

WWAA KNOWLEDGE | BUSHFIRE · BAL · NSW

Bushfire Design

Understand fire & land before design

A design guide for homes on bush fire prone land (BFPL) in NSW



WHY THIS NOTE

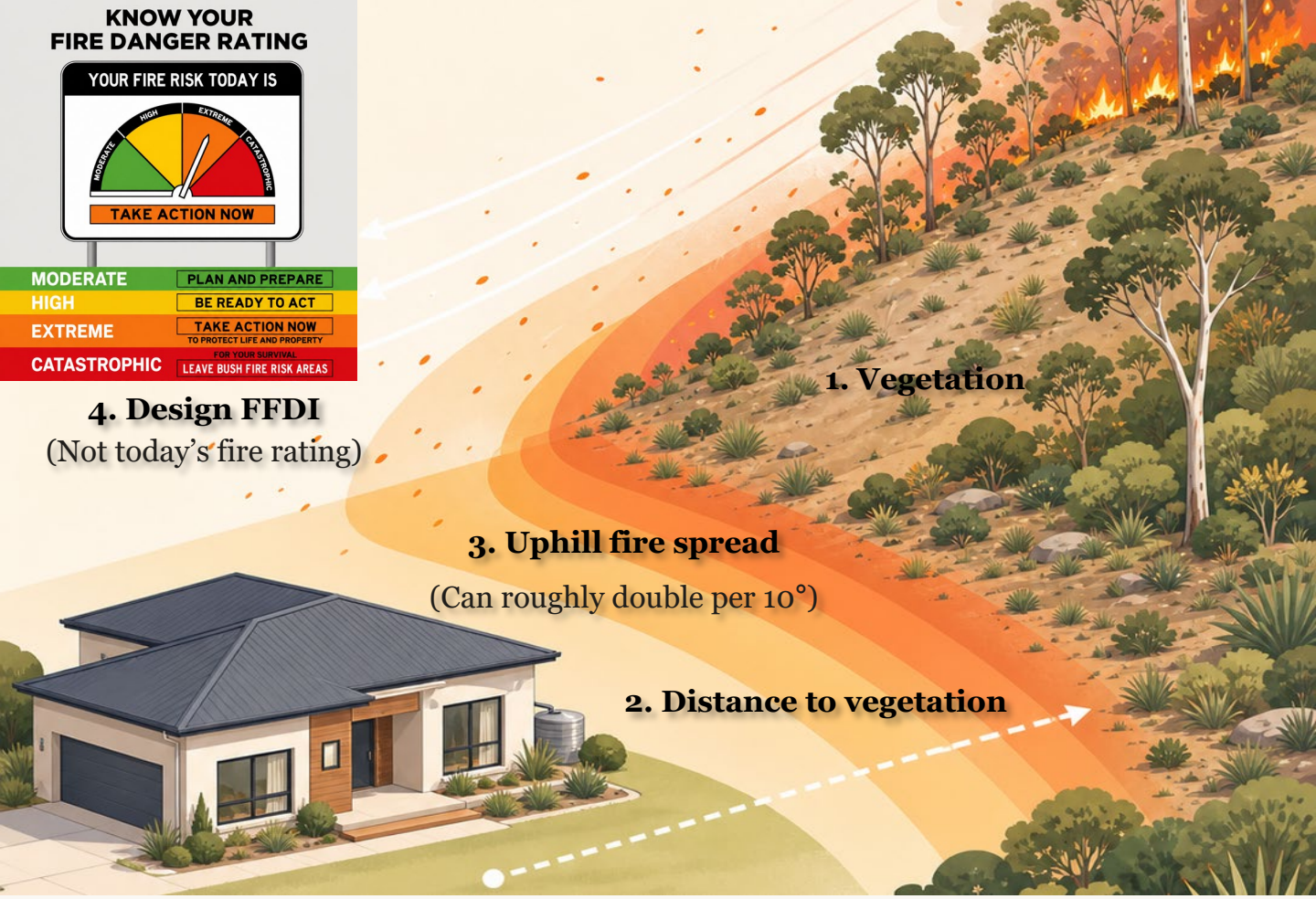
More than fire-rated windows

It is easy to focus on the BAL (Bush Fire Attack Level) and window specification alone. We consider fire exposure and protection across the whole building.

1. Site	Vegetation, distance, slope and design FFDI inform the BAL.
2. Layout	Position, openings, decks and landscape: the big trade-offs first.
3. Envelope	Roof, walls, windows, doors, vents and gaps: then the details.

WWAA DESIGN NOTE

Bushfire requirements should inform the design from the outset, including siting, openings and materials.



WHAT SETS THE LEVEL

Four things set the BAL

1. Vegetation	Forest, woodland, scrub and grassland each burn differently.
2. Distance	Horizontal distance from the house to the vegetation edge.
3. Slope	The slope under the vegetation affects how fast fire approaches.
4. FFDI	PBP uses a design Forest Fire Danger Index (FFDI) for the locality, not today's fire danger rating.

WWAA DESIGN NOTE

Read the land, then draw the house. Get the BAL report first, then settle the renders and materials. Put the same house on a different block and the answer can change.

BAL ratings and design strategy



BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ
≤ 12.5 kW/m²	≤19 kW/m²	≤29 kW/m²	≤40 kW/m²	>40 kW/m²
Mainly embers	**Embers and debris Radiant heat**	**Embers and debris High heat**	**Radiant heat Flame contact possible**	**Potential flame contact**
Keep roofs, gutters and gaps clear of fuel.	Openings, walls and low glass need care.	Many more detail rules; easy to miss items.	Tighter envelope and seals; check big openings early.	Performance solution; assess feasibility.

BAL-LOW: lowest assessed exposure; debris is still possible. Higher BALs require added construction measures.

WWAA DESIGN NOTE

BAL ratings guide construction requirements. They do not guarantee safety or determine whether a site can be developed.

HOW FIRE ARRIVES

Five ways bushfire reaches a house

1. Flame contact

Least common

Usually the last thing to arrive.

2. Embers

Major cause of house loss

Carried ahead by the wind, they land on roofs and in gaps.

3. Radiant heat

Arrives before the flames

Before the fire arrives, the heat is already testing glass, seals and walls.

4. Wind

Spreads fire and debris

Wind drives the fire and blows debris and embers at doors and windows.

5. Smoke

Finds every gap

It gets in through the smallest gaps, so sealing matters.

Design for all five, not just the flames.

WWAA DESIGN NOTE

Ember attack is a major cause of house loss. Address gaps as part of the whole building's bushfire protection.



THE ENVELOPE

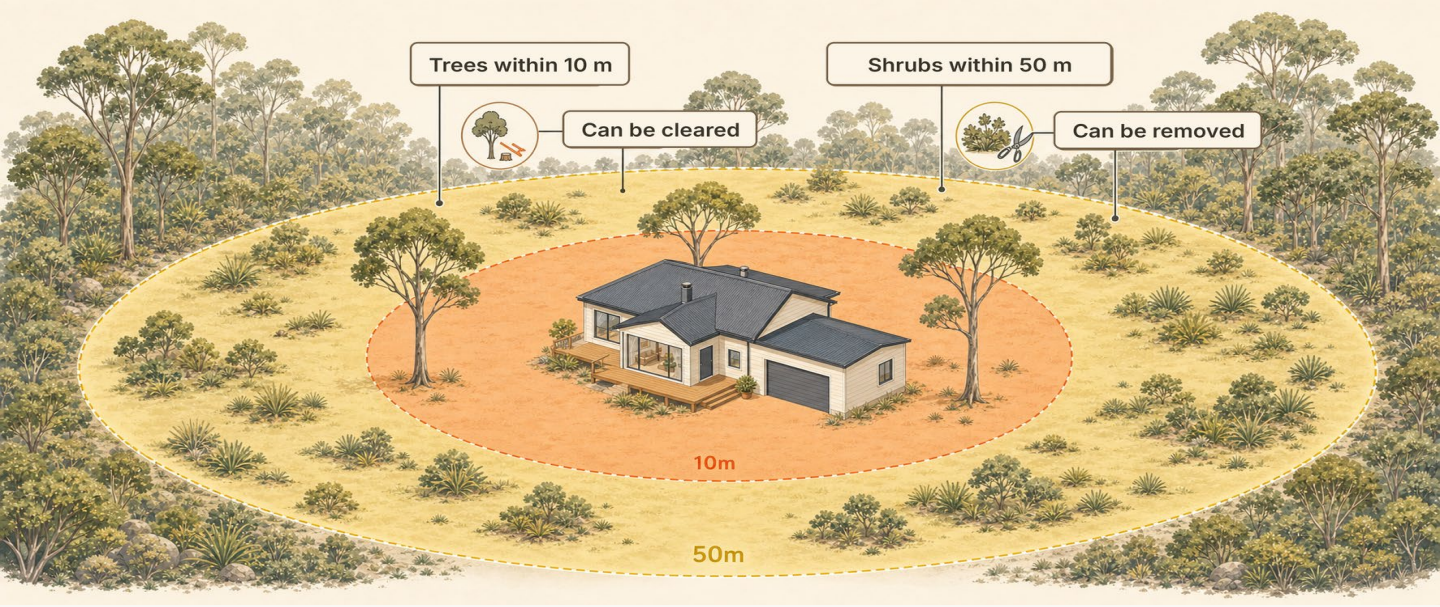
Treat the whole envelope as one system

Small things count: an unsealed ridge, a leaf-filled gutter, an unmeshed vent. Roof, eaves, openings and seals work as one envelope.

Roof	Roofing, sarking and sealing must meet the applicable BAL requirements.
Gaps	Seal roof–wall junctions, fascias, valleys and ridges against embers.
Openings	Use metal mesh with a maximum aperture of 2 mm, where required.
Upkeep	Complex roofs and box gutters trap leaves and are harder to clean.

WWAA DESIGN NOTE

Construction details depend on the assessed BAL, applicable standards and approval conditions.



TENDING THE LAND

Vegetation clearing under 10/50

The 10/50 Vegetation Clearing Scheme applies in mapped entitlement areas, distinct from bush fire prone land maps. It covers eligible existing buildings with lawful occupancy, not a planned new home. Check eligibility on the clearing day and follow the current Code. We plan maintenance alongside the landscape design.

Within 10 m	Trees: measure from an eligible building's external walls; follow the Code.
Within 50 m	Other vegetation, not trees: measure from eligible external walls; follow the Code.
Check first	Check the entitlement area, building eligibility, boundaries and current Code on the clearing day.

Check first, then clear, carefully and within the rules.

WWAA DESIGN NOTE

10/50 isn't permission to clear at will. If unsure, check with a bushfire consultant, an ecologist and council.

10/50: how it works and where it stops

The most common trap is assuming a map check is enough.

1. Check and keep a record	Check the NSW RFS online tool on the day of clearing. Confirm eligibility and current Code conditions, and save the result.
2. Boundaries and consent	Clear only your own land. If you're measuring from a neighbour's building, get written consent first.
3. Clear gently	Don't disturb the soil or use heavy machinery, and keep ground cover. You still have a duty of care to wildlife.

Where 10/50 doesn't let you go ahead

Check slope restrictions, waterway and other exclusions under the current Code.

Check protected vegetation, heritage and any applicable approval conditions before clearing.

WWAA DESIGN NOTE

If unsure, check with a bush fire consultant, an ecologist and council before clearing.

CDC or DA for your build?

In NSW, the BAL affects the approval path. A CDC (complying development certificate) or a DA (development application) means a different timeline and budget.

Check the land first	Check bush fire prone land maps with NSW RFS, the Planning Portal or council before design.
CDC only at lower risk	BAL-29 or below is only one CDC condition. All applicable Code requirements must be met.
BAL-40 / BAL-FZ	On BFPL, BAL-40 and BAL-FZ are excluded from complying development. A DA is required.
Who confirms the BAL	For a CDC, obtain a BAL certificate from council or a NSW RFS-recognised bush fire consultant.
Not just housing rules	Seniors housing, childcare and tourist accommodation may trigger more complex requirements.

WWAA DESIGN NOTE

BAL-29 or below does not establish CDC eligibility. Confirm all applicable requirements and the approval path before design.

Construction and opening protection

1. Deemed-to-satisfy (DTS)	Where DTS applies, check construction and installation against the NCC, applicable standards and NSW requirements.
2. Tested system	Window or door systems tested for the relevant exposure. Check the tested configuration and installation limits.
3. Bushfire shutters	Shutters may form part of opening protection. Check the system requirements and how they operate day to day.

In NSW, BAL-FZ requires a Performance Solution meeting NCC and PBP requirements. Shutters or AS 1530.8.2 tests alone do not establish compliance.

A tested system has limits

A tested system is a proven combination of glass, frame, hardware, screens, seals and installation. Check that the size, opening type and energy-efficient glazing still fall within it.

WWAA DESIGN NOTE

Don’t rely on ‘this range is rated to BAL-xx’. Look at the test report, the installation conditions and the configurations covered.

In short: five questions before design

1. Where will fire come from?

Vegetation, slope and wind direction shape how the house sits and faces.

2. Which elevations have greatest exposure?

Confirm what protection is required across the whole building.

3. Which approval path?

DA or CDC affects time, and the limits on design and floor area.

4. Will big openings work?

For glass facing the view, check the limits of the tested system first.

5. Who maintains it in ten years?

Details that are easy to maintain make a reliable design.

Confirm the strategy before sign-off.

Confirm the key roles and requirements early in design:

1. The bush fire consultant assesses BAL and advises on siting and the approval path;
2. The architect turns the constraints into plans, openings and envelope;
3. The certifier checks the applicable NCC, standards and approval requirements.

WWAA DESIGN NOTE

Confirm the BAL, siting and opening strategy early to reduce the risk of redesign.



Understand the fire. Read the land.
Then design your home.

Understanding Before Design.

Architecture for Life and Time.

William Wang Architect & Associates
Nominated Architect William Yen-Wen Wang · NSW 9897
MPhil in Environmental Design in Architecture, University of Cambridge
BArch (Hons 1) UNSW · PMP · LEED Green Associate
Level 25, 100 Mount Street, North Sydney NSW 2060