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Stockland
Senior Planning Coordinator
Level 4, 99 Melbourne Street
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Attention: Jacqui Carter

Dear Jacqui

Review of the bushfire risk and proposed mitigation for a revised development application - Bellvista II, Caloundra West

Parsons Brinckerhoff (PB) has been engaged by Stockland to review the bushfire hazard assessment for a proposal to establish mixed use development of up to 750 Lots located at Bellvista, West of Caloundra on the Sunshine Coast. Previous planning for the proposal had involved the preparation of a Bushfire Assessment Report by Land Graphics Landscape Architects and Environmental Planners and this document has formed the basis of this review.

It is the intention of this review to:

- provide an overview of the fire risk of the site
- provide recommendations to mitigate the risk of bushfire to any future residential community occurring at the Bellvista site
- review proposed layout to ensure the principles of bushfire protection have been integrated into the layout design.

The following review has been conducted under the framework of the State Planning Policy 1/03 - (Mitigating the Adverse Impacts of Flood, Bushfire and Landslide).

1. Fire risk

The site of the proposed Bellvista II development has been assessed in accordance with Australian Standard AS3959:Building in Bushfire Prone Areas, State Planning Policy 1/03 (Mitigating the Adverse Impacts of Flood, Bushfire and Landslide) and the Caloundra City Plan 2004's Bushfire Mitigation Code which has indicated that the site is a Low to Medium Bushfire Hazard Area.

The site consists of a number of different types of vegetation, consisting predominantly of melaleuca open forest, heathland vegetation, exotic pine plantations and grasslands occurring on flat slopes. These stands of vegetation are considered to be flammable and will support wildfires given favourable conditions and an ignition source. Records indicate that fires in the past have swept across the development site in the past. Most notably, fires occurred over the subject site in 1994 and more recently in 2006. Evidence of these fires exists on the site with a number of trees bearing fire scars.

2. Recommendations

The previous bushfire hazard assessment conducted by Land Graphics Landscape Architects and Environmental planners for the proposal has identified the main areas of bushfire risk. This study also contained a number of recommendations to be incorporated within the design of the proposal to ensure adequate bushfire protection is achieved for future development of the site. Those recommendations are reproduced as follows:

2.1 Fire breaks

It is recommended that perimeter roads comprising 2 lanes will be developed where possible between bushland and residential premises. Where this is not possible to achieve, a minimum 13 m+ wide fire break containing a fire trail is to be maintained between proposed building envelopes and the adjoining predominant vegetation to exclude potential direct flame contact and allow access to fire fighters. Where perimeter roads are able to be provided, a 19-22 m firebreak size should be considered (16 m road reserve + 3 to 6 m building setback). The location of additional open space areas such as parks which increase the separation between buildings and the adjoining bushland is also beneficial.

Building construction standards for adjoining houses will need to be modified depending on the size of the firebreak provided (13-22 m) to accommodate the discrepancy of incident radiant heat flux between these distances. Fire breaks are to be maintained in accordance with the following:

- the creation of 2 lane perimeter roads suitable to accommodate a 2wd urban fire tanker between all allotments and the adjoining bushland to allow unrestricted passing of such vehicles in an emergency (carriageway min 8 m from kerb to kerb). The proposed layout contains a 16 m wide road reserve and additional 3-6 m setback totalling 19-22 m fire break between the majority of lots and adjoining flammable vegetation

- where perimeter roads cannot be constructed as described above fire trails are to be constructed that enable access to 2wd urban fire tankers between proposed housing lots and the adjoining bushland. It is recommended that these fire trails be designed to not contain significant amounts of revegetation works or artificial wetlands within 13 m (modelled flame length of 12 m) of building envelopes. Where this circumstance exists more onerous building conditions will be triggered under the BCA and the revised Australian Standard owing to the greater radiant heat flux at this shorter setback. Buildings must not be located within 13 m of bushland or revegetation works that are characteristic of the prevailing surrounding native vegetation
- within open space areas adjoining bushland shrubs, trees, shrubs, sedges and grasses and small linear WSUD elements (such as swales and bio retention trenches) are acceptable provided that they:
 - ▶ are not areas of revegetation as described above
 - ▶ are well spread out and do not form a continuous canopy
 - ▶ are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a fire danger period
 - ▶ are located far enough away from the building so that they will not ignite the building by direct flame contact or radiant heat emission when under flaming combustion.
- any landscaping or plantings should be low flammability species
- a minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means any dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter)
- any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris where these structures are located against the building or within the firebreak
- the inclusion of large WSUD elements such as wetlands / drainage corridors containing large areas of native vegetation should be avoided within 20 m of proposed building envelopes.

Any reduction in fire break sizes to less than the predominant proposed 22 m will necessitate higher building construction standards as per the recommendation in section 2.6. No firebreak is to be less than 13 m in any circumstance.

2.2 Fire trails

Fire trails are to be constructed which will allow fire appliances to access the edge of bushland. Trails are to be constructed as per the requirements of recommendation in section 2.1. However may also be integrated with linear linkages containing concrete bicycle / pedestrian paths. Vehicle exclusion devices such as gates and bollards are to be locked and a key provided to the local fire service after construction. Fire trails should maintain access through to the land and trails to the south of the development to facilitate management of wildfire further to the south of the development by fire authorities should a fire approach from this direction.

2.3 Design of bushland parks

Bushland areas within the development should be master planned to enable the management of parks for fire. This includes managing for wildfire suppression and containment and for prescribed burning. Parkland is to be divided into firing blocks by fire control lines. Rotational burning of the blocks will be undertaken in the absence of natural wildfire ensuring fire regimes for various ecosystem types are maintained, creating a mosaic of burnt and unburnt vegetation and fuel loads are reduced. Bushfire mitigation will be required for all revegetated drainage reserves and retained bushland within the development. Fire regime guidelines for the identified Regional Ecosystems present on site have been produced by the DERM and are available on the DERM website and should form the basis of any prescribed fire regime.

2.4 Water supplies

The development will be connected to the reticulated water supply. Fire hydrants located within the development will be located and installed in accordance with Australian Standards, with fire hydrant locations to be highlighted with standard street markings (yellow painted icon on kerb and cats eye reflectors). All fire hydrants occurring on perimeter roads will be located on the bushland side of perimeter roads to prevent hoses being stretched across the road in case of a bushfire emergency. To avoid conflict, no services or hydrants will be located within on-street parking bays.

2.5 Gas supplies

If gas services are to be installed and maintained in accordance with AS 1596. The relief valves of any gas cylinder located near dwellings are to be directed away from buildings and away from combustible materials.

2.6 Building construction standards

Buildings are to be constructed in accordance with AS3959: 2009. The majority of lots are expected to fall within the BAL (building attack level) low to moderate categories given the proposed 22 m setback.

2.7 Street numbering, identification and legibility

To ensure fire services are able to navigate the Bellvista II development with ease, stage and precinct entry signs should be made of a reflective material and should include print larger greater than 80 mm in height. All fire trails shall be signed appropriately and mapped with a copy of the trail map provided to the local fire services.

2.8 Internal roads

Major access roads and perimeter roads located within the development need to be of a sufficient width to ensure that movement of fire appliances in emergency situations is not impeded. Kerbs located on the bushland side of perimeter roads will be designed to be semi mountable, to allow access to fire vehicles and appliances. As mentioned in recommendation in section 2.1, where perimeter roads are not provided by the concept plan, accesses should be provided to fire trails from internal roads.

2.9 Electrical transmission lines

All electrical transmission lines should be located underground to protect electrical infrastructure from fire events.

2.10 Landscaping

Landscaping within the development is to be considerate of the requirements specified for the development of fire breaks. Landscaping can form a source of fuel for bushfires and the installation of inappropriate plant species or mulching may serve to increase the spread of fire to adjacent land properties.

Landscaping within 100 m (likely extent of ember penetration) of bushland should limit the abundance of highly flammable native vegetation types in preference to low flammability native plants such as rainforest plants and avoid the creation of fire paths. Any landscaping within drainage reserves, streetscapes and WSUD elements shall also be comprised of species of a low flammability. Future residents should also be provided with information regarding the proper maintenance of homes and gardens with respect to bushfire hazards, including information of non-flammable mulching types and low flammability native plants.

Perimeter fences which have a bushland interface are to be constructed of a non-flammable material such as colour-bond, stone or brick as flammable fences may prevent fire fighting personnel access to properties and buildings.

2.11 Maintenance

The maintenance of all fire breaks and fire trails and the continuance of other bushfire mitigation practices will be required to achieve optimal bushfire mitigation. It is recommended that prior to the bushfire season a pre-fire checklist be developed and completed by those responsible for maintenance of the landscaping within the estate. Maintenance will include the management of fuel loads, grass, signage and access throughout the estate.

3. Bellvista II concept plan proposal and adoption of recommendations

The proposed layout successfully incorporates recommendations made within the initial Bushfire Assessment Report produced by Land Graphics. Bushfire planning concepts incorporated into the proposal are summarised below.

- proposed medium density development areas have been situated away from remnant bushland areas. The proposed medium density development areas are located adjacent to major collector roads allowing for efficient resident evacuations
- internal roads provide fire response services with access to bushland areas located to the South of the development site, which, in turn, allows access to fire trails and fire breaks for maintenance and fighting fires in the event of bushfires
- parks and open space have been strategically positioned throughout the development to provide house lots with buffers from nearby bushland areas. In the event of a bushfire it is unlikely a fire will be able to traverse the open space due to a lack of fuel load
- the incorporation of Water Sensitive Urban Design components has allowed for the positioning of drainage lines and measures which will act as buffers in fire events
- where possible, perimeter roads have been incorporated into the developments design, allowing fire services direct access to retained areas of bushland in fire events
- the location of perimeter roads are predominantly along frontages that have been identified as being at the greatest fire risk. The location of roads is considered to provide for effective buffers from any approaching fire front
- in areas where perimeter roads are not provided, purpose built fire trails/fire breaks are proposed.

4. Conclusion

Bushfire investigations completed as a result of preliminary planning for the site have indicated that the surrounding landform and predominant vegetation types represent a low to moderate fire risk. Given this level of risk Stockland has incorporated a number of bushfire risk mitigation recommendations to ensure an adequate standard of bushfire protection is incorporated into the proposed development. This level of bushfire protection ensures compliance with the requirements of State Planning Policy 1/03.

Yours sincerely



Brad McDonald
Principal Environmental Planner
Parsons Brinckerhoff Australia Pty Limited