

Bushfire Assessment

In relation to

Kempsey District Hospital

Prepared for

Watpac Constructions Pty Ltd

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1. Introduction

The Kempsey District Hospital (KDH) complex is on land in West Kempsey bounded by Polwood Street to the north, Tozer Street to the east and River Street to the west, comprising:

- Lots 1-8 Section 20A DP 759080;
- Lot 14 Section 23A DP 759080; and
- Lot 1 Section 23A DP 759080.

The West Kempsey Cemetery and associated open space adjoins the southern boundary of the KDH site.

The KDH complex is presently subject to work in association with the Kempsey District Hospital Stage 1 Redevelopment. As part of this redevelopment, additions are presently being constructed to the eastern part of the existing hospital complex.

The KDH Stage 1 redevelopment was subject to a Bushfire Protection Assessment that was prepared by Australian Bushfire Protection Planners Pty Ltd (ABPP) for the Kempsey District Hospital Stage 1 redevelopment (the ABPP Report).

The ABPP report recommended that all existing hospital buildings located within 100 metres of the bushfire hazard be upgraded to provide ember protection to the openings/vents etc. The recommendation simply requires upgrading to improve ember protection and does not require compliance with any particular Bushfire Attack Level (BAL) for the purposes of AS3959-2009 (Construction of Buildings in Bushfire Prone Areas). The work arising from the recommendation of the ABPP report is discussed in Section 2.3 of this report.

ABAC Australian Bushfire Assessment Consultants (ABAC) has been commissioned by Watpac Constructions Pty Ltd (Watpac) to consider the formulation of an alternative solution in relation to the recommendation of the ABPP report that all existing hospital buildings located within 100 metres of the bushfire hazard be upgraded to provide ember protection to the openings/vents etc.

The brief requires:

- a site inspection of the facility;
- investigation of the issues relating to the potential for ember attack on the existing buildings within the KDH and alternative measures that may be adopted in lieu of compliance with the recommendation of the ABPP Report for upgrading of the existing building(s) in relation to ember protection; and
- the assessment to be undertaken by a BPAD-Level 3 Accredited Bushfire Planning & Design Practitioner.

It is understood that this report is to be used as the basis for a request to amend the project approval by deletion of the requirement for upgrading of the existing building(s) in relation to ember protection.

A site inspection was conducted on 6 May 2014.

Simon Carroll, a BPAD-Level 3 practitioner certified by FPA Australia, carried out the assessment.

1.1 Scope

The scope of this report is limited to the issues relating to the recommendation of the ABPP report that all existing hospital buildings located within 100 metres of the bushfire hazard be upgraded to provide ember protection to the openings/vents etc.

This assessment does not deal with any aspects of the additions to the KDH complex as part of the Kempsey District Hospital Stage 1 Redevelopment.

Watpac proposes to delete the requirements for upgrading of the existing building(s) with the KDH complex in relation to ember protection.

The scope of this report is to consider the bushfire assessment considerations and qualitative aspects in relation to Watpac's proposal.

The following matters, inter alia, are outside the scope of this assessment.

- maintenance of vegetation on or adjacent to the site;
- emergency evacuation procedures for the hospital;
- compliance or otherwise of the existing buildings within the KDH complex with the relevant provisions of the Building Code of Australia (BCA).

1.2 Assumptions

The following assumptions have been made:

- no work is proposed to the existing buildings within the KDH complex;
- AS3959-2009 (Construction of Buildings in Bushfire Prone Areas) is not applicable to the existing buildings as no new work is proposed;
- The existing buildings are Class 9a buildings for the purposes of the BCA;
- The existing buildings within the KDH complex are fully compliant with the provisions of Part E of the BCA (as applicable) – Fire Fighting Services and Equipment; and
- KDH is staffed by security personnel 24 hours a day.

2. Bushfire Assessment Considerations

This report relates to those parts of the existing buildings within the KDH complex which are located within 100 metres of vegetation to the western side of River Street.

2.1 Bushfire Prone Land

Kempsey Council's Bushfire Prone Land Mapping indicates that the KDH site is mapped as containing areas of Category 1 vegetation and as being located within the 100 metre bushfire buffer to Category 1 vegetation.

The mapping is inaccurate inasmuch as there is only a limited amount of vegetation along the southern boundary of the site with the West Kempsey Cemetery.

The nearest vegetation likely to have any bushfire hazard potential is located on land to the western side of River Street, on sloping land between the western side of River Street and the eastern back of the Macleay River. The land obviously slopes down in a westerly direction from River Street towards the Macleay River.

The new additions comprising the Kempsey District Hospital Stage 1 Redevelopment are in excess of 100 metres from any potential bushfire hazard vegetation.

The major portion of the existing buildings within the KDH complex is located within 100 metres of the vegetation on the eastern side of River Street.

2.2 Previous Bushfire Attack Level Assessments

The KDH Stage 1 redevelopment was subject to a Bushfire Protection Assessment that was prepared by Australian Bushfire Protection Planners Pty Ltd (ABPP) for the Kempsey District Hospital Stage 1 redevelopment (the ABPP Report).

The ABPP report is referenced as Assessment number B121887-2, issued on 20 April 2013.

The ABPP report recommended that all existing hospital buildings located within 100 metres of the bushfire hazard be upgraded to provide ember protection to the openings/vents etc.

The origin of this recommendation is outlined in Section 6.6.2 of the ABPP report which refers to the relevant Director General's Requirement (DGR) from the NSW Department of Planning for the overall project.

The relevant DGR was that the bushfire assessment address the compliance of the existing hospital development with the requirements of the (RFS) *Planning for Bush Fire Protection 2006* guidelines and recommend any improvements to achieve a better bushfire protection outcome for the existing facility.

The areas of the existing hospital complex that are affected by the recommendation for upgrading as per the ABPP report are as shown in figure 12 on page 43 of that document.

The work arising from the recommendation of the ABPP report, in general, involves ensuring that windows and doors are tight fitting, have weather shields fitted to the bottoms of external doors and that all operable windows shall be fitted with a corrosion resistant steel or bronze mesh having a maximum aperture of 2mm. As well as operable doors and windows, all vents, louvers, weep holes and the like are to be fitted with corrosion resistant steel or bronze mesh having a maximum aperture of 2mm.

In relation to the Mental Health/Maternity building that is located adjacent to the corner of River Street and Polwood Street, the requirements include

considerations in relation to the existence or otherwise of toughened glass (and the replacement of existing glazing with 6mm toughened glass if toughened glass is not already fitted). The requirements were also to fit Crimsafe or other similar heavy duty mesh to both the opening sashes of the windows and Crimsafe to the exterior of the glazing within the external doors. There are a number of other matters that are ancillary to the intent of the ABPP report to recommend upgrading to the existing building in terms of ember protection.

2.3 The Director-General's Requirement

The ABPP Report responded to the relevant Director-General's Requirement (DGR) from the NSW Department of Planning, that the bushfire assessment address the compliance of the existing hospital development with the requirements of the (RFS) *Planning for Bush Fire Protection 2006* guidelines and recommend any improvements to achieve a better bushfire protection outcome for the existing facility.

The intent of the DGR requirement appears to have been to limit the potential for ignition of the buildings as a result of ember attack during a bushfire. AS3959-2009 (Construction of Buildings in Bushfire Prone Areas) identifies that in (predominantly residential) situations, occupants may leave a building if a bushfire approaches, leaving windows and/or doors open and raising the potential for embers to penetrate the building.

The provision of mesh screening to openings is advocated by the Standard as a tangible measure as a physical barrier against the entry of embers into a building in the event that occupants fail to close windows or doors.

The requirement for provision of mesh screening has its basis in more of a residential construction than a hospital situation. That said, the provision of mesh screening would serve to enhance the ember protection of the hospital buildings but it is not necessarily the only means of achieving such protection.

There are a number of measures, either in conjunction with or independent of the provision of mesh screens, that may also be implemented to ensure the protection of the buildings in the event of ember attack. These other measures, though, are largely intangible measures.

In the case of KDH, there are a number of different options and operational aspects of the complex that may be implemented – via management in use procedures or otherwise – to address issues to do with the detection and extinguishment of any embers which may impact on the existing hospital buildings. Central to this is the assumption that the KDH complex is staffed on a 24 hour basis.

It is understood that the deletion of the requirements for upgrading of the existing hospital buildings in relation to ember protection will require an amendment of the Project Approval to delete the relevant condition.

3. Qualitative Assessment

The proposal is to delete the requirements for upgrading of the existing building(s) within the KDH complex in relation to ember protection.

The conclusion of the site inspection of 6 May 2014 was that the existing hospital buildings will be subject to some degree of ember attack in the event of a bushfire occurring in the vegetation between the eastern bank of the Macleay River and the western/opposite side of River Street from the hospital complex.

While the land under this vegetation is relatively steep, sloping down from River Street to the river bank, it is noted that the extent of the vegetation is limited and constrained by the river to the west and River Street to the east.

Nevertheless, it appears that a quantitative analysis would simply identify that the KDH site may be subject to some degree of ember attack in the event of a bushfire.

In other words, a qualitative approach has been adopted in relation to the proposal to remove any requirement for the upgrading of the existing buildings within the hospital building with respect to ember protection.

The proposal does not require a formal alternative solution as there is no new work proposed and, therefore, the issue of compliance with any relevant Performance Requirements of the BCA does not arise in relation to the existing buildings within the KDH complex.

While a formal alternative solution is not required in relation to this matter, as the proposal involves deletion of the particular condition, an important issue it that it should be demonstrated that the proposal will not increase the potential for ignition caused by burning embers generated by a bushfire that is commensurate with the expected intensity of the bushfire attack on the existing hospital buildings.

3.1 The expected intensity of bushfire attack

The basis for the imposition of the DGR and the subsequent recommendation of the ABPP report is that there is a specific bushfire risk for the existing hospital buildings based upon the presence of vegetation to the west of the KDH site, within the land between the western (opposite) side of River Street and the Macleay River.

It has been noted previously that the extent of the vegetation is limited and constrained by the river to the west and River Street to the east.

The fact that this vegetation is heavily constrained evidences that it is unlikely to support or sustain any bushfire that would be likely to subject the hospital buildings to prolonged and intense ember attack to any extent that might increase the potential for ignition of the buildings.

In relation to the potential for ignition of the buildings, it is noted that some of the existing hospital buildings are heritage listed and contain construction elements that may be combustible under extreme conditions arising from a bushfire. For this reason, specific measures, aimed at the implementation of management is use procedures have been considered in a subsequent section of this assessment.

Any potential bushfire in the vegetation to the west of the site is likely to be of only limited duration.

The 'worst case' potential fire that might occur in this vegetation to the west may involve a bushfire initiating at the base of the slope, which would have to be at a point adjacent to the eastern bank of the Macleay River.

In terms of the 'worst case' potential fire, conditions would need to first be conducive to make the vegetation within the land to the western side of River Street available as fuel, then result in the ignition of a fire and effect its growth to the point where significant ember generation is likely to occur.

The fire would then have to run east towards the western side of River Street.

River Street provides permanent and effective separation between the KDH site and any vegetation to the west. The vegetation to the western side of River Street forms a band along the eastern bank of the Macleay River, and only a limited portion of vegetation is opposite the hospital site. The fact that the vegetation forms a band along the river does not have any potential to increase the potential "run" of any fire directly toward the western side of River Street, opposite the KDH site.

It is unlikely that any fire would remain unnoticed or undetected for a prolonged period of time. The prominent location of the site is a major factor as to why this is unlikely to occur. Also, any ember generation by a fire in the vegetation to the west of the KDH site would necessarily be preceded by the generation of a significant amount of smoke which would be highly visible to users of the hospital, motorists on River Street or nearby residents. This would result in any fire being reported and fire brigade intervention occurring at early stages in the development of the fire.

There is no known bushfire history for the vegetation to the west of the site to provide for any conclusion to be drawn as to how frequently, if ever, this vegetation has been subject to fire.

Consequently, while it is possible that an uncontrolled fire event may initiate within the vegetation to the west of the KDH site, it is unlikely that any fire would have the potential to approach the KDH site as a sustained and consistent line fire given the limited depth of the vegetation from east to west.

The potential for any significant and sustained ember attack on the KDH site is correspondingly limited.

Overall exposure of the KDH site to any line fire is also limited in the central and southern parts of the River Street frontage of the site by the existence of a dwelling and constructed car parking area on the western side of River Street.

3.2 Surveillance & potential for early detection of a bushfire

The KDH site is in an area that has a significant degree of inherent surveillance – both natural and applied – through its prominent visual location from River Street, a relatively busy road, and residential areas further to the east of the site.

Also, with regard to the assumptions made on Section 1.2, the hospital has 24 hour security staffing on site. This implies that any bushfire that might occur in vegetation on land to the west of the KDH site would be detected and reported early. This would limit the potential for any fire to fully develop and generate any significant amount of embers that might impact on the KDH. It is unlikely that any fire would occur within the vegetation and go unnoticed for any length of time that would result in the fire being able to fully develop.

3.3 Potential measures to be adopted

The main driver behind the proposal to delete the requirements for upgrading of the existing building(s) within the KDH complex in relation to ember protection is the significant amount of alteration and installation of screening materials that compliance with the recommendation would entail. Cost is also an accompanying factor.

The recommendation for upgrading for ember protection will affect almost every window and door opening to the existing hospital complex and will be a major task to comply with. Nevertheless, it is acknowledged that the hospital complex could be subject to a degree of ember attack. The proposal to delete the requirement for ember protection must, therefore, be responsive to that acknowledgement.

The potential measures to be implemented in lieu of the upgrading of the existing buildings have their basis in the manner in which the site is managed.

The hospital will have security patrols and grounds maintenance staff that would be able to monitor the site and remove any dead vegetative material or other debris that may accumulate on and around the buildings (which might, if subject to ember attack, otherwise be available for ignition if not removed).

The management in use procedures that can be implemented provide the potential measures to be adopted to ensure that the KDH site is managed, and the areas around buildings monitored, to minimise the risk of building ignition as a result of any potential ember attack arising from a bushfire in the vegetation to the west of the site. These include:

- (a) The maintenance of the buildings and grounds within the KDH complex are to be part of written management in use procedures for the KDH;
- (b) The written management in use procedures for the KDH are to require, on at least a weekly basis, the inspection of areas around the existing buildings to detect and remove any build-up of dead vegetative material or other flammable material; and
- (c) The written management in use procedures are to include, as a first step in the event that KDH management is notified of the issue of an extreme or catastrophic fire warning, a detailed procedure to ensure that each and every openable door and windows within the hospital complex is closed and secured, except for entry doors and required exit doors (see below).

In conjunction with the procedural measures above, there are also a range of physical works that can be implemented to prevent the potential for embers to enter the existing hospital buildings. These include, (if not already fitted) the provision of:

- (i) self-closers to all entry doors and required exit doors;
- (ii) screens to any fixed vents – excluding openings associated with air intakes or exhaust outlets for mechanical ventilation plant; and
- (iii) draught excluders to the base of external doors.

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4. Conclusion

Watpac proposes to delete the requirements for full upgrading of the existing building(s) within the KDH complex in relation to ember protection.

The qualitative assessment has concluded that there are a range of potential physical and procedural measures that can be implemented in lieu of full upgrading of the existing hospital buildings in relation to ember protection. This conclusion is subject to the assumptions made in Section 1.2 of this report.

It is understood that this report is to be used as the basis for a request to amend the project approval by deletion of the requirement for upgrading of the existing building(s) in relation to ember protection. In relation to any such request, it is considered that deletion of the requirement for upgrading of the existing building(s) is justified, subject to the following recommendations.

5. Recommendations

The following recommendations are made in relation to the proposal to delete the requirements for upgrading of the existing building(s) within the KDH complex in relation to ember protection:

- 5.1** If not already fitted, all entry doors and required exit doors are to be fitted with self-closers;
- 5.2** if not already fitted, any fixed vents – excluding openings associated with air intakes or exhaust outlets for mechanical ventilation plant – are to be fitted with screens incorporating mesh with an aperture size of 2mm. The mesh is to be made from aluminium, bronze or steel.
- 5.3** if not already fitted, draught excluders are to be fitted to the bottoms of external doors
- 5.4** The maintenance of the buildings and grounds within the KDH complex are to be part of written management in use procedures for the KDH;
- 5.5** The written management in use procedures for the KDH are to require, on at least a weekly basis, the inspection of areas around the existing buildings to detect and remove any build-up of dead vegetative material or other flammable material; and
- 5.6** The written management in use procedures are to include, as a first step in the event that KDH management is notified of the issue of an extreme

or catastrophic fire warning, a detailed procedure to ensure that each and every openable door and windows within the hospital complex is closed and secured, except for entry doors and required exit doors (which are to be fitted with self-closers as above).



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References

AS 3959, "Construction of buildings in bushfire-prone areas" (incorporating Amendments Nos. 1, 2 and 3), Standards Australia, 2009.

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