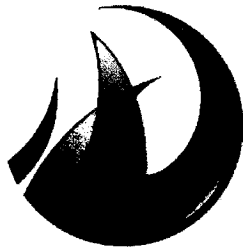
ATTACHMENT G

BUSHFIRE REPORT

Prepared by

Bushfire Safety Solutions P/L



Bushfire Safety Solutions

Bushfire Compliance Report

Proposed
West Pymble Indoor Pool Facility

Bicentennial Park
West Pymble

Report prepared by **Bushfire Safety Solutions.**

Postal Address: PO Box 7196 LPO South Penrith NSW 2750
Phone: 9833 7200 / 0419 636 902

Email:bushfiress@specbus.com

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This Report is copyright protected and can only be utilised by the Client for the purposes of this development proposal and is not available for use or to be copied in any form by others not authorised by **Bushfire Safety Solutions**.

This Report has been prepared in accordance with the Deemed to Satisfy (DTS) & Alternate Solutions compliance provisions of each relevant NSW regulatory requirement.

It is a condition that the use of this Report is only vested in the Client upon final payment of the Report fee.

The recommendations provided in the report respond to the requirements of Planning for Bushfire Protection 2006. The recommendations provide a guideline to both the relevant consent authority and the New South Wales Rural Fire Service as to how the proposed development can comply with the provisions of AS 3959 – 2009 and Planning for Bushfire Protection 2006.

Council or the RFS can then choose to provide final consent conditions based on our recommendations for compliance so as to satisfy the requirements of each relevant piece of legislation. These conditions will be outlined in your final development consent.

Disclaimer

This report is provided in good faith and is based on information supplied for the development by the Client.

Bushfire behaviour is an unpredictable phenomenon and is often erratic under extreme weather conditions.

All care has been taken in the preparation of this report and recommendations provided therein. Site conditions, vegetation regrowth and maintenance of asset protection zones are not regulated and therefore may not be maintained in perpetuity to ensure adequate separation between the assets and the bushfire prone vegetation.

Bushfire Safety Solutions accepts **no** liability for any ongoing bushfire threat to the property or maintenance of the bushfire protection measures provided to the development.

It is the responsibility of the owner of the property to maintain bushfire protection of the property at all times.

Active and passive bushfire protection measures require ongoing maintenance and diligence to ensure adequate bushfire protection.

Contents

		Page
Part 1- Introduction		
1.0	Introduction	4
1.2	Report Objectives	4
1.3	Scope and Limits of this Report	4
1.4	Summary of PBP 2006 – Compliance Assessment	5
1.5	Regulatory Framework	5
1.6	Reference Information and Documents	5
Part 2 – Development Characteristics		
2.0	Principal Development Characteristics	6
2.1	General Site Description	8
2.2	Bushfire Safety Assessment	9
2.3	Bushfire Prevention and Protection Measures	12
2.4	Bushfire Safety Design	13
2.4.1	Bushfire Design Scenarios	14
2.5	Deem to Satisfy Bushfire Compliance Solution	19
2.6	Performance Bushfire Compliance Solution	21
Part 3 - Recommendations		
3.0	Recommendations	25
3.1	Conclusion	27
Appendix A – Proposed Development Plans		28
Appendix B		33
Appendix C		40
References		46

Part 1

1.0 Introduction

This Report provides a bushfire threat analysis for the proposed West Pymble Indoor Pool Facility located at Bicentennial Park, West Pymble. The assessment examines the compliance provisions in Planning for Bushfire Protection 2006 regarding asset protection zones and general bushfire protection for a "*Special Fire Protection Purposes*" development classification.

The Report has been compiled using information provided by the Client and a detailed site assessment of local bushfire hazards that are in proximity to the proposed development.

1.2 Report Objectives

The objectives of this Report are to:

- Develop a bushfire compliance report for the proposed development in accordance with the requirements of the New South Wales regulatory provisions for building in designated bushfire prone areas;
- Provide recommendations for active and passive bushfire protection measures that comply with deem to satisfy and or performance based solutions in accordance with Planning for Bushfire Protection 2006.

1.3 Scope and Limits of this Report

This report provides a deem to satisfy assessment of the proposed West Pymble Indoor Pool Facility located at Bicentennial Park, West Pymble against the provisions of Planning for Bushfire Protection 2006, relevant aspects of AS3959 – 2009 for separation distances between an asset and the bushfire prone vegetation interface and any applicable bushfire compliance requirements of the Building Code of Australia for a Class 9 building.

This Report does not include an assessment of the building's compliance with the Building Code of Australia for building fire safety measures.

1.4 Summary PBP 2006 – Compliance Assessment

This bushfire compliance analysis has been undertaken as part of deem to satisfy assessment of proposed Swimming Pool Indoor Facility. The analysis has found that the proposed development is capable of generally complying with both the DtS and performance requirements for bushfire protection measures as specified in AS 3959 – 2009, the relevant provisions Building Code of Australia (2010) and Planning for Bushfire Protection 2006.

1.5 Regulatory Framework

The following regulatory requirements are cited for bushfire protection compliance in New South Wales.

(a) Environmental Planning and Assessment Act 1979;
(b) Building Code of Australia;
(c) Rural Fires Act 1997;
(d) Australian Standard 3959 – 2009;
(e) International Fire Engineering Guidelines – 2005;
(f) Planning for Bushfire Protection 2006 (as amended).

It is noted though that not all of the above regulations may be required for the purposes of this assessment

1.6 Referenced Information & Documents

The following documents have been referenced for this assessment:

- Architectural Plans prepared by Suters Architects dated 16 July 2010 Drawings 1 - 11.
- Demolition Plan S 20098.
- Ku-Ring-Gia Bicentennial Park Plan of Management 2002.
- BCA Logic BCA Assessment Report dated 13 July 2010.

Part 2

2.0 Principal Development Characteristics

The proposed development consists of new Administration, Entry foyer and Pool Hall. The proposed development is located within Ku-Ring-Gia Bicentennial Park, an area that consists generally of open recreation park areas, walking tracks and a sports oval.

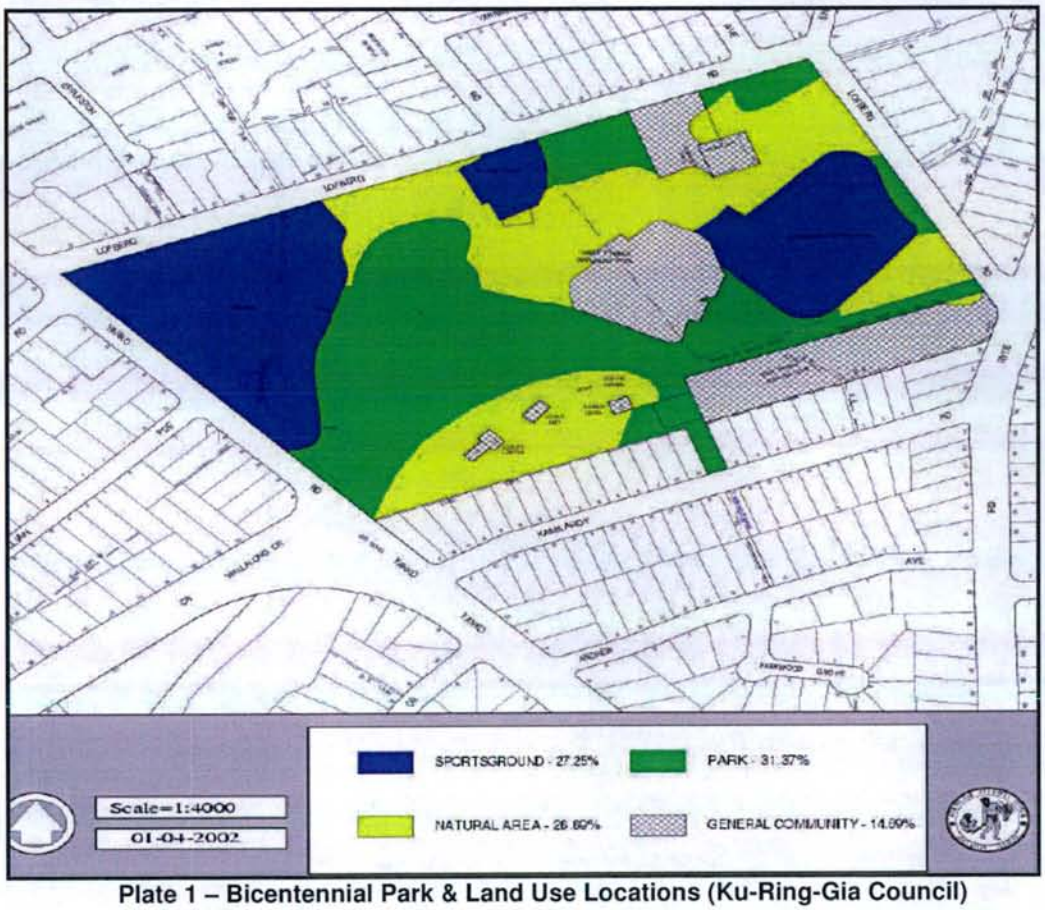


Plate 1 – Bicentennial Park & Land Use Locations (Ku-Ring-Gia Council)

Based on the proposed use of the new building, the development is classified as a "*Special Fire Protection Purpose*" development (PBP 2006 Section 4.2.6) and as such is to be assessed against the performance provisions of Section 4.2 of Planning for Bushfire Protection 2006.

The proposed new building will be constructed to comply with Type B construction in accordance with Specification C1.1 of the Building Code of Australia (BCA Logic Building Code of Australia Report 13 July 2010).

Vehicle access to the site is principally located off Lofberg Road.

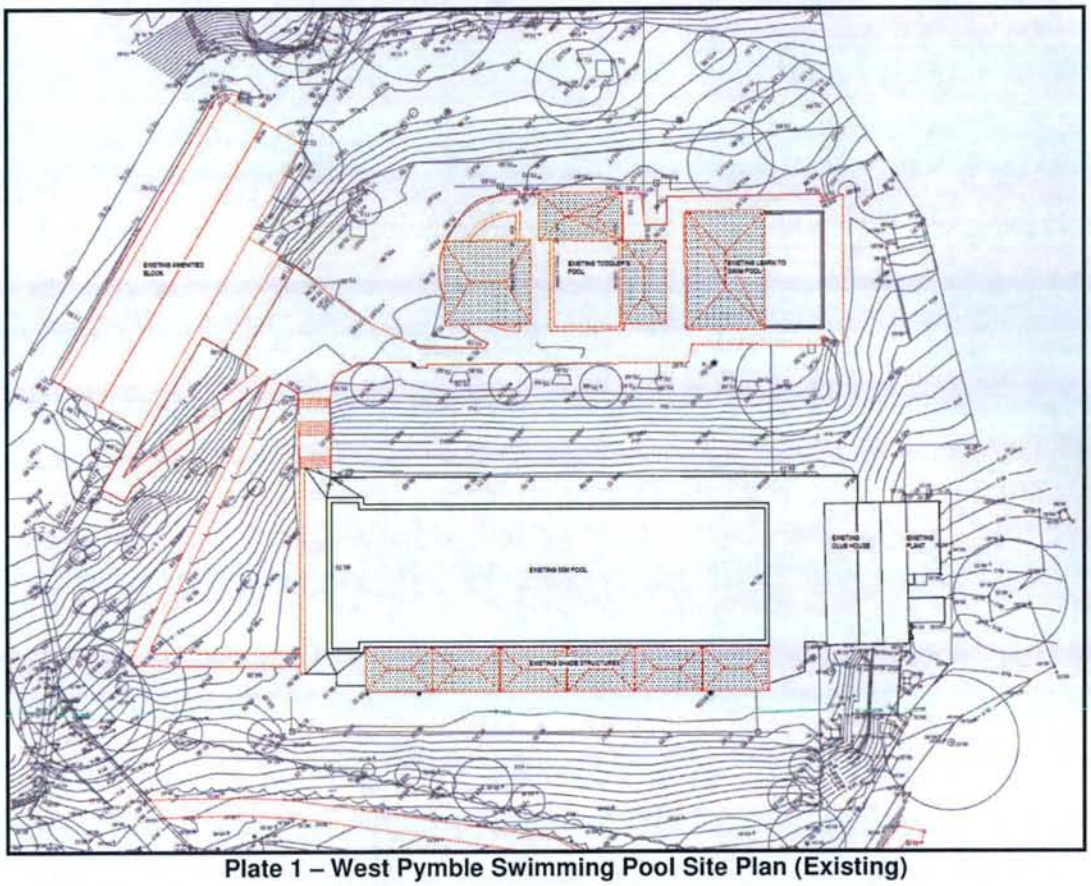


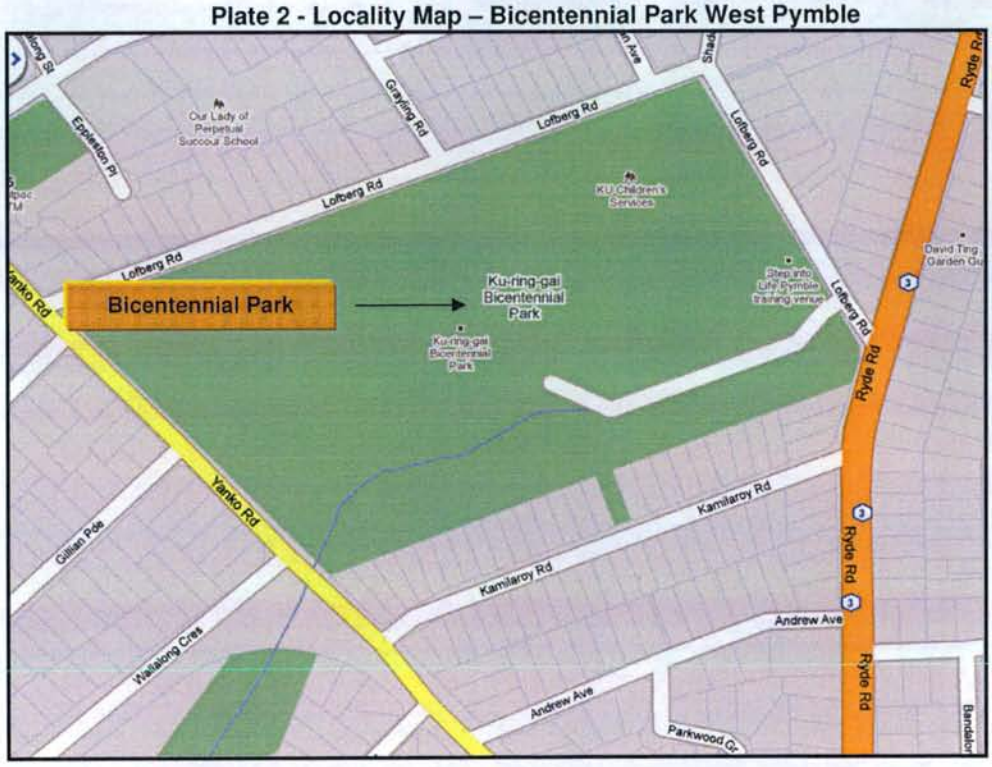
Plate 1 – West Pymble Swimming Pool Site Plan (Existing)

2.1 General Site Description

The property is on the eastern side of West Pymble and is located within the Lane Cove River catchment. Quarry Creek flows through the park area before discharging into the Lane Cove River system. Bicentennial Park has a range of variable land slopes, with a general tendency for the southern and northern aspects to fall towards the Quarry Creek riparian corridor.

Bicentennial Park is approximately 15.78 ha in size and adjoins existing residential lots to the west, east, north and south, with the prominent bushfire prone vegetation located within the Park on the north western aspects of the site.

Plate 2 - Locality Map – Bicentennial Park West Pymble



Land within the park does not appear to be specifically managed for bushfire hazard reduction. The composition and character of vegetation within Bicentennial Park suggests that the area is not particularly bushfire prone despite

the bushfire land mapping identifying the area as category 1 bushfire prone area.

Plate 3 – Aerial Property Plan Bicentennial Park

2.2 Bushfire Safety Assessment

Generally low risk bushfire prone vegetation surrounds the development site and is located wholly within the Park confines. The mapped bushfire prone vegetation appears to have been gradually modified over time, with the Park providing a variety of open fields, play areas and mix sporting facilities scattered throughout the area.

In its current state, the level of bushfire threat to the proposed new development is variable due to the nature and composition of the vegetation.

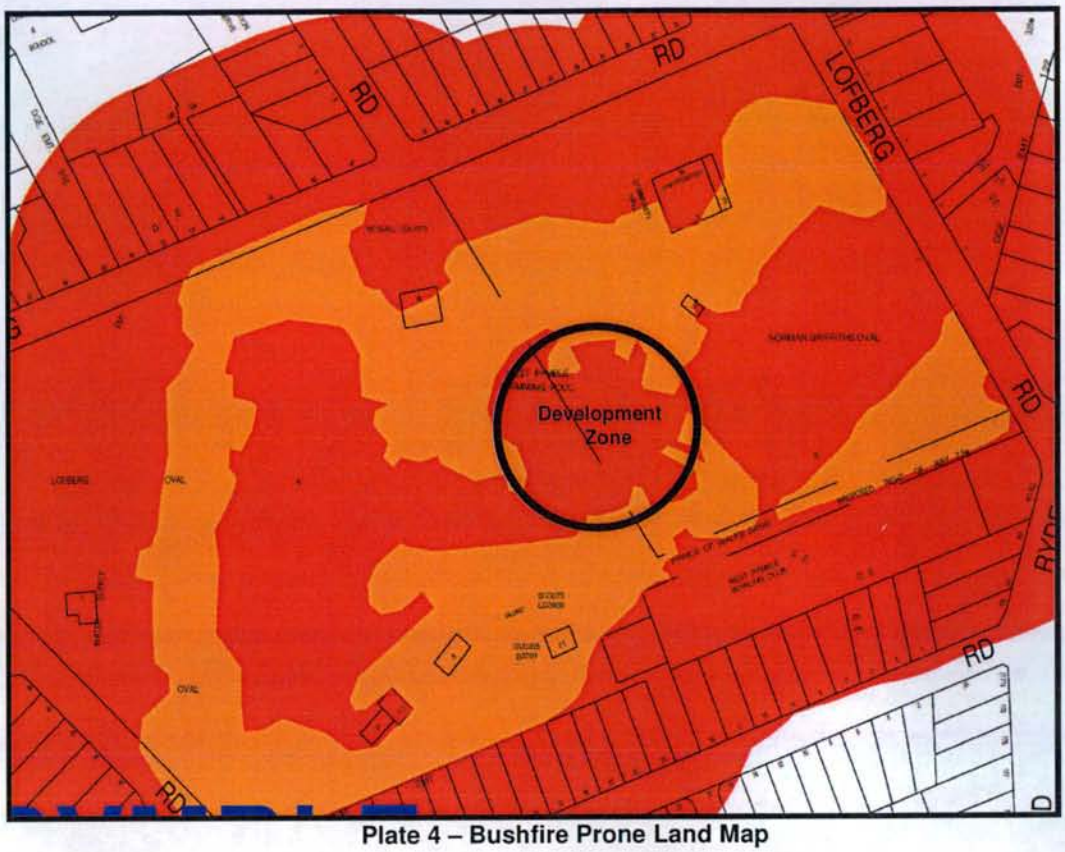


Plate 4 – Bushfire Prone Land Map

Plates 4 (above) and 5 (over) provide an aerial view of Bicentennial Park, the location of the mapped bushfire prone vegetation and the proximity of the proposed development zone to the bushfire prone vegetation.

The gradual reduction in the bushfire prone vegetation hazard within the Park has a direct bushfire impact influence particularly in regards to the level of passive bushfire protection measures any new construction would need to incorporate to enable ant new development to meet the minimum performance standards required by Planning for Bushfire Protection 2006.

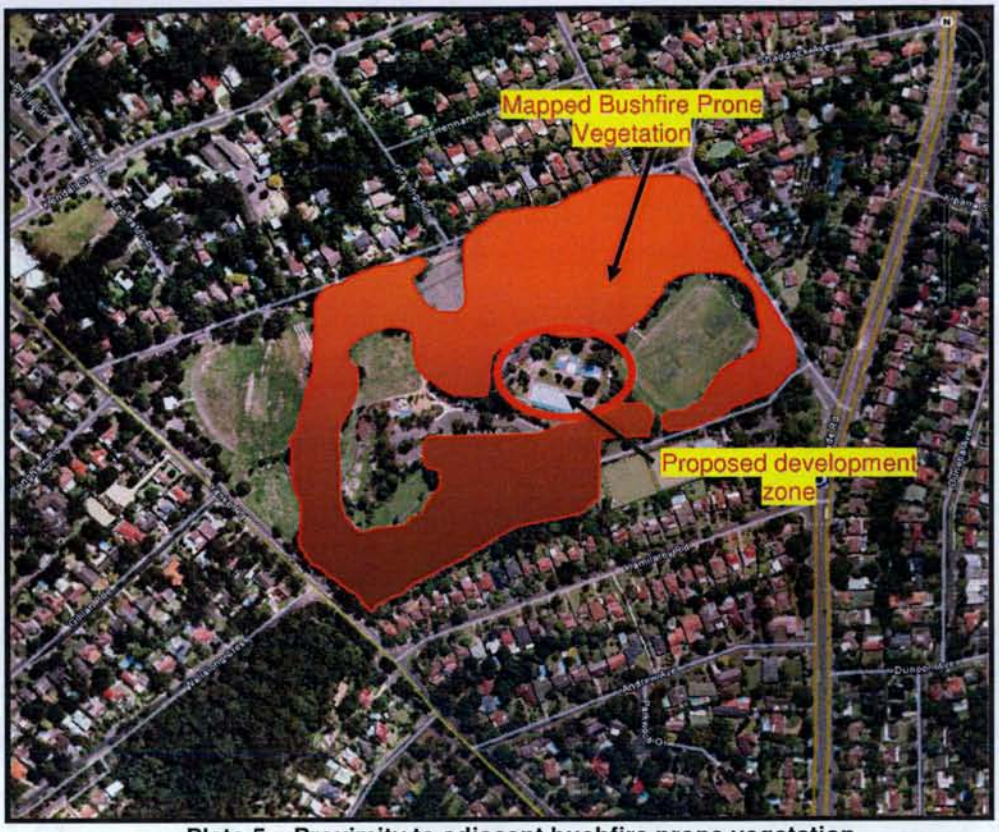


Plate 5 – Proximity to adjacent bushfire prone vegetation

An asset protection zone (APZ) and a defendable space are capable of being provided for the proposed development along the predominantly northern aspect. The APZ would require the understorey level to be managed to ensure that bushfire prone fuel would not exceed minimum 5t/ha to ensure that a critical mass bushfire in this area could not develop and threaten any of the facilities provided within the Park.

With a 40m APZ in place, the reduced level of bushfire prone vegetation mass would enable the proposed development to be constructed to an equivalent bushfire construction standard described in AS 3959 – 2009 for a level of protection rated as ***BAL 40*** (see discussion Section 2.3).

Accordingly, this assessment will examine methods of providing bushfire impact protection for the development particularly from ember attack and mid range

radiant heat flux emanating from a bushfire event approaching within the park from the north west.

2.3 Bushfire Preventative & Protection Measures

The nature of the proposed development requires a bushfire impact assessment to ensure compliance with the performance provisions of Planning for Bushfire Protection 2006 for "*Special Fire Protection Purpose*" development together with construction requirements specified in AS 3959 – 2009 and the Building Code of Australia.

Planning for Bushfire Protection 2006 requires "*Special Fire Protection Purpose*" development to be constructed to a certain standard of performance to ensure a high level of bushfire resilience during a bushfire event.

External building elements including wall claddings, roof cladding, window elements, door openings and external attachments are potentially exposed to the effects of radiant heat, ember throw and in some instances, flame impingement.

The performance provisions of Chapter 4, Clause 4.2.7 of PBP 2006 requires this type of development to meet certain performance criteria for asset protection zones, siting and design, construction standards, access requirements, water and utility services and landscaping.

As a result of the bushfire threat rating to the most bushfire prone aspect, the proposed development has been calculated as having a theoretical bushfire threat rating of "**BAL 40**" and therefore requires compliance with the equivalent level of construction as prescribed in AS 3959 – 2009 – "*Construction of buildings in bushfire-prone areas*" and as applicable to a Type B construction as specified in the Building Code of Australia, Specification C1.1.

2.3.1 Bushfire Prevention Measures

Standard bushfire prevention measures include the construction of asset protection zones that generally comply with the requirements of Table 2.4.2 (AS3959 – 2009) for asset separation from the bushfire prone vegetation, based on vegetation type and effective slope, Appendix 3 – Table A3.4 (PBP 2006 as amended) and the performance requirements as prescribed in PBP 2006, Clause 4.2.7, for "*Special Fire Protection Purpose*" developments.

The measures that are available to provide bushfire impact protection for a building include:

- Construction of a deemed to satisfy asset protection zone, in this case at least 40m separation would be required on the northern and western elevations;
- Construction standards that comply with the DtS provisions outlined in AS 3959 – 2009 for BAL 40 construction. In this case there are certain building elements that are referenced in AS 3959 – 2009 that are not referenced in the BCA for Class 9 buildings for any type of construction; and,
- The installation of active external bushfire protection measures including non combustible construction of external building elements that are exposed to the bushfire prone vegetation, active external fire protection systems including wall and opening drenchers, openable window and door screening and, in some instances, radiant heat protection shielding from non combustible fencing and the like.

Additional bushfire protection considerations for "Special Fire Protection Purpose" developments also include the protection of building occupants during a bushfire emergency. These measures can include:

- The formulation of a Bushfire Survival Plan for the development;
- An Emergency Evacuation Plan that includes consideration of the potential impacts and consequences of a local bushfire event; and,
- Emergency access to and from the development that enables an effective fire fighting response to be mounted so as to protect the development and its occupants during an emergency.

2.4 Bushfire Safety Design

Bushfire safety design includes using external building elements to provide passive bushfire protection measures so as to meet the performance requirements of Planning for Bushfire Protection (2006) that provide equivalence to the deem to satisfy standards outlined in AS 3959 – 2009.

Bushfire safety design also involves providing bushfire prone vegetation management that reduces the bushfire hazard that threatens the proposed development.

Elements of bushfire design to be analyzed for the proposed building include:

- Anticipated radiant heat exposure levels at the interface of the northern and western elevations;
- The extent of bushfire hazards that are within the minimum separation distances (in relation to site slope conditions) to the proposed development;
- Building classification and use; and,
- The impact of any bushfire event on the proposed development in relation to building occupants, the surrounding community and the opportunity for bushfire spread to continue through the property to adjoining properties.

In relation to the West Pymble Swimming Pool Facility, bushfire safety design features will be outlined in the following sections of this Report.

2.4.1 Bushfire Design Scenarios

The most likely bushfire threat stems from the north, north west of the proposed development.

A bushfire originating from this aspect could theoretically attain a high intensity based on low relative humidity, very high wind speed, high ambient air temperature and available combustible fuel densities. However, the limiting factor for a bushfire in this vicinity relates to the composition of the vegetation in the adjoining park areas and the limited size of the bushfire prone vegetation (approximately 3.7ha) within the Park.

Given the vegetation at the rear of the property borders existing open recreation fields, walking tracks and vehicle access roads together with the lack of depth of bushfire prone vegetation immediately to the rear of the subject building, a bushfire is unlikely to have any critical impact in terms of flame impingement and elevated radiant heat flux.

Ember throw from a bushfire originating from the north, north west is an element of potential bushfire threat that will require passive control measures to ensure the performance and resilience of the building during a severe bushfire event.

(a) Worst Bushfire Scenario Modelling

Accordingly, a worst case bushfire scenario that could theoretically impact the proposed development will be "modelled" on environmental elements that predict a likely bushfire behaviour consequence given certain inputs.

The following hypothetical maximum fire weather components for a critical bushfire event could include:

- An ambient air temperature of 45^0 C;
- Relative humidity of 12%;
- Wind speed from north west (the most prevalent wind direction for extreme bushfire weather conditions) 45km/hr;
- Available combustible fuel levels of 5t/ha;
- Forest vegetation classification;
- Slope class of 5^0; and,
- Fire is not controllable.

Modelling of a worst case scenario design bushfire under these parameters are estimated to produce a critical level bushfire with hypothetical flame heights of approximately 5m, fire spotting distance of 1.5km and a rate of spread of 0.66km/hr (source modelling - McArthur Forest Danger Meter Mk 5) (Source weather data BoM 1981 – 2010).

The design bushfire would approximate a relatively severe bushfire event (the worst bushfire event that can be expected using current research and bushfire behaviour modelling systems for a 1:100 year event). The effects of a bushfire of this consequence would impact on the proposed development potentially igniting bushfire fuel either at ground level or in areas of accumulations (roof intersections, concealed spaces, corners of enclosures and the like) and cause flame impingement upon the northern and possibly western elevations.

An assessment of bushfire prone vegetation within the Park has been assessed as being less than 5ta/ha, with large areas of grass ground cover, moderate understorey vegetation with low sunlight accessibility at ground level and as such, the effects of a bushfire approaching from upslope would generate lesser bushfire impacts as prescribed above.

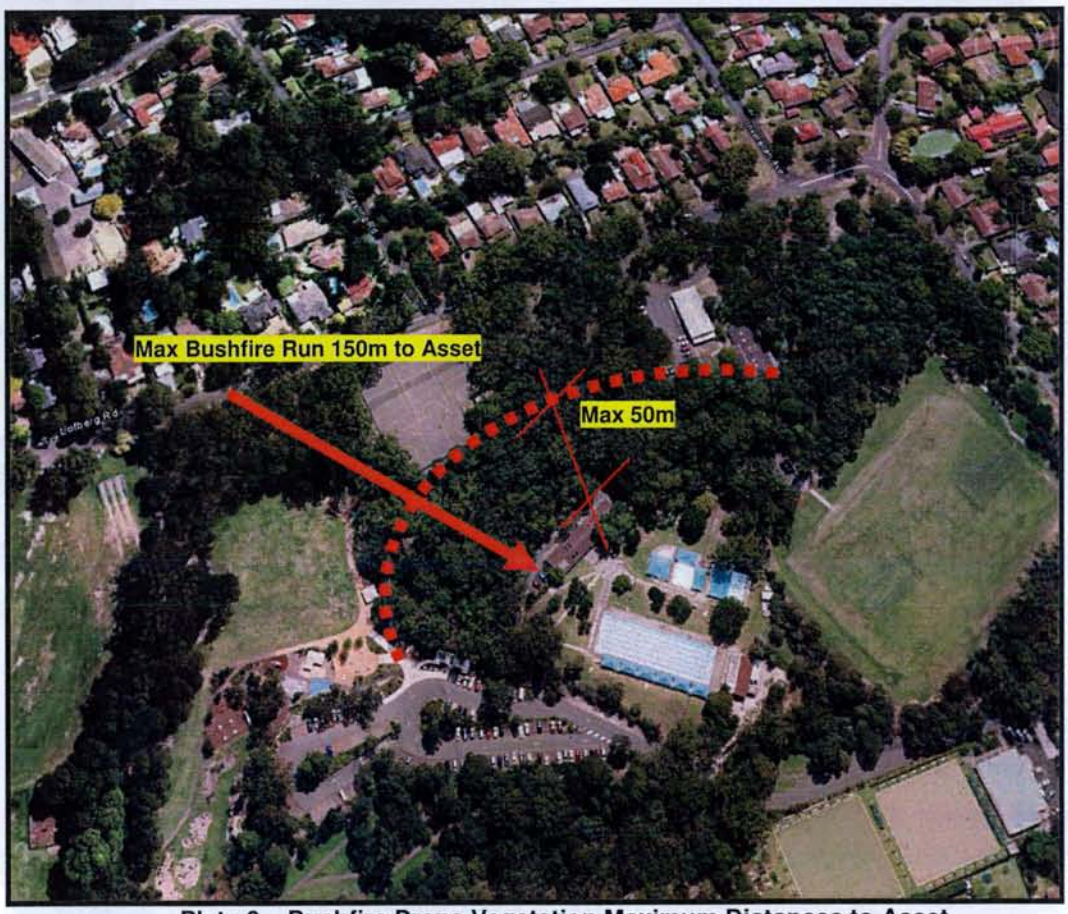


Plate 6 – Bushfire Prone Vegetation Maximum Distances to Asset

In order to meet the performance provisions of PBP 2006 and the BCA, any building in close proximity to this bushfire scenario would need to be capable of resisting the bushfire front and the residual effects of the bushfire.

The maximum length of bushfire prone vegetation is approximately 150m from Lofberg Street to the proposed building however, the vegetation is broken up into open spaces with grass areas, variable weed infestations, walking tracks and vehicle access pathways.

Therefore, it is reasonable to assume that a bushfire originating from the northern aspect off Lofberg Road would have a variable fire growth phase, and not necessarily reach a point that would exceed a 40kW/m^2 radiant heat flux bushfire event (refer "likely bushfire scenario" below).

(b) Likely Bushfire Scenario Modelling

Accordingly, a design bushfire scenario for the proposed development will be "modelled" on average environmental elements and is based on certain environmental parameters that predict a likely bushfire behaviour consequence given certain inputs.

Therefore the following hypothetical maximum fire behaviour components for an average bushfire impact could include:

- An ambient air temperature of 37^0 C;
- Relative humidity of 12%;
- Wind speed from north west (the most prevalent wind direction for extreme bushfire weather conditions) 50km/hr;
- Available combustible fuel levels of 2t/ha;
- Forest vegetation classification;
- Slope class of 5^0; and,
- Fire is potentially controllable.

Modelling of an average bushfire design scenario under these parameters would produce a high range level bushfire with hypothetical flame heights of 0.3m, fire spotting distance of 0.22km and a rate of spread of 0.2km/hr (source modelling - McArthur Forest Danger Meter Mk 5) (Source weather data BOM 1981 – 2010).

The design bushfire would approximate an average bushfire event that could be expected for the environment within Bicentennial Park. The impact of a bushfire of this consequence would not detrimentally impact on the proposed development due to the direction of the adjoining upslope and the limiting factor for any bushfire event to be reliant on being spread by prevailing wind.

The most likely impact of this bushfire scenario would be ember throw along the northern boundary line, with the fire moving in a south east direction through a diminishing area of bushfire prone vegetation down to an open carpark area.

As described, ember attack would be the principle bushfire impact and, as such, the proposed building would require protection measures to reduce the impacts of the embers on vulnerable portions of the building.

Incorporating appropriate vegetation management practices within the Park would assist in lessening the overall bushfire hazards and hence the threat to any or all of the assets within the Park, including the new Swimming Pool building.

The recommended practices would include:

- Limiting the extent of intensifying understorey regeneration within 40m of the proposed building such that the bushfire prone fuel accumulations do not exceed 5t/ha; and,

- Maintenance of tree branches within 5m of the proposed new building to limit the accumulations of leaf litter building up on the roof of the proposed building;

(c) Radiant Heat Flux

When modeled for radiant heat flux at the receiver the development can not exceed the construction level of **BAL 40**, with the total radiant heat flux to be maintained at >29kW/m^2 - < 40kW/m^2 but no greater.

This level of radiant heat flux exposure would produce a short term radiant heat gain at the building interface due to the direction the fire would travel, together with potentially burning embers circulating in and around the building. With the minimum APZ separation distance of 40m the building would be expected to resist any adverse consequences of a BAL 40 bushfire event.

(d) Ember Attack Scenario

The impact of ember attack can not be modelled due to the unpredictability of ember movement, size, continuing ignition and potential to remain a pilot ignition source once the ember has grounded or been deposited upon a building.

Additional uncertainties associated with ember attack relates to the probability of an ember landing in a particular location that is burdened with potentially combustible fuel, in sufficient quantities to cause a new fire source that is capable of growing to a size to cause property damage.

Density of ember attack is also unpredictable and lacks research data to accurately model the overall impact of an ember attack event. Notwithstanding this, it is possible to limit vegetation that has the potential to produce elevated ember throw within an adjoining asset protection zone. It is recommended that the adjoining asset protection zone therefore be managed such that any understorey be considered in terms of potential future ember generation when subject to a bushfire event.

The consequent uncertainty of a worst case scenario ember attack will require the proposed development to implement a general site cleaning program that removes leaf litter accumulations from the roof area of the building and surrounding grounds.

Window and door openings would also require non combustible and radiant heat resistant ember protection screens.

2.5 Deem to Satisfy Bushfire Compliance Solution

The proposed indoor pool facility building is considered capable of complying with deem to satisfy construction requirements prescribed in AS 3959 – 2009 DtS provisions for BAL 40 (where the BCA construction requirements for Type B building does not specifically address bushfire protection measures) and the objectives of PBP 2006 for the following construction elements.

- External Wall Cladding – toughened glazing and steel frame columns;
- Steel roof cladding; and,
- Concrete floors;

Specific bushfire protection measures recommended for the proposed building include:

- Secure, non combustible flashing at roof intersections, with no gaps at roof cladding intersections;
- Non combustible external guttering and downpipes (where provided);
- Steel mesh screens to be fitted to all windows and doors capable of being opened along the northern and western elevation (ground and first floor);
- The open areas surrounding the building being maintained as an inner protection area. This would include the aspects to the south and east of the building (within the actual swimming pool area).
- An asset protection zone to be established within the adjoining western and northern aspects of the building such that, for at least 40m, the undergrowth is managed so as to not exceed 5t/ha of bushfire prone vegetation. Note, existing tree stands do not require removal, though branches within 5m of the proposed building should be trimmed so as to not overhang the building and maintained as part of the management of the 40m asset protection zone.
- The provision of a reticulated water supply system that is capable of providing emergency water supply for any bushfire protection activities. The reticulated water supply is to comply with the requirements of section 4.1.3 and the acceptable solutions as prescribed for reticulated water supplies requiring the provision of a fire hydrant system that complies with AS 2419.1 – 2005.
- The provision of a fire hose capable of reaching all elevations of the building. Note, the fire hose should be a rubber hose of approximately minimum 18mm diameter and located away from the northern and western elevations.
- Vehicle access to the proposed development is to comply with section 4.1.3 of the PBP 2006, together with general Fire Brigade access being provided along the western aspect to enable maintenance and management of the northern and western aspect asset protection zones.

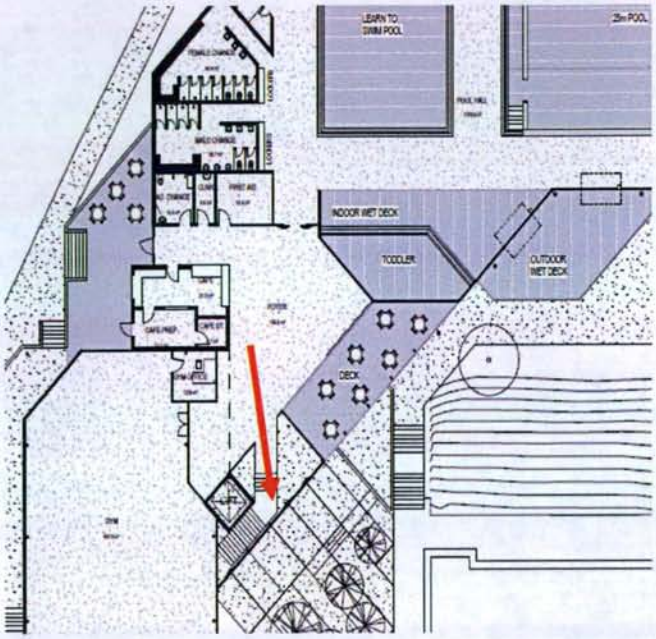
2.6 Performance Bushfire Compliance Solution

On the basis of the development achieving a compliant asset protection zone and that the building will be provided with passive bushfire protection elements that comply with AS 3959 – 2005 for ember protection, the proposed building does not require a performance based bushfire compliance solution.

The following compliance table summarises the specific areas of required compliance for bushfire protection.

Table 2.1 PBP 2006 s.4.2.7 - Compliance Table Summary

PBP 2006 Performance Criterion	Performance Solution
In relation to asset protection zones:	
• Radiant heat levels of greater than 10kW/m² will not be experienced by occupants or emergency services workers entering or exiting a building.	Total separation distance is variable between 12m to 40m to the actual bushfire vegetation interface from the western and northern aspects. The separation distance is such that radiant heat levels are considered to be no greater than 40.kW/m² at the receiver (building interface along the western and northern elevations). This level of radiant heat flux is within the recommended tolerable level for an appropriately designed building to be exposed to. In the case of the maximum 10 kW/m² the main entrance point to the building is to the south eastern elevation and this part of the building is fully shielded from the northern and western aspects and as such the anticipated radiant heat levels will be less than the maximum permitted levels due to bulk and design of the building. Entry & Exits to the building are located on the south eastern side of the development.



Fire fighting personnel and vehicles are therefore protected from the northern and western aspects.

Main egress points to building shown on southern elevation.

- Applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated.

Bicentennial Park has a slope of approximately 5° from the north to the south. The proposed development will have an upslope to the current area occupied by bushfire prone vegetation.

In accordance with this set of site conditions, it is expected that site slope, soil stability and the potential for crown fires is not a bushfire outcome for this location.

- APZs are managed and maintained to prevent the spread of a fire towards the building.

The proposed 40m APZ configuration will provide compliance with the requirements of Table A2.6.

The internal open space area to the south and eastern aspects will be constructed to an IPA standard.

• 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.	The proposed landscape works for the development will need to comply with Appendix 5 in PBP 2006 so as to ensure potential ground fires do not spread to any building within the complex.
• Internal Roads.	Internal roads are currently sealed and all weather road construction.
• Services – Water Gas and Electricity	All services are provided to the proposed development and are located under ground. Water supply is reticulated and will be provided to comply with AS2419.1 for both external and internal fire protection. All external fire safety measures will be accessible to both NSW Fire Brigades and Rural Fire Service appliances.
• Emergency and Evacuation Planning	The proposed development will have a compliant emergency and evacuation plan that complies with AS3745, will be consistent with the NSW RFS Guidelines for "Preparation and Emergency Evacuation Planning" and comply with AS 3745– 2002 "Emergency Control Organisations and Procedures for Buildings, Structures and Workplaces"

In relation to Emergency Evacuation:

• An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area	The plan adopts the RFS Bushfire Survival Plan principles.

In relation to Building Bushfire Protection Compliance

- The building is to comply with the performance requirements of the BCA;
- The building is to resist the passage of a passing bushfire front; and,
- The building is to be provided with bushfire protection measures that protect the building from the impact of a bushfire.

The performance requirement of the BCA for a Class 9 building in a bushfire prone area requires that the building is constructed to the requirements of AS 3959 – 2009.

The building is constructed to a standard that approximates BAL 40 standard of construction.

The following additional bushfire protection measures are recommended for the building:

(i) External fire hose to be installed and is to be capable of reaching all external building elevations. Fire hose to be solid and durable rubber hose and not plastic garden hose.

In relation to Building Bushfire Protection Compliance (cont)

- The building is to comply with the performance requirements of the BCA;
- The building is to resist the passage of a passing bushfire front; and,
- The building is to be provided with bushfire protection measures that protect the building from the impact of a bushfire.

(ii) External window openings to be protected against ember attack with steel mesh screens;

(iii) External fire doors to be solid core construction and located on the southern and eastern elevations.

Part 3

3.0 Recommendations

The proposed development is located within an area that is designated as being bushfire prone.

The proposed Indoor Pool Facility Building is capable of being protected against local bushfire impacts in accordance with the requirements of Chapter 4, Section 4.2 PBP 2006.

The proposed building will require the following bushfire protection measures to be provided prior to occupation so as to achieve a suitable level of compliance with the performance measures of PBP 2006.

- External Wall Cladding – toughened glazing and steel frame columns;
- Steel roof cladding; and,
- Concrete floors;
- Secure, non combustible flashing at roof intersections, with no gaps at roof cladding intersections;
- Non combustible external guttering and downpipes (where provided);
- Steel mesh screens to be fitted to all windows and doors capable of being opened along the northern and western elevation (ground and first floor);
- The open areas surrounding the building being maintained as an inner protection area. This would include the aspects to the south and east of the building (within the actual swimming pool area).
- An asset protection zone to be established within the adjoining western and northern aspects of the building such that, for at least 40m, the undergrowth is managed so as to not exceed 5t/ha of bushfire prone vegetation. Note, existing tree stands do not require removal, though branches within 5m of the proposed building should be trimmed so as to

not overhang the building and maintained as part of the management of the 40m asset protection zone.

- The provision of a reticulated water supply system that is capable of providing emergency water supply for any bushfire protection activities. The reticulated water supply is to comply with the requirements of section 4.1.3 and the acceptable solutions as prescribed for reticulated water supplies requiring the provision of a fire hydrant system that complies with AS 2419.1 – 2005.

- The provision of a fire hose capable of reaching all elevations of the building. Note, the fire hose should be a rubber hose of approximately minimum 18mm diameter and located away from the northern and western elevations.

- Vehicle access to the proposed development is to comply with section 4.1.3 of the PBP 2006, together with general Fire Brigade access being provided along the western aspect to enable maintenance and management of the northern and western aspect asset protection zones.

Note - Maintenance of Bushfire Safety Measures

All recommended bushfire safety measures require regular maintenance and testing for operational readiness. Whilst the regular inspection and maintenance of bushfire protection measures is not compulsory, it is recommended that each bushfire protection measures is tested at least once per year to ensure operational readiness.

3.1 Conclusion

The proposed Indoor Pool Facility is capable of complying with the general performance provisions of Planning for Bushfire Protection 2006, the Building Code of Australia (Volume 1 – 2010) and AS 3959 – 2009.

In accordance with the recommendations provided in this Report the proposed development should be approved in accordance with Section 100B of the Rural Fires Act 1997.

Signed: Dated: 14 September 2010
Steve Parrott – FPA Accredited Practitioner - A
Bushfire Safety Solutions

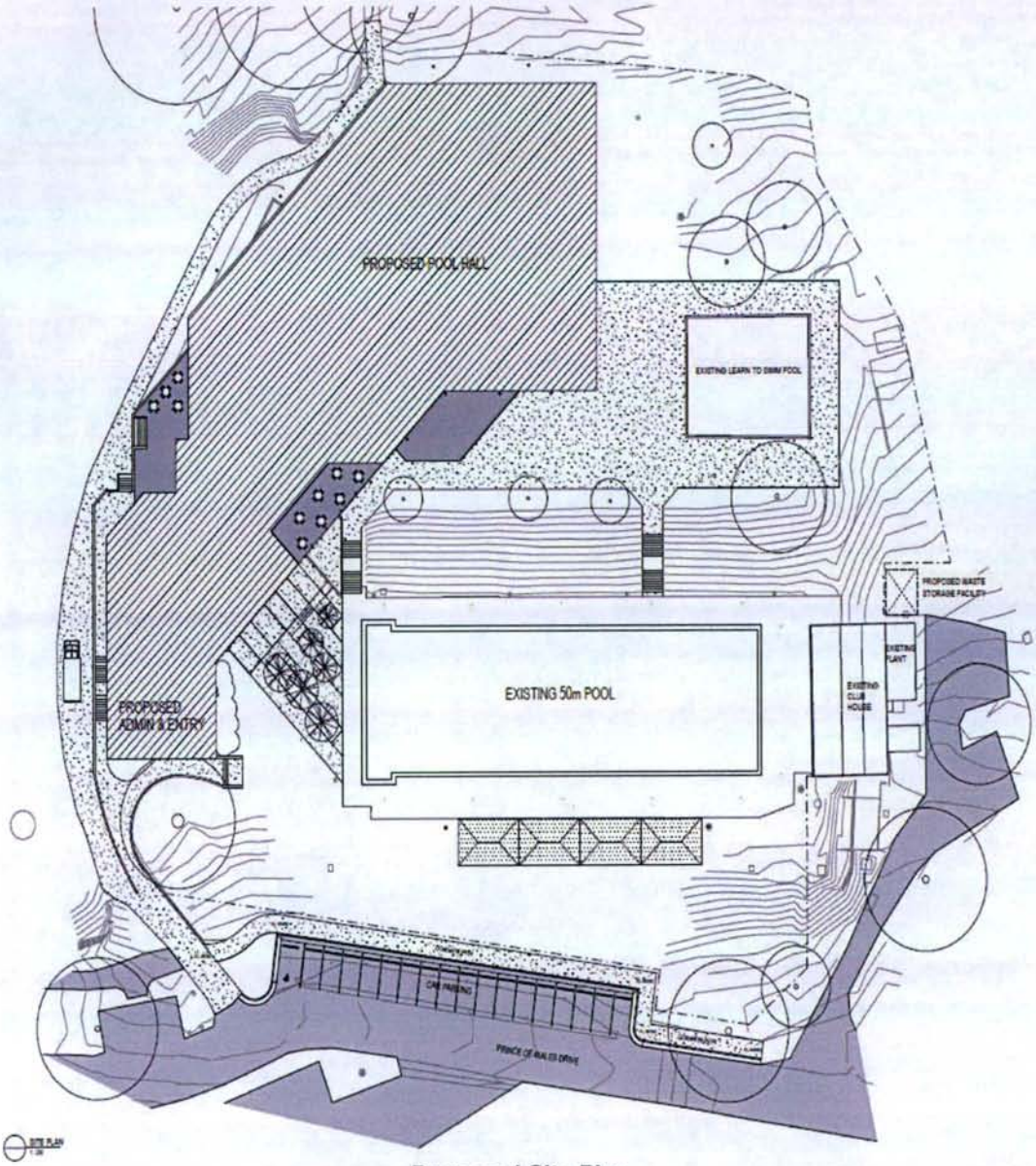
Member of Fire Protection Association of Australia
Bach of App Sc. (EH).
Grad Dip (Building in Bushfire Prone Areas – 2008).

Appendix A

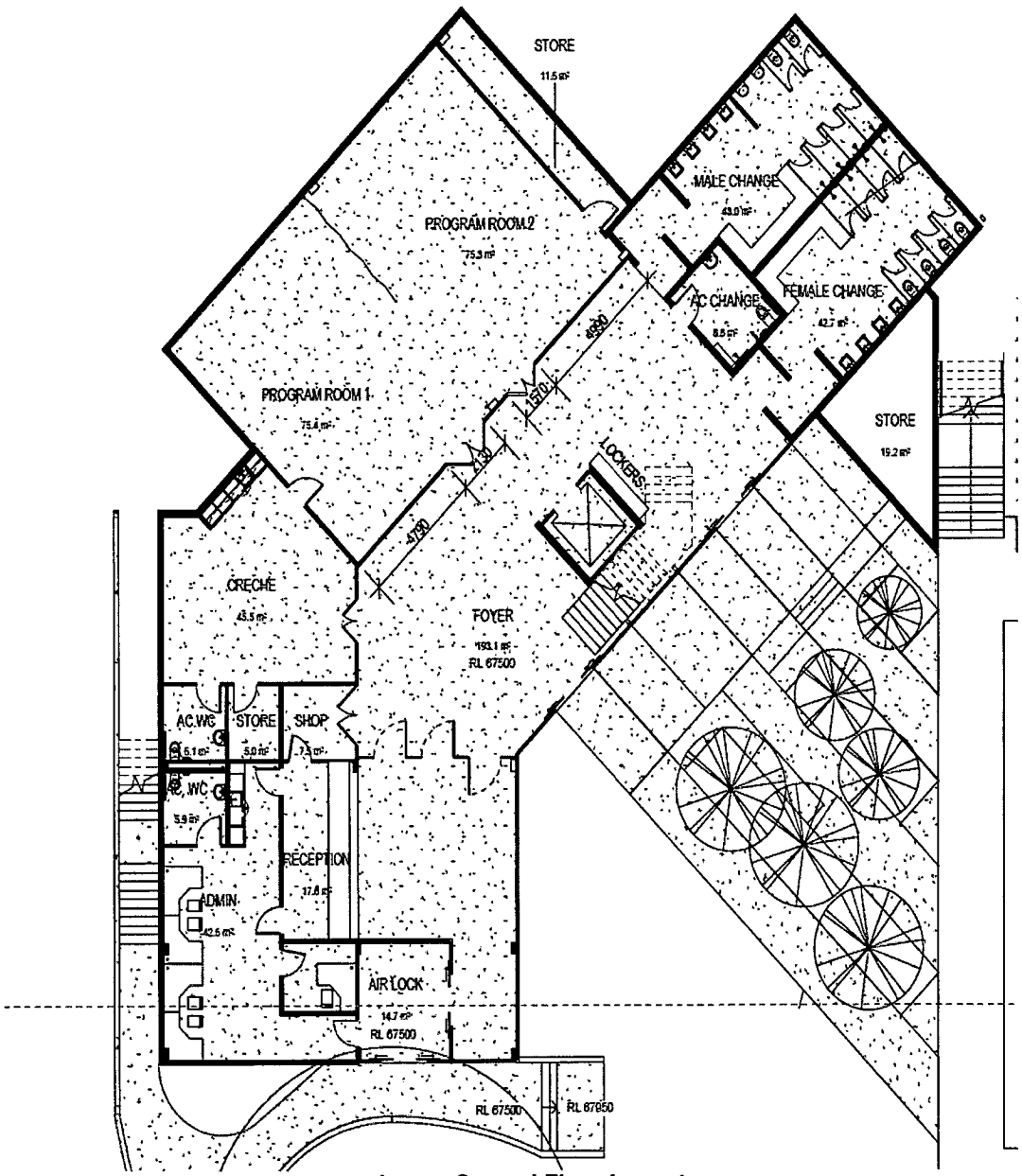
Development Plans

Indoor Pool Facility Bicentennial Park West Pymble

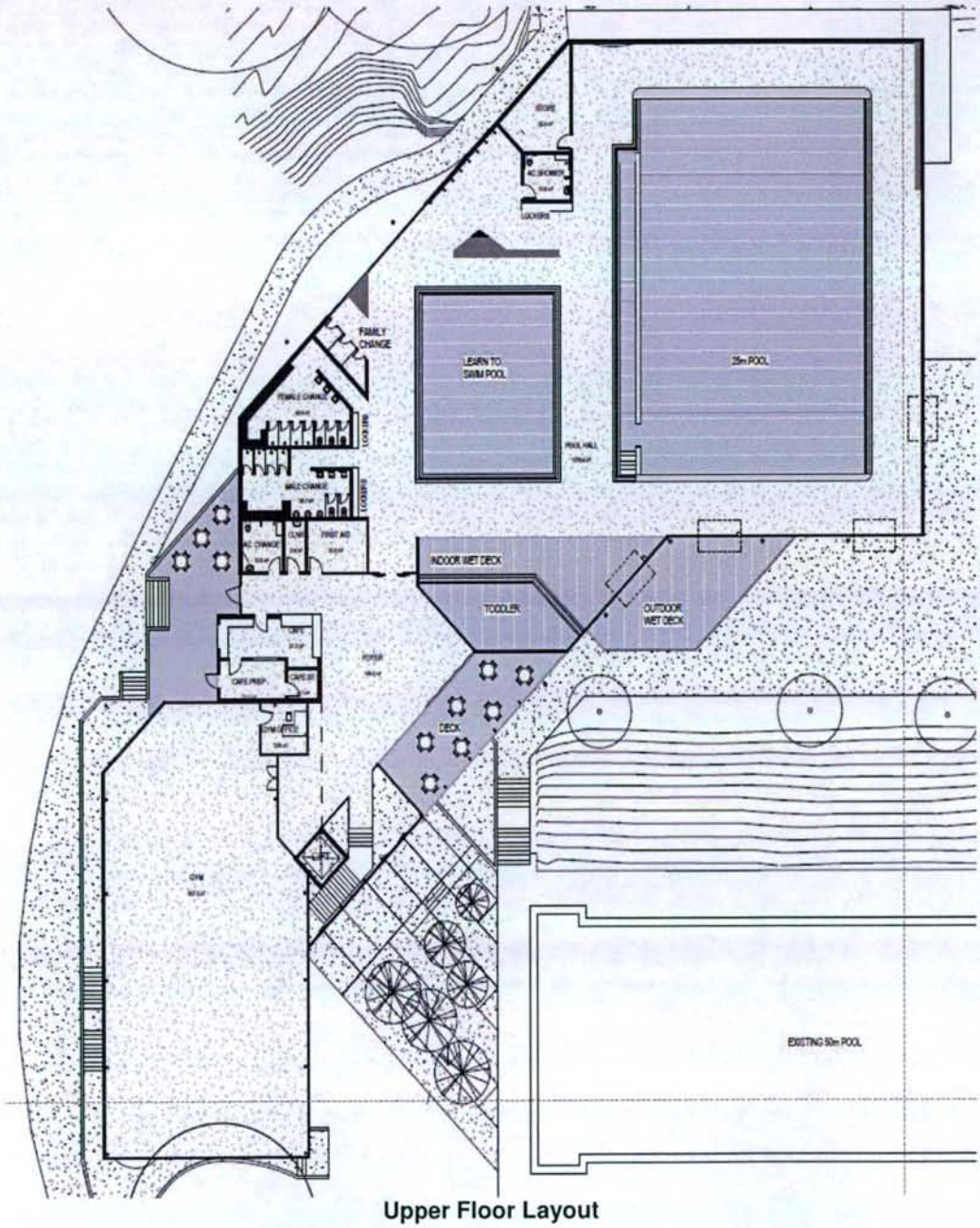
NSW



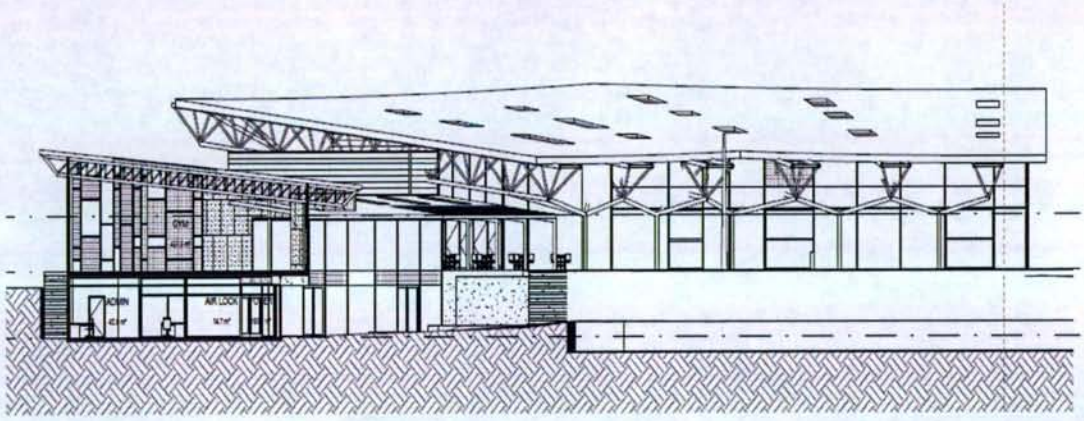
Proposed Site Plan



Lower Ground Floor Layout



Upper Floor Layout



3 VIEW FROM CARPARK

Appendix B

Bushfire Emergency Response Plan

Indoor Pool Facility Bicentennial Park West Pymble

Emergency Bushfire Protection Strategies

West Pymble Swimming Pool Centre has in place an emergency evacuation procedure for a building fire and how pool staff should react in accordance with their emergency evacuation plan.

Evacuation of a building during a bushfire event is not the same as a single evacuation of a building when the fire incident relates to within a particular premise.

Bushfire evacuation is a more involved procedure and requires forward planning to ensure the evacuees have a safe place to take refuge during the bushfire incident.

Bushfire Evacuation

Bushfire evacuation should include relevant information so as to ensure the occupants of a property that is directly threatened by a bushfire can safely move from the incident zone to a location that provides safe refuge until the emergency has passed.

The New South Wales Rural Fire Service has provided emergency evacuation criteria that a proposed plan should address including:

1. under what circumstances will the complex be evacuated.
2. where will all persons be evacuated to.
3. roles and responsibilities of persons co-ordinating the evacuation.
4. roles and responsibilities of persons remaining with the complex after evacuation.
5. a procedure to contact the NSW Rural Fire Service District Office / NSW Fire Brigade and inform them of the evacuation and where they will be evacuated to.

In accordance with generally accepted standards for emergency evacuation plans the following key points are considered for the preparation of Bushfire

Evacuation Plan for West Pymble Swimming Centre Bicentennial Park West Pymble, New South Wales.

Evacuation Planning Principles

The Queensland Fire and Rescue Service (2003), recommend that a fire related evacuation plan should include:

- How to report a fire, or other emergency.
- The evacuation procedures to ensure occupants can safely leave the area of danger, including escape routes and location of exit doors.
- The duties required of any staff required to assist with the evacuation.
- Procedures to account for occupants after evacuation, and the location of a safe assembly area.

Additionally, any evacuation plan should provide people with a suitable level of knowledge to ensure they can safely leave a dangerous area in an emergency, should the need arise. Also, all occupants need to know what they should do and how to respond in the event of fire occurring in the building (QLD Fire & Rescue Service 2003).

Planning for Bushfire Protection 2006 does not provide a standard guideline for the evacuation of a property or area that is being impacted upon by a bushfire emergency. Standards Australia has yet to develop an Australian Standard for bushfire emergency evacuation however an evacuation plan needs to address three (3) essential criteria;

- When to evacuate;
- How to evacuate; &
- Where to evacuate.

(Queensland Fire & Rescue Service 2003)

The proceeding bushfire evacuation plan for the in-door pool facility building will address these three criteria to ensure building occupants have an emergency evacuation procedure to follow during any critical incident bushfire event.

Preamble

This evacuation plan is to be used in conjunction with any future bushfire evacuation requirements specified by Standards Australia or any other statutory agency (e.g. New South Wales Rural Fire Service).

The proposed evacuation plan also adopts the principles of the New South Wales Rural Fire Service "Fast Fact 07/08" and the principles of AS 3475 – 2002 "Emergency control organization and procedures for buildings, structures and workplaces".

It should be noted that the swimming pool administration already has an established Evacuation Plan for the pool in the advent of a building related emergency (i.e. building fire or other incident). The incorporation of an emergency procedure for a bushfire incident can therefore be integrated into the existing evacuation plans for the proposed indoor swimming pool facility building.

Evacuation Plan

Part 1 – When to Evacuate.

New South Wales Rural Fire Service provides regular fire weather and emergency community warnings during times of critical fire situations. Bushfire threats to property can occur quickly and may occur before the relevant authority has an opportunity to issue community warnings of the bushfire danger to property.

Management of community evacuation is vested with the New South Police Service, with orders to evacuate a property issued through Police visiting individual properties to warn occupants of the impending danger and to leave premises and proceed to a predetermined safe refuge.

Residents can monitor bushfire progress and potential dangers to property through various means including regular monitoring of a nominated public radio station, Rural Fire Service web based updates and through public awareness visits by the New South Wales State Emergency Service.

The decision to evacuate the property needs to be based on reliable, timely and up to date information about the behaviour of the fire that threatens the subject property.

The decision to evacuate occupants of the pool building should therefore be based on:

a. Warnings or directives issued by NSW Police to residents that an evacuation of an area is required due to an approaching bushfire;

b. Pre-emptive advice issued by the NSW Police, SES or Rural Fire Service that residents should prepare for an evacuation of a property due to expected adverse conditions that may place a property in direct danger to an approaching bushfire.

An evacuation route should be predetermined to enable to the safe egress of the site to the nominated evacuation point. There is currently ***no nominated safe refuge points*** identified within Bicentennial Park to evacuate to should a bushfire impact the area.

Under these circumstances and until the New South Wales Rural Fire Service determines a suitable "Neighbourhood Safer Place" location for the Park, the following bushfire emergency strategy for the swimming pool building is suggested.

Part 2 – Emergency Bushfire Plan

The current New South Wales Rural Fire Service has a bushfire threat warning advice system that involves six warning levels of bushfire danger.

The bushfire warning levels that are of importance for the pool staff to monitor are the Extreme and Catastrophic warning categories as these two warning levels provide advice that residents should be prepared to leave their properties if a bushfire event should occur in proximity to their property.

In situations where the pool were to open during these warning periods, it is recommended that the pool manager liaise with the local Rural Fire Service Office to ascertain the local bushfire threat levels to determine whether the pool should operate for the day.

During a "Catastrophic" bushfire warning advice, it is recommended that the pool **not open** and patrons remain at home until the bushfire warning has decreased and the centre reopens.

It is standard procedure that bushfire warnings are issued twenty four hours in advance and, acting on this standard protocol, the pool manager can decide to close the pool facility with at least a day's notice in advance. This early warning will then advise patrons not attend the pool during the catastrophic bushfire warning period.

Part 3 – Swimming Pool Bushfire Protection – Extreme to Catastrophic Bushfire Warning Periods

In order to protect pool patrons during extreme and catastrophic bushfire warning periods and in particular the latter, it is suggested that the pool organise a team of trained staff who are able to attend the pool to provide intervention to suppress ember attack should a bushfire impact the building.

It is suggested that bushfire protection team wear suitable clothing to protect against radiant heat and smoke and the team be capable of operating the static water supply pump and bushfire hose reel system.

Vigilance in and around the building's curtlidge areas, external landscaping and roof areas are critical points to monitor during any bushfire ember attack.

All windows and doors should remain closed during the impact phase to ensure embers do not penetrate the building internal spaces.

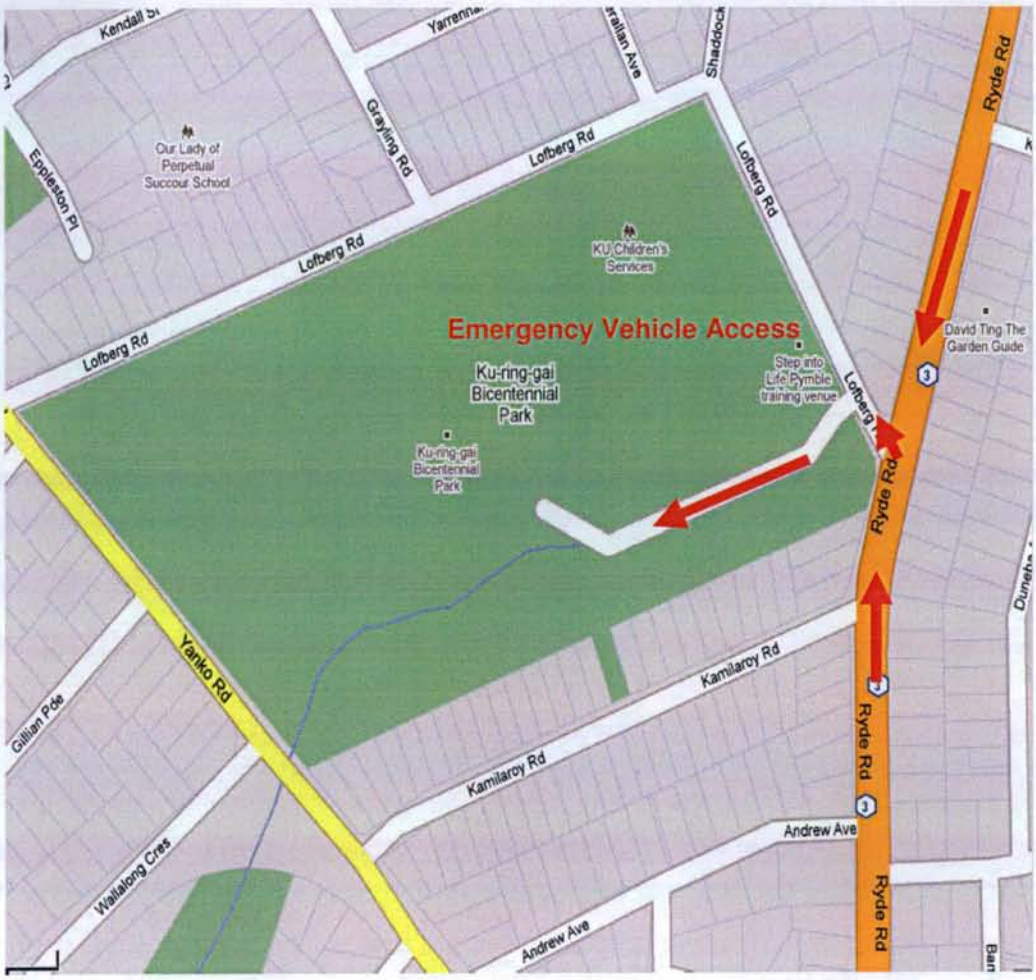
- **Bushfire Emergency Plan Summary**

The monitoring of bushfire warning advice by the pool manager on a daily basis during severe to catastrophic bushfire threats provides the trigger to close the pool in order to negate the need to evacuate patrons from the pool facility should that direction be given.

The monitoring of the pool building by a team of trained staff during a bushfire event close by the pool will assist in protecting the building and outside equipment from being damaged due to ember attack.

Should a "Neighbourhood Safer Place" be designated by the NSW Rural Fire Service for West Pymble residents in the future, the option to close the pool on severe to catastrophic bushfire threat periods can be reviewed in respect to these particular bushfire warning periods.

Should a bushfire impact the area un-expectantly, it is recommended that, in the absence of any warning to the contrary, that evacuation of patrons is not undertaken and the Centre is shut down with all occupants remaining within the building until the danger passes.



Appendix C

Site Photographic Record

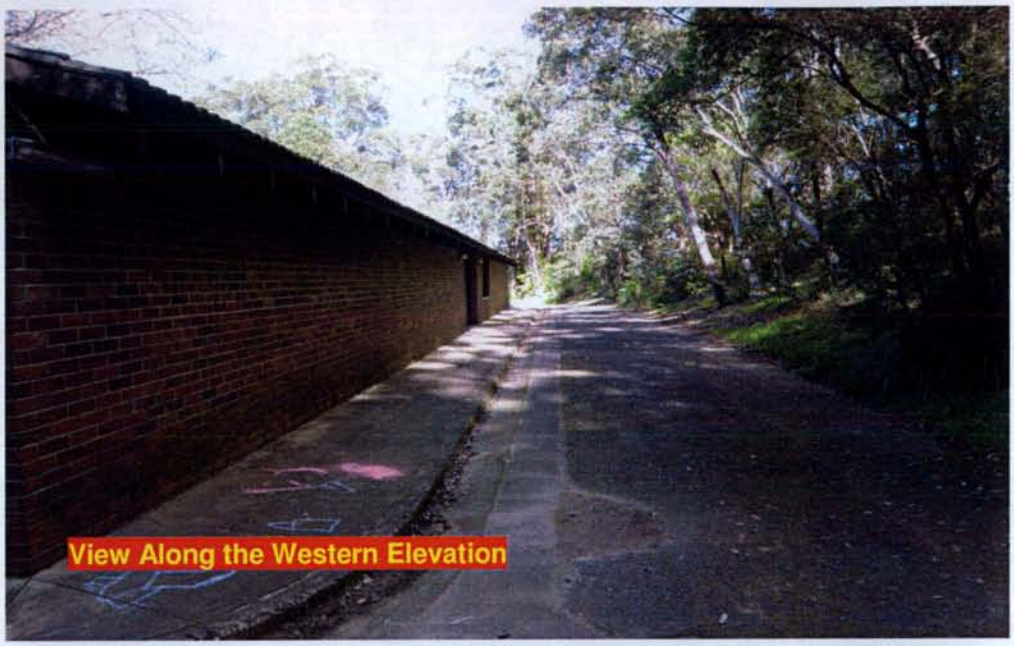
Indoor Pool Facility Bicentennial Park West Pymble

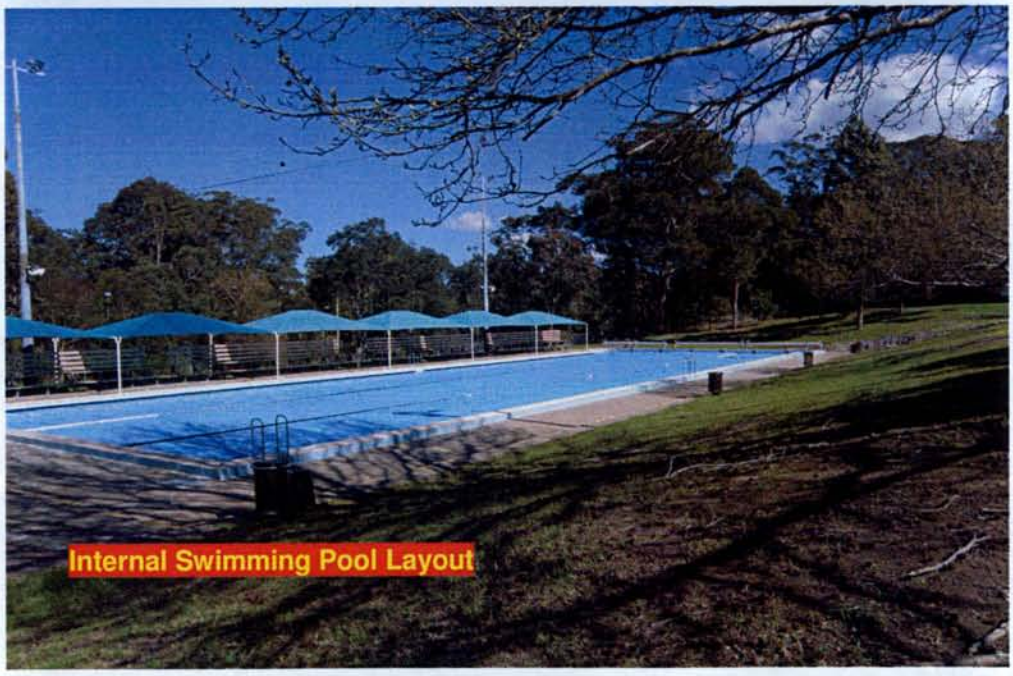

Internal Road Portions


Typical Understorey Within APZ


Creek Corridor


Internal APZ Fuel Structures

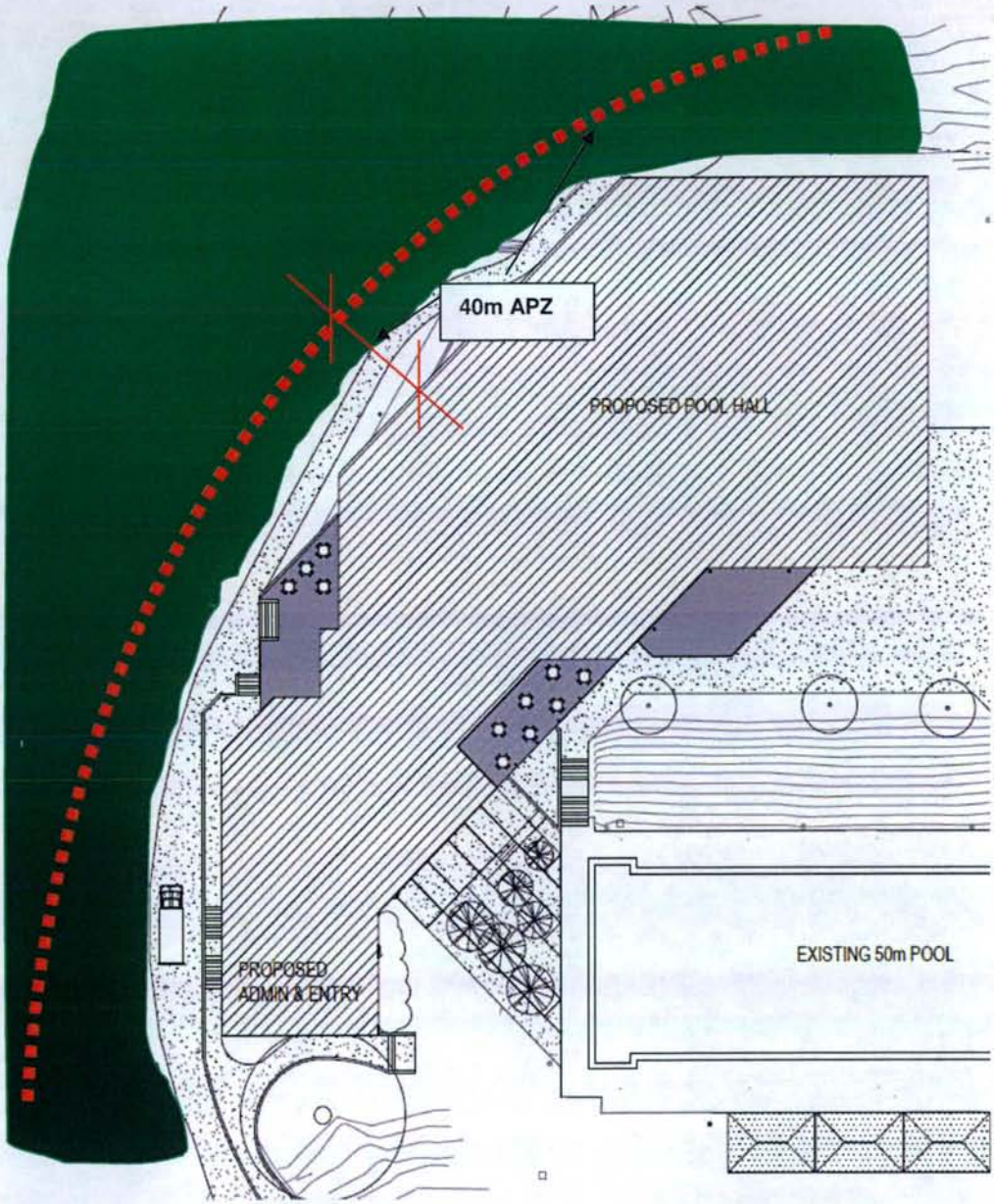

View Along the Western Elevation


Internal Swimming Pool Layout

Appendix D

APZ Plan

Indoor Pool Facility
Bicentennial Park
West Pymble



40m APZ Plan - Not to Scale

References

AS 3959 (Construction of Buildings in Bushfire Prone Areas) - 2009.

International Fire Engineering Guidelines - 2005

NSW Rural Fire Service – Guidelines for Asset Protection Zones (June 2003).

Planning for Bushfire Protection 2001 & 2006 – New South Wales Rural Fire Service.