



BUSHFIRE THREAT ASSESSMENT

FOR
PROPOSED ADDITIONS AND
ALTERATIONS
AT

7 BOREE ROAD, FORESTVILLE

NSW 2087

ALTERNATIVE SOLUTION

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| | |
|------------------------------------|---|
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Executive Summary

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Fides Environmental for proposed additions and alterations at 7 Boree Road, Forestville NSW 2087. The report forms part of the supporting documentation for a DA to be submitted to Northern Beaches Council (NTB).

The report demonstrates compliance with Planning for Bushfire Protection 2019 (NSW RFS, 2019) and AS3959-2018 Construction of Buildings in Bush Fire Prone Areas. This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal. Recommendations are provided with regard to fuel management, access provision of emergency services, building protection and construction standards to facilitate an acceptable solution.

PBP recognises that infill development proposals will be constrained by existing situations and pre-existing subdivision patterns and existing built forms surrounding the subject site. Consequently, each proposal must be considered on its merits and in accordance with the intent and performance criteria for infill development. The following has been recommended:

1. Asset Protection Zone (APZ) - The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

- The alterations and additions to the dwelling are to be built to **BAL-FZ** on the Southern, Eastern and Western elevations and **BAL-40** from the Northern elevation due to shielding. To achieve these BAL ratings, the following APZ is recommended:
 - The areas of the site outside the development footprint within the allotment should be managed as an Inner Protection Area (IPA).
- These distances are to be managed as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protection Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'.

2. Property Access – Firefighting Vehicles can access the dwelling and exit the property safely.

- **N/A** – there are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.



3. Construction Standards – Construction standards seek to increase the protection of the habitable buildings from bushfire. The shorter the APZ (distance between the external wall of the habitable building and the unmanaged vegetation), then the higher the construction standard, which is referred to as the BAL

- Assessment in accordance with AS3959-2018 has shown that the proposed alterations and additions be built to **BAL-FZ** for the Southern, Eastern and Western elevations and **BAL-40** for the Northern elevation due to shielding.
- The existing building must be upgraded to improve ember protection by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any subfloor areas, openable windows, vents, weepholes, and eaves. External doors are to be fitted with draft excluders.

4. Landscaping – The type, location and ongoing maintenance of landscaping is considered a necessary BPM

- The identified APZs are to be managed in accordance with PBP (Appendix 4);
- A clear area of low-cut lawn or pavement is maintained adjacent to the dwellings; and
- Fencing details in accordance with PBP (7.6 – Fences and gates)

The proposed development is provided with a better outcome due to the following:

- The site is in an urban area, with established access directly to the existing dwelling and utilities such as water supply are already connected to the site. Hydrants occur within 70m of the existing dwelling.
- A defensible space is provided within the site to allow firefighters into the property and undertake firefighting operations.
- The proposed development is shielded from the bushfire hazard interface by the existing building which will be upgraded for ember protection accordingly.

**I certify the development conforms to the relevant specifications and requirements of
Planning for Bushfire Protection 2019**



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Terms & Abbreviations

| Abbreviation | Meaning |
|----------------|--|
| APZ | Asset Protection Zone |
| AS2419-2017 | Australian Standard – Fire Hydrant Installations |
| AS3959-2018 | Australian Standard – Construction of Buildings in Bush Fire Prone Areas |
| BCA | Building Code of Australia |
| BPA | Bush Fire Prone Area (Also Bushfire Prone Land) |
| BFPL Map | Bush Fire Prone Land Map |
| BPMs | Bush Fire Protection Measures |
| BFSA | Bush Fire Safety Authority |
| CC | Construction Certificate |
| <i>EPA Act</i> | <i>NSW Environmental Planning and Assessment Act 1979</i> |
| FFDI | Forest Fire Danger Index |
| FMP | Fuel Management Plan |
| ha | hectare |
| IPA | Inner Protection Area |
| LGA | Local Government Area |
| NTB | Northern Beaches Council |
| OPA | Outer Protection Area |
| PBP | Planning for Bushfire Protection 2019 |
| PoM | Plan of Management |
| RF Act | Rural Fires Act 1997 |
| RF Regulation | Rural Fires Regulation |



CONTENTS

| | | |
|-------------------|---|------------|
| 1 | INTRODUCTION | 1 |
| 1.1 | Site Particulars | 1 |
| 1.2 | Description of the Proposal | 3 |
| 1.3 | Legislative Requirements | 3 |
| 1.4 | Objectives of Assessment | 3 |
| 2 | METHODOLOGY | 5 |
| 2.1 | Vegetation Assessment | 5 |
| 2.2 | Slope Assessment | 5 |
| 3 | SITE ASSESSMENT | 6 |
| 3.1 | Vegetation & Slope Assessment | 6 |
| 4 | BUSHFIRE ATTACK ASSESSMENT | 8 |
| 4.1 | Determination of Bushfire Attack Levels | 9 |
| 5 | COMPLIANCE | 12 |
| 6 | CONCLUSION & RECOMMENDATIONS | 17 |
| 7 | BIBLIOGRAPHY | 19 |
| APPENDIX A | PROPOSED SITE PLANS | A-1 |
| APPENDIX B | ASSET PROTECTION ZONES | B-1 |
| APPENDIX C | WATER AND HYDRANT INFORMATION | C-2 |
| APPENDIX D | AS3959 2018 - BAL-FZ CONSTRUCTION REQUIREMENTS | D-3 |

TABLES

| | |
|---|----|
| Table 3-1: Vegetation Classification | 6 |
| Table 4-1: Determination of BALs for the Proposed Additions and Alterations | 9 |
| Table 5-1: Proposed Compliance with Development Standards | 12 |

FIGURES

| | |
|------------------------------------|----|
| Figure 1-1: Site Location | 2 |
| Figure 1-2 Bushfire Prone Land Map | 4 |
| Figure 3-1: Vegetation Map | 7 |
| Figure 4-1: BAL Map | 11 |



I INTRODUCTION

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Fides Environmental for proposed additions and alterations at 7 Boree Road, Forestville, hereafter referred to as the “site” (refer to Figure 1-1 for site locality). Refer to Appendix A for Proposed Site Plans.

This BTA is suitable for submission with a Development Application (DA) and provides information on measures that will enable the development to comply with ‘Planning for Bushfire Protection’ (NSW RFS, 2019), hereafter referred to as PBP (RFS, 2019).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the Environmental Planning and Assessment Amendment (Planning for Bushfire Protection) Regulation 2007 and the Rural Fires Amendment Regulation 2007 (RF Amendment Regulation 2007).

I.1 Site Particulars

| | |
|-----------------------------|------------------------------------|
| Locality: | 7 Boree Road, Forestville NSW 2087 |
| LGA: | Northern Beaches Council |
| Current Land Use: | Existing Dwelling |
| Forest Danger Index: | 100 FFDI |



Client: Fides
Environmental
Project Name

Figure 1-1: Site Location

Legend

Subject Land

Assessment Area

Cadastral

Building Outline

100m

140m



I.2 Description of the Proposal

This DA relates to the proposal for additions and alterations to an existing dwelling. The proposal will meet the key requirement of PBP for infill development being that the new development provides a better bushfire risk outcome than that which exists on site. This can be achieved by construction upgrade for the new development and the implementation of APZs. Refer to Appendix A for proposed plans.

I.3 Legislative Requirements

The site has been mapped as Bush Fire Prone Land Map (BFPLM) by NTB. Refer to Figure 1-2.

This report forms part of the supporting documentation for a Development Application (DA) to be submitted to NTB.

This BTA has been prepared using current legislative requirements and associated guidelines for assessment of bushfire protection, these being:








- PBP (RFS, 2019);
- AS3959-2018 Construction of Buildings in Bushfire Prone Area; and

I.4 Objectives of Assessment

This report has been prepared to address the requirements of Clause 44 of the Rural Fires Regulation. This BTA also addresses the six key Bush Fire Protection Measures (BFRMs) in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced APZ (and their components being Inner Protection Areas (IPA's) and Outer Protection Areas (OPA's);
- Sitting and design of the proposal;
- Construction standards;
- Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;
- Adequate water supply and pressure, and utility services; and
- Suitable landscaping, to limit fire spreading to a building.



| | | | | |
|--|---|--|--|--|
| Client: Fides Environmental Project Name | <div>Legend</div> <div><div><div></div><div>Subject Land</div></div><div><div></div><div>Cadastre</div></div><div><div></div><div>Building Outline</div></div></div> <div><div>Assessment Area</div><div><div><div></div><div>100m</div></div><div><div></div><div>140m</div></div></div></div> <div><div>Bushfire Prone Area</div><div><div><div></div><div>Vegetation Category 1</div></div><div><div></div><div>Vegetation Buffer</div></div></div></div> | | | |
| Figure 1-2: Bushfire Prone Land | | | | |



2 METHODOLOGY

2.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent
- Confirmation of the vegetation assemblage typology present.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.



3 SITE ASSESSMENT

The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2019).

3.1 Vegetation & Slope Assessment

In accordance with PBP (RFS 2019), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. This assessment is depicted in Table 3-1.

In accordance with PBP (RFS 2019), an assessment of the slope that the vegetation considered a bushfire hazard was undertaken and the results are presented in Table 3.1 below.

Table 3-1: Vegetation Classification

| Proposed Additions and Alterations | | |
|------------------------------------|-------------------------|--------------------|
| Direction | Vegetation Type | Slope |
| North | Residential Development | N/A |
| East | Residential Development | N/A |
| South | Forest vegetation | Downslope (15-20°) |
| West | Residential Development | N/A |



| | |
|--|--|
| Client: Fides Environmental Project Name | <div>Legend</div> <div><div><div><div></div></div><div>Subject Land</div></div><div><div><div></div></div><div>Assessment Area</div></div><div><div><div></div></div><div>100m</div></div><div><div><div></div></div><div>140m</div></div><div><div><div></div></div><div>Cadastre</div></div></div> <div><div><div></div></div><div>Building Outline</div></div> <div><div><div></div></div><div>Line Distance</div></div> <div><div><div></div></div><div>Elevation Contours</div></div> <div><div><div></div></div><div>Classified Vegetation</div></div> <div><div><div></div></div><div>Forest (wet and dry sclerophyll) ect.</div></div> |
| Figure 3-1: Vegetation Map | |



4 BUSHFIRE ATTACK ASSESSMENT

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer / architect should be made aware of this recommendation. It may be necessary to have dwelling plans checked by the architect involved to ensure that the proposed dwellings meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2018.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FFDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**
There is insufficient risk to warrant any specific construction requirements but there are still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**
There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m².

(c) **BAL – 19** The risk is considered to be **MODERATE**
There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m².

(d) **BAL-29** The risk is considered to be **HIGH**
There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.

The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m².



(e) **BAL-40** The risk is considered to be **VERY HIGH**
There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m².

(f) **BAL-FZ** The risk is considered to be **EXTREME**
There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux greater than 40 kW/m².

4.1 Determination of Bushfire Attack Levels

Using a FFDI of 100, the information relating to vegetation, slope and according to Table A1.12.5 of PBP 2019 that determined the appropriate BAL. The results from this bush fire risk assessment are detailed below in Table 4-1–Bush Fire Attack Assessment and Figure 4-1 shows the BALs.

Table 4-1: Determination of BALs for the Proposed Additions and Alterations

| Vegetation Type & Direction | Separation Distance from Vegetation | Slope Under Vegetation | Bushfire Attack Level (BAL) | Construction Requirements |
|--|--|-------------------------------|-------------------------------------|--|
| Residential Development to the North | >100m | N/A | BAL-40 due to shielding. See below. | <i>NSW offers no Deemed to Satisfy Solution for building within the FZ. As such, the proposed development will need to be built to BAL-FZ plus additional measures to provide for bushfire protection. Refer to Appendix D for requirements of BAL-FZ.</i> |
| Residential Development to the East | >100m | N/A | BAL-FZ | |
| Forest to the South | >33m | Downslope (15-20°) | BAL-FZ | |
| Residential Development to the West | >100m | N/A | BAL-FZ | |

Given the information in Table 4-1 above, although the Southern, Eastern and Western elevations have been assessed as **BAL-FZ**, the Northern elevation has been assessed as **BAL-40** due to shielding of the existing building from the bushfire hazard interface and the upgrades in construction to the existing building to provide a better bushfire outcome.

Figure A1.8a

Radiant heat impact and shielding.

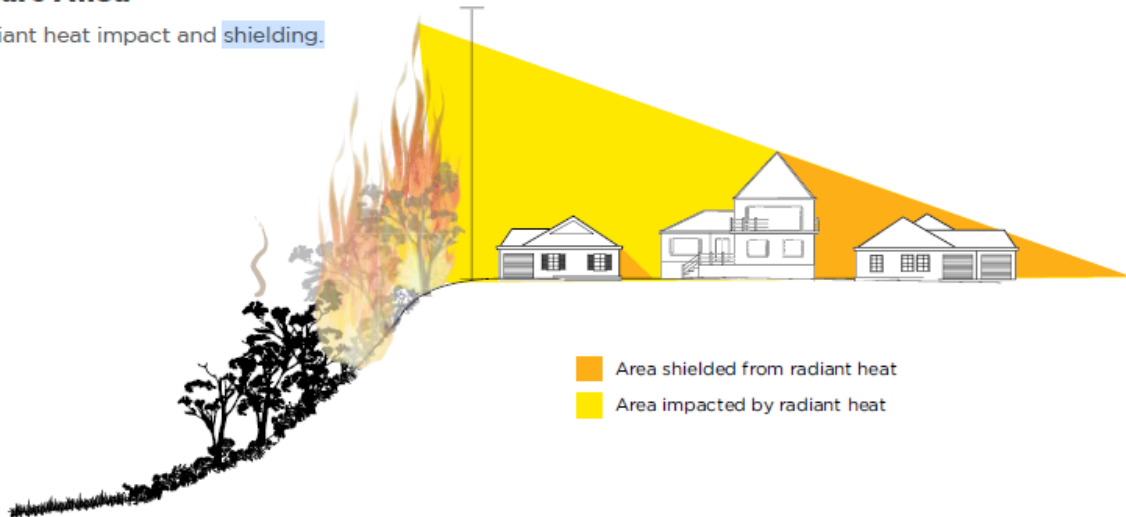
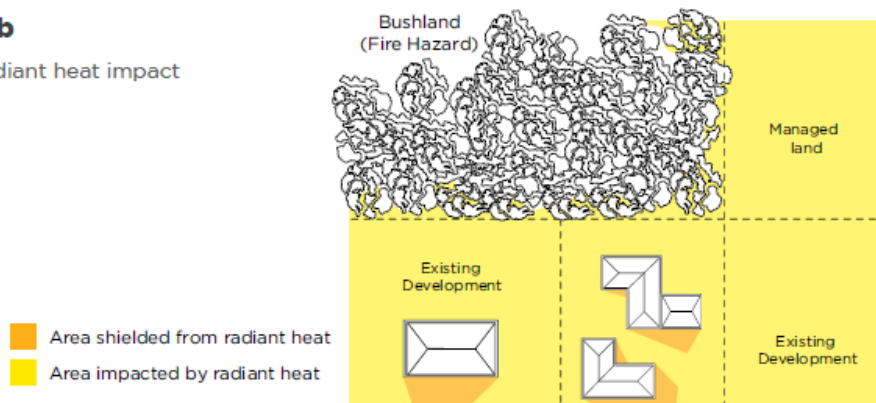
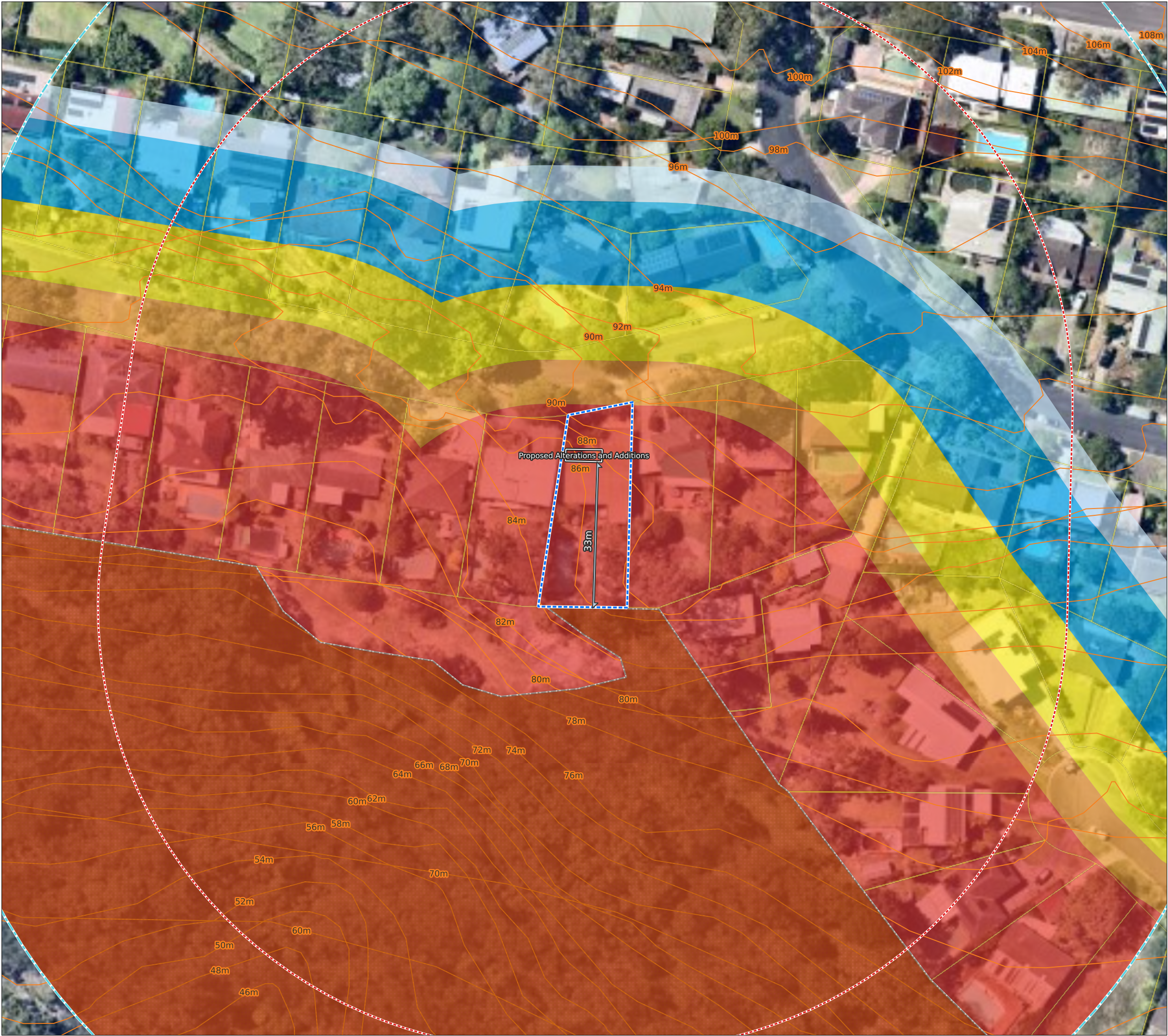


Figure A1.8b

Plan view of radiant heat impact and shielding.





Legend

- Line Distance
- Building Outline
- Subject Land
- Assessment Area**
 - 100m
 - 140m
- Classified Vegetation**
 - Forest (wet and dry sclerophyll) ect.
 - Elevation Contours
 - Cadastre
- BAL Contours**
 - BAL FZ
 - BAL 40
 - BAL 29
 - BAL 19
 - BAL 12.5

Scale 1: 1,000

0 10 20 30 Metres



Client: Fides Environmental

Project: 7 Boree Road, Forestville NSW 2087

Figure 4-1: BAL Map

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5 COMPLIANCE

The proposal is for an addition and therefore development standards apply. Table 5-1 details the proposed compliance with Development Standards for Infill development.

Table 5-1: Proposed Compliance with Development Standards

| Acceptable Solutions | Performance Criteria | Compliance |
|---|---|---|
| ASSET PROTECTION ZONES | | |
| › an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1. | › APZs are provided commensurate with the construction of the building; and › A defensible space is provided. | Complies with Performance Criteria – A suitable APZ is unachievable however a defensible space is provided. The entire site should be managed as an IPA. |
| › APZs are managed in accordance with the requirements of Appendix 4 of PBP. | › APZs are managed and maintained to prevent the spread of a fire to the building. | Complies with Acceptable Solution – the site is to be managed to the requirements of PBP Appendix 4 (summarised in Appendix B here) |
| › APZs are wholly within the boundaries of the development site. › APZ are located on lands with a slope less than 18 degrees. | › the APZ is provided in perpetuity. › APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised. | Complies with Acceptable Solution – APZs are on site and do not occur on steep land. |
| › property access roads are two-wheel drive, all- weather roads. | › firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation. | Complies with Acceptable Solution – the site has direct access to Boree Road via a private driveway. |
| › the capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 | › the capacity of access roads is adequate for firefighting vehicles. | Complies with Acceptable Solution – Road access is adequate for emergency vehicles. |



| | | |
|--|---|---|
| tonnes), bridges and causeways are to clearly indicate load rating. | | |
| <ul style="list-style-type: none"> › hydrants are provided in accordance with the relevant clauses of AS 2419.1:2017; › There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available. | › there is appropriate access to water supply. | Complies with Acceptable Solution – A hydrant is located within 70m. |
| <ul style="list-style-type: none"> › at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road; › There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. | › firefighting vehicles can access the dwelling and exit the property safely. | N/A – the site is connected to the public road system by driveway <10m long. |
| WATER SUPPLIES | | |
| <ul style="list-style-type: none"> › reticulated water is to be provided to the development, where available; and › a static water supply is provided where no reticulated water is available. | › an adequate water supply is provided for firefighting purposes. | Complies with Acceptable Solution – The site is connected to reticulated water. |



| | | |
|---|--|---|
| <ul style="list-style-type: none"> › fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2017; › hydrants are not located within any road carriageway; and › reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. | <ul style="list-style-type: none"> › water supplies are located at regular intervals; and › the water supply is accessible and reliable for firefighting operations. | Complies with Acceptable Solution – Hydrants are appropriately placed. |
| <ul style="list-style-type: none"> › fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2017. | <ul style="list-style-type: none"> › flows and pressure are appropriate. | Complies with Acceptable Solution – Flows and pressure assumed compliant. |
| <ul style="list-style-type: none"> › all above-ground water service pipes external to the building are metal, including and up to any taps. | <ul style="list-style-type: none"> › the integrity of the water supply is maintained. | Complies with Acceptable Solution – All above ground pipes will meet the specifications of the acceptable solution |
| <ul style="list-style-type: none"> › where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d. | <ul style="list-style-type: none"> › a static water supply is provided for firefighting purposes in areas where reticulated water is not available. | N/A – The site is connected to reticulated water. |
| ELECTRICITY SERVICES | | |
| <ul style="list-style-type: none"> › where practicable, electrical transmission lines are underground; and › where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> ○ lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and ○ no part of a tree is closer to a power line than the distance set out in accordance with the specifications | <ul style="list-style-type: none"> › location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. | Complies with Acceptable Solution – Electrical services to the site will meet the requirements of the acceptable solution |



| | | |
|---|---|--|
| in ISSC3 Guideline for Managing Vegetation Near Power Lines. | | |
| GAS SERVICES | | |
| <ul style="list-style-type: none"> › reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used; › all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side; › connections to and from gas cylinders are metal; › polymer-sheathed flexible gas supply lines are not used; and › above-ground gas service pipes are metal, including and up to any outlets. | › location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings. | Complies with Acceptable Solution – Gas services to the site will meet the requirements of the acceptable solution |
| CONSTRUCTION STANDARDS | | |
| <ul style="list-style-type: none"> › BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and › construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone). | › the proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact. | Complies with Performance Criteria – The proposed alterations and additions have been assessed as BAL-FZ from the Southern, Eastern and Western elevations and BAL-40 from the Northern elevation due to shielding. |
| › fencing and gates are constructed in accordance with section 7.6. | › proposed fences and gates are designed to minimise the spread of bush fire. | Can Comply – Fencing on site will meet the requirements of the acceptable solution |
| › Class 10a buildings are constructed in accordance with section 8.3.2. | › proposed Class 10a buildings are designed to minimise the spread of bush fire. | N/A – the proposed alterations and additions are not classed as 10a. |



LANDSCAPING

| | | |
|---|---|--|
| <ul style="list-style-type: none">› compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);› a clear area of low-cut lawn or pavement is maintained adjacent to the house;› fencing is constructed in accordance with section 7.6; and› trees and shrubs are located so that:<ul style="list-style-type: none">○ the branches will not overhang the roof;○ the tree canopy is not continuous; and○ any proposed windbreak is located on the elevation from which fires are likely to approach. | <ul style="list-style-type: none">› landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions. | Complies with Acceptable Solution – the site is to be managed to the requirements of PBP Appendix 4 (summarised in Appendix B here) |
|---|---|--|

6 CONCLUSION & RECOMMENDATIONS

In summary, a Bushfire Risk Assessment has been undertaken for proposed additions and alterations at 7 Boree Road, Forestville NSW 2087. The report forms part of the supporting documentation for a Development Application (DA) to be submitted to Northern Beaches Council (NTB).

PBP recognises that infill development proposals will be constrained by existing situations and pre-existing subdivision patterns and existing built forms surrounding the subject site. Consequently, each proposal must be considered on its merits and in accordance with the intent and performance criteria for infill development. The following has been recommended:

1. Asset Protection Zone (APZ) - The APZ provides space and reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and to prevent direct flame contact.

- The alterations and additions to the dwelling are to be built to **BAL-FZ** on the Southern, Eastern and Western elevations and **BAL-40** from the Northern elevation due to shielding. To achieve these BAL ratings, the following APZ is recommended:
 - The areas of the site outside the development footprint within the allotment should be managed as an Inner Protection Area (IPA).
- These distances are to be managed as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protect Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'.

2. Property Access – Firefighting Vehicles can access the dwelling and exit the property safely.

- N/A – there are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.

3. Construction Standards – Construction standards seek to increase the protection of the habitable buildings from bushfire. The shorter the APZ (distance between the external wall of the habitable building and the unmanaged vegetation), then the higher the construction standard, which is referred to as the BAL

- Assessment in accordance with AS3959-2018 has shown that the proposed alterations and additions be built to **BAL-FZ** for the Southern, Eastern and Western elevations and **BAL-40** for the Northern elevation due to shielding.



- The existing building must be upgraded to improve ember protection by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any subfloor areas, openable windows, vents, weepholes, and eaves. External doors are to be fitted with draft excluders.

4. Landscaping – The type, location and ongoing maintenance of landscaping is considered a necessary BPM

- The identified APZs are to be managed in accordance with accordance with PBP (Appendix 4);
- A clear area of low-cut lawn or pavement is maintained adjacent to the dwellings; and
- Fencing details in accordance with PBP (7.6 – Fences and gates)

The proposed development is provided with a better outcome due to the following:

- The site is in an urban area, with established access directly to the existing dwelling and utilities such as water supply are already connected to the site. Hydrants occur within 70m of the existing dwelling.
- A defensible space is provided within the site to allow firefighters into the property and undertake firefighting operations.
- The proposed development is shielded from the bushfire hazard interface by the existing building which will be upgraded for ember protection accordingly.

**I certify the development conforms to the relevant specifications and requirements of
Planning for Bushfire Protection 2019**



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APPENDIX A PROPOSED SITE PLANS

ALTERATION AND ADDITION RESIDENTIAL DEVELOPMENT

CDC SUBMISSION

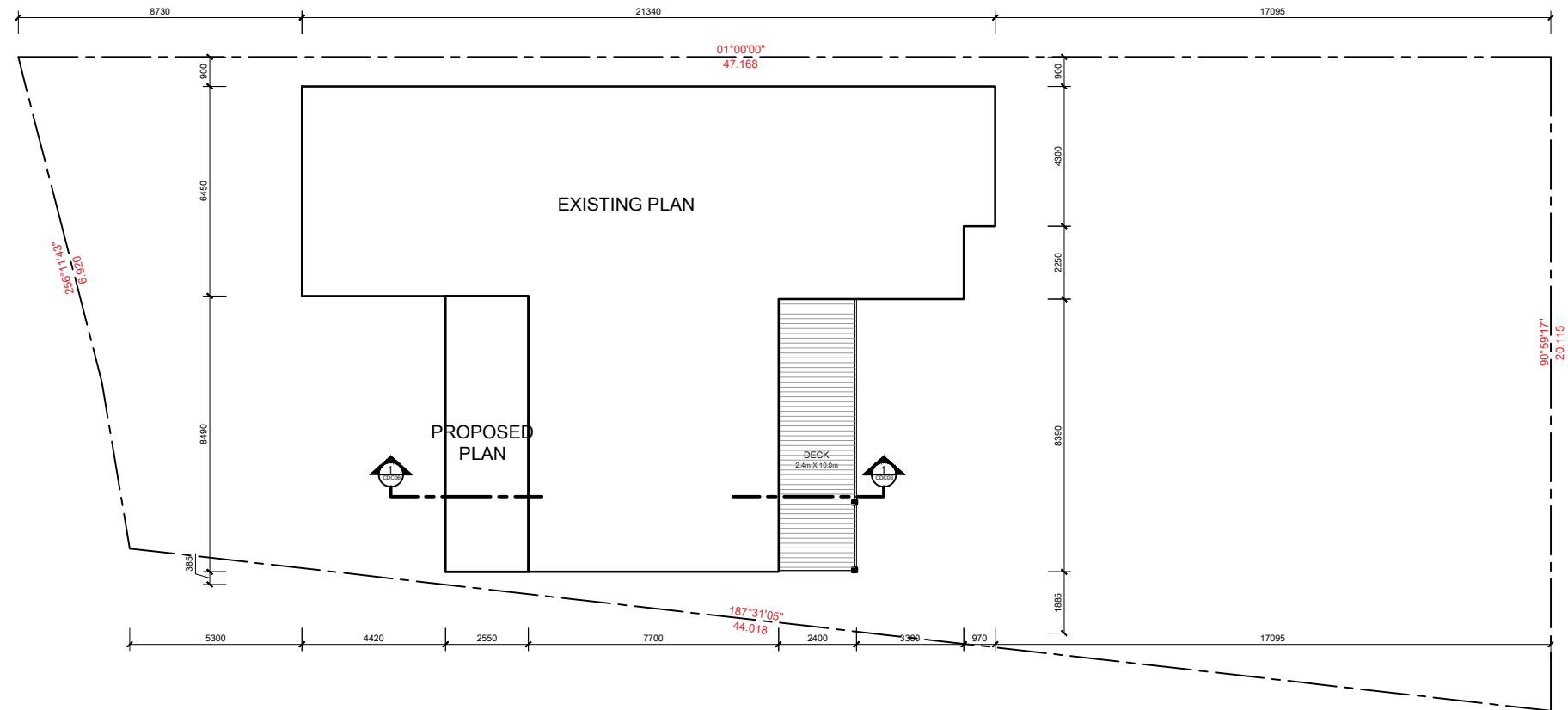
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PROJECT NO. : 18279

| DRAWING NO. | DRAWING NAME |
|-------------|-------------------------|
| CDC 00 | COVER PAGE |
| CDC 01 | SITE PLAN |
| CDC 02 | GROUND FLOOR PLAN |
| CDC 03 | LOWER GROUND FLOOR PLAN |
| CDC 04 | ELEVATIONS 1 |
| CDC 05 | ELEVATION 2 |
| CDC 06 | SECTION 1 |

DESIGN STANDARDS

| | |
|---|---|
| SMOKE DETECTORS & HEAT DETECTORS | SPECS. E2.2(a) BCA, AS 1670.1-1995, AS 3786-1993 |
| PROTECTION OF BUILDINGS FROM SUBTERRANEAN TERMITES | AS 3660.1-2000 |
| THE DEMOLITION OF STRUCTURES | AS 2601 |



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architecture | urban design | interior design

CONSULTANTS

NOTE

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7 BOREE ROAD, FORESTVILLE
NSW 2087

ALTERATION AND ADDITION

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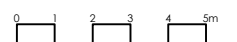
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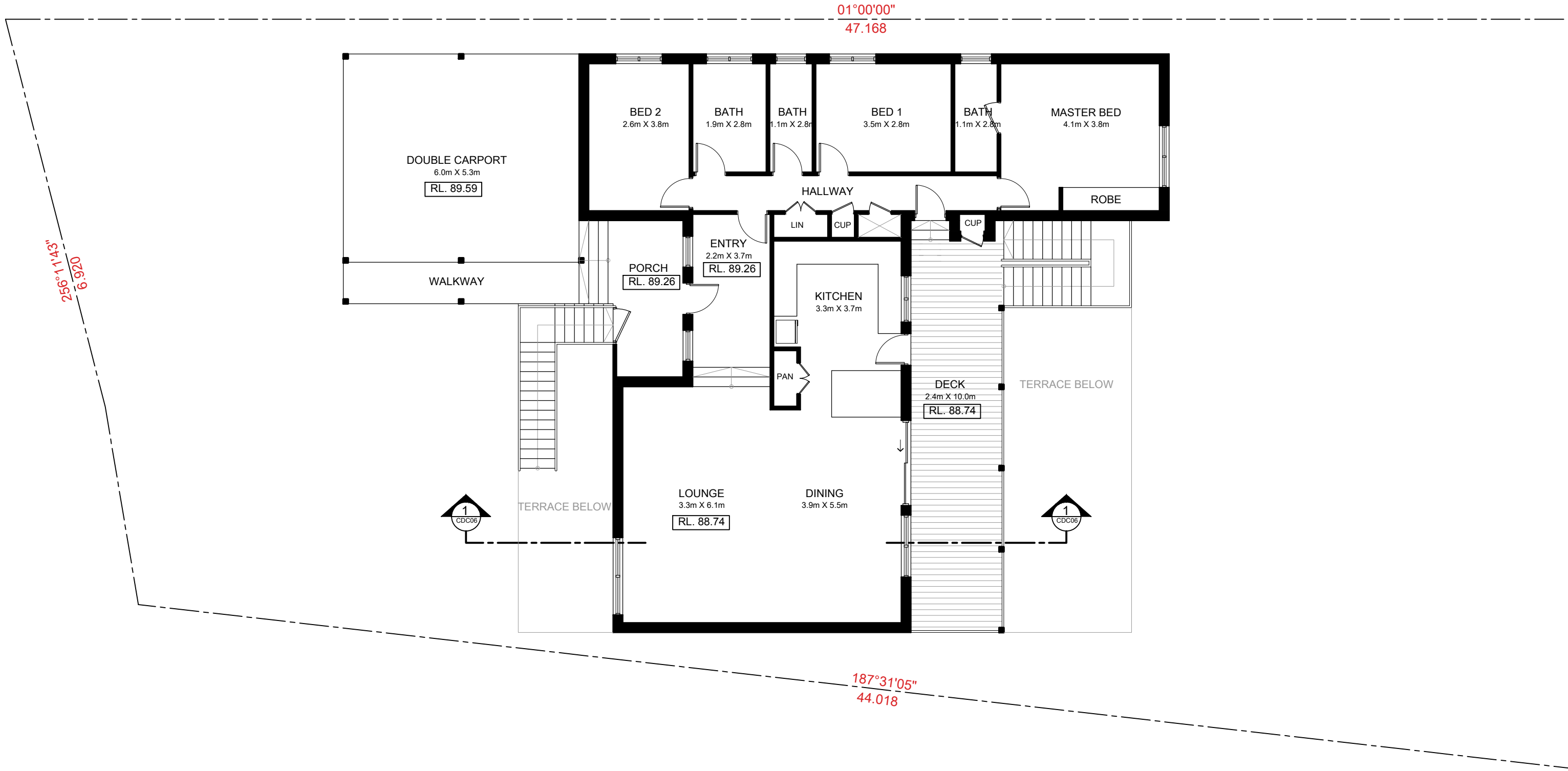
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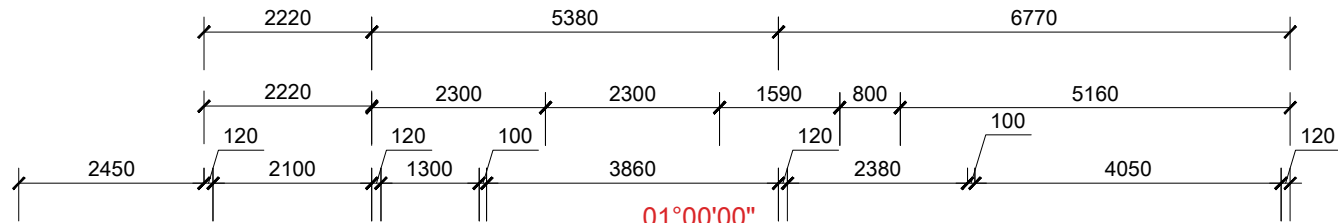
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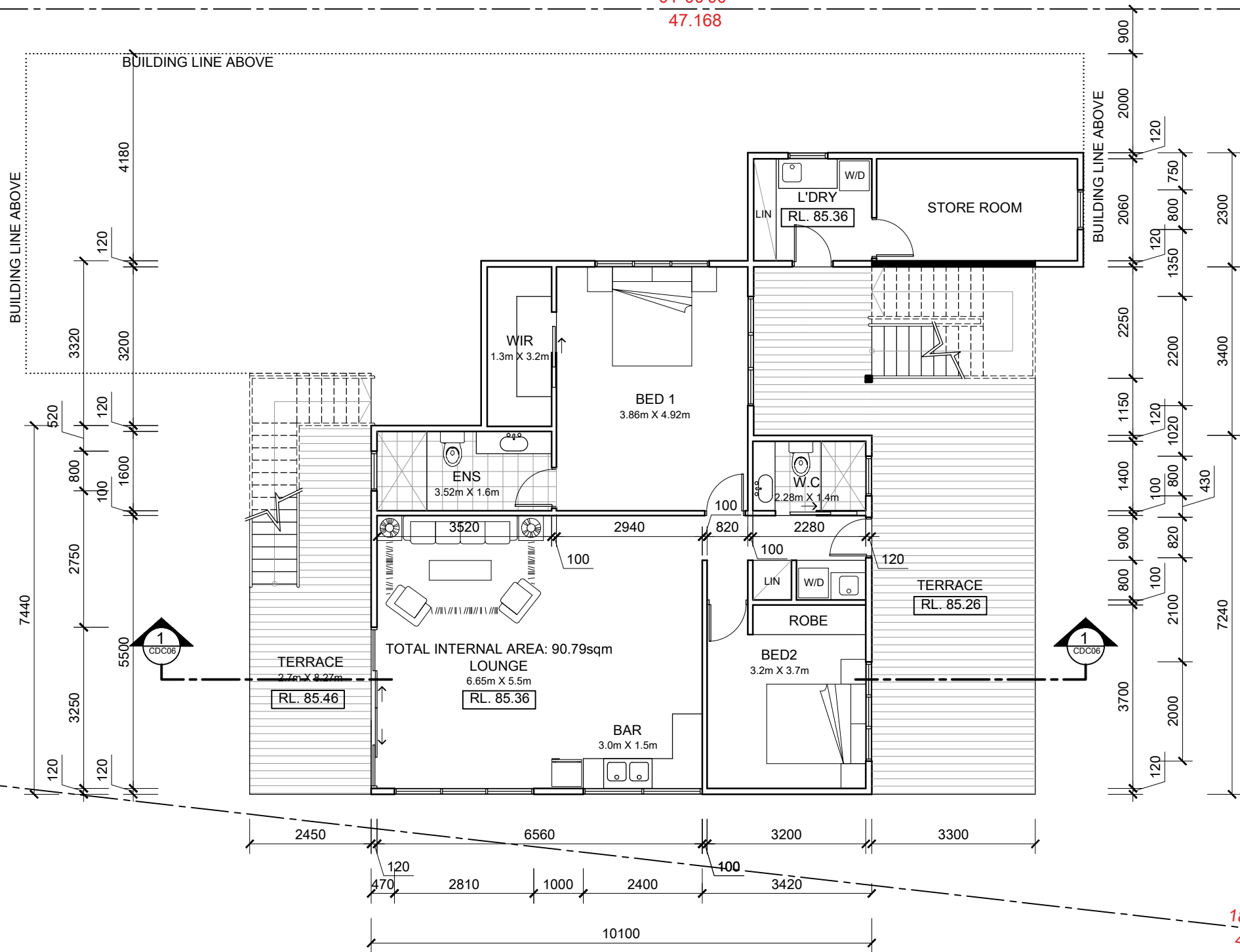




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NSW 2087

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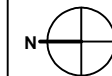
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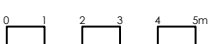
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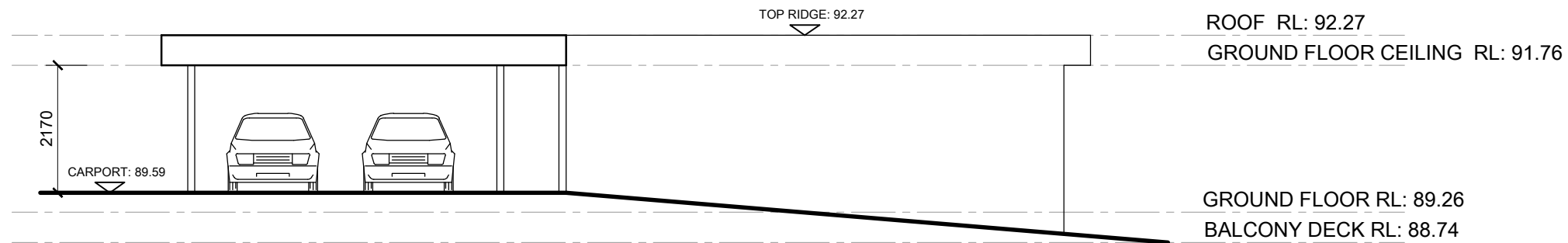
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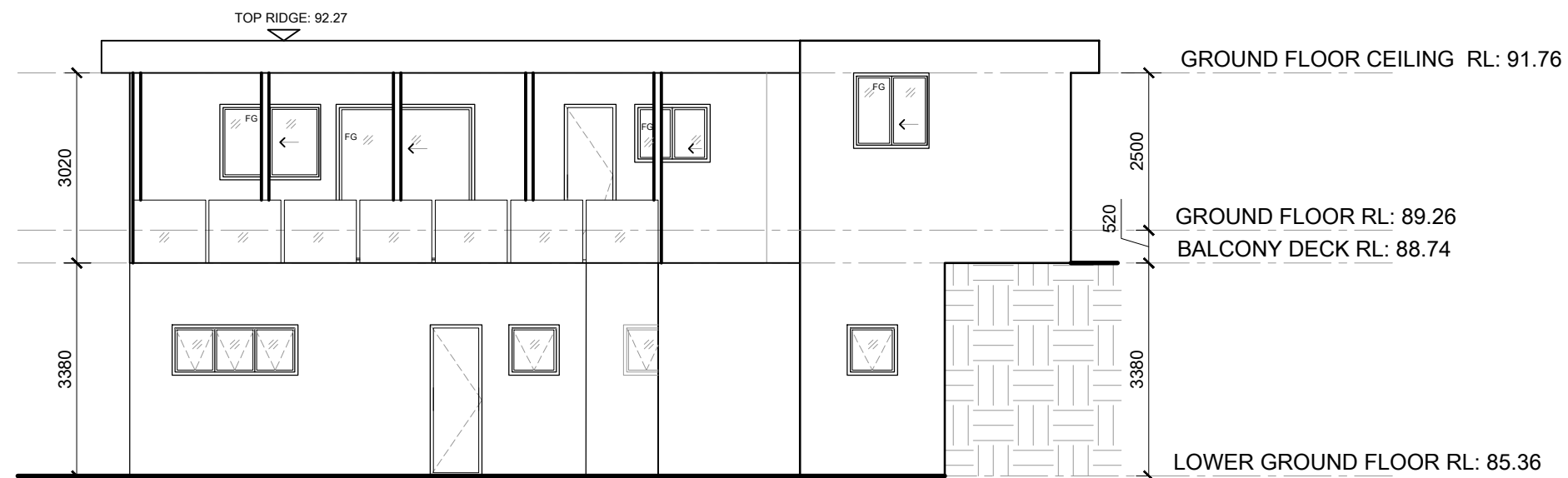
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① NORTH ELEVATION



② SOUTH ELEVATION

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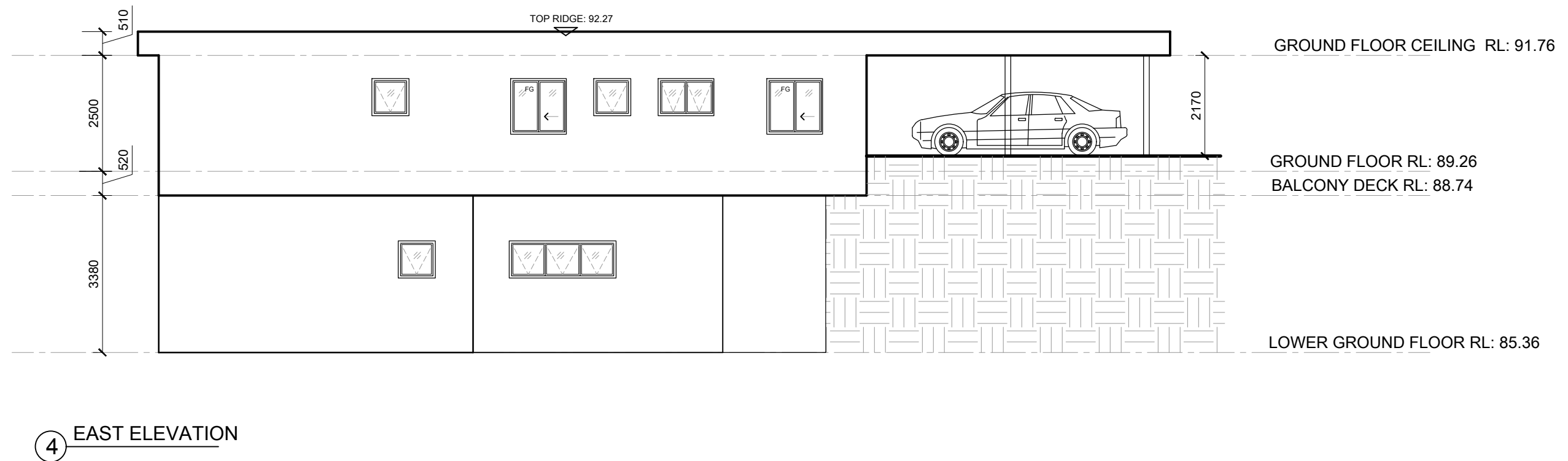
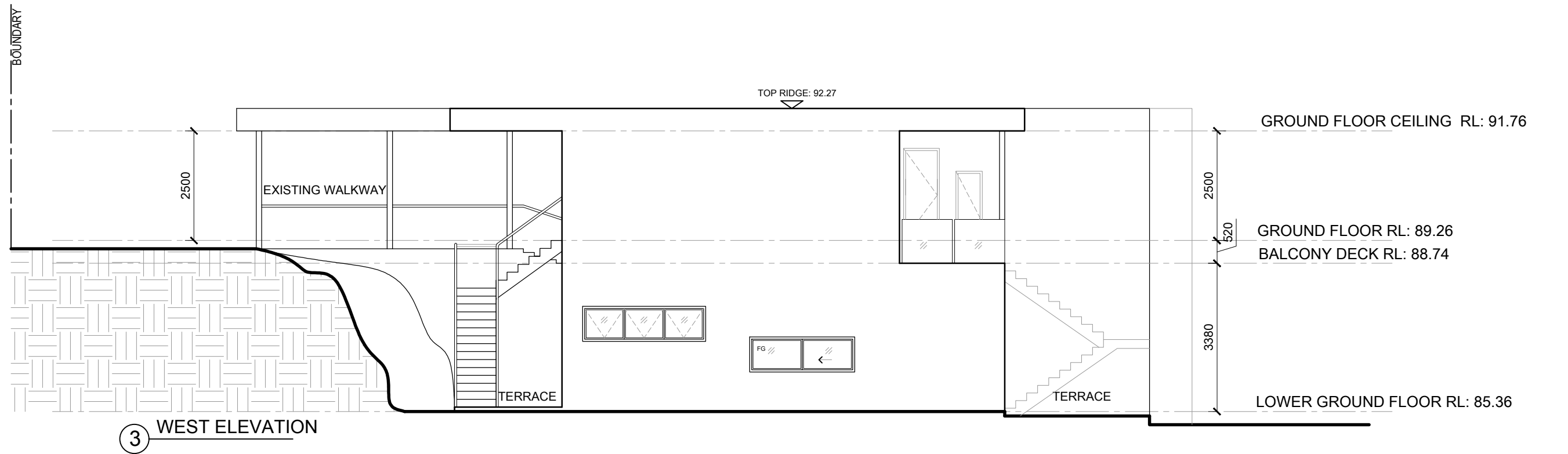
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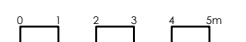
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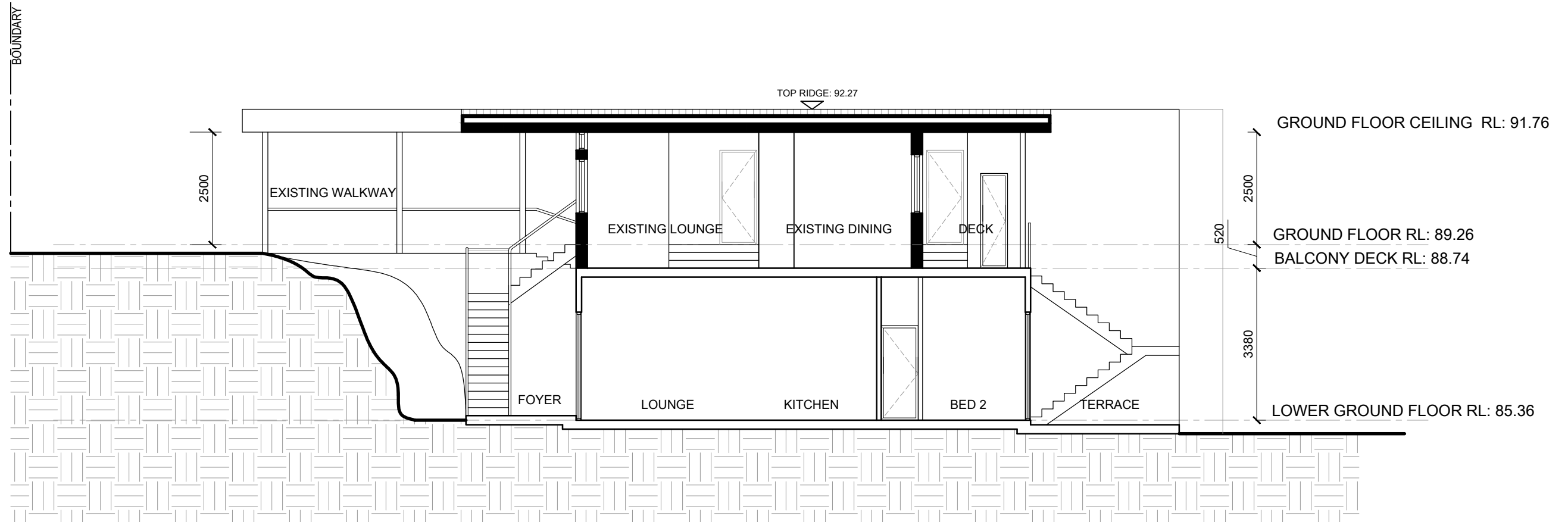
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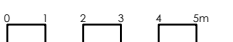
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APPENDIX B ASSET PROTECTION ZONES

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMS, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

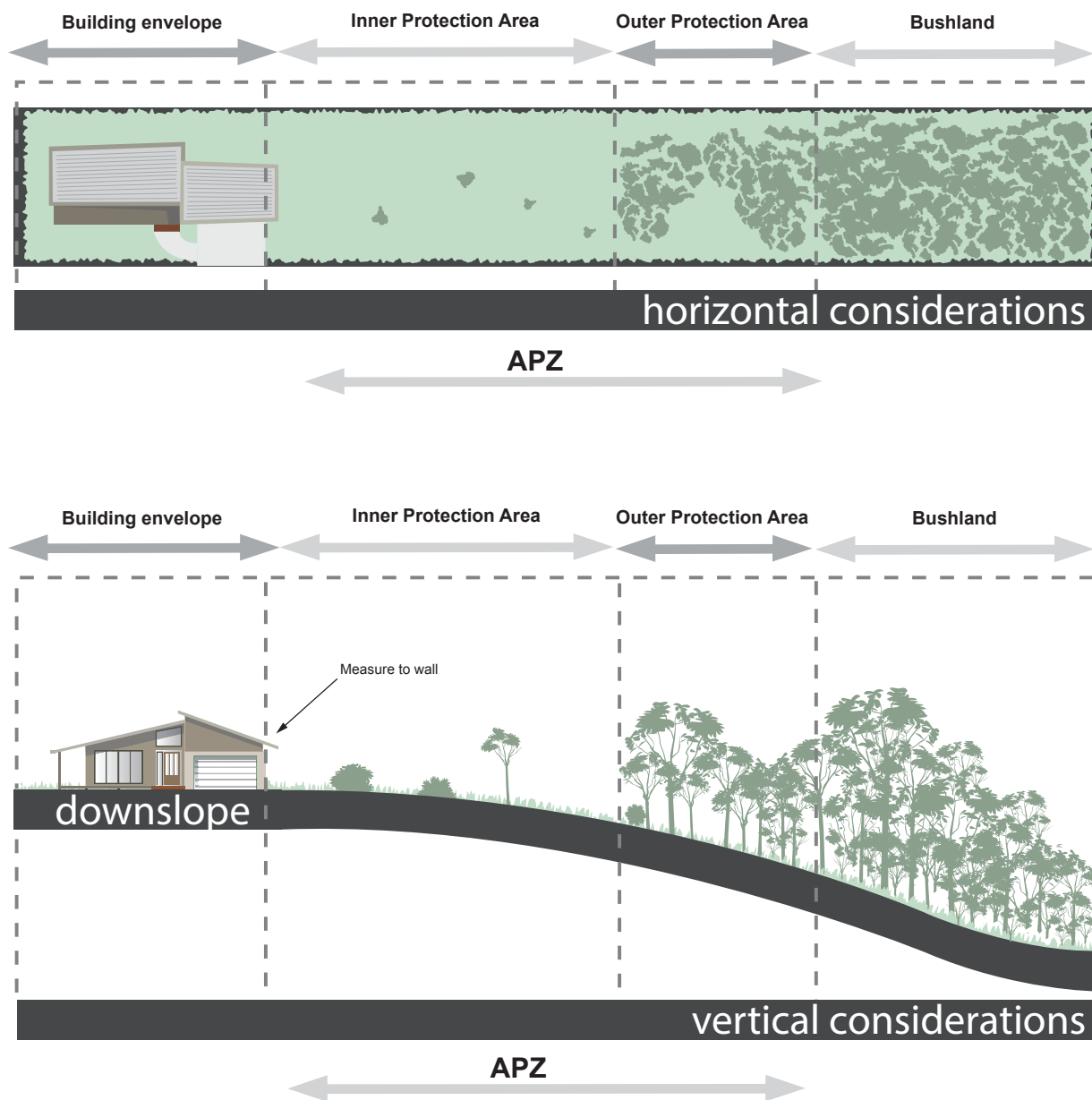
- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

Figure A4.1

Typical Inner and Outer Protection Areas.



A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

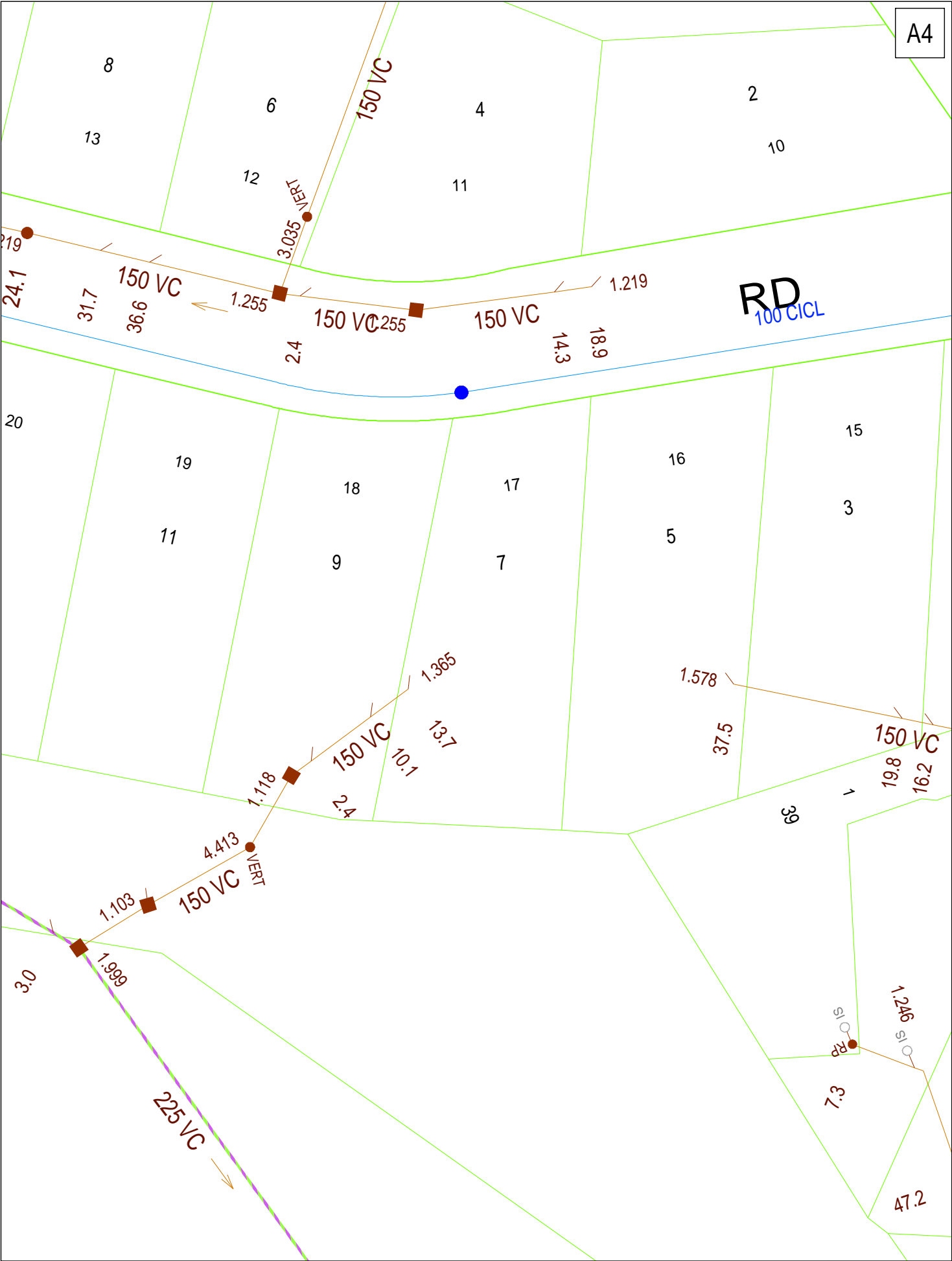
- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

APPENDIX C WATER AND HYDRANT INFORMATION

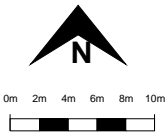


A4

DBYD Address:
7 Boree Rd
Forestville NSW 2087
DBYD Job No: 38468127
DBYD Sequence No: 249909347

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Plan 1 of 1



Guide to reading Sydney Water Before You Dig Plans

This guide will help you understand our plans and what our services are.

| Sewer | | Property Details | |
|--|--|--|--|
| Sewer Main (with flow arrow & size type text) | | Boundary Line | |
| Disused Main | | Easement Line | |
| Rising Main | | House Number | |
| Maintenance Hole (with upstream depth to invert) | | Lot Number | |
| Sub-surface chamber | | Proposed Land | |
| Maintenance Hole with Overflow chamber | | Sydney Water Heritage Site (please call 132 092 and ask for the Heritage Unit) | |
| Ventshaft EDUCT | | | |
| Ventshaft INDUCT | | | |
| Property Connection Point (with chainage to downstream MH) | | | |
| Concrete Encased Section | | | |
| Terminal Maintenance Shaft | | | |
| Maintenance Shaft | | | |
| Rodding Point | | | |
| Lamphole | | | |
| Vertical | | | |
| Pumping Station | | | |
| Sewer Rehabilitation | | | |
| Pressure Sewer | | Water | |
| Pressure Sewer Main | | WaterMain - Potable (with size type text) | |
| Pump Unit (Alarm, Electrical Cable, Pump Unit) | | Disconnected Main - Potable | |
| Property Valve Boundary Assembly | | Proposed Main - Potable | |
| Stop Valve | | Water Main - Recycled | |
| Reducer / Taper | | Special Supply Conditions - Potable | |
| Flushing Point | | Special Supply Conditions - Recycled | |
| Vacuum Sewer | | Restrained Joints - Potable | |
| Pressure Sewer Main | | Restrained Joints - Recycled | |
| Division Valve | | Hydrant | |
| Vacuum Chamber | | Maintenance Hole | |
| Clean Out Point | | Stop Valve | |
| Stormwater | | Stop Valve with By-pass | |
| Stormwater Pipe | | Stop Valve with Tapers | |
| Stormwater Channel | | Closed Stop Valve | |
| Stormwater Gully | | Air Valve | |
| Stormwater Maintenance Hole | | Valve | |
| | | Scour | |
| | | Reducer / Taper | |
| | | Vertical Bends | |
| | | Reservoir | |
| | | Recycled Water is shown as per Potable above. Colour as indicated | |
| Private Mains | | Potable Water Main | |
| | | Recycled Water Main | |
| | | Sewer Main | |
| | | Symbols for Private Mains shown grey | |

Pipe types

| | | | |
|----------------|------------------------------------|----------------|-------------------------------------|
| ABS | Acrylonitrile Butadiene Styrene | AC | Asbestos Cement |
| BRICK | Brick | CI | Cast Iron |
| CICL | Cast Iron Cement Lined | CONC | Concrete |
| COPPER | Copper | DI | Ductile Iron |
| DICL | Ductile Iron Cement (mortar) Lined | DIPL | Ductile Iron Polymeric Lined |
| EW | Earthenware | FIBG | Fibreglass |
| FL BAR | Forged Locking Bar | GI | Galvanised Iron |
| GRP | Glass Reinforced Plastics | HDPE | High Density Polyethylene |
| MS | Mild Steel | MSCL | Mild Steel Cement Lined |
| PE | Polyethylene | PC | Polymer Concrete |
| PP | Polypropylene | PVC | Polyvinylchloride |
| PVC - M | Polyvinylchloride, Modified | PVC - O | Polyvinylchloride, Oriented |
| PVC - U | Polyvinylchloride, Unplasticised | RC | Reinforced Concrete |
| RC-PL | Reinforced Concrete Plastics Lined | S | Steel |
| SCL | Steel Cement (mortar) Lined | SCL IBL | Steel Cement Lined Internal Bitumen |
| SGW | Salt Glazed Ware | SPL | Steel Polymeric Lined |
| SS | Stainless Steel | STONE | Stone |
| VC | Vitrified Clay | WI | Wrought Iron |
| WS | Woodstave | | |

In an emergency, or to notify Sydney Water of damage or threats to its structures, call 13 20 90 (24 hours, 7 days)

Further information and guidance is available in the 'Plumbing, building and developing' section of Sydney Water's website at www.sydneywater.com.au, where you will find the following under 'Before You Dig':

- Essential references
 - Avoid Damaging Water and Sewer Pipelines
 - Important Information about Before You Dig
 - Technical guidelines: Building over and adjacent to pipe assets
- See Also
 - Building over or next to assets, section of Sydney Water's website at www.sydneywater.com.au

Or call **13 20 92** for Customer Enquiries.

Note: The lodging of enquiries via www.byda.com.au will enable you to receive, via email, colour plans in PDF format 24 hours a day, 7 days a week.

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APPENDIX D AS3959 2018 - BAL-FZ CONSTRUCTION REQUIREMENTS

SECTION 9 CONSTRUCTION REQUIREMENTS FOR BAL—FZ

9.1 GENERAL

A building assessed in Section 2 as being BAL—FZ shall conform with Section 3 and Clauses 9.2 to 9.8 and have a minimum setback distance of 10 m from the edge of the classified vegetation.

In circumstances where the 10 m setback distance between the building and the edge of the classified vegetation cannot be achieved, those elements of the building that are less than 10 m from the edge of the classified vegetation shall conform with AS 1530.8.2.

The details for roof systems specified in Appendix H are the result of testing to AS 1530.8.2 and are deemed to satisfy solutions for the purpose of this Standard.

Any element of construction or system that satisfies the test criteria of AS 1530.8.2 may be used in lieu of the applicable requirements contained in Clauses 9.2 to 9.8.

NOTES:

- 1 BAL—FZ is primarily concerned with protection from flame contact together with ember attack and radiant heat of more than 40 kW/m².
- 2 Construction in BAL—FZ may require reliance on measures other than construction. The requirements for construction of a building BAL—FZ may be regulated by the building authorities having jurisdiction in the States and Territories of Australia.

9.2 SUB-FLOOR SUPPORTS

This Standard does not provide construction requirements for subfloor supports where the subfloor space is enclosed with a wall that conforms with Clause 9.4.

Where the subfloor space is unenclosed, systems, including support posts, columns, stumps, piers and poles, shall—

- (a) have an FRL of at least 30/—/— and shall be non-combustible; or
- (b) be a system conforming with AS 1530.8.2; or
- (c) be a combination of Items (a) and (b).

NOTE: This requirement applies to the subject building only and not to verandas, decks, steps, ramps and landings (see Clause 9.7).

C9.2 *Combustible materials stored in the subfloor space may be ignited by embers and impact the building.*

9.3 FLOORS

9.3.1 General

This Standard does not provide construction requirements for concrete slabs on the ground.

9.3.2 Elevated floors

9.3.2.1 Enclosed subfloor space

This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with a wall that conforms with Clause 9.4.

| |
|---------------|
| BAL—FZ |
|---------------|

9.3.2.2 Unenclosed subfloor space

Where the subfloor space is unenclosed, the floor system, including bearers, joist and flooring, shall—

- (a) have an FRL of at least 30/30/30 and the surface material shall be non-combustible; or
- (b) have the underside of the combustible elements of the floor system protected with a 30 min resistance to incipient spread of fire system; or
- (c) conform with AS 1530.8.2 when tested from the underside; or
- (d) be a combination of any of Items (a), (b) or (c).

9.4 WALLS**9.4.1 General**

The exposed components of external walls shall be as follows:

- (a) Non-combustible material including the following provided the minimum thickness is 90 mm:
 - (i) Full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone.
 - (ii) Precast or in situ walls of concrete or aerated concrete.
 - (iii) Earth wall including mud brick.or
- (b) A system conforming with AS 1530.8.2 when tested from the outside.
or
- (c) A system with an FRL of 30/30/30 or –/30/30 when tested from the outside.
or
- (d) A combination of any of Items (a), (b) or (c).

9.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed.

9.4.3 Vents and weepholes

Except for exclusions provided in Clause 3.6, vents and weepholes in external walls shall be screened with a mesh made of corrosion-resistant steel or bronze.

9.5 EXTERNAL GLAZED ELEMENTS, ASSEMBLIES AND DOORS**9.5.1 Bushfire shutters**

Where fitted, bushfire shutters shall conform with—

- (a) Clause 3.7, except that perforations are not acceptable over the door system; and
- (b) AS 1530.8.2 when tested from the outside.

BAL—FZ**9.5.2 Screens for windows and doors**

Where fitted, screens for windows and doors shall have a mesh or perforated sheet made of corrosion-resistant steel or bronze.

The frame supporting the mesh or perforated sheet shall be metal.

Screen assemblies shall be attached using metal fixings.

9.5.3 Windows and sidelights

Window assemblies shall—

- (a) be completely protected by a bushfire shutter that conforms with Clause 3.7 and Clause 9.5.1; or
- (b) the openable portion of the window shall be screened internally or externally with a screen that conforms with Clause 3.6 and Clause 9.5.2; and either—
 - (i) the window system shall have an FRL of at least $-/30/-$; or
 - (ii) the window system shall conform with AS 1530.8.2 when tested from the outside.

9.5.4 Doors—Side-hung external doors (including French doors, panel fold and bi-fold doors)

Side-hung external doors, including French doors, panel fold and bi-fold doors, shall—

- (a) be completely protected by bushfire shutters that conform with Clause 3.7 and Clause 9.5.1.
- or*
- (b) conform with the following:
 - (i) All door systems, including door frames and doors with glazed panels, shall—
 - (A) have an FRL of at least $-/30/-$; or
 - (B) conform with AS 1530.8.2 when tested from the outside.
 - (ii) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable.
 - (iii) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.
 - (iv) Seals shall not compromise the FRL or the performance achieved in AS 1530.4.

9.5.5 Doors—Sliding doors

Sliding doors shall—

- (a) be completely protected by a bushfire shutter that conforms with Clause 3.7 and Clause 9.5.1;
- or*
- (b) conform with the following:
 - (i) All sliding door systems, including those with glazed panels, shall—
 - (A) have an FRL of at least $-/30/-$; or
 - (B) conform with AS 1530.8.2 when tested from the outside.
 - (ii) Sliding doors shall be tight-fitting in the frames.

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| BAL—FZ |
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9.5.6 Doors—Vehicle access doors (garage doors)

The following applies to vehicle access doors:

- (a) Vehicle access doors shall be non-combustible.
- (b) Where the garage is attached to the building, the requirements of Clause 3.2.2(b) shall apply.
- (c) All vehicle access doors shall be protected with suitable weather strips, draught excluders, draught seals or brushes. Door assemblies fitted with guide tracks do not need edge gap protection.

NOTES:

- 1 Refer to AS/NZS 4505 for door types.
- 2 Gaps of door edges or building elements should be protected as per Section 3.

C9.5.6(c) *These guide tracks do not provide a direct passage for embers into the building.*

- (d) Weather strips, draught excluders, draught seals or brushes to protect edge gaps or thresholds shall be manufactured from materials having a flammability index not exceeding 5.
- (e) Vehicle access doors shall not include ventilation slots.

9.6 ROOFS (INCLUDING PENETRATIONS, EAVES, FASCIAS AND GABLES, AND GUTTERS AND DOWNPIPES)**9.6.1 General**

The following applies to all types of roofs and roofing systems:

- (a) The roof/wall and roof/roof junction shall be sealed either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and between the rafters at the line of the wall. They shall also be protected in accordance with Clause 3.6.
- (b) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet conforming with Clause 3.6 and made of corrosion-resistant steel or bronze.
- (c) Roof-mounted evaporative coolers are not permitted in BAL—FZ.

Appendix H provides two generic systems for skillion, hipped and gabled roofs which are deemed to satisfy Clause 9.6 (BAL—FZ).

9.6.2 Tiled roofs

Tiled roofs shall conform with—

- (a) Appendix H; or
- (b) a system tested to AS 1530.8.2.

9.6.3 Sheet roofs

Sheet roofs shall conform with—

- (a) Appendix H; or
- (b) a system tested to AS 1530.8.2.

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| BAL—FZ |
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9.6.4 Veranda, carport and awning roof

The following applies to veranda, carport and awning roofs:

- (a) A veranda, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clause 9.6.1, 9.6.2, 9.6.3, 9.6.5 and 9.6.6.
- (b) A veranda, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c), Appendix D] conforming with Clause 9.4 shall have a non-combustible roof covering and the complete support structure shall be—
 - (i) of non-combustible material; or
 - (ii) timber rafters lined on the underside with fibre-cement sheet a minimum of 6 mm in thickness, or with material conforming with AS 1530.8.2; or
 - (iii) a system conforming with AS 1530.8.2; or
 - (iv) a combination of any of Items (i), (ii) or (iii).

9.6.5 Roof penetrations

The following applies to roof penetrations:

- (a) Roof penetrations, including arials, vent pipes and supports for solar collectors or the like, shall be sealed with mineral fibre at the roof to prevent gaps. The material used to seal the penetration shall be non-combustible.
 NOTE: As a general principle, the service penetration should not significantly compromise the performance of the element of construction it penetrates nor should it be a means to allow the passage of burning embers or heat transfer such that fire could spread to the interior of a structure.
- (b) Roof lights and roof ventilators shall be systems conforming with AS 1530.8.2 when tested from the outside with one of the deemed to satisfy roof systems described in Appendix H.
- (c) Pipe or conduit that penetrates the roof covering shall conform with AS 1530.8.2.

9.6.6 Eaves linings, fascias and gables

The following applies to eaves linings, fascias and gables:

- (a) Gables shall conform with Clause 9.4.
- (b) Fascias and bargeboards shall conform with AS 1530.8.2.
- (c) Eaves linings shall be—
 - (i) a system with an FRL of –/30/30; or
 - (ii) a system conforming with AS 1530.8.2; or
 - (iii) a combination of Items (i) and (ii).
- (d) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 9.6.5.
- (e) Eaves ventilation openings shall be fitted with ember guards in accordance with Clause 3.6 made of corrosion-resistant steel or bronze.
- (f) Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds.

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| BAL—FZ |
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9.6.7 Gutters and downpipes

This Standard does not provide requirements for downpipes.

If installed, gutter and valley leaf guards shall be non-combustible.

Gutters shall be non-combustible.

Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible materials.

9.7 VERANDAS, DECKS, STEPS AND LANDINGS**9.7.1 General**

Decking shall not be spaced.

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.

9.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings**9.7.2.1 *Materials to enclose a subfloor space***

The subfloor spaces of verandas, decks, steps, ramps and landings are deemed to be 'enclosed' when—

- (a) the material used to enclose the subfloor space conforms with Clause 9.4; and
- (b) all openings are protected in accordance with Clause 3.6 and made of corrosion-resistant steel or bronze.

9.7.2.2 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

9.7.2.3 *Framing*

This Standard does not provide construction requirements for the framing of verandas, pergolas, decks, ramps or landings (i.e. bearers and joists).

9.7.2.4 *Decking, stair treads and the trafficable surfaces of ramps and landings*

Decking, stair treads and the trafficable surfaces of ramps and landings shall be—

- (a) of non-combustible material; or
- (b) of fibre-cement sheet; or
- (c) a system conforming with AS 1530.8.2; or
- (d) a combination of any of Items (a), (b) or (c).

9.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings**9.7.3.1 *Supports***

Support posts, columns, stumps, stringers, piers and poles shall be—

- (a) of non-combustible material; or
- (b) a system conforming with AS 1530.8.2; or
- (c) a combination of Items (a) and (b).

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| BAL—FZ |
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9.7.3.2 Framing

Framing of verandas, decks, ramps or landings (i.e. bearers and joists) shall be—

- (a) of non-combustible material; or
- (b) a system conforming with AS 1530.8.2; or
- (c) a combination of Items (a) and (b).

9.7.3.3 Decking, stair treads and the trafficable surfaces of ramps and landings

Decking, stair treads and the trafficable surfaces of ramps and landings shall be—

- (a) of non-combustible material; or
- (b) fibre-cement sheet; or
- (c) a system conforming with AS 1530.8.2; or
- (d) a combination of Items (a), (b) or (c).

9.7.4 Balustrades, handrails or other barriers

Those parts of the handrails and balustrades less than 125 mm from any glazing shall be of non-combustible material.

Those parts of the handrails and balustrades that are 125 mm or more from the building have no requirements.

9.7.5 Veranda posts

Veranda posts shall be made from non-combustible material.

9.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water supply pipes shall be metal.

External gas pipes and fittings above ground shall be of steel or copper construction having a minimum wall thickness in accordance with gas regulations or 0.9 mm whichever is the greater. The metal pipe shall extend a minimum of 400 mm within the building and 100 mm below ground.

NOTE: Refer to State and Territory gas regulations, AS/NZS 5601.1 and AS/NZS 4645.1.

C12.5 *Concern is raised for the protection of bottled gas installations. Location, shielding and venting of the gas bottles needs to be considered.*