

Bushfire Threat Assessment

For Proposed Dwellings
Within Stage 20
At
Northlakes Estate

Prepared for
Northlakes Pty Ltd

Job Reference 24446 - July 2007



HARPER
SOMERS
O'SULLIVAN

PLANNING ▶ SURVEYING ▶ ECOLOGY

A member of **RPS** Group Plc



HARPER
SOMERS
O'SULLIVAN

PLANNING > SURVEYING > ECOLOGY

A member of **RPS** Group Plc

PREPARED BY:

Harper Somers O'Sullivan Pty Ltd
PO Box 428
Hamilton NSW 2303
Tel: (02) 4961 6500
Fax: (02) 4961 6794
Web: www.hso.com.au

| | |
|---|---------------------------|
| <i>PROJECT: CONSTRUCTION LEVELS AS3959-1999, STAGE 20 NORTH LAKES ESTATE.</i> | |
| <i>CLIENT:</i> | <i>NORTH LAKES ESTATE</i> |
| <i>OUR REF.</i> | <i>24446</i> |
| <i>DATE:</i> | <i>JULY 2007</i> |
| <i>APPROVED BY:</i> | <i>EMMA GRAHAM</i> |
| <i>SIGNATURE:</i> | |
| <i>CHECKED BY:</i> | <i>SARAH JONES</i> |
| <i>SIGNATURE:</i> | |

CONTENTS

| | | |
|----------|---|-----------|
| 1 | INTRODUCTION | 1 |
| 2 | METHODOLOGY | 1 |
| 3 | VEGETATION AND SLOPE ASSESSMENT | 1 |
| 4 | DESIGN AND CONSTRUCTION STANDARDS | 2 |
| 5 | WATER SUPPLY | 21 |
| 6 | INGRESS / EGRESS AND PROPERTY ACCESS ROADS | 21 |
| 7 | LANDSCAPING AND MAINTENANCE | 21 |
| 8 | REFERENCES | 22 |

LIST OF FIGURES

| | | |
|-----------------|---|-----------|
| Figure 1 | Construction Level Map (Current Situation) | 10 |
| Figure 2 | Construction Level Map (Future Situation) | 20 |

List of Tables

| | | |
|----------------|---|-----------|
| Table 1 | Recommended Construction Standards for proposed dwellings within Stage 20 based on the current situation and an FDI of 100.2 | |
| Table 2 | Recommended Construction Standards for proposed dwellings within Stage 20 based on future development occurring to the north of the site (Stage 21). | 11 |

Appendices

| | | |
|--------------------|------------------------------|------------|
| APPENDIX A: | BUILDING REQUIREMENTS | A-1 |
|--------------------|------------------------------|------------|

1 INTRODUCTION

RPS - Harper Somers O'Sullivan (RPS - HSO) has been engaged by North Lakes Pty Ltd to undertake an assessment to determine the required level of construction from section 3 of Australian Standard 3959 – 1999 (AS3959) that applies to future dwelling within Stage 20 of the Northlakes Estate, hereafter referred to as the 'site'.

This report is suitable for submission with a Development Application for a dwelling under Section 79BA of the *Environmental Planning and Assessment Act 1979* and provides information on measures that will enable the development to comply with 'Planning for Bushfire Protection' (NSW RFS, 2006) (hereafter referred to as 'PBP').

The required level of construction for future dwellings within the site has been based on two situations. These being;

1. If proposed dwellings are built with the current established Asset Protection Zones.
2. If proposed dwellings are built in the future after subsequent development has occurred to the north.

To determine the required levels of construction, this assessment adheres to the methodology and procedures outlined in Appendix 3 – 'Site Bush Fire Attack Assessment' in *Planning for Bushfire Protection* (RFS, 2006) (now referred to in this report as PBP 2006).

2 METHODOLOGY

To determine the required level of construction for future dwellings the following steps were undertaken:

- Identification of all vegetation types within 140m of the site using Keith (2004).
- The distance of each vegetation formation identified and the allotments.
- Determine the effective slope for each vegetation group.
- Determine the relevant Forest Danger Index (FDI).
- Match the relevant FDI, appropriate vegetation, distance and effective slope to determine the applicable bushfire attack to the site.
- Determine the appropriate level of construction.

3 VEGETATION AND SLOPE ASSESSMENT

To the north of the site Open Forest occurs upslope from the allotments. To the east of the site Open Forest occurs either cross-slope or upslope from the allotments. To the south of the site Open Forest occurs downslope from the allotments on a slope of 0 – 5 degrees. To the west of the site Open Forest occurs on a cross slope.

Site plans indicate that a 40 - 60m temporary Inner Protection Area has been established to the north of the allotments. In future, this area will accommodate Stage 21 of Northlakes Estate and therefore will undergo residential development. A 40m Inner Protection Area has been established to the south and east of the allotments.

4 DESIGN AND CONSTRUCTION STANDARDS

Using the information relating to vegetation, slope, FDI (100) and then according to Table A3.3 PBP 2006 Table 1 and Figure 1 illustrates the required construction standards for future dwellings within Stage 20 based on the current situation. Table 2 and Figure 2 illustrate the required construction standards for future dwellings once future development occurs to the north of the site.

Table 1 - Recommended Construction Standards for proposed dwellings within Stage 20 based on the current situation and an FDI of 100.

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------------|---|
| Lot 2001 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 34 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 34 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2002 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 34 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 34 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2003 | Open Forest (to the south) | Downslope (0– 5 degrees) | 49 -100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|--|
| Lot 2004 | Open Forest (to the south) | Downslope (0– 5 degrees) | 49 -100m | Medium | Level 1 AS3959-1999 |
| Lot 2005 | Open Forest (to the north) | Downslope (0– 5 degrees) | 49 -100m | Medium | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Upslope | 40-100m | Medium | |
| Lot 2006 | Open Forest (to the north) | Upslope | 40-100 | Medium | Level 1 AS3959-1999 |
| Lot 2007 | Open Forest (to the north) | Upslope | 40 -100m | Medium | Level 1 AS3959-1999 |
| Lot 2008 | Open Forest (to the north) | Upslope | 40 - 100m | Medium | Level 1 AS3959-1999 |
| Lot 2009 | Open Forest (to the north) | Upslope | 40 - 100m | Medium | Level 1 AS3959-1999 |
| Lot 2010 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2011 | Open Forest (to the north) | Upslope | 40 -100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|---|
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49– 100m | Medium | |
| Lot 2012 | Open Forest (to the north) | Upslope | 40-100m | Medium | Level 1 AS3959-1999 |
| Lot 2013 | Open Forest (to the north) | Upslope | 40-100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2014 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2015 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2016 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2017 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|---|
| Lot 2018 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the east) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2019 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the dwelling built within 36-49m will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the east) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2020 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 36 - 49m 49 – 100m | High Medium | That part of the dwelling built within 25-36m from the Open Forest will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2021 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-------------------|--|--|---|------------------------------------|--|
| Lot 2022 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2023 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2024 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2025 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2026 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2027 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|-----------------------------------|
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2028 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2029 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2030 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2031 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Upslope | 40 – 100m | Medium | |
| | Open Forest (to the south) | Cross-slope | 49 – 100m | Medium | |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|------------|---------------------------------------|---|--|-----------------------------|--|
| Lot 2032 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Cross-slope | 40 –100m | Medium | |
| Lot 2033 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Cross-slope | 40 – 100m | Medium | |
| Lot 2034 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Cross-slope | 40 –100m | Medium | |
| Lot 2035 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | That part of the dwelling built within 29 – 40m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Cross-slope | 29 - 40m 40 – 100m | High Medium | |
| | Open Forest (to the south) | Cross-slope | 29 - 40m 40 –100m | High Medium | |
| | Open Forest (to the south) | Cross-slope | 29 – 40m 40 – 100m | High Medium | |

To Note: Where a dwelling elevation (façade) is not facing any source of bush fire attack, that elevation can be classified to the next lower level of construction from that determined for the dwelling as a whole. The level cannot fall to less than Level 1 construction where any part of the building is closer than 100m of the source of bush fire attack (unless provided for). An elevation is exposed if there is a direct line of sight from any part of that elevation to the source of bush fire attack. Refer to Figure 1 for Construction Level Map. Refer to Appendix A for Building Requirements.

Finally, it is believed that the implementation of the measures and recommendations forwarded within this report would contribute to the amelioration of the potential impact of any bushfire upon this site, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

WARNING






Note that this Construction Level Map depicts clearly defined boundaries between vegetation communities that are a product of individual interpretation and are not distinguished by clearly defined boundaries 'on the ground'.

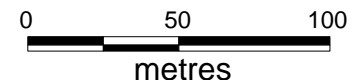
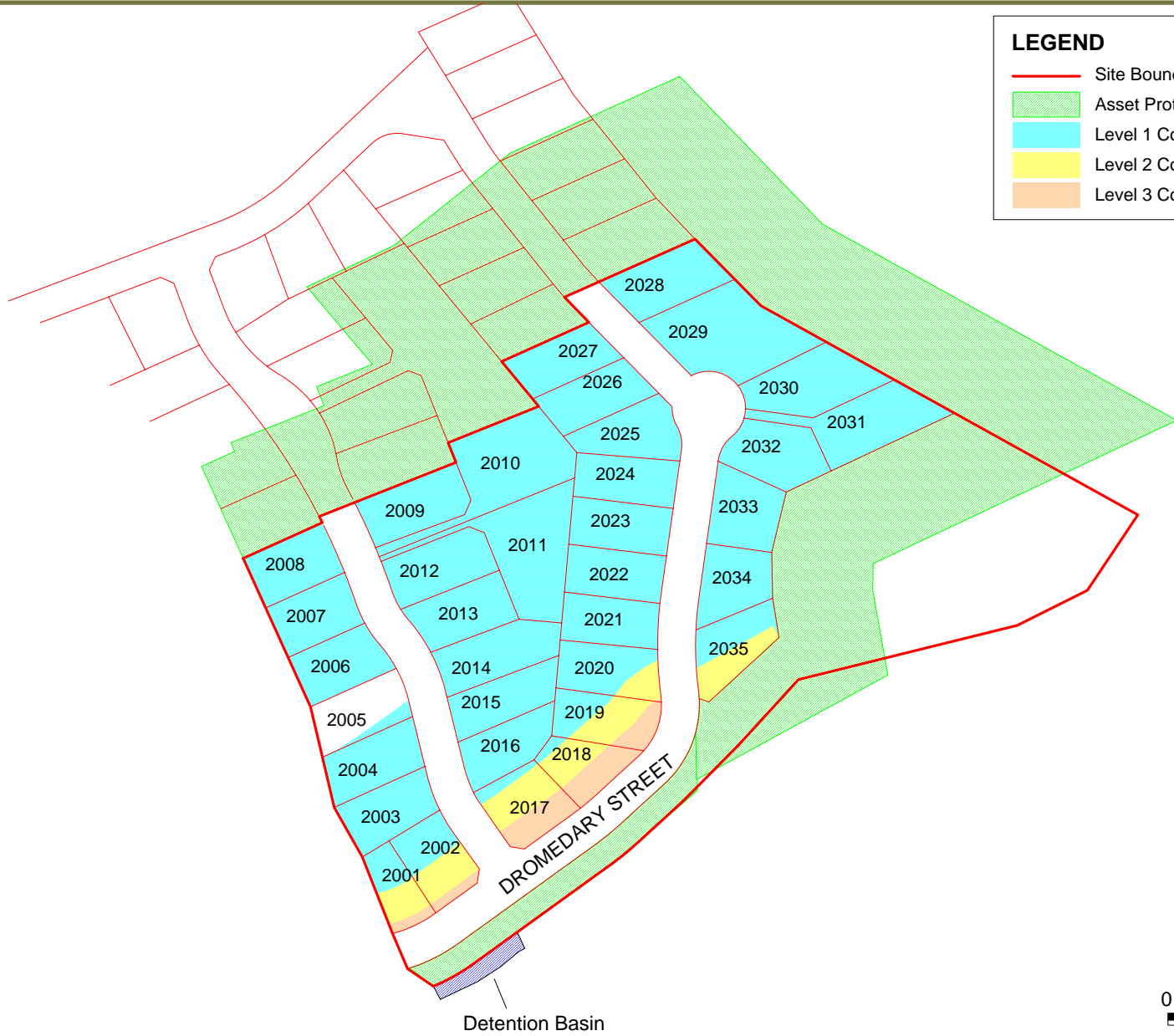
Therefore this map should only be treated as an indication of approximate peripheries between delineated vegetation communities.

Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore no account for intergrading areas between delineated vegetation communities has been made.

Final bushfire setbacks subject to accurate ground survey which should be undertaken at the design stage.

LEGEND

-  Site Boundary
-  Asset Protection Zone
-  Level 1 Construction Level AS3959-1999
-  Level 2 Construction Level AS3959-1999
-  Level 3 Construction Level AS3959-1999



TITLE:
 Stage 20 Northlakes Estate
 Construction Levels
 Current Situation

CLIENT:
 North Lakes Pty Ltd



PLANNING SURVEYING ECOLOGY

Copyright
 This document & the information shown shall remain the property of Harper Somers O'Sullivan Pty Ltd. The document may only be used for the purpose for which it was supplied and in accordance with the terms of engagement for the commission. Unauthorised use of this document in any way is prohibited.

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
 T: 02 4961 6500 F: 02 4961 6794 E: survey@hso.com.au W: www.hso.com.au ABN 11 093 343 858

SCALE: 1: 2500 at A4 Size
DRAWN: E. Graham
APPROVED:
DATUM: MGA Zone 56 (GDA 94) **DATE:** 17/8/2007
LAYOUT REF: J:\JOBS\241\24446 - Northlakes\GPS\24446_ConstLvlA-A4_310707.wor
CONTOUR INTERVAL: N/A
JOB REF: 24446

Table 2 - Recommended Construction Standards for proposed dwellings within Stage 20 based on future development occurring to the north of the site (Stage 21).

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------------|---|
| Lot 2001 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 34 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 34 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2002 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 34 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 34 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2003 | Open Forest (to the south) | Downslope (0– 5 degrees) | 49 -100m | Medium | Level 1 AS3959-1999 |
| Lot 2004 | Open Forest (to the south) | Downslope (0– 5 degrees) | 49 -100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|------------|---------------------------------------|---|--|-----------------------------|--|
| Lot 2005 | Open Forest (to the north) | Downslope (0– 5 degrees) | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0– 5 degrees) | 49 -100m | Medium | |
| Lot 2006 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2007 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2008 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2009 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2010 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2011 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49– 100m | Medium | |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|------------|---------------------------------------|---|--|-----------------------------|--|
| Lot 2012 | Open Forest (to the north) | Upslope | > 100m | Low | No Construction Level Requirement |
| Lot 2013 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2014 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| Lot 2015 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2016 | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------------|---|
| Lot 2017 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2018 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the building within 36-49m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the east) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2019 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the dwelling built within 36-49m will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the east) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|------------|---------------------------------------|---|--|-----------------------------------|---|
| Lot 2020 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 25 - 36m 36 - 49m 49 – 100m | Extreme High Medium | That part of the dwelling built within 25 – 36m from the Open Forest to the south will need to be built to a Level 3 AS3959 ; that part of the dwelling built within 36-49m will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| Lot 2021 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | Level 1 AS3959-1999 |
| Lot 2022 | Open Forest (to the north) | Upslope | >100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | |
| Lot 2023 | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| Lot 2024 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|--|
| | Open Forest (to the south) | Downslope (0 – 5 degrees) | 49 – 100m | Medium | Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| Lot 2025 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2026 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the south will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Downslope (0-5 degrees) | 49 – 100m | Medium | |
| Lot 2027 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open Forest to the east will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2028 | Open Forest (to the north) | Upslope | > 100m | Low | That part of the dwelling built within 49 – 100m from the Open |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|--|
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | Forest to the east will need to be built to a Level 1 AS3959 and no construction level would apply to the remaining part of the dwelling. |
| Lot 2029 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2030 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Cross-slope | 40 – 100m | Medium | |
| Lot 2031 | Open Forest (to the north) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the east) | Upslope | 40 – 100m | Medium | |
| | Open Forest (to the south) | Cross-slope | 49 – 100m | Medium | |
| Lot 2032 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |

| Lot Number | Vegetation Type / direction from site | Average Slope of Land (degrees) where vegetation occurs | Separation Distance of vegetation from proposed dwelling | Category of Bushfire Attack | Recommended Construction Standard |
|-----------------|---------------------------------------|---|--|-----------------------------|--|
| | Open Forest (to the south) | Cross-slope | 40 –100m | Medium | |
| Lot 2033 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Cross-slope | 40 – 100m | Medium | |
| Lot 2034 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | Level 1 AS3959-1999 |
| | Open Forest (to the south) | Cross-slope | 40 –100m | Medium | |
| Lot 2035 | Open Forest (to the east) | Upslope | 40 – 100m | Medium | That part of the dwelling built within 29 – 40m from the Open Forest to the south will need to be built to a Level 2 AS3959 and a Level 1 AS3959-1999 would apply to the remaining part of the dwelling. |
| | Open Forest (to the south) | Cross-slope | 29 - 40m 40 – 100m | High Medium | |
| | Open Forest (to the south) | Cross-slope | 29 - 40m 40 –100m | High Medium | |
| | Open Forest (to the south) | Cross-slope | 29 – 40m 40 – 100m | High Medium | |

Refer to Figure 2 for Construction Level Map based on further development being undertaken in Stage 21 to the north of the site.

To Note: Where a dwelling elevation (façade) is not facing any source of bush fire attack, that elevation can be classified to the next lower level of construction from that determined for the dwelling as a whole. The level cannot fall to less than Level 1 construction where any part of the building is closer than 100m of the source of bush fire attack (unless provided for). An elevation is exposed if there is a direct line of sight from any part of that elevation to the source of bush fire attack. Refer to Figure 1 for Construction Level Map. Refer to Appendix A for Building Requirements.

Finally, it is believed that the implementation of the measures and recommendations forwarded within this report would contribute to the amelioration of the potential impact of any bushfire upon this site, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

WARNING

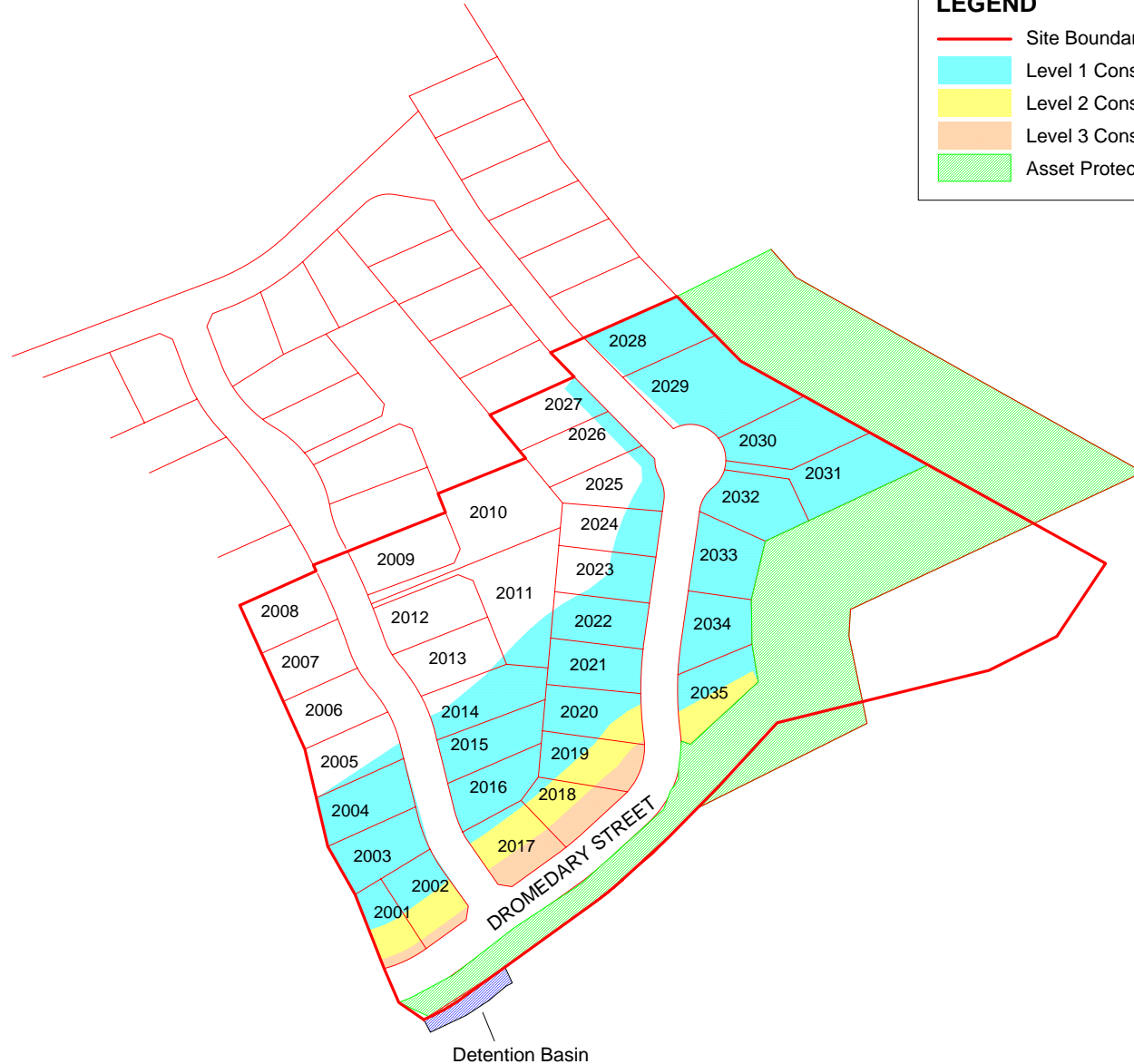
Note that this Construction Level Map depicts clearly defined boundaries between vegetation communities that are a product of individual interpretation and are not distinguished by clearly defined boundaries 'on the ground'. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities.

Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

Final bushfire setbacks subject to accurate ground survey which should be undertaken at the design stage.

LEGEND

- Site Boundary
- Level 1 Construction Level AS3959-1999
- Level 2 Construction Level AS3959-1999
- Level 3 Construction Level AS3959-1999
- Asset Protection Zones



TITLE:

Stage 20 Northlakes Estate
Construction Levels
Following development
of Stage 21

CLIENT:

North Lakes Pty Ltd



**HARPER
SOMERS
O'SULLIVAN**

SCALE: 1: 2500 at A4 Size

DRAWN: E.Graham

APPROVED:

DATUM: MGA Zone 56 (GDA 94) **DATE:** 17/8/2007

LAYOUT REF: J:\JOB\24446 - Northlakes\GPS\24446_ConstL_LevelA-A4_310707.wor

CONTOUR INTERVAL: N/A

JOB REF: 24446

PLANNING SURVEYING ECOLOGY

Copyright
This document & the information shown shall remain the property of Harper Somers O'Sullivan Pty Ltd. The document may only be used for the purpose for which it was supplied and in accordance with the terms of engagement for the commission. Unauthorised use of this document in any way is prohibited.

241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4961 6500 F: 02 4961 6794 E: survey@hso.com.au W: www.hso.com.au ABN 11 093 343 858

5 WATER SUPPLY

The site is connected to reticulated water supply therefore water supply is adequate.

6 INGRESS / EGRESS AND PROPERTY ACCESS ROADS

Ingress and egress routes for residents and fire fighting crews to the proposed allotments are available from Dromedary Street, Shipley Street and Hooghly Avenue. These are all public roads and therefore access is considered to be suitable for fire-fighting purposes.

7 LANDSCAPING AND MAINTENANCE

In terms of landscaping and maintenance within the site, it is recommended that the following occur:

- Shrubs or ground covers not to be in contact with the dwelling.
- Fire retardant plants or plants of low flammability be used. Characteristics of these plants include high salt resistance and moisture content/low volatile oil content with the lowest branches being raised from the ground (such plants are commercially available).
- The owners are aware of the importance of an ongoing maintenance regime for bushfire protection.
- The remainder of the site should be managed as an Inner Protection Area (IPA).

8 REFERENCES

Department of Bush Fire Services (undated). *Bush Fire Readiness Checklist*.

NSW Fire Brigades (1988). *Hazard Reduction for the Protection of Buildings in Bushland Areas*. New South Wales Fire Brigades.

NSW Rural Fire Service (2004). *Guidelines for Single Dwelling Development Applications – Single Dwellings*. June 2004, NSW Government.

NSW Rural Fire Service (2006). *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. October 2006.

NSW Rural Fire Service (1997). *Bush Fire Protection for New and Existing Rural Properties*. September 1997, NSW Government.

NSW Rural Fire Service (2004). *Development Control Note 001 – Use of Fire Retardant Timber*. NSW Government.

Ramsay, G.C., and Dawkins, D. (1993). *Building in Bushfire-prone Areas – Information and Advice*. CSIRO and Standards Australia.

Specht, R. L. (1981). *Major Vegetation Formations in Australia*. In: *Ecological Biogeography of Australia*, Dr W. Junk Publishers, The Hague.

Standards Australia (1999). AS 3959 – 1999: *Construction of Buildings in Bushfire-prone Areas*.

APPENDIX A: BUILDING REQUIREMENTS

Appendix 4

BUILDING REQUIREMENTS FOR BUSH FIRE PROTECTION

(Incorporating key components of AS3959 Construction of Buildings in Bushfire-prone Areas)

| | LEVEL 1 CONSTRUCTION | LEVEL 2 CONSTRUCTION | LEVEL 3 CONSTRUCTION | FLAME ZONE <i>Note: Reference to additional site requirement will be necessary for this category. For example: water supply, access, shielded egress</i> |
|---|--|--|---|--|
| Flooring systems | <ul style="list-style-type: none"> Concrete slab on ground Enclosed suspended floors - no requirements Open subfloors; Bearer greater than 600mm above ground – no requirements Bearer less than 600mm above ground require either the floor frame to be protected by non-combustible sheets or timber floor frame to be fire retardant | As for level 1 | As for level 2 except that for open subfloors timber floor framing is required to be fire retardant | All floors are to be fully enclosed with a non-combustible material |
| Supporting posts, columns, stumps, piers and poles | <ul style="list-style-type: none"> Non-combustible Fire retardant treated timber treated up to 400mm above finished ground level Timber mounted on galvanised metal shoes that provide a clearance of 75mm above finished ground or paving | As for level 1 | As for level 2 except that timber in unenclosed floor spaces shall be fire retardant-treated to full height | <p>All floors are to be fully enclosed with non-combustible material</p> <p>All other posts on attached or adjacent structures shall be non-combustible</p> |
| External Walls | <p>Must have an external leaf with either one or a combination of:</p> <ul style="list-style-type: none"> Masonry, concrete, pise, rammed earth or stabilised earth A frame wall that incorporates either a sarking or insulation material immediately behind the cladding A wall of timber logs gauge planed and the space between the logs sealed to prevent burning debris and to allow for building movement <p>Combustible leaf or cladding must be greater than 400mm above finished ground</p> | As for level 1 except that: <ul style="list-style-type: none"> PVC cladding is not permitted External timber wall cladding shall be of fire retardant-treated timber | As for level 2 | <ul style="list-style-type: none"> External walls shall not include any combustible material Additional radiant heat protection such as non-combustible fencing or shielding and or a drenching water system |

| | | | | |
|--|---|---|--|---|
| <p>Windows <i>Note:</i> A vertical dormer window or clerestory is regarded as a normal window, not a rooflight</p> | <p>Openable windows shall be screened with mesh max. aperture 1.8mm that remains in place while the window is open;</p> <ul style="list-style-type: none"> • Aluminium • Bronze • Corrosion resistant steel | <p>As for level 1 except that aluminium shall not be used</p> <p>In addition, timber shall be fire retardant-treated timber except where protected by non-combustible shutters. Leadlight windows are to be protected by shutters</p> | <p>As for level 2, except that where windows are not protected by non-combustible shutters they shall be glazed with toughened glass</p> | <p>As for level 3 except that non-combustible shutters or windows constructed to withstand 40kw/m² radiant heat exposure for 3 minutes shall be provided on the elevation exposed directly to the hazardous vegetation</p> |
| <p>External Doors</p> | <p>External doors shall be fitted with;</p> <ul style="list-style-type: none"> • Draught excluders, and • Tight fitting door screens fitted with; <ul style="list-style-type: none"> - Aluminium - Bronze - Corrosion resistant steel | <p>As for level 1 except that aluminium shall not be used</p> <p>If leadlight glazing panels are incorporated in the doors, they shall be protected by shutters constructed of a non-combustible material or of toughened glass</p> | <p>As for level 2, except that;</p> <ul style="list-style-type: none"> • Timber doors shall be fire retardant treated timber or covered in a non-combustible covering <p>OR protected with non-combustible shutters</p> <p>OR shall be solid core having a thickness of not less than 35mm</p> <ul style="list-style-type: none"> • Sliding glass doors may be treated as for windows • If glazing panels are incorporated they shall be of toughened glass | <p>As for level 3 except that non-combustible shutters or glazing constructed to withstand 40kw/m² radiant heat exposure for 3 minutes shall be provided on the elevation exposed directly to the hazardous vegetation</p> |

| LEVEL 1 CONSTRUCTION | | LEVEL 2 CONSTRUCTION | LEVEL 3 CONSTRUCTION | FLAME ZONE Note: Reference to additional site requirement will be necessary for this category. For example: water supply, access, shielded egress |
|--|---|--|---|--|
| Vents and Weepholes | Vents and weepholes shall be protected with spark guards made from 1.8mm mesh that is either; <ul style="list-style-type: none"> Aluminium Bronze Corrosion resistant steel | As for level 1 except that aluminium shall not be used | As for level 1 except that aluminium shall not be used | As for level 3 |
| Roofs | Sheeted roofs—Only metal or fibre-cement sheet shall be used. Gaps to be sealed or protected by; <ul style="list-style-type: none"> Fully sarking the roof with sarking with a flammability index of not more than 5 or Providing corrosion resistant steel or bronze mesh, profiled metal sheet, neoprene seal, compressed mineral wool or similar material Rib caps and ridge caps shall be sealed using methods outlined in the AS3959 Tiled roofs shall be provided with sarking Shingles and shakes shall not be used All roofing shall be non-combustible | As for level 1 construction except that all roof sheeting shall be non-combustible and sarked | As for level 2 construction except that fibre-reinforced cement or aluminium shall not be used. | As for level 3 |
| Roof lights Note: A vertical dormer window or clerestory window is regarded as a normal window, not a rooflight | All penetrations of the roof space for the installation of roof lights and associated shafts shall be sealed with a non-combustible sleeve or lining Thermoplastic sheet in a metal frame may be used for a roof light, but in a diffuser installed at ceiling level shall be wired or toughened glass in a metal frame. Vented rooflights shall be provided with corrosion resistant steel or bronze mesh. | As for level 1 except that rooflight glazing shall be of wired glass Thermoplastic or toughened glazing shall not be used | As for level 2 | As for level 2 except that glazing shall be required to withstand 40kw/m ² radiant heat exposure for 3 minutes |

| | As for level 1 | As for level 2 | As for level 3 except that roof ventilators shall not be permitted on the plane of the roof nearest to the unmanaged vegetation |
|---|--|---|---|
| Ventilators | All components must be non-combustible and shall be protected against the entry of sparks and embers with corrosion resistant steel or bronze mesh. | As for level 2 | As for level 3 except that roof ventilators shall not be permitted on the plane of the roof nearest to the unmanaged vegetation |
| Roof mounted evaporative cooling units | Roof mounted evaporative cooling units shall only be used if openings to the cooling unit are encased in corrosion resistant steel or bronze mesh | As for level 2 | As for level 3 except that roof mounted evaporative cooling units shall not be permitted on the plane of the roof nearest to hazardous vegetation |
| Eaves | Eaves shall be enclosed and the fascias or the gaps between the rafters shall be sealed | As for level 2 except that aluminium shall not be used | As for level 3 except that all materials shall be non-combustible |
| Fascias | No requirements | As for level 2 except that no fibre-reinforced cement or aluminium sheet shall be used. | As for level 3 except that all materials shall be non-combustible |
| Gutters and Downpipes | Any materials or devices used to stop leaves collecting in the gutters shall have a flammability index of not greater than 5 when tested in accordance with AS 1530.2 | As for level 2 | As for level 3 |
| Service Pipes (Water and Gas) | All exposed piping for water and gas supplies, shall be of metal. Pipes of other materials shall be buried to a depth of at least 300mm below finished ground level | As for level 2 | As for level 3 |

| | LEVEL 1 CONSTRUCTION | LEVEL 2 CONSTRUCTION | LEVEL 3 CONSTRUCTION | FLAME ZONE Note: Reference to additional site requirement will be necessary for this category. For example, water supply, access, shielded egress |
|--------------------|---|---|---|--|
| Verandas and Decks | <p>No timbers shall be allowed to directly connect with the remainder of the dwelling</p> <p>Slab SUSPENDED SLAB; supported by posts, columns, stumps, piers and poles that are protected by:</p> <ul style="list-style-type: none"> • Non-combustible material • Fire retardant treated timber treated up to 400mm above finished ground level • Timber mounted on galvanised metal shoes that provide a clearance of 75mm above finished ground or paving • OR Enclosed against the entry of embers. The enclosure shall be non-combustible within 400mm of the finished ground level <p>SHEET OR TONGUE AND GROOVE FLOOR; is acceptable where bearer is greater than 600mm above ground (see protection for supports above)</p> <p>A sheet or tongue and groove floor that is less than 600mm above finished ground at any point shall be enclosed. This enclosure shall be non-combustible where it is within 400mm of the finished ground level.</p> <p>SPACED DECKING: shall have a clearance of at least 5mm between adjacent timbers. The external perimeter of the decking shall not be enclosed nor shall access to the space beneath the decking be impeded. (see protection for supports above)</p> | As for level 1, except that if spaced decking is used, it shall be non-combustible or fire-retardant-treated timber | As for level 2 except that all materials shall be non-combustible or where timber is used, it shall be fire-retardant-treated including any balustrades | As for level 3 except all materials shall be non-combustible including treads risers, balustrade and any other attachments on the side of the dwelling exposed to the unmanaged vegetation |
| | | As for level 1, except that if spaced decking is used it shall be non-combustible or fire-retardant-treated timber | As for level 2 except that all materials shall be non-combustible or where timber is used, it shall be fire-retardant-treated including any balustrades | As for level 3 except all materials shall be non-combustible including treads risers, balustrade and any other attachments on the side of the dwelling exposed to the unmanaged vegetation |

source: Infill Development in Bush Fire Prone Areas, Blue Mountains City Council