Building Code & Bushfire Hazard Solutions

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FPA AUSTRALIA
Certified Business
Bushfire Planning & Design
BPD-BA-02354

Mr Trevor Lam
C/- Byrnes PDM
PO Box 1021
WAHROONGA NSW 2076

1st April 2010
Our Ref. 100392

Attn: Mr Adam Byrnes

Re: PROPOSED RESIDENTIAL REZONING
177 WRIGHTS ROAD KELLYVILLE
BUSHFIRE HAZARD ASSESSMENT CONSTRAINTS STATEMENT

Dear Adam,

We thank you for engaging us to provide a report on bushfire mitigation matters applicable for the above property.

The purpose of this statement is to outline the requirements for bushfire mitigation measures that would be applicable for possible future residential development within this property. It is our understanding that the proposed development application would involve the rezoning and subsequent subdivision of the subject property into multiple new residential allotments to allow for the construction of new residential dwellings within each new allotment.

This type of development is deemed integrated under s100B of the Rural Fires Act 1997 and therefore any future DA would require a Bushfire Safety Authority from the NSW Rural Fire Service as part of the DA assessment process.

It must be noted that this constraints statement only addresses possible residential development within the subject property, not seniors living, aged care, child care or any other deemed Special Fire Protection Purpose.

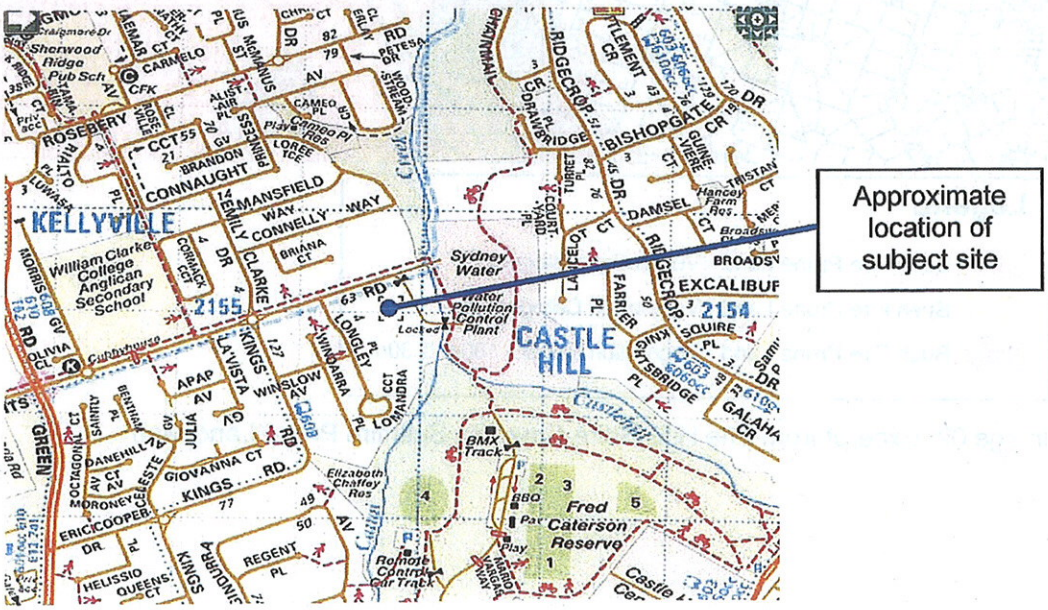


Image 01: Extract from street-directory.com.au

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and / or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bushfire Protection - 2006' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 'Construction of buildings in bushfire-prone areas'. The approving body for integrated development is the NSW Rural Fire Service Head Office, Lidcombe.

Any development within bushfire prone areas would be subject to the strict application of Planning for Bushfire Protection 2006 including set back restrictions and building materials.

Bushfire prone areas are defined as those areas;

- within or within 100m of high or medium bushfire hazards; or
- within or within 30m of low bushfire hazards.

In this instance the subject property is depicted on The Hills Shire Council's Bushfire Prone Land Map as containing Category 1 Vegetation and its associated 100 metre buffer zone.

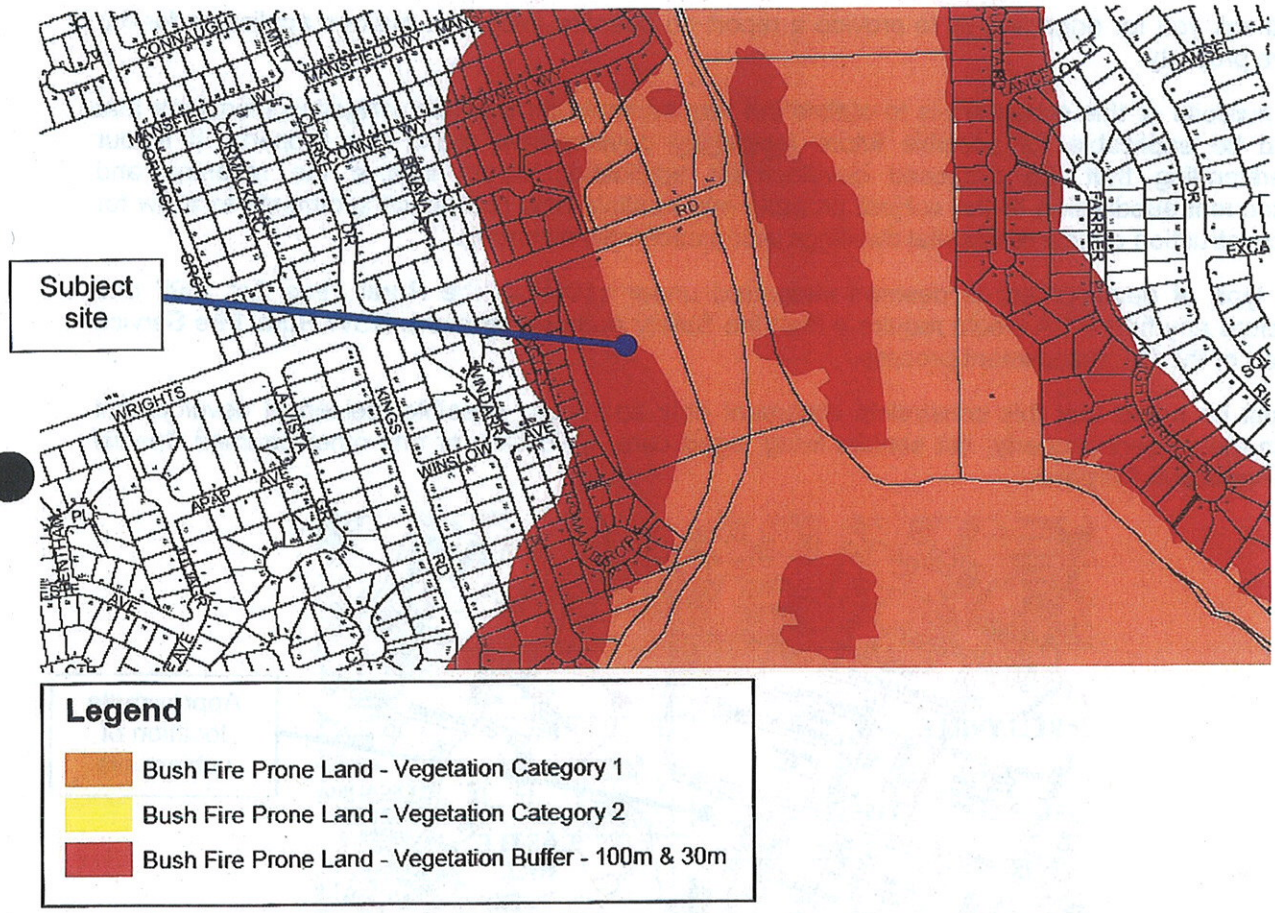


Image 02: Excerpt from The Hills Shire Council's Bushfire Prone Land Map

Vegetation:

The vegetation within the eastern portion of the subject property was found to currently be unmanaged and would be considered a bushfire hazard should maintenance of this area not occur. For the purpose of this assessment it has be assumed that all vegetation within the subject property will be managed and it is understood you will undertake your own due diligence study on this with an ecologist.

The vegetation identified as posing a bushfire hazard to any proposed development within the subject property is located to the east within the Sydney Water Sewage Treatment Plant property and south within neighbouring vacant allotments and Fred Caterson Reserve.

The vegetation posing a hazard within the Sydney Water Sewage Treatment Plant property was found to consist of two distinct communities. The first, located immediately adjacent the subject property's eastern boundary, was found to consist of trees 10-20 metres in height with a 30-50% foliage cover and an understorey of small shrubs and grasses. It was noted that this vegetation community was determined to be Sydney Hinterland Transition Woodland by UBM Ecological consultants, however for the purpose of assessment under Planning for Bushfire Protection 2006 this vegetation was determined to be Forest.

The second vegetation community was found to be located along the existing creeklines and subsequently found to consist trees 10 – 20 metres in height with a 30-70% foliage cover and an understorey of low level broad leafed plants and weed varieties. This community would be considered a Riparian corridor with heavy weed infestation.

Although there is a greater than 50 metre fire run directly from the east it is of our opinion that applying a full forest hazard on a 10 degree downslope does not accurately represent the expected bushfire impact from this aspect. We have therefore modelled a forest fire impacting from south across slope past the subject property.

The vegetation posing a hazard within the neighbouring vacant allotments and Fred Caterson Reserve was found to consist of trees 10-20 metres in height with a 30-50% foliage cover and an understorey of small shrubs and grasses. It was noted that a large stormwater retention pit is located to the south of the subject property which was accounted for in the bushfire design modelling.

For the purpose of assessment under PBP the vegetation posing a hazard to all aspects was determined to be Forest.

Photograph 01: View southwest from within the Sydney Water property

Slope:

The slope that would most significantly affect fire behaviour within the hazard must be assessed for at least 100 metres from the proposed development site. The slope was measured onsite using an inclinometer and verified from topographic imagery of the area.

The results are as follows:

- 0 degrees across slope within the hazard to the east
- 10 degrees down slope within the hazard to the southeast
- 5 degrees down slope within the hazard to the south

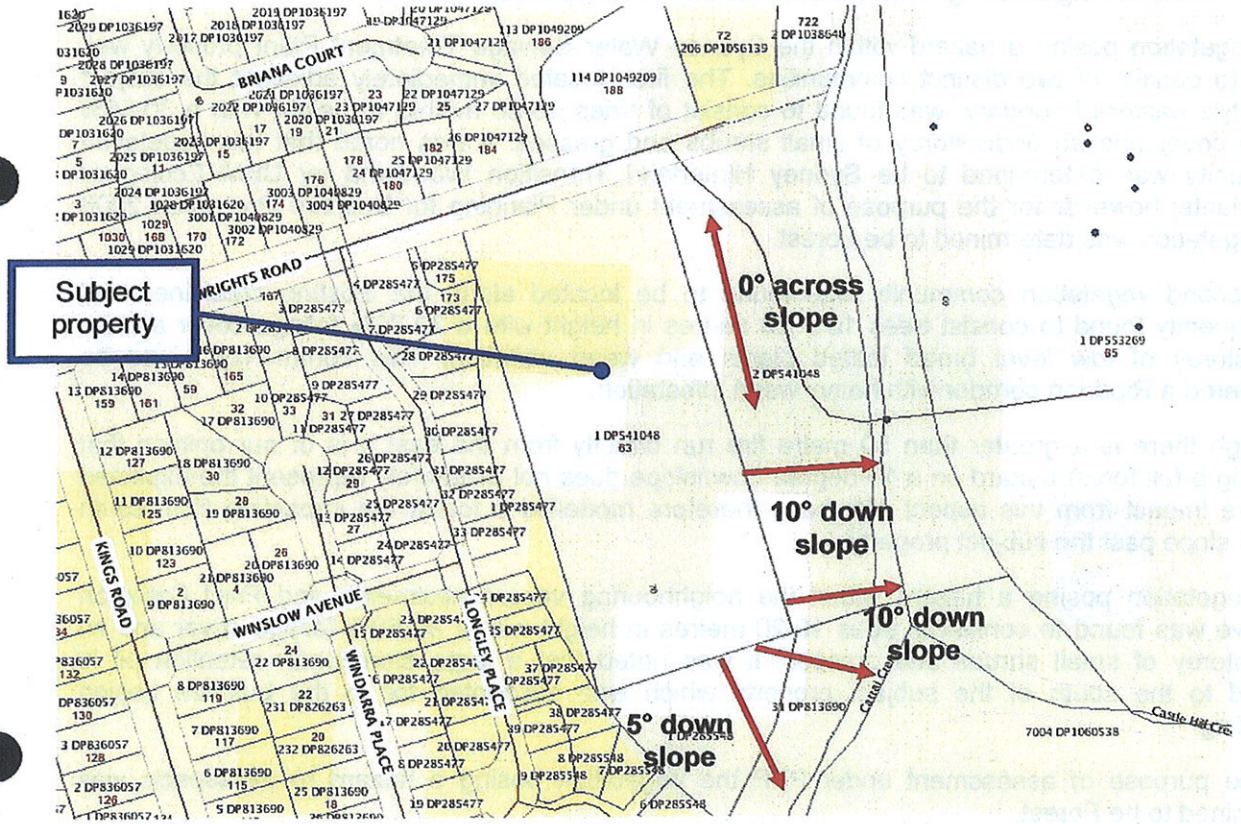


Image 03: Topographic image of the subject area from the Dept. of Lands SixViewer database

Asset Protection Zone:

Asset Protection Zones for residential development are determined from Table A2.4 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 29kW/m^2. With a 0 degree across slope from Forest vegetation and a 20 metre wide fire front an Asset Protection Zone (APZ) of 18.6 metres is required to the east, consisting entirely of an Inner Protection Area (IPA).

With a 10 degree downslope from Forest vegetation an APZ of 34 metres is required to the southeast, consisting of a 18 metre IPA and 16 metre Outer Protection Area (OPA). Finally, with a 5 degree downslope from Forest vegetation an APZ of 26 metres is required to the south, consisting of a 14 metre IPA and 12 metre OPA.

Should a formal easement be provided over part of any neighbouring allotments allowing for the ongoing management the grounds, those allotments can be included within the required Asset Protection Zone.

Within the APZ's roads, swimming pools, play areas, and non habitable structures such as detached garages and work sheds are permitted.

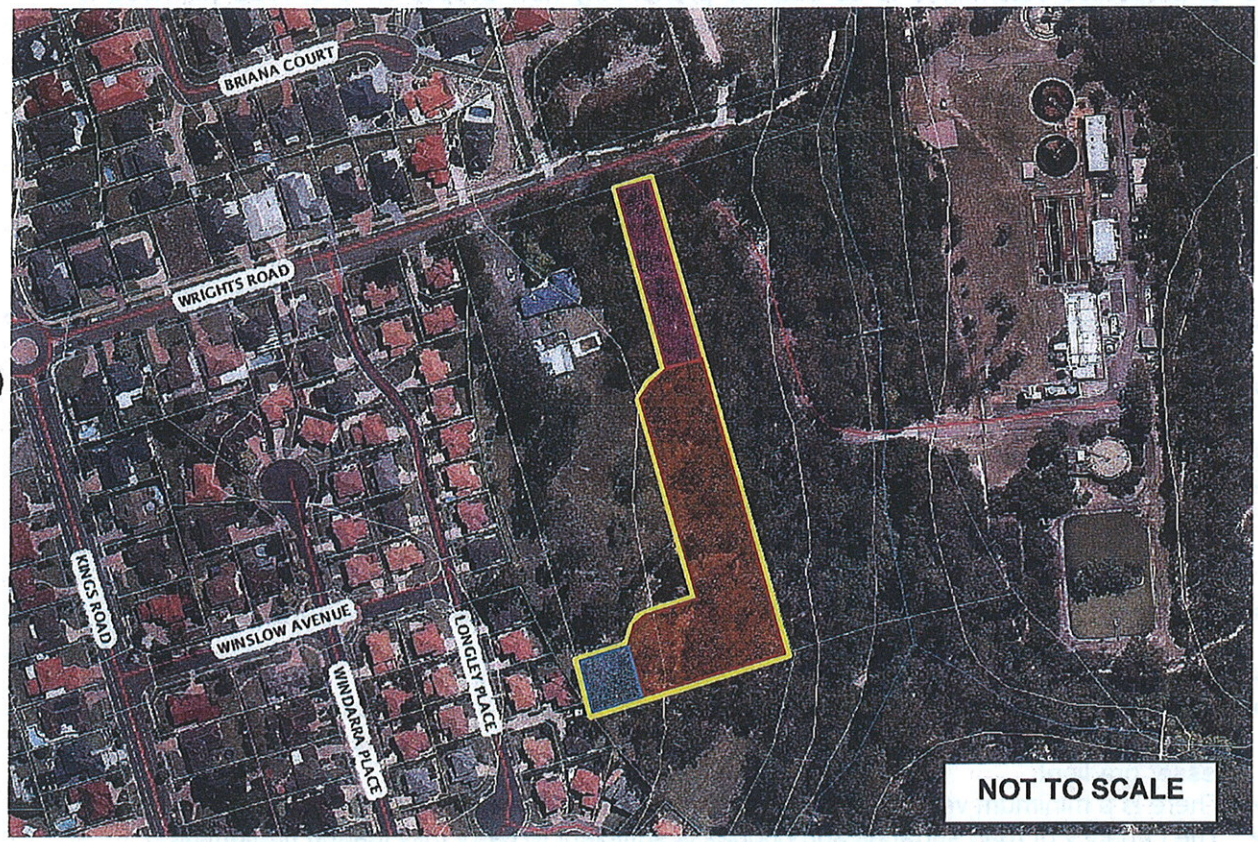


Image 04: Aerial image of the subject property overlayed with the required Asset Protection Zones

Key:

- Extent of required Asset Protection Zones
- Required 18.6 metre APZ
- Required 26 metre APZ
- Required 34 metre APZ

Access:

Planning for Bushfire Protection addresses design considerations for access roads and internal roads for properties determined to be bushfire prone. Any new access drive or road will need to comply with the requirements for 'Property Access' and 'Public Roads' as detailed in section 4.1.3 of Planning for Bushfire Protection 2006.

The following are the requirements for Public Roads as detailed in section 4.1.3 of PBP which must be applied to any new access provisions to more than three dwellings:

- Public roads are two-wheel drive, all weather roads.
- Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (medium Rigid Vehicle).
- The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas.
- Traffic management devices are constructed to facilitate access by emergency services vehicles.
- Public roads have a cross fall not exceeding 3 degrees.
- All roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard.
- Curves of roads (other than perimeter roads) are a minimum inner radius of six metres and minimal in number, to allow for rapid access and egress.
- The minimum distance between inner and outer curves is six metres.
- Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.
- There is a minimum vertical clearance to a height of four metres above the road at all times.
- The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating.
- Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression.
- Public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression.
- Public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.
- One way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.
- Parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays.
- Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.

Curve radius (inside edge) (metres)	Swept Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40-69	3.0	3.9	7.5
70-100	2.7	3.6	6.9
>100	2.5	3.5	6.5

Image 06: 'Table 4.1 – Road widths for Category 1 Tanker' from PBP 2006

It should be noted that a perimeter road is the preferred option of the NSW Rural Fire Service. It is of our opinion that we can provide favourable argument to remove the need for a perimeter road due to the location of existing surrounding fire trails, access roads and access handles, however roads will still need to comply with section 4.1.3 of PBP detailed above.

The following are the requirements for individual property access drives as detailed in section 4.1.3 of PBP which must be applied to any new access drives providing access to 3 or less dwellings:

- 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
- A minimum carriageway width of four metres for rural- residential areas, rural landholdings or urban areas with a distance of greater than 70 metres from the nearest hydrant point to the most external part of a proposed building (or footprint).

Note: No specific access requirements apply in a urban area where a 70 metres unobstructed path can be demonstrated 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 (i.e. a hydrant or water supply).

- In forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by two metres wide, making a minimum trafficable width of six metres at the passing bay.
- A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches.
- Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.
- The minimum distance between inner and outer curves is six metres.
- The crossfall is not more than 10 degrees.
- Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.

Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

- Access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way.

Water Supply:

Any proposed allotment which locates the most distant external point of the building footprint greater than 70 metres from a hydrant will require a static water supply. The capacity of the static water supply will depend on the size of the proposed allotment. The following Table details the capacity of the required static water supply.

Allotment size	Water requirement
<1,000m^2	5,000 l/lot
1,000 – 10,000m^2	10,000 l/lot

The required static water supply can be a swimming pool provided suitable access is available.

There is also an option to extend a hydrant complying with AS2419 into the subject property to remove the requirement to provide static water supplies.

Construction:

The required Asset Protection Zones (APZ) are based on a Bushfire Attack Category of 'Extreme' and therefore any new building not exceeding the required APZ will require Level 3 construction under AS3959 – 1999.

Should the required APZ be exceeded than the required construction level can be reduced accordingly.

The following table details the distances required for each level of construction:

	Level 3	Level 2	Level 1
East	18.6-28m setback	29-39m setback	40-100m setback
Southeast	34-44m setback	45-59m setback	60-100m setback
South	26-36m setback	37-48m setback	49-100m setback

Auxiliary buildings including maintenance sheds, etc, can be located within the APZ's. Depending on the location of auxiliary buildings construction detail above Level 3 under AS3959 – 1999 may be required.

Conclusion:

Under Planning for Bushfire Protection 2006 any proposed residential development would require an Asset Protection Zone (APZ) from the vegetation within the Sydney Water Sewage Treatment Plant property to the east and vegetation within and neighbouring vacant allotments and Fred Caterson Reserve to the south.

Any new residential allotment must show that it can accommodate a building footprint achieving the required Asset Protection Zones detailed herein. Should a formal easement be provided over part of the neighbouring allotments allowing for the ongoing management the grounds, those allotments can be included within the required Asset Protection Zones.

The required Asset Protection Zones (APZ) are based on a Bushfire Attack Category of 'Extreme' and therefore any new dwelling not exceeding the required APZs will require Level 3 construction under AS3959 – 1999.

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979, the Rural Fires Act 1997, the Rural Fires Regulations 2008, the RFS document known as 'Planning for Bushfire Protection – 2006' for the purposes of bushfire hazard determination and Australian Standard AS3959 – 1999 titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions. The author has made a single site visit to the subject property.

Having regard to bushfire mitigations matters it is of our opinion that the property has the capacity to be zoned residential and should the proposed subdivision comply with the above recommendations then we will be in a position to put forward a favourable report during DA submission.

Should you have any further questions please do not hesitate in contacting myself.

Prepared by
Building Code & Bushfire Hazard Solutions P/L

Stuart McMonnies
G. D. Design in Bushfire Prone Areas
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD-A Certified Practitioner
Certification number – BPD – PA-09400

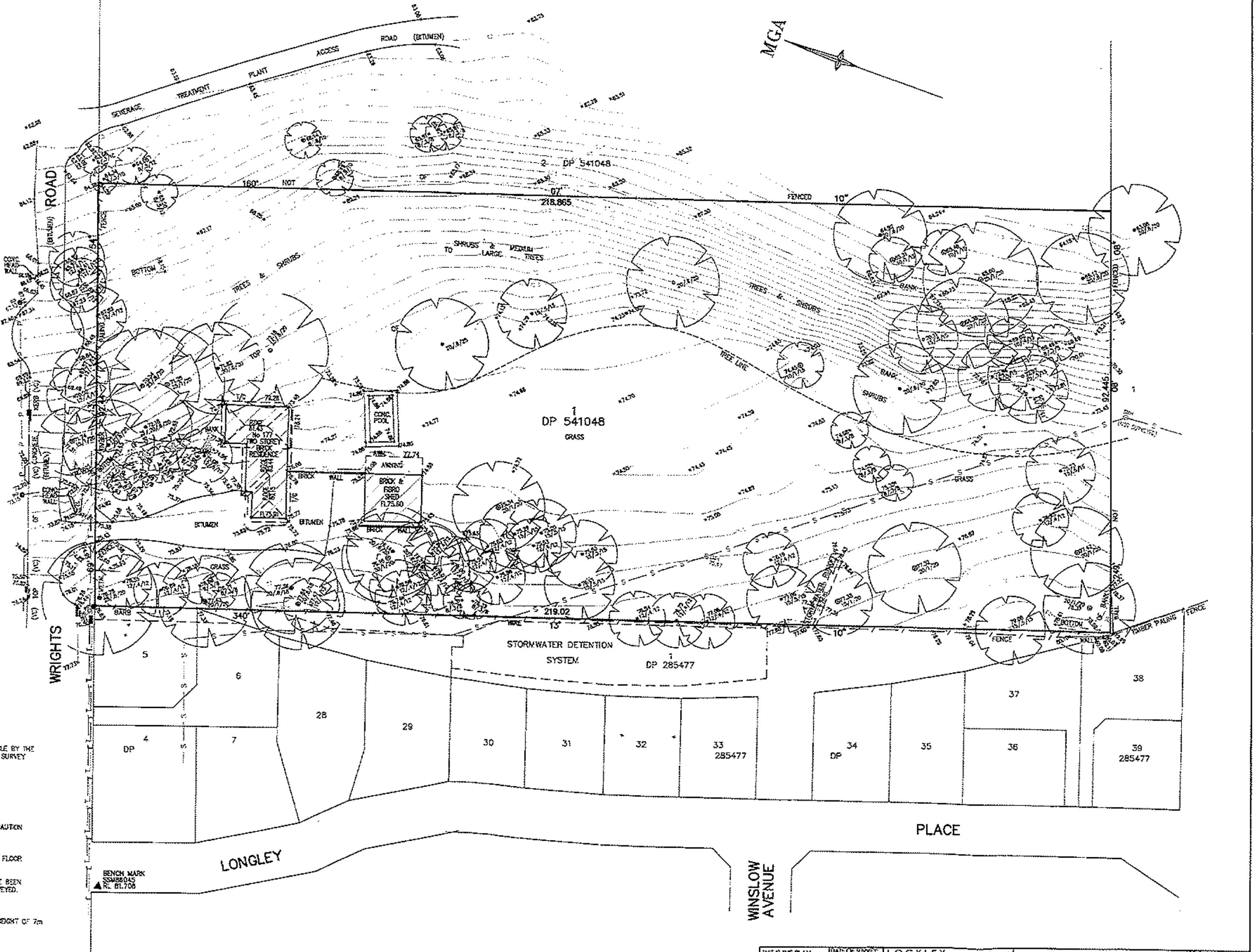
Disclaimer:

Quote from Planning for Bushfire Protection 2006, '*Any representation, statement opinion, or advice expressed or implied in this publication is made in good faith on the basis that the State of New South Wales, the NSW Rural Fire Service, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above..*'

Similarly the interpretations and opinions provided by Building Code and Bushfire Hazard Solutions in regard to bushfire protection are also given in the same good faith.

LEGEND

BENCH MARK	▲
TELSTRA PIT	TEL
ELECTRIC LIGHT POLE	ELP
POWER POLE	PP
KERB INLET PIT	KIP
SEWER MANHOLE	SMH
VEHICLE CROSSING	VC
GAS	
TELSTRA	— T —
ELECTRICITY (U/GROUND)	— E —
STORMWATER	
SEWER	— S —
ELECTRICITY (OVERHEAD)	— P —



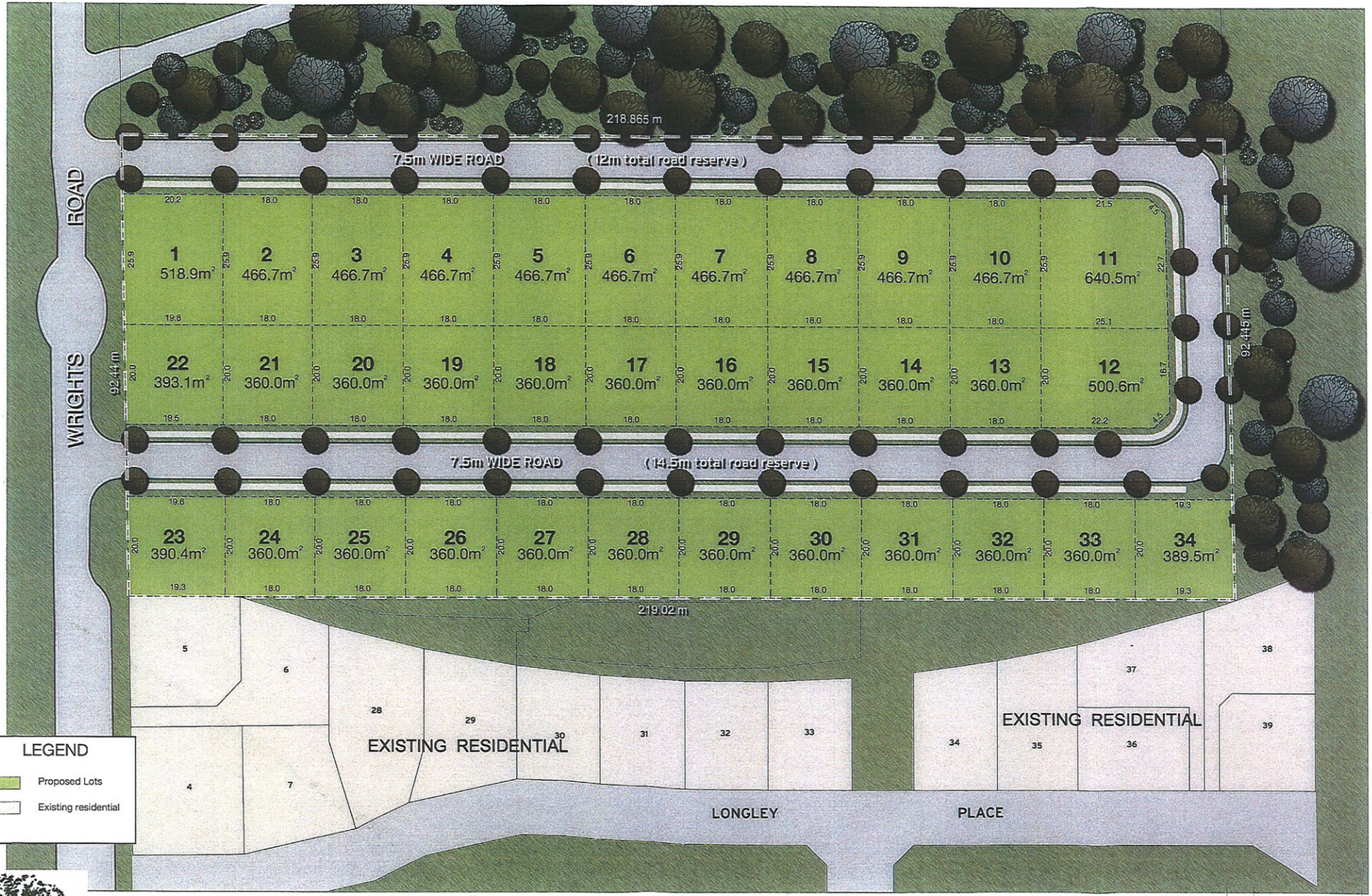
NOTES

1) THE BOUNDARIES HAVE NOT BEEN MARKED
2) ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE BY THE OFFICE of LAND & PROPERTY INFORMATION (NSW) AND ARE SUBJECT TO FINAL SURVEY
3) ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM SSM86045 R.L. 81.708 (A.H.D.) IN WRIGHT ROAD.
4) CONTOUR INTERVAL 0.5m
5) CONTOURS ARE INDICATIVE ONLY.
6) ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
7) KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
8) FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
9) NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
10) 8/.4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED: 29-04-10	DATE OF SURVEY: 19,20&27-04-2010	CLIENT: BYRNES PDM P/L
Registered Surveyor NSW	DATUM: AHD	PLAN OF DETAIL AND LEVELS OVER LOT 1 IN DP541048 KNOWN AS No 177 WRIGHTS ROAD, CASTLE HILL
	SITE AREA: 2.023 ha	LGA: THE HILLS SHIRE

LOCKLEY LAND TITLE SOLUTIONS
Registered Surveyors NSW
19 Massey Street Gladesville NSW 2111
PO BOX 400 Gladesville NSW 1675
ph:(02) 9879 6077
fax:(02) 9879 7143

ORIGINAL PLAN SIZE: A1 1:400
PROJECT No: -
JOB REFERENCE: 32905DT
SHEET 1 OF 1 SHEETS



Green Tree Design

N

drawn :
Green Tree Designs
0407 206 007 - greentreedesigns@gmail.com

project :
Proposed Subdivision

address :
177 Wrights Road,
Castle Hill, NSW 2155

client :
Byrnes PDM

title :
Concept Subdivision layout

ISSUE	DATE	REVISIONS	AUTHOR
A	22.06.10	Issue for CONCEPT	

DRAWN BY: | CHECKED BY: | DWG No: CPT-01
DATE: 16.06.10 | SCALE: 1:500 @ A2