Appendix No. 9

Bushfire Constraints Advice

ecological AUSTRALIA

BUSHFIRE CONSTRAINTS ADVICE

Proposed Residential Development
370 Old Northern Rd, Castle Hill

Prepared for
KMSJ Pty Ltd and Lanox Pty Ltd

31 March 2010

Bushfire Constraints Advice

Proposed Residential Development:

370 Old Northern Road, Castle Hill

PREPARED FOR	KMSJ Pty Ltd and Lanox Pty Ltd
PROJECT NO	10SUTBUS-0015
DATE	March 2010

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1 Property and proposal

Name:	KMSJ Pty Ltd and Lanox Pty Ltd c/o PGH Environmental Planning		
Postal address:	PO Box 714, Springwood NSW 2777		
Street or property Name:	370 Old Northern Road		
Suburb, town or locality:	Castle Hill	**Postcode:**	2154
Lot/DP no:	Lot 2 DP 135804		
Local Government Area:	The Hills Shire Council		
Type of area:	Urban		
Type of development:	Residential		

1.1 DESCRIPTION OF PROPOSAL

KMSJ Pty Ltd and Lanox Pty Ltd commissioned Eco Logical Australia Pty Ltd (ELA) to prepare constraints advice for the future residential development of 370 Old Northern Road, Castle Hill (hereafter referred to as the subject land).

A desktop assessment of the proposed development was undertaken on 25 February 2010 and this constraints advice has been prepared by Senior Bushfire Planner, Susan Courtney.

1.2 LOCATION AND DESCRIPTION OF SUBJECT LAND

The subject land is located on the western side of Old Northern Road in Castle Hill in north-western Sydney as shown in Figure 1. The nearest bush fire prone vegetation consists of dry sclerophyll forest adjacent the subject land to the north and the north-west as shown in Figure 1. A plan of the proposed development is shown in Figure 2.

Figure 1: Aerial photograph showing subject land and surrounding vegetation

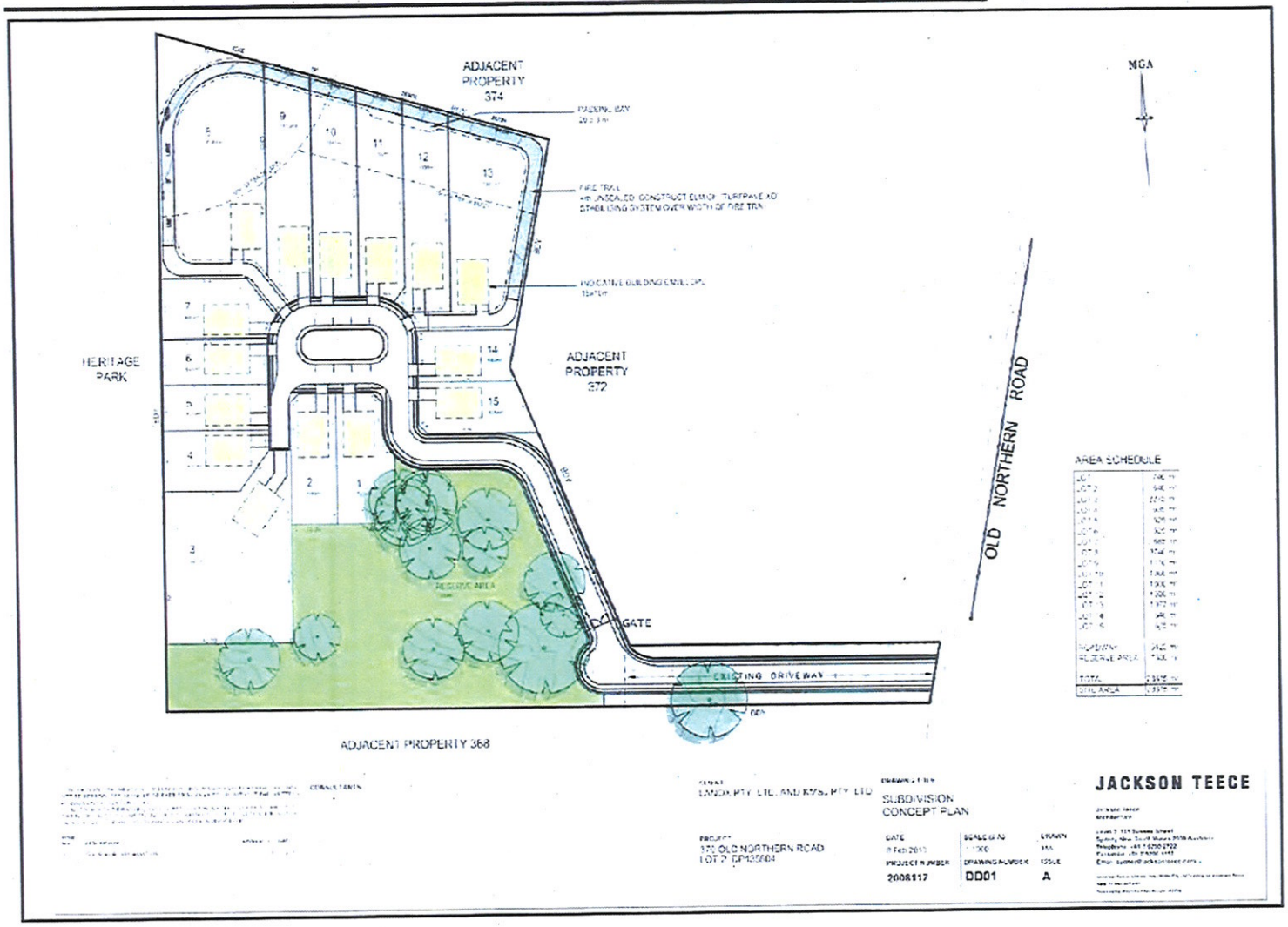

Figure 2: Plan of proposed subdivision

2 Site Data

The subject land is identified as Bush Fire Prone Land by The Hills Shire Council. The following constraints advice has been prepared in accordance with Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008*, and 'Planning for Bushfire Protection 2006' (RFS 2006) herein referred to as PBP.

2.1 VEGETATION TYPES AND SLOPES

The vegetation and slope have been assessed in all directions both within and adjacent the subject land. In accord with PBP the predominant vegetation class has been calculated within the subject land and for a distance of at least 140 m out from the boundary of the subject land, and the slope class *"most significantly affecting fire behaviour having regard for vegetation found [on it]"* determined for a distance of at least 100 m in all directions.

The only bush fire prone vegetation within 140 m of the subject land is an Endangered Ecological Community known as 'Blue Gum High Forest' to the north and north-west. This vegetation is classified as 'forest' by PBP.

There is a reserve proposed on the southern side of the proposed subdivision. It is unknown at this stage what management regime will be required within this reserve and consequently it is not possible to determine the vegetation type that will result. If the reserve is allowed to regenerate, it is assumed that it will become Blue Gum High Forest which is classified as 'forest' by PBP.

In all other directions there are managed lands including mown parklands to the west within Castle Hill Heritage Park, paddocks to the south and managed gardens on the adjacent residential property to the east.

The subject land slopes down steeply from east to west and the forest to the north is in the PBP slope category 'downslope <0-5 degrees' while the forest to the north-west is in the PBP slope category 'downslope >15-18 degrees'. If the southern reserve is allowed to regenerate, the resulting forest will be on downslopes in the PBP slope category 'downslope >5-10 degrees'.

3 Asset Protection Zones (APZs)

Figure 4 shows the APZs that will be required for future residential development adjacent the vegetation surrounding or potentially within the subject land. The subject land is capable of accommodating the required APZs as outlined in Table 1 below and Figure 2.

Table 1: Threat assessment, APZ and category of bushfire attack

Location	Slope[1]	Vegetation[2]	PBP required APZ[3]	Comment
North	>0-5° downslope	Forest	25 m	APZ is already in place within the subject land
North-west	>15°-18° downslope	Forest	60 m	APZ is already in place within the subject land
South	>5°-10° downslope	Forest (if not managed as APZ)	35 m	If APZ is not located within reserve it will need to be located within adjacent allotments
All other directions	Managed lands			

[1] Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes according to PBP

[2] Predominant vegetation is identified, according to PBP and *"Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate"*.

[3] Assessment according to PBP.

[4] Assessment according to PBP.

4 Construction standard

The category of bushfire attack and required building construction standard level as per Australian Standard AS 3959 'Construction of buildings in bushfire-prone areas' for future buildings within the subject land will be determined at the Development Application stage (Standards Australia 2000).

The most recent version of AS 3959-2009 will be enacted in NSW when the new BCA is adopted in May 2010 (Standards Australia 2009). At this stage it is unclear as to exactly how this standard will be applied to new buildings in bushfire prone areas in NSW, however, information is expected from the RFS in the near future. The new standard will not change the areas where Levels 1, 2 and 3 apply, but it will contain new details to consider for construction under each Level.

5 Water supply

The subject land will be serviced by reticulated water. The furthest point from any future dwellings to a hydrant is to be less than 70 m. The reticulated water supply is to comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles;
- Hydrants are not located within any road carriageway;
- All above ground water and gas service pipes external to the building are metal, including and up to any taps; and
- The [PBP] provisions of parking on public roads are met (Standards Australia 2005).

6 Gas and electrical supplies

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed:

- lines are to be installed with short pole spacing, unless crossing gullies, and
- no part of a tree should be closer to a powerline than the distance specified in "Vegetation Safety Clearances" issued by Energy Australia (NS179 April 2002).

Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 [Standards Australia 2008).

7 Access

7.1 CAPABILITY OF PUBLIC ROADS

The proposed public road within the proposed subdivision is able to comply with all of the requirements of PBP as outlined in Table 2, aside from the requirement to be a through road. The public road loops back on itself and is the single public access road within the proposed development. However, this road is located within the centre of the proposed development and leads traffic away from the bushfire hazard to the north out through existing managed lands onto Old Northern Road. Consequently, this road is unlikely to become blocked by a bushfire within nearby bush fire prone vegetation to the north.

7.2 PROPERTY ACCESS ROADS

Provided that the future residential development of the subject land is serviced by reticulated water as outlined in Section 5, and the speed limit within the development is less than 70 kph, there will be no specific bushfire requirements for property access roads (as per Table 3).

7.3 PERIMETER ROADS/FIRE TRAILS

A perimeter road or fire trail is proposed to be located adjacent the forest to the north and west of the subject land. This perimeter road or fire trail can comply with all of the requirements of PBP as outlined in Table 4.

Table 2: Performance criteria for proposed public roads*[1]

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
• firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)	• public roads are two-wheel drive, all weather roads
• public road widths and design that allows safe access for firefighters while residents are evacuating an area	• 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 • public 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 • 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	• 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 indicated load rating
• roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered	• 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
• there is clear access to reticulated water supply	• public roads up to 6.5 metres wide provide parking within parking bays and located 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 located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression
• parking does not obstruct the minimum paved width	• parking bays are a minimum of 2.6 metres wide from kerb to 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

*[1] PBP page 21

Table 3: Performance criteria for proposed property access roads*[1]

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
• access to properties is provided in recognition of the risk to fire fighters and / or evacuating occupants	• at least one alternative property access road is provided for individual dwelling (or groups of dwellings) that are located more than 200 metres from a public through road
• the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles • all weather access is provided	• bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes • roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge)
• road widths and design enable safe access for vehicles	• 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 • internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius • 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

*[1] PBP page 23

Table 4: Performance criteria for fire trails*[1]

Performance Criteria	Acceptable Solutions
The intent may be achieved where:	
▪ the width and design of the fire trails enables safe and ready access for firefighting vehicles	▪ a minimum carriageway width of four metres with an additional one metre wide strip on each side of the trail (clear of bushes and long grass is provided ▪ the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed ▪ a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided ▪ the crossfall of the trail is not more than 10 degrees ▪ the trail has the capacity for passing by: - reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and / or - a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay ▪ *Note: Some short construction in the access may be accepted where they are not less than the minimum (3.5m) and extend for no more than 30m and where obstruction cannot be reasonably avoided or removed*
▪ fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons	▪ the fire service is accessible to firefighters and maintained in a serviceable condition by the owner of the land ▪ appropriate drainage and erosion controls are provided ▪ the fire trail system is connected to the property access road and / or to the through road system at frequent intervals of 200 metres or less ▪ fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge) ▪ gates for fire trails are provided and locked with a key / lock system authorized by the local RFS
▪ fire trails designed to prevent ween infestation, soil erosion and other land degradation	▪ fire trail does not adversely impact on natural hydrological flows ▪ fire trail design acts as an effective barrier to the spread of weeds and nutrients ▪ fire trail construction does not expose acid-sulphate soils

*[1] PBP page 25

8 Conclusion

Based on this initial bushfire constraints assessment, the subject land is capable of accommodating the proposed development types provided that the development is designed with consideration of APZs along those boundaries adjacent bushland, appropriate road design and installation of water and other services.

Susan Courtney
Senior Bushfire Planner

9 References

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