



Boundary wall fire resistance rating



BY JOHN GRANT,
ANZIA, JOHN GRANT
ARCHITECTS

Controlling fire spread between residential buildings and outbuildings is important for protecting life and property. We recap the requirements and look at an area of confusion – fire rating of windows and doors in walls close to a boundary.

BRANZHELPLINE calls suggest that misunderstandings remain about the fire resistance rating (FRR) requirements for walls less than 1 m distance from the boundary but at an angle of 90° or greater to the boundary.

This article updates and builds on previous articles in *Build 141 External fire spread on houses* and *Build 158 External fire spread between buildings*. These addressed external spread of fire between buildings and the change to Building Code Acceptable Solution C/AS1 in 2017 to include a notional boundary between two buildings on the same property under a single land title if they contain sleeping risk groups.

Acceptable Solution C/AS1

C/AS1 covers the critical aspects of external fire spread:

- Fire spread across boundaries affecting other property.
- Fire spread from lower roofs.
- External surface finishes.

It covers houses, townhouses, small multi-unit dwellings and limited-area outbuildings such as carports.

Sprinklers change external wall requirements

Where the building is protected with a sprinkler system, external walls do not need an FRR.

Where the building is not protected with a sprinkler system, external walls must have an FRR of no less than 30/30/30 (structural adequacy/integrity/insulation) in the standard test AS 1530.4 *Methods for fire tests on building materials, components and structures. Part 4: Fire-resistance tests for elements of construction*.

Check walls under 1 m from boundary

Under C/AS1, buildings built less than 1 m from the boundary must have boundary walls that meet the FRR and exterior surface finish specifications.

For single household units, attached side-by-side dwellings and outbuildings, walls less than 1 m and angled at less than 90° to the boundary must have an FRR of 30/30/30 from both sides of a wall.

However, return walls that are 90° or more, even if they are within 1 m of the boundary, do not need an FRR (Figure 1). This exception is sometimes overlooked by designers.

Windows and doors

Any windows and doors in walls that require an FRR also need to have an FRR of -/30/30. These may be sourced from a proprietary supplier.

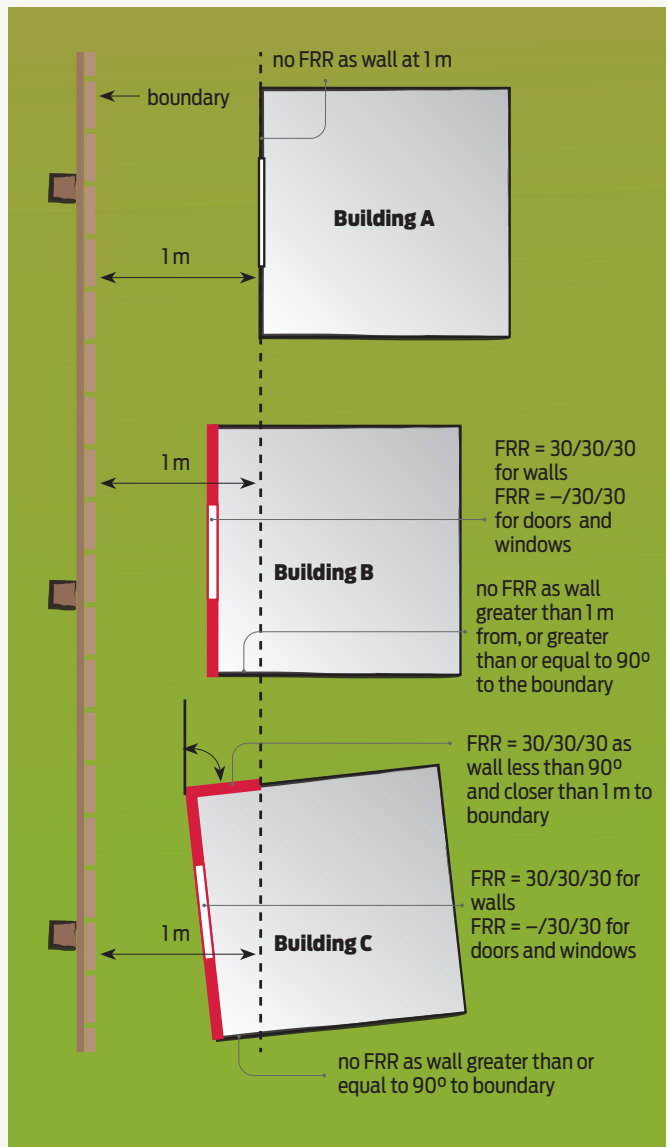


Figure 1

Fire ratings for various building orientations for single or attached dwelling and outbuildings.

Multi-unit dwellings

For multi-unit dwellings with no more than one household unit above another, essentially the same applies as for single household units, except that walls less than 5 m and less than 90° from the boundary must have an FRR of 30/30/30. However, any windows and doors in those walls only need to have an FRR if less than 1 m from the boundary (Figure 2).

Protecting eaves

There are two options for eaves where the associated wall is less than 1 m from the boundary (Figure 3):

- Protecting the underside of the eaves and wall.
- Extending the fire-rated wall up to the underside of the roof.

If the eaves of the building are less than 650 mm from the boundary, both the eaves and wall must have an FRR, even if the wall is located more than 1 m from the boundary and would otherwise not have an FRR.

The FRR required is 30/30/30 from both sides of the wall or to the underside of a fire-rated eaves projection. Various manufacturers offer options for wall linings and construction to meet this requirement.

Attached buildings

If an attached C/ASI controlled building is another property and one roof is lower than the other, either:

- the roof must have an FRR of 30/30/30 up to a distance of 5 m from the external wall to the other property (see Figure 4, option 1) or
- the higher external wall of the other property, if 5 m or closer to the lower roof on another property, must have an FRR of 30/30/30 (up to a height of 9 m) (see Figure 4, option 2) or
- the building under the roof that requires an FRR is protected by a sprinkler system complying with NZS 4515:2009 *Fire sprinkler systems for life safety in sleeping occupancies (up to 2000 square metres)*. ➔

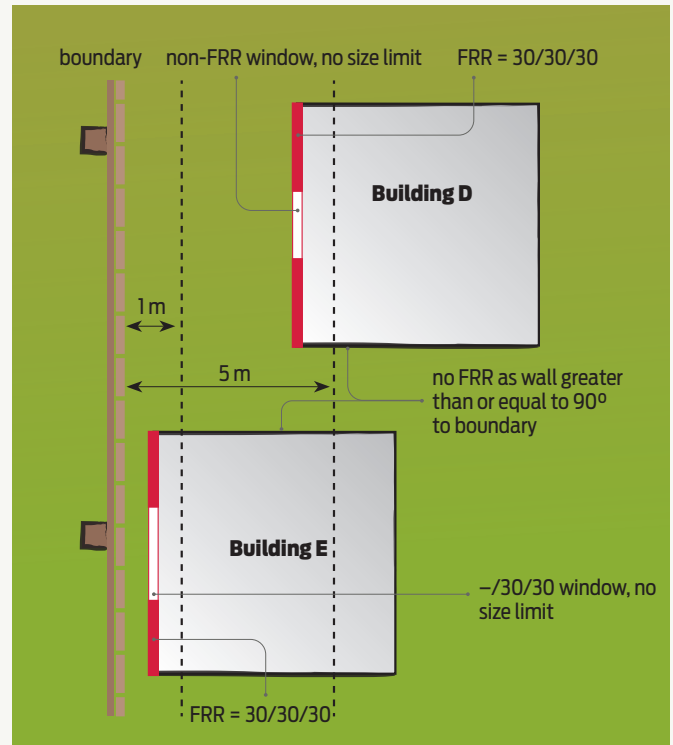


Figure 2 Fire rating for multi-unit dwelling.

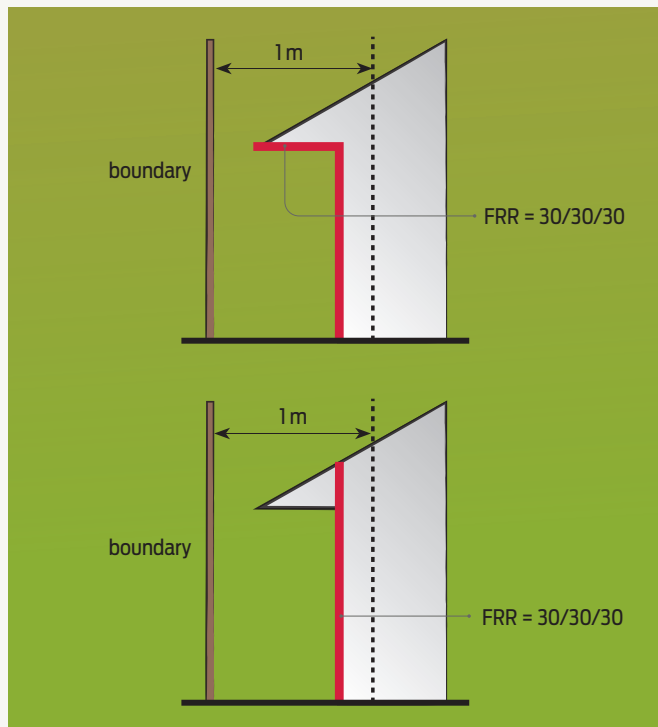


Figure 3 Two options for fire rating eaves.

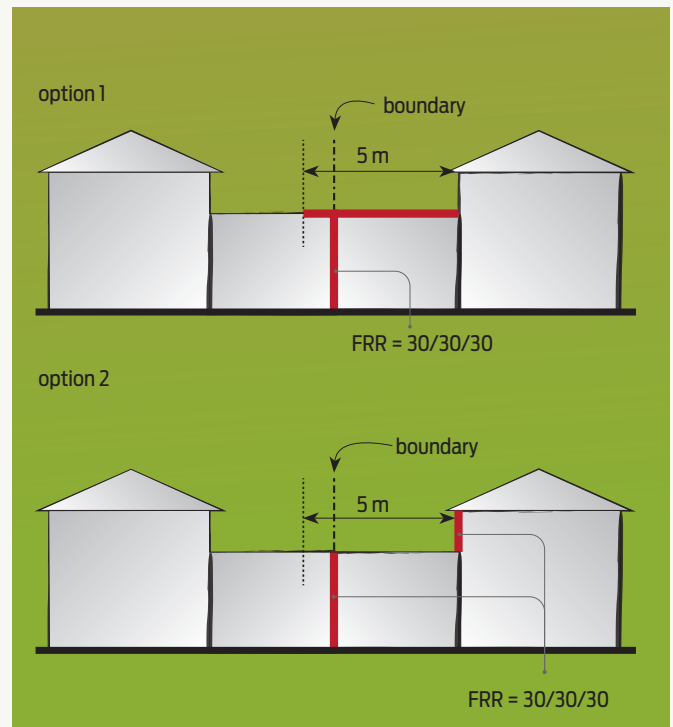


Figure 4 Protection from a lower roof.

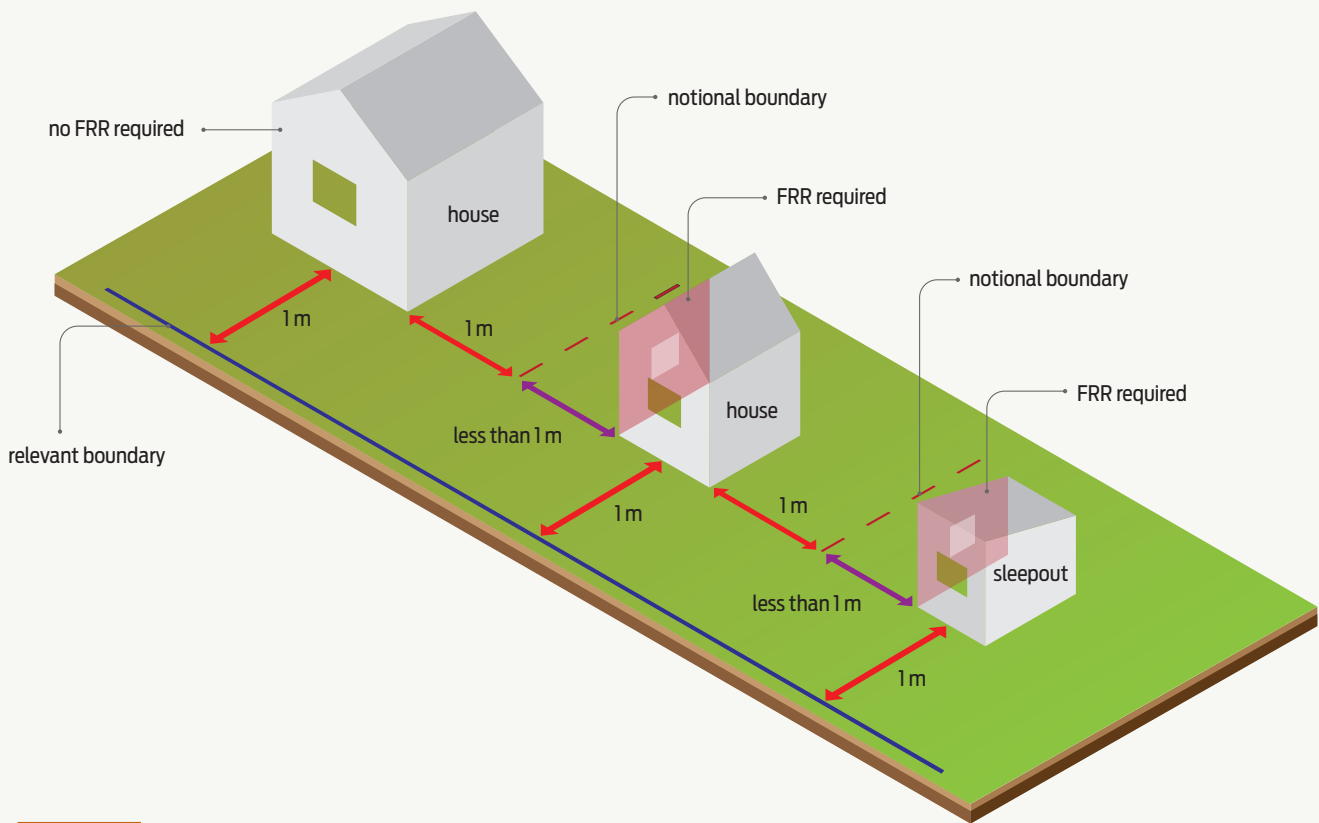


Figure 5 Fire resistance ratings for three sleeping risk group buildings on the same title.

This also applies to any windows and penetrations in the wall or roof.

In these situations, the 1 m distance for FRR does not apply. Also, any separation, no matter how small, between buildings under separate titles removes this FRR requirement, but then the 1 m requirement applies.

Exterior surface finish requirements

There are exterior surface finish requirements (see C/AS1 Table 5.1) for external walls for buildings that are:

- less than 1 m from the boundary
- more than 1 m but whose height is greater than 10 m.

Where the wall cladding is non-combustible and any applied coating is less than 1 mm thick, there are no requirements for the exterior surface finish, and they can be at any distance to the boundary and at any height.

Where the combustibility of a timber product is modified through the application of a fire-retardant treatment to meet the requirements, it has to have been subjected to a regime of accelerated weathering as described in C/AS1 Appendix C C7.1.3.

No FRR needed for some open structures

For carports and similar open-walled structures, there are no FRR requirements for walls and posts when:

- at least two sides are completely open to the environment
- the carport and adjacent building are under the same ownership
- the roof plan area is no more than 40 m² and no part of the roof is closer than 300 mm to a relevant boundary. If the roof area is greater than 40 m², it must be more than 300 mm from the boundary.

If any of these requirements is not satisfied, the FRR requirements listed above for houses and other outbuildings must be followed.

Select notional boundary that works best

The boundary between two buildings on separate titles is the relevant boundary and will be marked on the deposited plans.

For buildings on the same section under one title and the same ownership, a notional boundary exists between the two buildings – for example, between the house and the sleepout.

Depending on the distance to the notional boundary from each building, the fire rating requirements may apply to one or both buildings. The location of the notional boundary can be chosen to give the preferred solution, but once selected cannot be changed. It may be easier or cheaper to provide an FRR on only one building.

The requirements for an FRR for buildings on the same title are the same as for buildings across a relevant boundary. If the buildings are less than 2 m apart (from the face of the cladding) one of the buildings will require an FRR of 30/30/30 (Figure 5). If the buildings on the same title are 2 m or more apart, no FRR is required.

Treat alteration work as a new build

Older houses are sometimes less than 1 m from the property boundaries.

Section 112 of the Building Act requires that:

- proposed alterations fully comply with applicable clauses of the Building Code
- the building will continue to comply with all other relevant Code clauses

(for example, structure) to at least the same extent as before the alteration.

Therefore, the requirement for new building work during alterations to houses, townhouses, small multi-unit dwellings and limited-area outbuildings is the same as for new construction for the control of external fire spread. The same applies when altering an external wall, including if only altering the external cladding.

Cannot simply replace windows like for like

Sometimes, to get more natural light or for a particular view, people may want to replace or add a window in an existing non-fire-rated wall less than 1 m from the boundary.

If that wall would need to be fire rated if built new under C/AS1, the new window must provide adequate protection to the boundary. Like cannot be replaced for like. Either a fire-rated window or a non-fire-rated window protected by a drencher system can be installed.

Double-glazed fire-rated windows are available, as are steel and specific types of hardwood frames that can be appropriately glazed. These are expensive and may not have the desired visual effect.

Other windows and doors in the wall that are not being replaced can remain as they are, even if they are not fire rated, as the dwelling still complies with the Building Code to the same extent it did before the alteration work was carried out.

An alternative is to add more light

Alternatively, it could be worth considering a skylight, which can often be easily and affordably installed. Located at a higher level on the roof and greater than 1 m from the boundary, skylights usually provide more sun and light than similar-sized windows. They are built to a high specification and come with multiple options, including:

- for low or standard roof pitches
- fixed sash or manual/electronic opening
- rain sensors
- external sun shades
- internal blinds.

The topic is a complex one

External fire spread is complex, and it is usually appropriate to discuss the project, whether a new building, alterations or replacement work, with the local council to get their opinion. Determinations by MBIE may also help. ◀