24th August 2023

Fire Design Brief/Pre - Development Application Meeting

Proposal: Proposed Subdivision/Rezoning

Re: Lot 3 DP 1201486 No 80 Silverdale Road The Oaks

Key Stakeholders

Owner – Mick Nocera

Consultant Planner – Michael Brown

Project Manager – Chad Ghassibe - Proficient Constructions (AUST)

Bushfire Consultants – Tim Mecham

Rural Fire Service Representative (RFS) – to be confirmed

1.0 Communication with Key Stakeholders

The initial concept subdivision layout proposed that the Asset Protection Zones (APZs) be provided in accordance with the adjoining properties to the south.

The owner/developer was advised that site specific assessment would be required for the proposed subdivision/rezoning and it was agreed that the site specific assessment be undertaken.

The initial communications included discussions with the Planner, Owner and Project Manager for a fire trail in lieu of a perimeter road. The cost of the perimeter road is significant and it was considered, that it may be possible to achieve the same level of protection for Lots 106 - 111 by a perimeter fire trail.

The latest Subdivision Layout can be seen in **Appendix 1.**

2.0 Eastern Hazard

2.1 Deemed to Satisfy Acceptable Solutions and Performance Criteria

Table 5.3a of PBP, 2019 states:

a. Acceptable Solution

"Asset Protection Zones are provided in accordance with Tables A1.12.2 and A1.12.3 based on FFD1."

b. Performance Criteria

"Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each lot."

2.2. Scope and Purpose

The dominant hazard is to the east with the lots affected by the hazard as discussed below are Lots 106 -111.

The hazard consists mostly of exotic species in the steep areas and grassland in the less steep areas further to the east/south of the development, see **Appendix 2.**

The slopes in the steeper parts of the eastern hazard are over 20° and those steeper slopes extend for approximately 80 metres.

Beyond the steeper slopes and the exotic species is grassland vegetation, that is currently managed by cattle grazing.

To determine the slope that will affect the fire, verification methods have been used (Couch V4.1), comparison with the deemed to satisfy provisions of Planning for Bush Fire Protection (2019) and AS3959 (2018).

The purposes of this section of the brief are to assess the likely parameter of a fire travelling from the east.

2.3. Documentation, Relevant Data and Assessment Method

The proposal is for a residential subdivision.

As previously stated, the dominant hazard is to the east of the proposed subdivision and consists of steep slopes approximately 80m in length where the unmanaged hazards exist. Beyond this hazard is grassland currently managed by cattle grazing only, on less steep slopes.

This hazard in the unmanaged area consisting mostly of lantana, however, there areas of tree canopy.

To assess the likely fire emanating from the hazard, the Bush Fire Attack Assessor (Couch V4.1) was used as a verification method.

The Bushfire Attack Assessor was used to consider a number of scenarios.

These considerations include:

1. Worst case scenarios.
2. A comparison with a short fire run for the hazard vegetation.

The assessment methods include comparison with deemed to satisfy and a verification method.

Both qualitative and quantitative approaches have been used.

2.3.1 Input Data for the Eastern Hazard

As detailed above and shown in the photos in **Appendix 3,** there is mostly lantana, however there are areas of tree canopy. The tree canopy in most areas is not touching and does not provide for a continuous run of fire. There is shrub type vegetation in some areas more likely in the interface between the unmanaged vegetation and the proposed subdivision area.
The lantana has a canopy cover greater than 70% and the modelling has considered vegetation similar to both woodland and rainforest in accordance with A1.9 of Planning for Bush Fire Protection, 2019.

A slope of 29° downslope was used in the modelling to build a factor of safety into the reporting.

2.3.2. Worst case scenarios for the Eastern Hazard

The Bushfire Attack Assessor was used to consider worst case scenario fires with respect to vegetation similar to woodland and rainforest. The worst case scenario, does not consider the different types of vegetation in the hazard. It is known that the lantana hazard extends for approximately 80m before the grassland hazard. This grassland hazard is not a full hazard as it is currently managed by cattle grazing and the owner advises that this management will continue.

a. A hazard similar to Woodland with a 29° downslope (0° site slope) resulted in a radiant heat level of 31.12 kW/m² (See **Appendix 4**).

b. A hazard similar to rainforest with a 29° downslope (0° site slope) resulted in a radiant heat level of 28.75 kW/m² (See **Appendix 5**).

With no consideration of the different hazards to the east (ie. Grassland then the Exotic vegetation) the Bushfire Attack Assessor concluded that with a separation distance of 55m:

2.3.3. Short Fire Run for the Eastern Hazard

It is acknowledged that the short fire run cannot be applied to the hazard. The fire to the east is emanating from a grassland that is partially managed by cattle grazing before the exotic vegetation.

Conservatively a 90m short fire run was used in the calculation.

The Bushfire Attack A was used to complete short fire run scenarios with respect to the hazard and concluded that with a separation distance of 50m:

a. A hazard similar to woodland with a 29° downslope (0° site slope) resulted in a radiant heat level of 24.23kW/m² (See **Appendix 6**).

b. A hazard similar to rainforest with a 29° downslope (0° site slope) resulted in a radiant heat level of 21.48 kW/m² (See **Appendix 7**).

2.4. Discussion with respect to Eastern Hazard

1. There is approximately a 7kW/m² difference between the full effect fire and the short fire run scenario.
2. The lantana has a canopy cover greater than 70% therefore can be considered as hazard similar to Rainforest in PBP, 2019. It was also noted that there minimal ground in lieu of the lantana coverage and the slope.
3. It is known that Lantana will add to a forest fire and separately will burn with short residency.
4. The existing tree canopy is separated and does not provide for a continuous run of fire. The limited shrub number also not expected to add to the fire intensity.

2.5. Recommendation

That the hazard to the east be considered as similar to a rainforest hazard and therefore a minimum APZ of 55m is to be provided form the hazard.

Lot 106

The 55m setback impacts on Lot 106 and a suitable building envelope cannot be identified. Lot 106 is now proposed to be part of the residual lot. It is also recognised that with performance reporting and shielding there is good potential for a dwelling on Lot 106. Further reporting may also indicate for a future dwelling also on the residual lot for the farming activity.

3.0 Fire Trail in lieu of Perimeter Road

3.1 Deemed to Satisfy Acceptable Solutions and Performance Criteria

Table 5.3b states:

a. The Acceptable Solutions

"Perimeter roads are provided for residential subdivisions of three (3) or more allotments."

b. Performance Criteria

"Firefighting vehicles are provided with safe, all weather access to structures."

3.2 Scope and Purpose

The proposal is for a four (4) metre sealed fire trail with six (6) metre pavement in lieu of a perimeter road on the rear eastern boundary, to provide rear access to the interface of Lots 106 – 111, residential lots, for firefighting vehicles.

The purpose of the report is to provide evidence that the sealed fire trail with pavement will afford the same level of protection to Lots 106 - 111 as a perimeter road.

3.3 Documentation, Relevant Data and Assessment Method

The four (4) metre sealed fire trail with six (6) metre pavement is approximately 270m in length. It is proposed to be located on the interface between the lots and the hazard. The sealed fire trail including the pavement will be used to access the interface between the hazards and Lots 106 - 111.

The four (4) metre sealed fire trail with six (6) metre pavement will become the property of the residual lot which will include Lot 106 until further reporting is completed.

As previously discussed, there are possibilities for a dwelling on the current Lot 106 and the residual lot.

The assessment method is a comparison with the deemed-to-satisfy and a qualitative approach has been used.

3.4 Discussions

In consideration of the perimeter fire trail:

a. Is a minimum of four (4)m wide for working space in accordance with Fire and Rescue NSW "Access for Fire Brigade Vehicles and Fire Fighters".
b. It is proposed to provide hydrant points along the perimeter fire trail for use by any attending brigades.
c. The sealed part road will provide easier maintenance and all weather travel. There will be one (1) owner responsible for the maintenance of the perimeter fire trail.
d. The trail is not a main access so there should be no traffic other than attending brigades in a fire event.
e. All other deemed-to-satisfy provisions of Table 5.3b of PBP, 2019 for general access and non perimeter roads will comply.

3.5 Recommendation

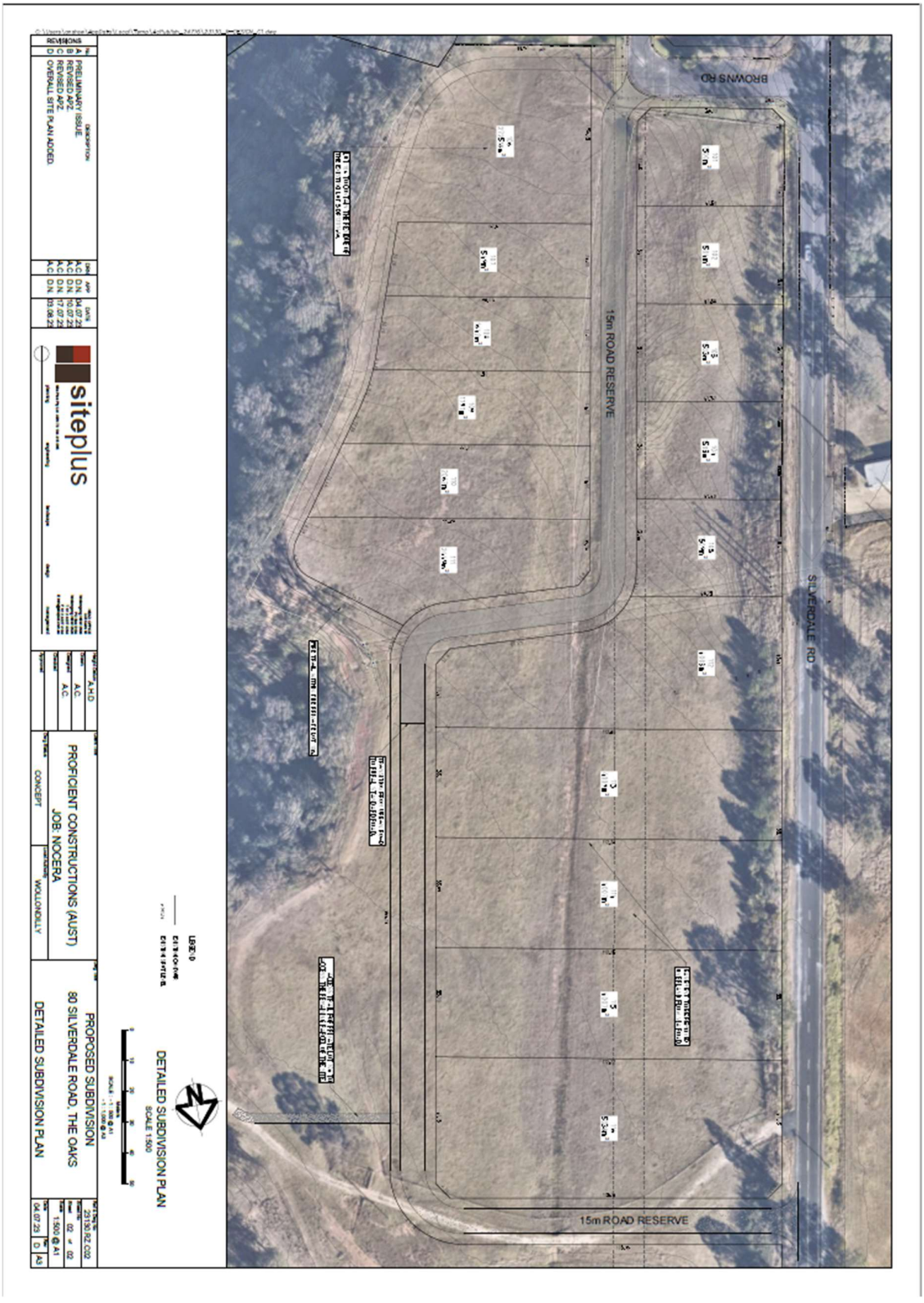
It is considered that the four (4) metre sealed fire trail with six (6) metre pavement will provide for at least the same level of protection as a perimeter road.

Regards

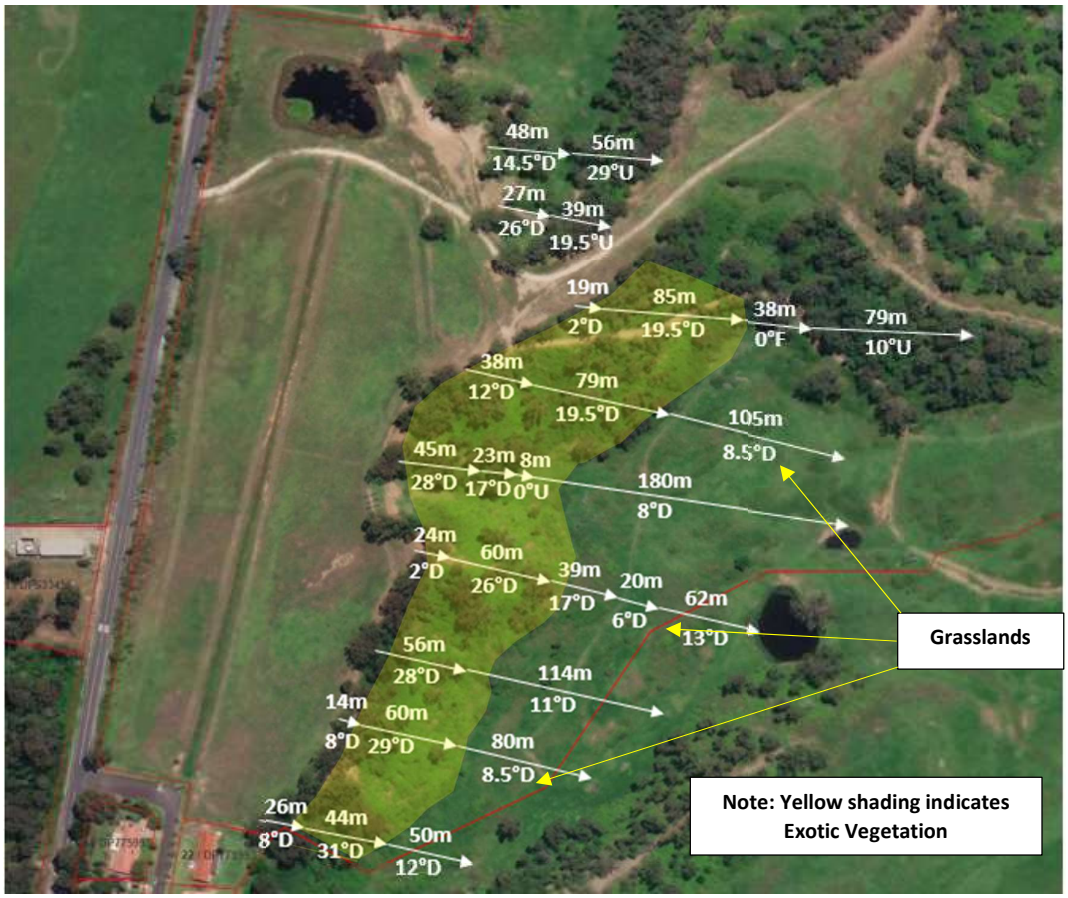
Tim Mecham
Midcoast Building and Environmental

Appendix 1

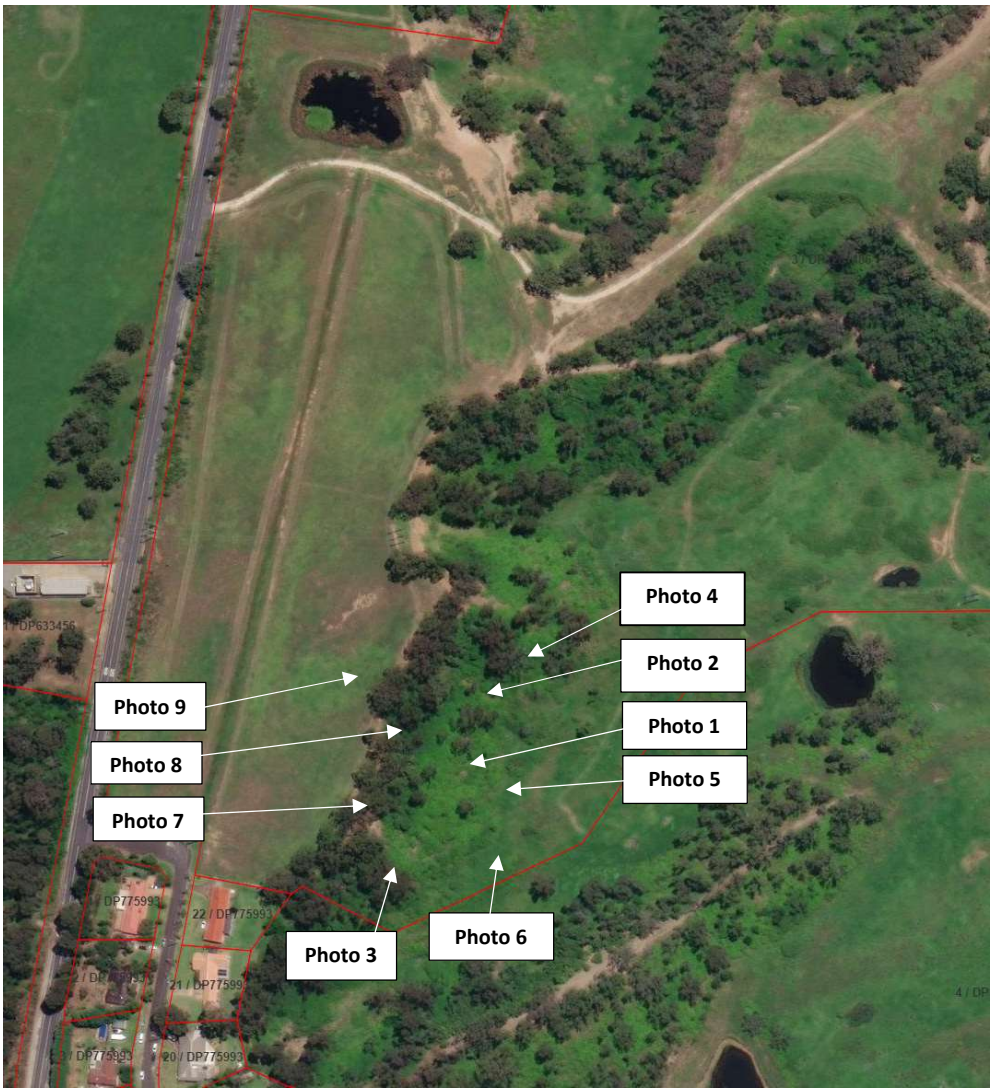

REVISIONS
PRELIMINARY ISSUE
REVISED AZ
OVERALL SITE PLAN ADDED
siteplus
PROFICIENT CONSTRUCTIONS (AUST)
JOB: NOCERA
CONCEPT
WOLLONGILLY
PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS
SITE SUBDIVISION PLAN
SITE SUBDIVISION PLAN
SCALE 1:1,500
LEGEND
SILVERDALE ROAD


BROWNS RD
SILVERDALE RD
15m ROAD RESERVE
15m ROAD RESERVE
siteplus
PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS
DETAILED SUBDIVISION PLAN
DETAILED SUBDIVISION PLAN
SCALE 1:500
PROFICIENT CONSTRUCTIONS (AUST)
JOB: NOCERA
REVISIONS
PRELIMINARY ISSUE
REVISED APZ
REVISED APZ
OVERALL SITE PLAN ADDED

Appendix 2


48m
14.5°D
56m
29°U
27m
26°D
39m
19.5°U
19m
2°D
85m
19.5°D
38m
0°F
79m
10°U
38m
12°D
79m
19.5°D
105m
8.5°D
45m
28°D
23m
17°D
8m
0°U
180m
8°D
24m
2°D
60m
26°D
39m
17°D
20m
6°D
62m
13°D
56m
28°D
114m
11°D
14m
8°D
60m
29°D
80m
8.5°D
26m
8°D
44m
31°D
50m
12°D
Grasslands
Note: Yellow shading indicates Exotic Vegetation

Appendix 3 – Approximate Photo Locations and Photos



Photos 1, 2 and 3 – Looking from the east to the exotic vegetation hazard

Photo 2

Photo 3

Photo 4

Photo 5 – Showing grassland vegetation before exotic vegetation

Photo 6 – More photos of grassland area

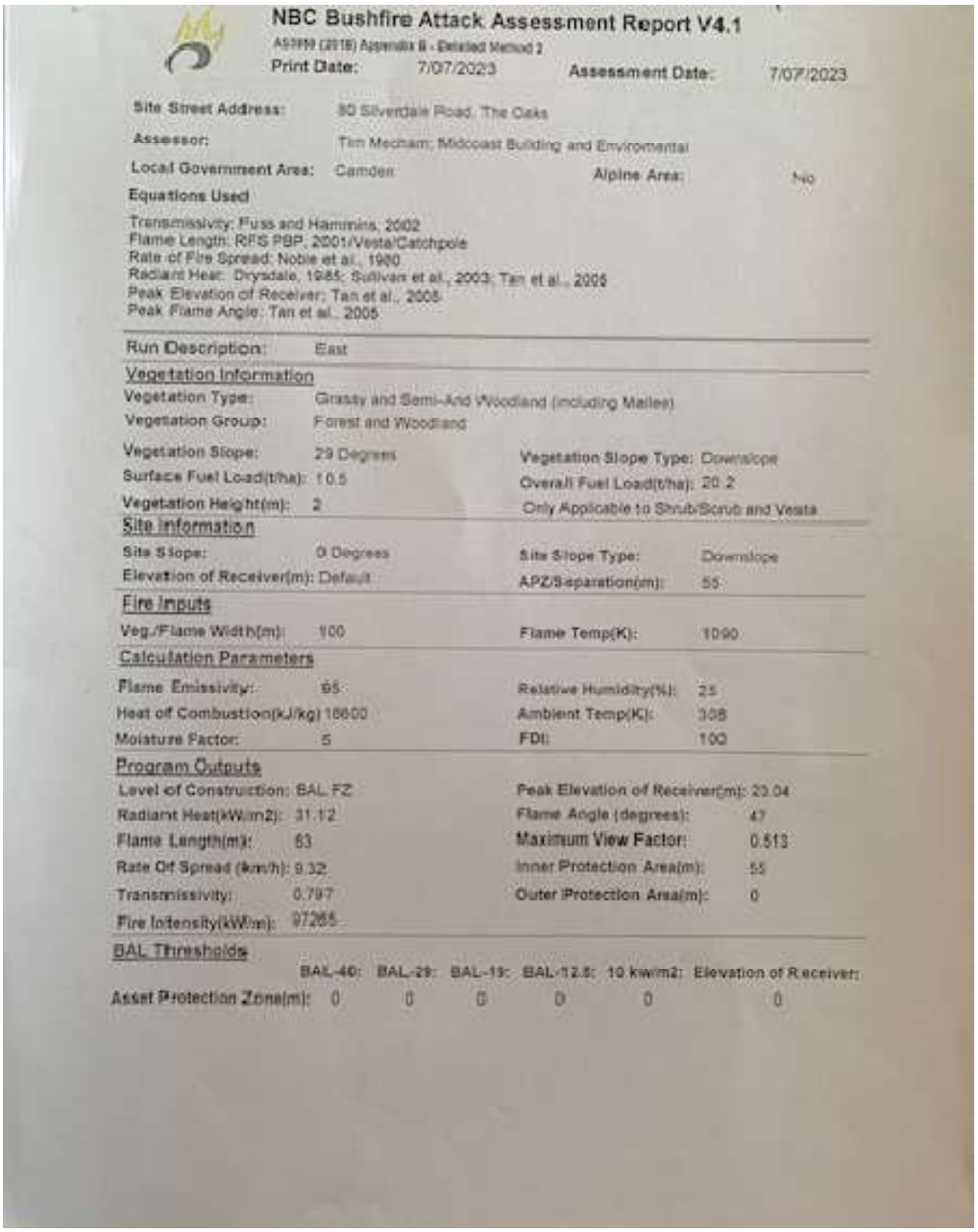
Photo 7 – Looking from the top of the bank

Photo 8 – Another photo from top of bank

Photo 9 – Looking from the proposed subdivision to top of bank

Photo 10 – Showing minimal ground cover under lantana

Appendix 4



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 7/07/2023 Assessment Date: 7/07/2023

Site Street Address: 80 Silverdale Road, The Oaks

Assessor: Tim Mecham; Midcoast Building and Environmental

Local Government Area: Camden 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: East

Vegetation Information

Vegetation Type: Grassy and Semi-Arid Woodland (including Mallee)
Vegetation Group: Forest and Woodland

Vegetation Slope: 29 Degrees
Vegetation Slope Type: Downslope
Surface Fuel Load(t/ha): 10.5
Overall Fuel Load(t/ha): 20.2
Vegetation Height(m): 2
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): 55

Fire Inputs

Veg./Flame Width(m): 100
Flame Temp(K): 1090

Calculation Parameters

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

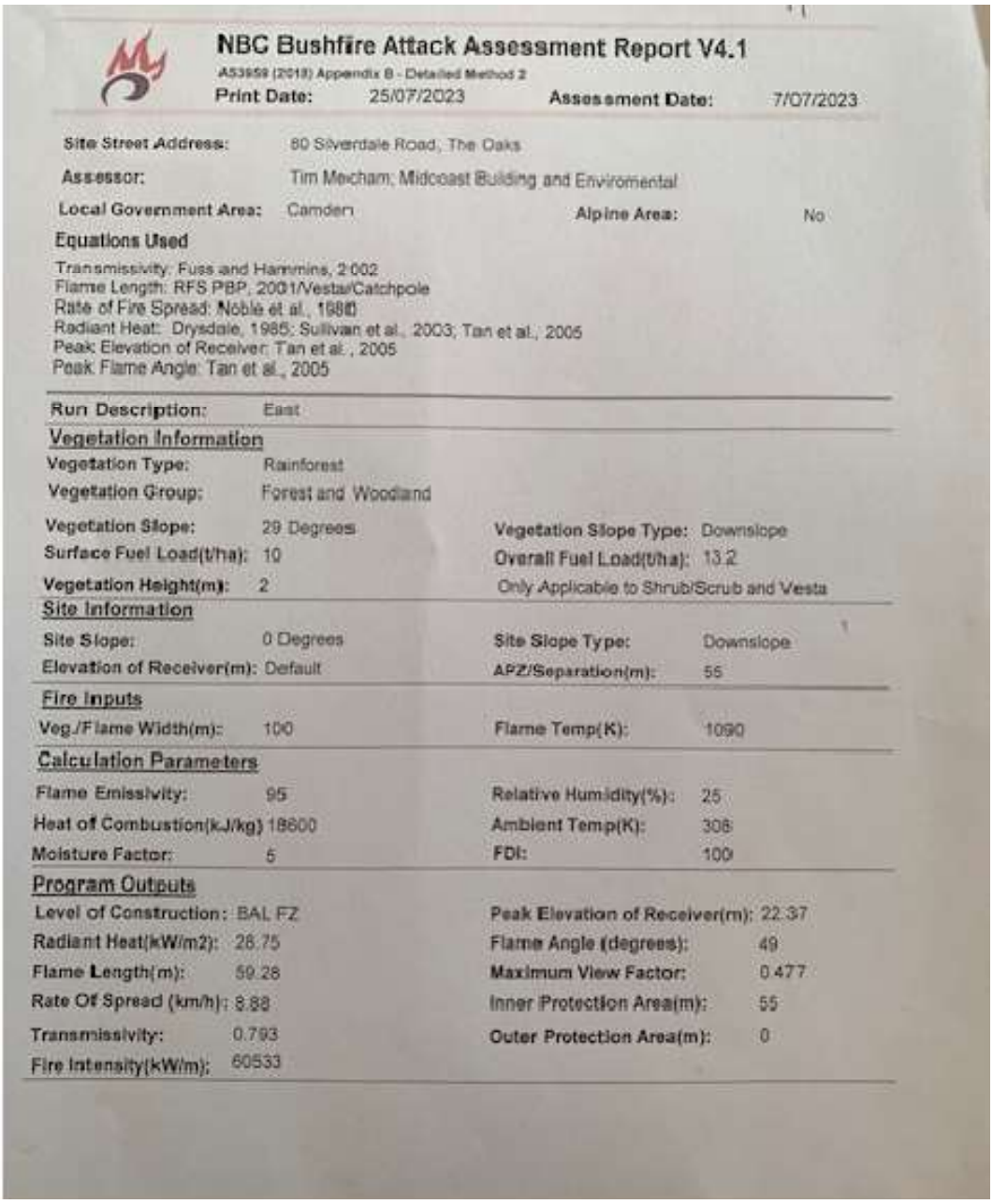
Program Outputs

Level of Construction: BAL FZ
Peak Elevation of Receiver(m): 23.04
Radiant Heat(kW/m2): 31.12
Flame Angle (degrees): 47
Flame Length(m): 83
Maximum View Factor: 0.513
Rate Of Spread (km/h): 9.32
Inner Protection Area(m): 55
Transmissivity: 0.797
Outer Protection Area(m): 0
Fire Intensity(kW/m): 97265

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	0	0	0	0	0	0

Appendix 5



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 25/07/2023 **Assessment Date:** 7/07/2023

Site Street Address: 80 Silverdale Road, The Oaks

Assessor: Tim Mecham; Midcoast Building and Enviromental

Local Government Area: Camden **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: East

Vegetation Information

Vegetation Type:	Rainforest		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	29 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	10	**Overall Fuel Load(t/ha):**	13.2
Vegetation Height(m):	2	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):**	55

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1090

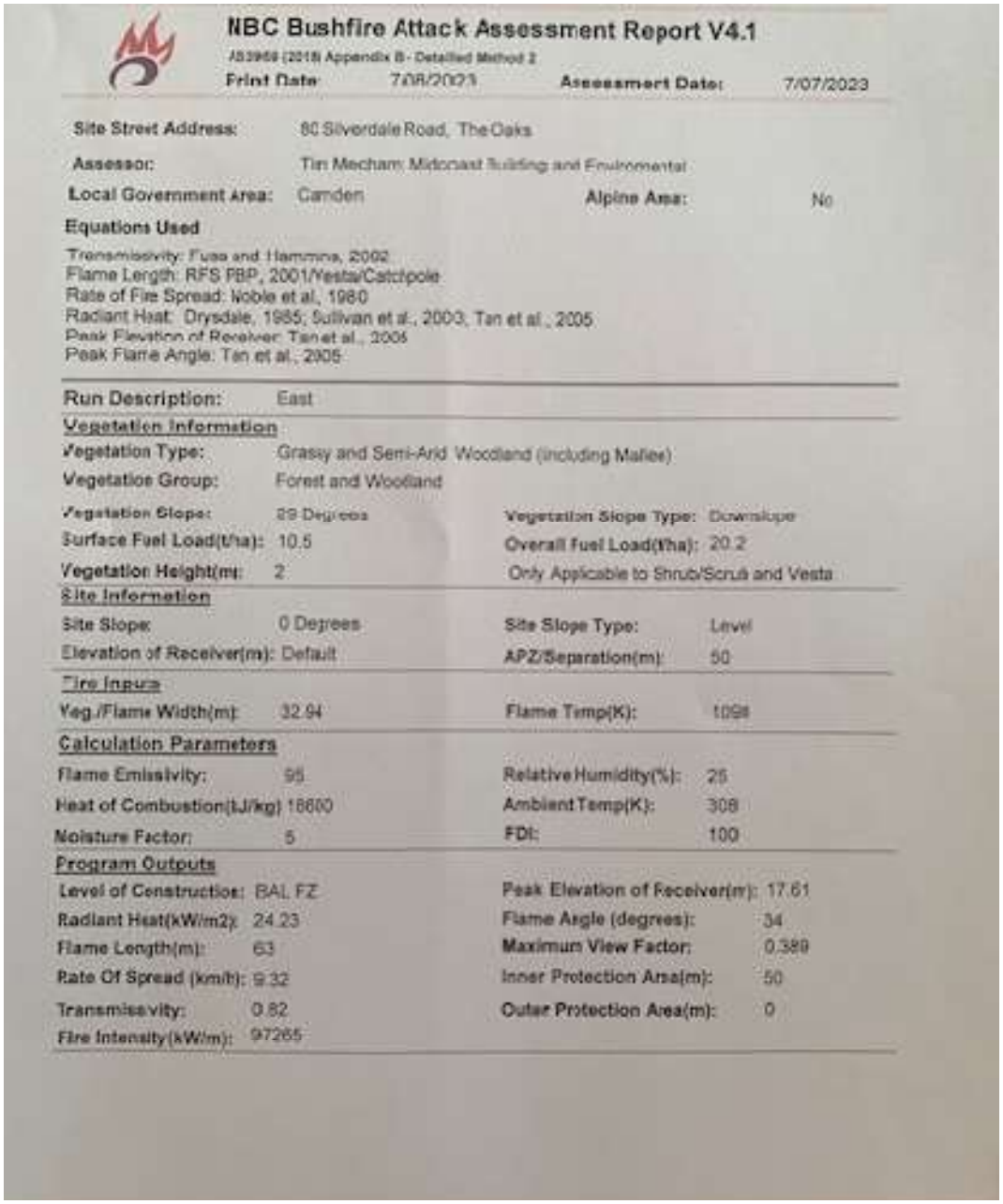
Calculation Parameters

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 FZ	**Peak Elevation of Receiver(m):**	22.37
Radiant Heat(kW/m2):	28.75	**Flame Angle (degrees):**	49
Flame Length(m):	59.28	**Maximum View Factor:**	0.477
Rate Of Spread (km/h):	8.88	**Inner Protection Area(m):**	55
Transmissivity:	0.793	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	60533		

Appendix 6



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 7/07/2023 **Assessment Date:** 7/07/2023

Site Street Address: 80 Silverdale Road, The Oaks

Assessor: Tim Mecham Midcoast Building and Environmental

Local Government Area: Camden **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: East

Vegetation Information

Vegetation Type:	Grassy and Semi-Arid Woodland (including Mallee)		
Vegetation Group:	Forest and Woodland		
Vegetation Slope:	29 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	10.5	Overall Fuel Load(t/ha):	20.2
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	0 Degrees	Site Slope Type:	Level
Elevation of Receiver(m):	Default	APZ/Separation(m):	50

Fire Inputs

Veg./Flame Width(m):	32.94	Flame Temp(K):	1098

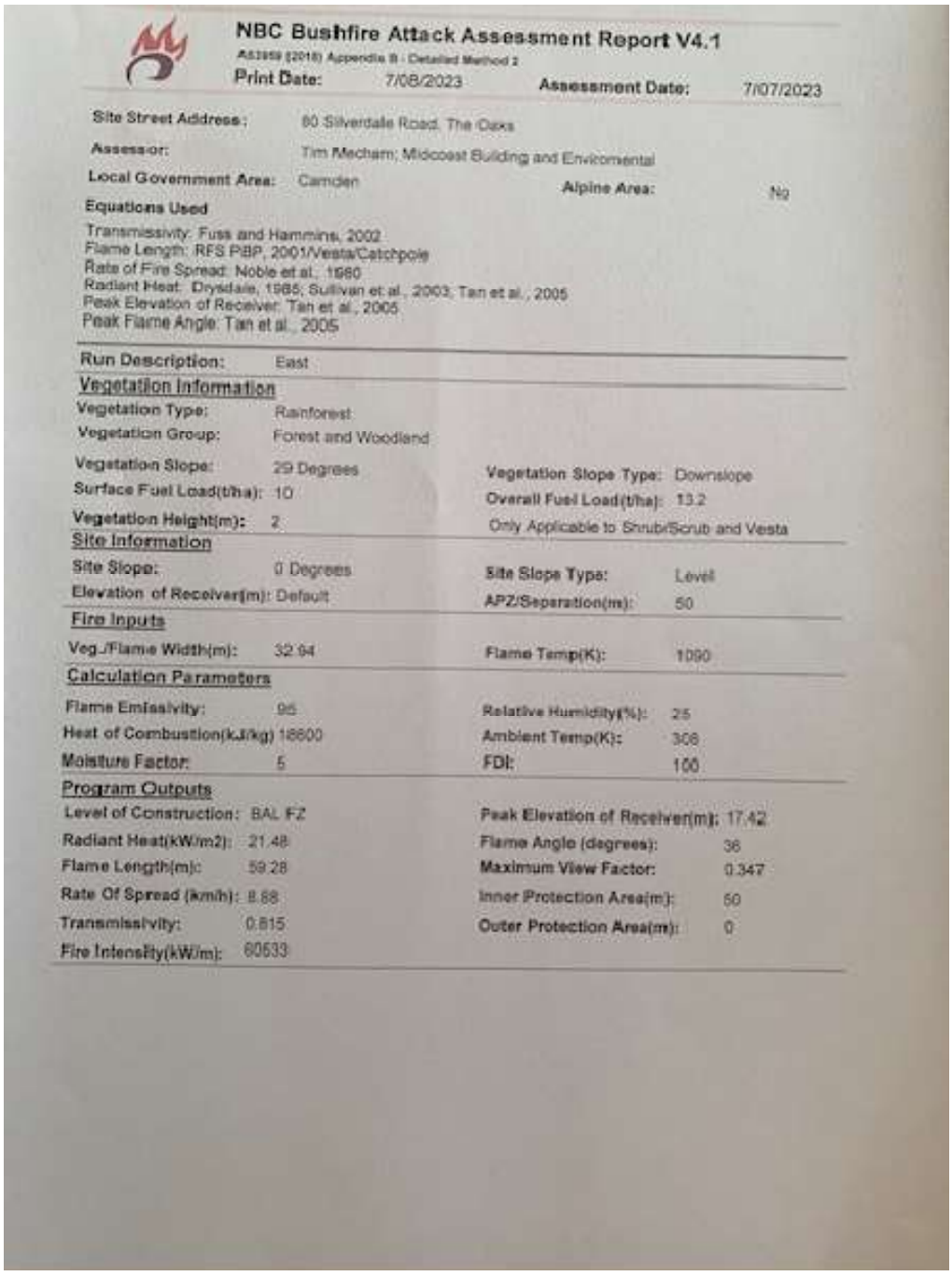
Calculation Parameters

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 FZ	Peak Elevation of Receiver(m):	17.61
Radiant Heat(kW/m2):	24.23	Flame Angle (degrees):	34
Flame Length(m):	63	Maximum View Factor:	0.389
Rate Of Spread (km/h):	9.32	Inner Protection Area(m):	50
Transmissivity:	0.82	Outer Protection Area(m):	0
Fire Intensity(kW/m):	97265		

Appendix 7



NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 7/08/2023 Assessment Date: 7/07/2023

Site Street Address: 80 Silverdale Road, The Oaks

Assessor: Tim Mecham; Midcoast Building and Environmental

Local Government Area: Camden 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: East

Vegetation Information

Vegetation Type: Rainforest
Vegetation Group: Forest and Woodland
Vegetation Slope: 29 Degrees
Vegetation Slope Type: Downslope
Surface Fuel Load(t/ha): 10
Overall Fuel Load(t/ha): 13.2
Vegetation Height(m): 2
Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees
Site Slope Type: Level
Elevation of Receiver(m): Default
APZ/Separation(m): 50

Fire Inputs

Veg./Flame Width(m): 32.94
Flame Temp(K): 1090

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 FZ
Peak Elevation of Receiver(m): 17.42
Radiant Heat(kW/m2): 21.48
Flame Angle (degrees): 36
Flame Length(m): 59.28
Maximum View Factor: 0.347
Rate Of Spread (km/h): 8.88
Inner Protection Area(m): 50
Transmissivity: 0.815
Outer Protection Area(m): 0
Fire Intensity(kW/m): 60533

Yours faithfully

Tim Mecham MAIBS MAIEH
Midcoast Building and Environmental