

24 November 2021

Frasers Property Australia
Level 2, 1C Homebush Bay Drive
Rhodes NSW 2138
Attn: Esteban Insausti

Dear Esteban,

RE: APZ Assessment –Ed Square S75 MOD12

Frasers Property Australia engaged Peterson Bushfire to undertake an assessment of Asset Protection Zone (APZ) constraints related to a S75 modification (MOD 12) of the Town Centre NW portion of Ed Square.

The modification is seeking approval to amend the permissible building height and GFA of Town Centre NW to accommodate a future application for the development of a high school. The changes and development of a school will replace the approved residential use, which is proposed to be relocated to Stage 9 of Residential Precinct 3 further to the east.

This advice has been prepared to demonstrate that Town Centre NW can accommodate a school development and the required the Asset Protection Zone (APZ) from the bushfire hazard identified to the west of MacDonald Road.

The subject lot is mapped as 'bushfire prone land' and a school is defined as Special Fire Protection Purpose (SFPP) development. The school therefore is to comply with the required bushfire protection measures specified by NSW Rural Fire Service (RFS) document 'Planning for Bush Fire Protection 2019' (PBP), including the APZ building setback.

Eco Logical Australia (5th August 2021) recommend a 50 m APZ from the woodland vegetation on the western side of MacDonald Road. This APZ distance complies with the Acceptable Solution for SFPP developments adjacent woodland hazard situated on a slope class of 'downslope 0-5 degrees' as listed in Table A1.12.1 of PBP. The APZ has been measured from the western edge of the footpath that runs parallel to MacDonald Road.

There is also the option to utilise an alternate solution to determine the APZ dimension using the NBC Bushfire Attack Assessor by using specific vegetation slope rather than the PBP slope class of 'downslope 0-5 degrees'. The land underneath the woodland falls away gently to the west allowing a smaller APZ than 50 m based on modelling detailed slope transects. The document 'Comprehensive Vegetation Fuel Loads' (RFS 2019) is also relied upon in lieu of the Acceptable Solution fuel loads listed within PBP.

The alternate solution uses the NBC Bushfire Attack Assessor to demonstrate that the performance criteria for the determination of APZ for SFPP development is satisfied. The performance criteria in Table 6.8a of PBP is "*radiant heat levels of greater than 10 kw/m² (calculated at 1200K) will not be experience on any part of the building*".

Figure 1 (Attachment A) shows 12 slope transects identifying various slope assessments, including worst-case scenario, over the 100 m assessment area. Each transect shows the resulting downslope, and these range from 1.0 to 2.4 degrees for the most part, with an outlier of 3.5 degrees at the southern end. Using the NBC Bushfire Attack Assessor, these slopes result in an APZ of 43m for Town Centre NW as mapped on Figure 1. The model reports for each slope transect are included at Attachment B.

The APZ is to be measured from the western edge of the pathway alongside the western side of Macdonald Road as shown on Figure 1. This is the point whereby the land changes from 'managed land' to bushfire hazard.

The 16 m APZ to Town Centre SW remains applicable, and the APZ required to woodland to the east of Residential Precinct 3 Stage 9 is also 16 m. The adjoining managed lands will accommodate both APZs.

Please don't hesitate to get in touch should you seek clarification.

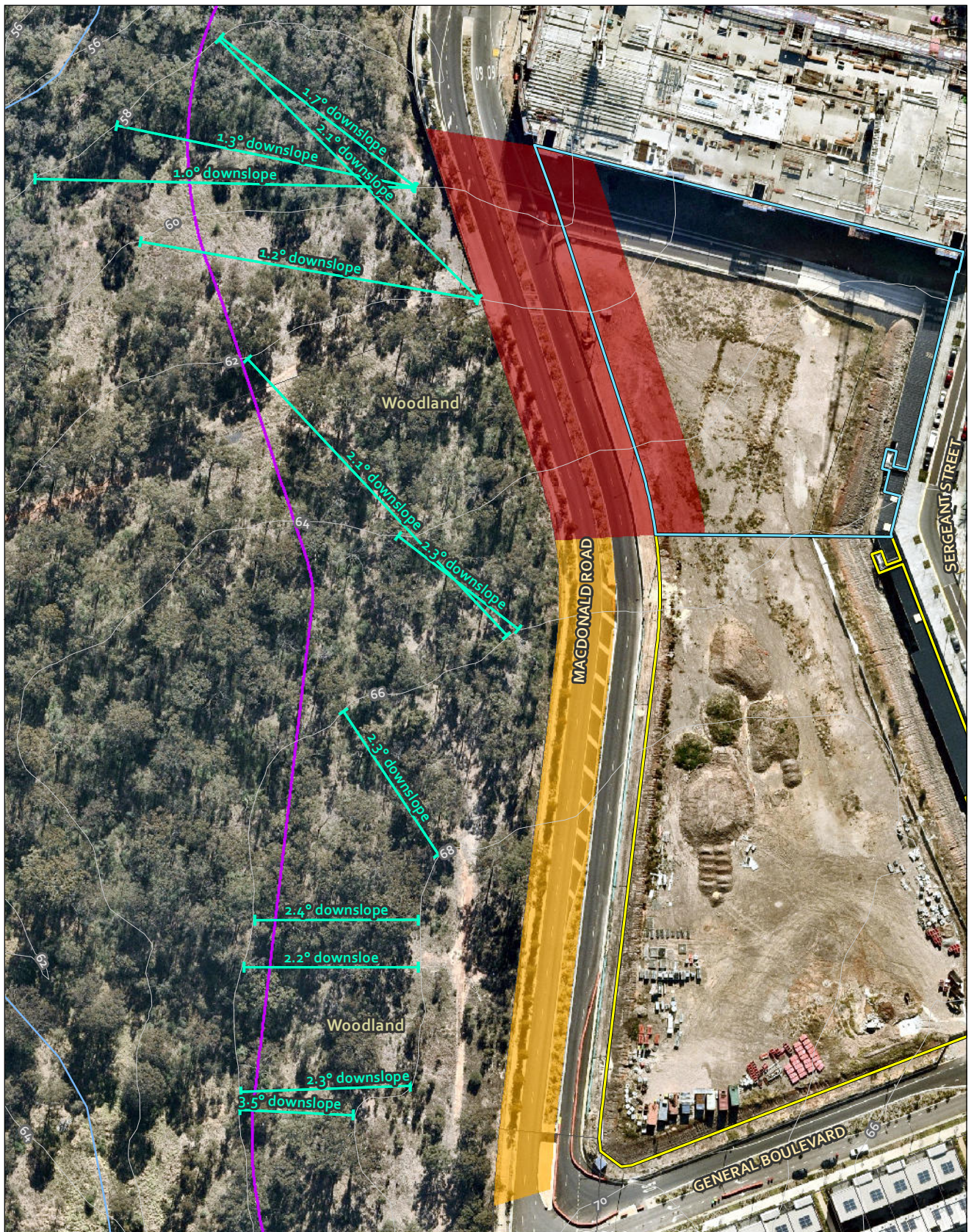
Yours sincerely,



David Peterson
Director



Attachment A – Figure 1 – Slope transects and APZ



Legend

- Slope Transect
- Contour - 2m
- Watercourse
- Subject Land - Residential

- Subject Land - SFPP
- Slope Assessment Area - 100m
- Cadastre

- Asset Protection Zone**
- Asset Protection Zone - 43m - SFPP
 - Asset Protection Zone - 16m - Residential

DKGIS
 Date: 24/11/2021
 0 12.5 25 50
 Metres

Figure 1: Bushfire Hazard Analysis and Asset Protection Zone

Coordinate System: GDA 1994 MGA Zone 56
 Imagery: © Nearmap

Attachment B – NBC Bushfire Attack Assessor model reports



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 28/10/2021

Assessment Date: 5/10/2021

Site Street Address: Ed Square High School Development, Edmondson Park

Assessor: David Peterson; Peterson Bushfire

Local Government Area: Liverpool

Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001/Vesta/Catchpole

Rate of Fire Spread: Noble et al., 1980

Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005

Peak Elevation of Receiver: Tan et al., 2005

Peak Flame Angle: Tan et al., 2005

Run Description: 1.0 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 1 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 41

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.2

Radiant Heat(kW/m²): 10

Flame Angle (degrees): 81

Flame Length(m): 10.53

Maximum View Factor: 0.113

Rate Of Spread (km/h): 1.29

Inner Protection Area(m): 41

Transmissivity: 0.794

Outer Protection Area(m): 0

Fire Intensity(kW/m): 12004

Run Description: 1.2 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 1.2 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 42

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.26

Radiant Heat(kW/m2): 9.78

Flame Angle (degrees): 81

Flame Length(m): 10.64

Maximum View Factor: 0.111

Rate Of Spread (km/h): 1.3

Inner Protection Area(m): 42

Transmissivity: 0.792

Outer Protection Area(m): 0

Fire Intensity(kW/m): 12171

Run Description: 1.3 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 1.3 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 42

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.28

Radiant Heat(kW/m2): 9.83

Flame Angle (degrees): 81

Flame Length(m): 10.7

Maximum View Factor: 0.111

Rate Of Spread (km/h): 1.31

Inner Protection Area(m): 42

Transmissivity: 0.792

Outer Protection Area(m): 0

Fire Intensity(kW/m): 12255

Run Description: 1.7 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland
Vegetation Group: Woodlands
Vegetation Slope: 1.7 Degrees **Vegetation Slope Type:** Downslope
Surface Fuel Load(t/ha): 10 **Overall Fuel Load(t/ha):** 18.07
Vegetation Height(m): 0.9 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope
Elevation of Receiver(m): Default **APZ/Separation(m):** 43

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1200

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25
Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308
Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 12.5 **Peak Elevation of Receiver(m):** 5.39
Radiant Heat(kW/m2): 10.06 **Flame Angle (degrees):** 80
Flame Length(m): 10.94 **Maximum View Factor:** 0.114
Rate Of Spread (km/h): 1.35 **Inner Protection Area(m):** 42
Transmissivity: 0.792 **Outer Protection Area(m):** 0
Fire Intensity(kW/m): 12598

Run Description: 2.1 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland
Vegetation Group: Woodlands
Vegetation Slope: 2.1 Degrees **Vegetation Slope Type:** Downslope
Surface Fuel Load(t/ha): 10 **Overall Fuel Load(t/ha):** 18.07
Vegetation Height(m): 0.9 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Downslope
Elevation of Receiver(m): Default **APZ/Separation(m):** 43

Fire Inputs

Veg./Flame Width(m): 100 **Flame Temp(K):** 1200

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25
Heat of Combustion(kJ/kg) 18600 **Ambient Temp(K):** 308
Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 12.5 **Peak Elevation of Receiver(m):** 5.51
Radiant Heat(kW/m2): 9.95 **Flame Angle (degrees):** 80
Flame Length(m): 11.18 **Maximum View Factor:** 0.113
Rate Of Spread (km/h): 1.39 **Inner Protection Area(m):** 43
Transmissivity: 0.79 **Outer Protection Area(m):** 0
Fire Intensity(kW/m): 12950

Run Description: 2.2 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 2.2 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 44

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.54

Radiant Heat(kW/m2): 9.69

Flame Angle (degrees): 80

Flame Length(m): 11.25

Maximum View Factor: 0.11

Rate Of Spread (km/h): 1.4

Inner Protection Area(m): 44

Transmissivity: 0.789

Outer Protection Area(m): 0

Fire Intensity(kW/m): 13040

Run Description: 2.3 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 2.3 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 44

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.57

Radiant Heat(kW/m2): 9.75

Flame Angle (degrees): 80

Flame Length(m): 11.31

Maximum View Factor: 0.111

Rate Of Spread (km/h): 1.41

Inner Protection Area(m): 44

Transmissivity: 0.789

Outer Protection Area(m): 0

Fire Intensity(kW/m): 13130

Run Description: 2.4 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 2.4 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 44

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.6

Radiant Heat(kW/m2): 9.8

Flame Angle (degrees): 80

Flame Length(m): 11.37

Maximum View Factor: 0.111

Rate Of Spread (km/h): 1.42

Inner Protection Area(m): 44

Transmissivity: 0.789

Outer Protection Area(m): 0

Fire Intensity(kW/m): 13221

Run Description: 3.5 degrees

Vegetation Information

Vegetation Type: Coastal Valley Grassy Woodland

Vegetation Group: Woodlands

Vegetation Slope: 3.5 Degrees

Vegetation Slope Type: Downslope

Surface Fuel Load(t/ha): 10

Overall Fuel Load(t/ha): 18.07

Vegetation Height(m): 0.9

Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees

Site Slope Type: Downslope

Elevation of Receiver(m): Default

APZ/Separation(m): 46

Fire Inputs

Veg./Flame Width(m): 100

Flame Temp(K): 1200

Calculation Parameters

Flame Emissivity: 95

Relative Humidity(%): 25

Heat of Combustion(kJ/kg) 18600

Ambient Temp(K): 308

Moisture Factor: 5

FDI: 100

Program Outputs

Level of Construction: BAL 12.5

Peak Elevation of Receiver(m): 5.96

Radiant Heat(kW/m2): 9.8

Flame Angle (degrees): 80

Flame Length(m): 12.1

Maximum View Factor: 0.112

Rate Of Spread (km/h): 1.53

Inner Protection Area(m): 46

Transmissivity: 0.786

Outer Protection Area(m): 0

Fire Intensity(kW/m): 14264
