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RPS Australia East Pty Ltd ABN 44 140 292 762  
A member of the RPS Group Plc

**Date:** 2/5/2018  
**Our Ref:** 139898  
**Via:**

Attn: Mr Nathan Grice  
Thelem Consulting Pty Ltd  
Suite 3. Level 2  
Plaza Building Australia Square  
95 Pitt Street  
Sydney NSW 2000

Dear Nathan,

**Bushfire Threat Assessment: 3 Quarry Road, Dural**

RPS Australia Asia Pty Ltd was engaged in 2016 by H Investments International Pty Ltd to complete a Bush fire Threat Assessment for a proposed seniors housing at Lot 2A DP158064 and Lot 1 DP230172, also known as 3 Quarry Road and 4 Viney Road, Dural.

The Bush fire Threat Assessment report completed in 2016 has been reviewed in consideration of Planning for Bush fire Protection (2006) and Australian Standard AS:3959-2009 'Construction of Buildings in Bushfire prone areas', to ensure that document is consistent with current practises and complies with current regulatory requirements. This includes the broad aims and objectives within Section 1.2.1, Specific Objectives of Special Fire Protection Purpose Development' in Section 4.2.3, and Performance Criteria identified within Section 4.2.7 'Standards for Bushfire Protection Measures for SFPP Development' within the Planning for Bushfire Protection (2006).

**In summary, the site does constitute bush fire prone land and the conclusion and recommendations within the 2016 report stand.** Attention should be provided to the internal road access requirements for emergency services to facilitate evacuation and respond to wildfire and the establishment of shielding around the exits of Building 'H' in the final design plans.

The aims and objectives listed in section 1.2.1 of PBP 2006 remain applicable to SFPP developments and are illustrated below.

**Planning for bushfire protection compliance (PBP 2006)**  
*Broad Aims and objectives of PBP (2006)*

ELEMENT	COMPLIANCE
Afford occupants of any building adequate protection from exposure to a bush fire;	<b>YES</b> – This development provides occupants protection from bush fire through the establishment of appropriate APZ, construction standards and emergency infrastructure and procedures.
Provide for a defensible space to be located around buildings;	<b>YES</b> – A defensible space has been established between the buildings and bush fire hazard. The entire property should be maintained as an inner protection zone in accordance with NSW Rural Fire Services' document 'Standards for Asset Protection Zones'.
Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;	<b>YES</b> – Separation between the bush fire threat and building results in a BAL-10 at the entrances and exits of the buildings. This separation will prevent direct flame contact and appropriate construction standards in accordance with AS:3959 will prevent material ignition.
Ensure that safe operational access and egress for emergency service personnel and residents is available;	<b>YES</b> – Access to the site via Quarry Road and the turning opportunities facilitate emergency response access and egress. The installation of appropriate traffic management devised within the site such road width, construction of road shoulders that facilitate passing vehicles, shrub vegetation not be established on the side of the road and appropriate road side signage for no parking shall be installed.
Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);	<b>YES</b> – The entire property should be maintained as an inner protection zone in accordance with NSW Rural Fire Services' document 'Standards for Asset Protection Zones', and programmed into maintenance schedules for the development into perpetuity.
Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting).	<b>YES</b> – Vehicle access, water supply and emergency evacuation procedures have been considered in the design elements of the development.

The aims and objectives listed in section 1.2.1 of PBP 2006 remain applicable to SFPP developments, however further consideration has been given to SFPP developments due to the nature of these environments and the occupants they accommodate. Occupants of SFPP developments are generally more vulnerable to bush fire attack therefore specific objectives have been put in place to ensure greater protection is provided (section 4.2.3 PBP 2006). Specific objectives include:

**Planning for bushfire protection compliance (PBP 2006)**  
*Specific Aims and objectives of SFPP developments within PBP (2006)*

ELEMENT	COMPLIANCE
Provide for the special characteristics and needs of occupants. Unlike residential subdivisions, which can be built to a construction standard to withstand the fire event, enabling occupants and firefighters to provide property protection after the passage of fire, occupants of SFPP developments may not be able to assist in property protection. They are more likely to be adversely affected by smoke or heat while being evacuated.	<b>YES</b> – The development provides vehicle egress to the entrances and exits of all buildings and APZ in accordance with PBP and construction standards in accordance with AS:3959 shall be implemented.
Provide for safe emergency evacuation procedures. SFPP Developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats.	<b>YES</b> – The development shall comply with <b>emergency/evacuation plan is prepared consistent with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan, compliance with AS 3745-2002</b> 'Emergency control organisation and procedures for buildings, structures and workplaces' for <b>residential accommodation</b> and <b>compliance with AS4083-1997</b> 'Planning for emergencies – for health care facilities'.
During emergencies, the risk to firefighters and other emergency services personnel can be high through prolonged exposure, where door-to-door warnings are being given and exposure to the bush fire is imminent.	<b>YES</b> – The development provides protection to emergency service workers performing door-to-door warnings/evacuation by locating exits and entrances away from the bush fire hazard near vehicle access. Establishing shield associated with entrances and exits of Building H should be considered in final design.

**Planning for bushfire protection compliance (PBP 2006)**  
*Planning controls for Residential building Special Fire Protection Purposes*

Performance Criteria	Determination of Proposed Development	COMPLIES
<b>Asset Protection Zones</b>		
Radiant heat levels greater than 10kW/m <sup>2</sup> will not be experienced by occupants or emergency services workers entering or exiting the building	<ul style="list-style-type: none"> <li>An APZs is provided in accordance with the relevant tables and figures in Appendix 2 of PBP (2006).</li> <li>Exits are located away from the hazard side of the building.</li> <li>The APZ is wholly in the boundaries of the development site.</li> </ul>	<b>Yes</b> – The concept plan indicates the entire development site shall be managed as an Inner Protection Zone. Building 'I' has entrances on the southern side which are facing away from the hazard and exposed to less than 10kW/m <sup>2</sup> radiant heat. Establishing shield associated with entrances and exits of Building H should be considered in final design. APZs is wholly in the boundaries of the development.
The applicant demonstrates that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated	<ul style="list-style-type: none"> <li>Mechanisms are in place to provide for the maintenance of the APZ over the life of the development.</li> <li>The APZ is not located on lands with a slope exceeding 18 degrees.</li> </ul>	<b>Yes</b> – APZ is not on a slope exceeding 18 degrees and maintenance of APZ can be made a condition of consent.
APZ are managed and maintained to prevent the spread of fire towards the building	<ul style="list-style-type: none"> <li>In accordance with the requirements of 'Standards for Asset Protection Zones (2005)</li> <li>Note - a Monitoring and Fuel Management Program should be required as a condition of development consent.</li> </ul>	<b>Yes</b> – The concept plan indicates the entire development site shall be managed as an Inner Protection Zone. APZ shall be in compliance with RFS Asset Protection Zones (2005)
Vegetation is managed to prevent flame contact and reduce radiant heat to buildings, minimise the potential for wind driven embers to cause ignition and reduce the effect of smoke on residents and fire-fighters.	<ul style="list-style-type: none"> <li>Compliance with Appendix 5 of PBP (2006).</li> </ul>	<b>Yes</b> – APZ shall be in compliance with Bush Fire Provision – Landscaping and Property Maintenance

Access - Internal Roads		
Internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle.	<ul style="list-style-type: none"> <li>Internal roads are two-wheel drive, sealed, and all-weather.</li> <li>Internal perimeter roads are provided with at least two traffic lane widths (carriage 8 metres minimum kerb to kerb) and shoulders on each side, allow traffic to pass in opposite directions.</li> <li>Roads are through roads. Dead end roads are not more than 100m in length from a through road, incorporated a minimum 12 metres outer radius turning circle, and are clearly posted as a dead end.</li> <li>Traffic management devices are constructed to facilitate access by emergency services vehicles.</li> <li>A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided.</li> <li>Curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.</li> <li>The minimum distance between inner and outer curves grades are not more than 10 degrees.</li> <li>Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.</li> <li>Cross fall of the pavement is not more than 10 degrees.</li> <li>Roads do not transverse through wetland or other land potentially subject to inundation.</li> <li>Roads are clearly sign-posted, and bridges clearly indicate load ratings.</li> <li>The internal road surface and bridges have a capacity to carry fully-loaded fire fighting vehicles (15 tonnes).</li> </ul>	<p><b>Yes</b> – Internal roads are 2-wheel drive, sealed and all weather, appropriate clearances.</p> <p>The concept plan provides insufficient detail on carriage width. This can be made a condition of consent</p> <p>All internal roads are continuous. The concept plan provides insufficient detail on the inner and outer turning circle radius. This can be made a condition of consent</p> <p>Grades, cross fall and signage can be made a condition of consent.</p> <p>No bridges, flood or wetland issues.</p> <p>Internal road capacity can be made a condition of consent.</p>

Water, Electricity and Gas		
<p><b>RETICULATED WATER SUPPLY</b></p> <p>Water supplies are easily accessible and located at regular intervals</p>	<ul style="list-style-type: none"> <li>Access points for reticulated water supply to SFPP development incorporate a ring main system for all internal roads.</li> <li>Fire hydrant spacing, sizing and pressure comply with AS2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressure anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.</li> <li>The provision of public roads in section 4.1.3 in relation to parking are met.</li> </ul>	<p><b>Yes</b> – The concept plan provides insufficient detail on reticulated water supply. This can be made a condition of consent.</p>
<p><b>NON- RETICULATED WATER SUPPLY</b></p> <p>A water supply reserve dedicated to firefighting purposes is installed and maintained. The supply of water can be an amalgam of minimum quantities for each lot in the development and be reticulated with dedicated firefighting lines.</p>	<ul style="list-style-type: none"> <li>10000 litres is the minimum dedicated water supply required for firefighting purposes for each occupied building, excluding drench systems.</li> <li>The provision for suitable connection for RFS and/or NSW FB purposes in section 4.1.3 in relation to water supplies is made available.</li> </ul>	<p><b>Yes</b> – The development is within a reticulated water supply area.</p>
<p><b>ELECTRICITY</b></p> <p>Location of electricity services will not lead to ignition of surrounding bushland or the fabric of buildings or risk to life from damaged electrical infrastructure.</p>	<ul style="list-style-type: none"> <li>Electricity transmission lines are under ground.</li> </ul>	<p><b>Yes</b> – Electricity is under ground.</p>
<p><b>GAS</b></p> <p>Location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings.</p>	<ul style="list-style-type: none"> <li>Reticulated or bottled gas is installed and maintained in accordance with AS1596-2002 and the requirements of relevant authorities. Metal piping is to be used.</li> <li>All fixed LPG tanks are kept clear of all flammable materials and located on the non-hazard side of the development.</li> <li>If gas cylinders need to be kept close to the building, the release valves must be directed away from the building and away from any combustible material, so they do not act as a catalyst to combustion.</li> <li><b>Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.</b></li> </ul>	<p><b>Yes</b> – The concept plan provides insufficient detail on gas supply. This can be made a condition of consent.</p>

Emergency and Evacuation planning		
An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area.	<ul style="list-style-type: none"> <li>▪ <b>An emergency/evacuation plan is prepared consistent with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan.</b></li> <li>▪ <b>Compliance with AS 3745-2002</b> 'Emergency control organisation and procedures for buildings, structures and workplaces' for residential accommodation'.</li> <li>▪ <b>Compliance with AS4083-1997</b> 'Planning for emergencies – for health care facilities'.</li> </ul> <p>The developer should provide a copy of the above document to the local Bush Fire Management Committee for their information prior to the occupation of any accommodation of a special fire protection purpose or community title subdivision.</p>	<b>Yes</b> – Can be made a condition of consent.
Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan.	<ul style="list-style-type: none"> <li>▪ <b>An emergency management committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedure Manual.</b></li> <li>▪ <b>Detailed plans of all Emergency Assembly Areas</b> including 'onsite' and 'offsite' arrangements as stated in <b>AS 3745-2002</b> are clearly displayed, and an annual (as a minimum) trail emergency evacuation is conducted.</li> </ul>	<b>Yes</b> – Can be made a condition of consent.

Yours sincerely

**Duncan Scott-Lawson**  
RPS