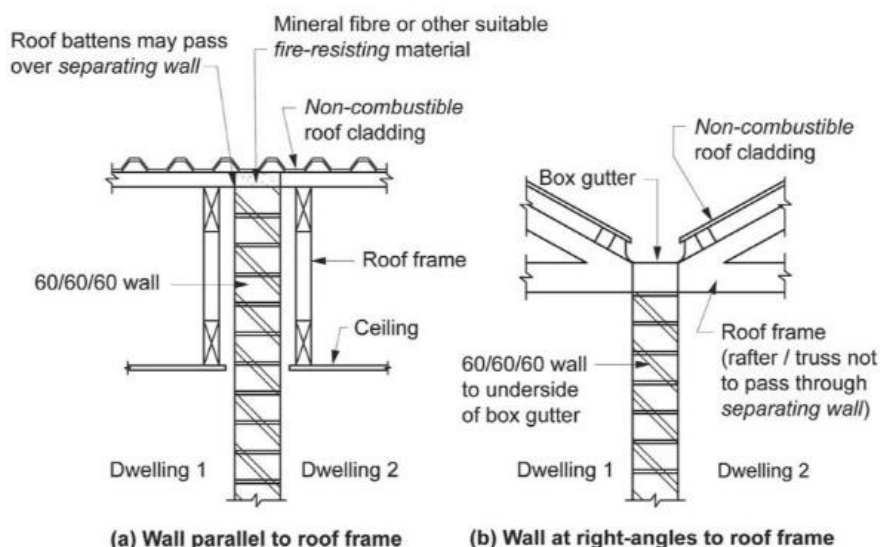
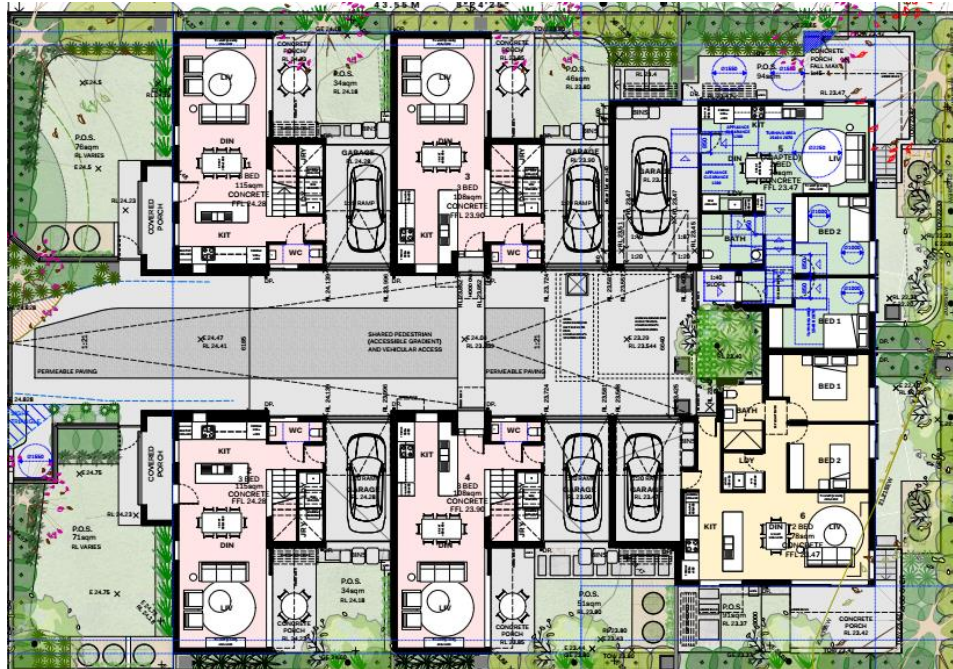


Figure 3.7.3.2 Separating wall construction—Underside of non-combustible roof cladding

Diagram a.



Compliance readily achievable and to be documented throughout design progression. Architect to note the requirements of separating construction above and provide details of the wall systems separating the townhouses from each other as highlighted in red below.



Services in separating walls

- (a) Any service opening, other than those listed in (b), (c) and (d), in a separating wall must have construction with an FRL of not less than -/60/60.
- (b) If an electrical wire or cable penetrates a separating wall –
 - (i) The service and building element at the penetration must –
 - (A) Be identical with a prototype assembly that has been tested in accordance with AS 4072.1 and AS 1530.4 and achieve an FRL of not less than -/60/60; or
 - (B) Differ from a prototype assembly of the service and building element in accordance with AS 4072.1; or
 - (ii) The service must be installed so that –
 - (A) The opening is neatly formed, cut or drilled and no closer than 50 mm to any other service; and
 - (B) The opening is no larger in cross-section than –
 - (aa) 2000mm² if only a single cable is accommodated and the gap between the cable and the wall is no wider than 15 mm; or
 - (bb) 500 mm² in any other case; and
 - (C) Any gap between the service and the wall is packed with mineral fibre or other suitable fire-resistant material
- (c) If an electrical switch, outlet, socket or the like is accommodated in a separating wall –
 - (i) The service and building element at the penetration must –
 - (A) Be identical with a prototype assembly which has been tested in accordance with AS 4072.1 and AS 1530.4 and achieve an FRL of not less than -/60/60; or
 - (B) Differ from a prototype assembly of the service and building element in accordance with AS 4072.1; or
 - (ii) The service must be installed so that –
 - (A) The opening or recess –
 - (aa) is not located opposite any point within 300mm horizontally or 600mm vertically of any opening or recess on the opposite side of the wall; or
 - (bb) does not extend beyond half the thickness of the wall; and
 - (B) Any gap between the service and the wall is packed with mineral fibre or other suitable fire-resistant material.

- (d) Other than where a tested system is used in accordance with (c)(i), if an electrical switch, socket, outlet or the like is accommodated in a hollow separating wall, the cavity immediately behind the service must be framed and packed with mineral fibre or other suitable fire-resistant material

Compliance readily achievable and to be documented in the next phase of design. Architect and Services Consultants to note and provide further details where applicable for further assessment prior to the issue of the relevant Crown Works Certificate.

Roof lights

Combustible roof lights, skylights or the like installed in a roof or part of a roof required to have a non-combustible covering must –

- (a) Have an aggregate area not more than 20% of the roof or part of the roof; and
- (b) Be not less than 900 mm from the vertical projection of a separating wall extending to the underside of the roof covering

Compliance readily achievable and to be further documented as the design progresses. The current configuration of the proposed roof lights provided to townhouses comply. Architect to confirm if the proposed roof lights will be non-combustible.

Smoke Alarms

Smoke alarms must be located in Class 1a buildings and comply with AS3786. Smoke alarms shall be powered from the consumer mains source where a consumer mains source is supplied to the building; and be interconnected where there is more than alarm. Note that in a Class 10a private garage where the use of the area is likely to result in smoke alarms causing spurious signals, any other alarm deemed suitable in accordance with AS1670.1 may be installed provided that smoke alarms complying with AS3786 are installed elsewhere in the Class 1 building.

Smoke alarms must be located in –

- Any storey containing bedrooms, 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
- Each other storey not containing bedrooms

Compliance readily achievable and to be documented as the design progresses. Electrical / Fire Services Consultant to note and provide plans and design certification prior to the issue of the Crown Works Certificate.

10.0 Health and Amenity

Wet Areas

Wet areas must be constructed in accordance with Part 3.8.2 and comply with AS 3740.

Compliance readily achievable and details of the proposed waterproofing material used is to be provided prior to the issue of the BCA Completion Certificate.

Room Heights

Heights of rooms and other spaces must be not less than –

- Habitable rooms excluding kitchens – 2.4m
- Kitchens – 2.1m
- Corridors, passageways or the like – 2.1m
- Bathrooms, shower rooms, laundry, sanitary compartment, airlock, pantry, storeroom, garage, car parking area or the like – 2.1m

The BCA states that in a room or space with a sloping ceiling or projections below the ceiling line within for a non-habitable space, such as the proposed store rooms and laundry under the stairs to level 1, a height of not less than 2.1m is required for at least two-thirds of the floor area of the room or space and when calculating the floor area of the room or space any part that has a ceiling height of less than 1.5m is not included.

The architect has stated that the future plans will show that the laundry has full length joinery and the spaces are inaccessible.

Facilities

The townhouses are provided with:

- A kitchen sink,
- Facilities for the preparation and cooking of food,
- A bath or shower,
- Clothes washing facilities ie a washtub in the same room space for a washing machine,
- A closet pan and washbasin.

Note the door to a fully enclosed sanitary compartment must either open outwards, slide, be readily removable from the outside of the compartment, or have a clear space of 1.2m between the closet pan and the doorway.

Light

Natural light amounting to at least 10% of the floor areas of all habitable rooms is required to be provided in accordance with the Building Code of Australia requirements. The natural light provided complies with the BCA requirements.

The non-habitable rooms are provided with a combination of artificial lighting in accordance with AS/NZS 1680.0 2009 and natural light.

Compliance readily achievable and to be documented in the next phase of design. Architect to note and provide window calculation for further review prior to the issue of the Crown Works Certificate.

Ventilation

Ventilation must be provided to a habitable room, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose by any of the following means:

- (a) Openings, windows, doors or other devices which can be opened –
 - (i) With a ventilating area not less than 5% of the floor area of the room required to be ventilated; and
 - (ii) Open to –
 - (A) A suitably sized court, or space open to the sky; or
 - (B) An open verandah, carport, or the like; or
 - (C) An adjoining room in accordance with (b)

Compliance readily achievable and to be documented in the next phase of design. Architect to note and provide window openable area calculation for further review prior to the issue of the Crown Works Certificate.

Location of sanitary compartments

Sanitary compartment must not open directly into a kitchen or pantry unless –

- (a) Access is via an airlock, hallway or other room; or
- (b) The sanitary compartment is provided with an exhaust fan or other means of mechanical exhaust ventilation

Sound Insulation

- (a) A separating wall between Class 1 buildings, or a wall that separates a Class 1 building from a Class 10a building which is not associated with the Class 1 building must –
 - (i) Have an $R_w + C_r$ (airborne) not less than 50; and
 - (ii) Be of discontinuous construction if it separates a bathroom, sanitary compartment, laundry or kitchen in one Class 1 building from a habitable room (other than a kitchen) in an adjoining Class 1 building

Note, walls required to have sound insulation must continue to –

- (i) The underside of the roof above; or
- (ii) A ceiling that provides the sound insulation required for the wall

Compliance readily achievable and to be documented as the design develops. Architect to note that the walls separating the townhouses are required to achieve the abovementioned requirements. Details of the sound insulation to the separating walls are to be provided for assessment along with the Acoustic Engineers Design Certificate prior to the issue of the Crown Works Certificate.

Services

- (a) Services must not be chased into concrete or masonry separating walls

- (b) If a duct, soil, waste, water supply or storm water pipe is located in a separating wall –
 - (i) A door or panel providing access to a duct or pipe required to be separated must –
 - (A) Not open into any habitable room, other than a kitchen; and
 - (B) In any other part must be firmly fixed so as to overlap the frame or rebate of the frame by not less than 10 mm and be constructed of
 - (aa) wood, plasterboard or blockboard not less than 33 mm thick; or
 - (bb) compressed fibre reinforced cement sheeting not less than 9 mm thick; or
 - (cc) other suitable material with a mass per unit area not less than 24.4kg/m²; and
 - (ii) In the case of the water supply pipe, it must –
 - (A) Only be installed in discontinuous construction; and
 - (B) In the case of a water supply pipe that serves one dwelling, not be fixed to the wall leaf on the side of any other dwelling and have a clearance not less than 10 mm to the other wall leaf.
- (c) Electrical outlets must be offset from each other –
 - (i) In masonry walling, not less than 100mm; and
 - (ii) In timber or steel-framed walling, not less than 300 mm.

Compliance readily achievable and to be documented as the design progresses. Architect and Services Consultants to note the above requirements and provide details where applicable prior to the issue of the relevant Crown Works Certificate.

Pliable building membrane

- (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.

Compliance readily achievable. Architect to note and provide further details of the condensation management controls for the proposed works noting that compliance shall be achieved with the Acceptable Construction Practices of this clause.

Flow rate and discharge of exhaust systems

- (a) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a minimum flow rate of –
 - (i) 25 L/s for a bathroom or sanitary compartment; and
 - (ii) 40 L/s for a kitchen or laundry
- (b) Exhaust from a bathroom, sanitary compartment, or laundry must be discharged –
 - (i) Directly or via a shaft or duct to outdoor air; or
 - (ii) To a roof space that is ventilated in accordance with BCA Clause 3.8.7.4

Compliance readily achievable and to be documented in the next phases of design documentation. Mechanical Engineer to note flow rates for all required and proposed exhaust systems and provide details of compliance prior to the issue of the relevant Crown Works Certificate.

11.0 Safe Movement and Access

Stair Construction

The following provisions apply to all stair construction:

- All stairs are to be designed to take loading forces in accordance with AS/NZS 1170.1
- Not more than 18 and not less than 2 risers in each flight
- The riser and going dimensions shall be in accordance with the provisions of Table 3.9.1.1
- The dimensions of the goings and risers must be constant throughout the flights;
- The riser openings must not have a gap of more than 125mm;
- In the case of a stairway with winders –

- A maximum of 3 consecutive winders in lieu of a quarter landing in a flight and a maximum of 6 consecutive winders in lieu of a half landing in a flight; and
- The going of all winders in lieu of a quarter or half landing may vary from the going of the straight treads within the same flight provided that the going of such winders is constant.
- Treads and landings (where the landing leads to a flight below) must have a slip resistance classification not less than that listed in Table 3.9.1.3 when tested in accordance with AS 4586 or a nosing strip tested to the same level of compliance
- Landings are required to have a minimum length of 750mm and have a gradient not steeper than 1:50
- Landings shall be provided where the sill of a threshold of a doorway opens onto a stairway that provides a change in floor level or floor to ground level greater than 3 risers or 570mm
- Landings shall extend across the full width of a doorway

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

Note to Table 3.9.1.1: Riser and going dimensions must be measured in accordance with Figure 3.9.1.4.

Figure 3.9.1.4 Riser and going dimensions—Measurement

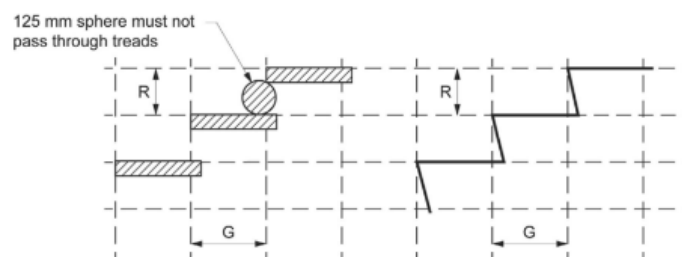


Table 3.9.1.3 Slip-resistance classification

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

Compliance readily achievable and is to be documented as the design progresses. Architect to note the above-mentioned requirements and provide details of all internal stairs within the townhouses for further assessment prior to the issue of the relevant Crown Works Certificate. Note input from the Structural Engineer will be required to determine the proposed stair loading forces.

Balustrades & Handrails

Barriers to prevent falls

- (a) A continuous barrier must be provided along the side of a trafficable surface, such as –
- A stairway, ramp or the like;
 - A floor, corridor, hallway, balcony, deck, verandah, mezzanine, access bridge or the like; and
 - A roof top space or the like to which general access is provided; and
 - Any delineated path of access to a building
- Where it is possible to fall 1 m or more

Barriers shall be constructed as follows:

- The height shall be not less than 865mm above the nosings of the stair treads and not less than 1 m above the floor of any landing, corridor, hallway, balcony, deck, verandah, access path, mezzanine, access bridge, roof top space or the like to which general access is provided

- A transition zone may be incorporated where the barrier height changes from 865mm to 1 m on the stair flight to the landing
- Openings in barriers must not permit openings larger than 124mm
- Barriers shall be designed to take the appropriate loading forces specified in AS/NZS 1170.1

Compliance readily achievable and further details to be provided prior to the issue of the Crown Works Certificate. Architect to note that barriers to prevent falls are to be provided to all internal stair cases. Structural Engineer to note and include compliance with all loading forces specified in AS/NZS 1170.1 in the design certification.

Handrails shall be constructed as follows:

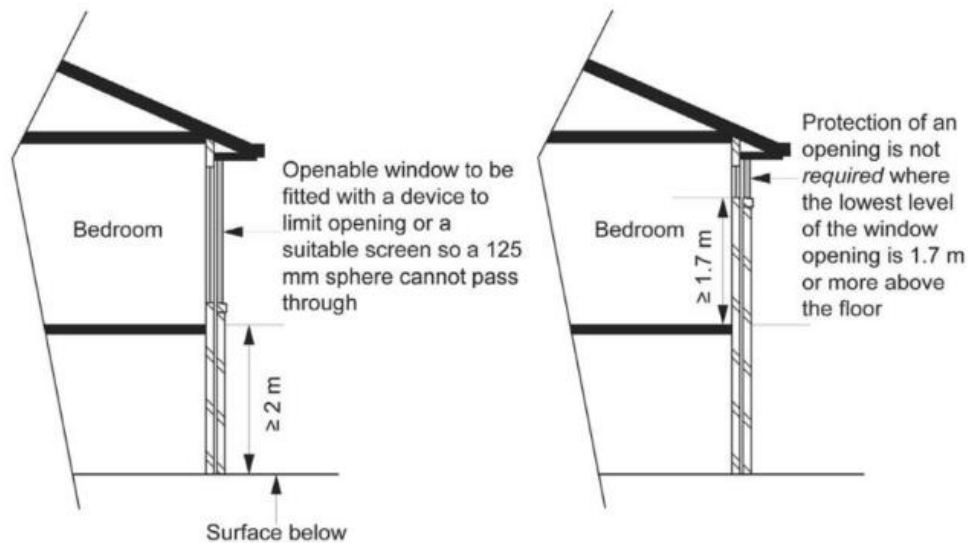
- Handrails shall be located along at least one side of the stairway or ramp
- They shall be located along the full length of the stair flight
- The top surface of the handrail shall not be less than 865 mm vertically above the nosings of the stair treads
- They shall be continuous in construction and have no obstruction on or above them that would tend to break a handhold, except for newel posts, ball type stanchions or the like

Compliance readily achievable and further details are to be provided prior to the issue of the Crown Works Certificate. Architect to note the above-mentioned requirements and provide further details of the handrails to the stairs (both internal and external where provided) for further assessment.

Protection of openable windows – bedrooms

- (a) A window opening in a bedroom must be provided with protection, where the floor below the window is 2m or more above the surface beneath
- (b) Where the lowest level of the window opening covered by (a) is less than 1.7m above the floor, the window opening must comply with the following:
 - (i) The openable portion of the window must be protected with –
 - (A) A device capable of restricting the window opening; or
 - (B) A screen with secure fittings
 - (ii) A device or screen required by (i) must –
 - (A) Not permit a 125mm sphere to pass through the window opening or screen; and
 - (B) Resist an outward horizontal action of 250 N against the –
 - (aa) window restrained by the device; or
 - (bb) screen protecting the opening; and
 - (C) Have a child resistant release mechanism if the screen or device is able to be removed, unlocked or overridden
- (c) Where the device or screen provided in accordance with (b)(i) is able to be removed, unlocked or overridden, a barrier with a height not less than 865mm above the floor is required to the openable window in addition to window protection.
- (d) A barrier covered by (c) must not –
 - (i) Permit any openings greater than 124mm to pass through it; and
 - (ii) Have any horizontal or near horizontal elements between 150 mm and 760 mm above the floor that facilitates climbing

Compliance readily achievable and to be documented as the design progresses. Architect to note the requirements and provide details of compliance to all bedroom windows on the first floor prior to the issue of the relevant Crown Works Certificate.



12.0 Ancillary Provisions

Bushfire and Flood Prone Areas

Compliance with the requirements of these clauses is to be noted in the design where applicable. A copy of the S10.7(2)&(5) Planning Certificate is to be ascertained to confirm if the existing lot falls within a flood prone or bushfire area.

Alpine Areas

NA

13.0 Additional Construction Requirements

High Wind Areas

The buildings must be designed and constructed in accordance with Part 3.10.1 of Building Code of Australia where it is considered to be located in a high wind area. Structural Engineer to note the requirements of this Clause and provide details demonstrating compliance where applicable.

Earthquake Areas

The Building Code of Australia states that design in accordance with the BCA's Structural Design Manuals satisfies the requirements for earthquake resistance.

The buildings must be constructed in accordance with the structural drawings prepared by the Structural Engineers. Design certification demonstrating compliance with AS/NZS 1170.4 shall be provided prior to the issue of the Crown Works Certificate

14.0 Structural Design Manuals

The buildings must be constructed in accordance with the structural drawings to be prepared and certified by the Structural Engineers.

15.0 Energy Efficiency

NA - The BASIX requirements supersede Part 3.12 of the Building Code of Australia. Architect to note the BASIX requirements and provide details of compliance prior to the issue of the Crown Works Certificate.

16.0 Adaptable Housing Requirements

As it appears that consideration has been made for one of the townhouses on this development to be adaptable so the requirements of AS4299 will apply. Compliance is readily achievable and further details are to be provided for further assessment prior to the issue of the Crown Works Certificate.

17.0 Conclusion

The building's design provided to date has been assessed in respect to the deemed to satisfy provisions of the Building Code of Australia 2019 Amendment 1 Volume Two. The plans are at a point where the inherent Building Code of Australia philosophies have been checked for compliance. The design is at a point where the design can be further developed. Further reviews are required to be carried out prior to the completion of the design and issue of the Crown Works Certificate.

APPENDIX A

List of drawings reviewed for this report:

Architectural drawings prepared by Carter Williamson

Architectural Drawing List

Dwg No.	Sheet Name	Scale	Paper Size	Revision	Rev. Date
01-00	Plan: Block Analysis	1:500	A3	C	10/11/22
01-01	Plan: Site Analysis	1:200	A3	G	10/11/22
10-02	Plan: Demolition	1:100	A1	E	10/11/22
10-10	Plan: Site Plan	1:100	A1	F	10/11/22
10-11	Plan: Ground Floor	1:100	A1	U	10/1/23
10-12	Plan: First Floor	1:100	A1	O	10/1/23
10-13	Plan: Roof	1:100	A1	I	10/11/22
10-20	Area Calculations	1:200	A1	G	10/11/22
20-01	Sections A & B	1:100	A1	M	10/11/22
20-02	Sections C & D	1:100	A1	K	10/1/23
30-01	Elevations: Front & Rear	1:100	A1	M	10/1/23
30-02	Elevations: East & West	1:100	A1	L	10/1/23
30-03	Elevations: Internal Driveway	1:100	A1	I	10/1/23
70-01	Sun View Winter (June 21)	NTS	A1	G	10/11/22
70-10	Shadow Diagrams Winter (June 21)	1:250	A1	I	10/11/22
90-01	Notification - Cover Page	NTS	A3	D	10/11/22
90-02	Notification - Site/Landscape Plan	1:200	A3	D	10/11/22
90-03	Notification - Development Data	1:200	A3	D	10/11/22
90-04	Notification - Elevations	1:200	A3	G	10/11/22
90-05	Notification - Schedule of Finishes	1:200	A3	E	10/1/23
90-06	Notification - Shadow Diagrams	1:500	A3	D	10/11/22