

Bushfire Hazard Assessment Report

Revised:
Master Plan

At:
Charlton Christian College

Reference Number: 90462C

Prepared For:
Mr John Kroon

27th March 2013



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List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 as amended.
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMS	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Lake Macquarie Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2006
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

Charlton Christian College is located at 43 Fassifern Road, Fassifern and is within Lake Macquarie Council's local government area.

Existing development on the site includes classrooms (including art, music & food tech general learning areas), library, science building, multi-purpose hall, parking areas, court areas and a playing field. A revised Master Plan which involves the construction of three (3) general learning areas (classrooms), a technology training centre, pre school, admin / staff and specialist buildings, alterations and additions to existing library and the construction of various outdoor areas (including physical education court, cricket nets, paved area, new car park and extension to an existing car park) and new awnings has been prepared.

The vegetation that is posing a threat to the proposed building footprints (as shown on the revised master plan prepared by Stanton dahl architects job no. 1447.12, dwg no. A01/P4, dated 05/02/2013) is located southwest and northwest within the subject property itself.

Lake Macquarie Council's Bushfire Prone Land Map identifies the subject allotment as containing designated Category 1 and Category 2 Vegetation and their associated buffer zones, therefore the application of *Planning for Bush Fire Protection - 2006* (PBP) must apply in this instance.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide Charlton Christian College, Lake Macquarie Council and the NSW Rural Fire Service with an independent bushfire hazard determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that the Rural Fire Service / Council may elect to place within any consent conditions for future development.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire hazard assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2008, and the RFS document known as '*Planning for Bush Fire Protection 2006*' for the purposes of bushfire hazard determination and *Australian Standard 3959 2009* titled 'Construction of buildings in bushfire-prone areas' as amended for building/structural provisions.

Company representatives have made several site inspections of the subject property and the surrounding area.

5.0 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2006*.

	Northeast	Southeast	Southwest	Northwest
Vegetation Structure	Maintained curtilages	Sports oval	Forest	Forest
Slope	n/a	n/a	0 - 5 degrees down	0 - 5 degrees down
Required Asset Protection Zone for New SFPP	n/a	n/a	70 metres	70 metres
Proposed Asset Protection Zone	n/a	n/a	≥70 metres	≥70 metres
Significant Environmental Features	Fassifern Road	Sports oval	Existing fire trail	Existing fire trail
Threatened Species	APZ Existing	APZ Existing	APZ Existing	APZ Existing
Aboriginal Relics	APZ Existing	APZ Existing	APZ Existing	APZ Existing
Bushfire Attack Level	n/a	n/a	BAL 12.5	BAL 12.5
Required Construction Level	BAL 12.5	BAL 12.5	BAL 12.5	BAL 12.5
Proposed Construction Level	BAL 12.5	BAL 12.5	BAL 12.5	BAL 12.5

Asset Protection Zones Compliance

The minimum required Asset Protection Zone for new Special Fire Protection Purpose development was determined from Table A2.6 of PBP to be 70 metres to the southwest and northwest. The proposed works will provide Asset Protection Zones (APZ) of ≥70 metres, consisting of maintained grounds entirely within the subject property.

Construction Level Compliance

The highest Bushfire Attack Level to the proposed works was determined to be 'BAL 12.5' and therefore construction must comply with that of BAL 12.5 under section 3 & 5 under AS 3959 – 2009 and the addendum to Appendix 3 of Planning for Bushfire Protection 2006.

Some of the proposed works were found to be located > 100 metres from the hazard interfaces and as such are within BAL Low. These include the three new General Learning Areas and admin / staff building. Please refer to the attached plan for a depiction of the buildings >100 metres from the hazard interfaces.

Access and Services

Guideline Ref.	Proposed Development Determinations
Property Access	The proposed extension to the existing internal carpark will allow for an additional vehicle entry/exit point from the school grounds. The proposed car park extension must comply with the requirements for Internal Roads as detailed in section 4.2.7 of PBP.
Water Supply	Existing hydrants are available throughout the subject property for the replenishment of attending fire services.
Evacuation	Evacuation is possible by utilising existing road infrastructure. It is recommended that the school update their Bush Fire Evacuation Plan to be in accordance with the NSW Rural Fire Service guidelines emergency management plans and cover the proposed new buildings.

6.0 Aerial view of the subject allotment



Image 01: Aerial view of the subject area c/- nearmap.com

7.0 Bushfire Hazard Assessment

7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document '*Planning for Bush Fire Protection - 2006*' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in *Australian Standard 3959 – 2009 'Construction of buildings in bushfire prone areas'*.

Planning for Bush Fire Protection – 2006, (PBP) formally adopted on the 1st March 2007 and amended May 2010 (Appendix 3) provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject development relates to a revised Master Plan for the Charlton Christian College and involves the construction of three (3) general learning areas (classrooms), a technology training centre, pre school, admin / staff and specialist buildings, alterations and additions to existing library and the construction of various outdoor areas (including physical education court, cricket nets, paved area, new car park and extension to an existing car park) and new awnings.

To accord with PBP the development is classified as infill Special Fire Protection Purpose development under s4.25 of PBP.

Legend

-  BUSH FIRE PRONE VEGETATION CATEGORY 1
-  BUSH FIRE PRONE VEGETATION CATEGORY 2
-  BUSH FIRE PRONE VEGETATION BUFFER 100m and 30m



Image 02: Extract from Lake Macquarie Council's Bushfire Prone Land Map

7.02 Location

The subject property is known as Charlton Christian College located at 43 Fassifern Road, Fassifern and is within Lake Macquarie Councils Local Government Area. The School has street frontage to Fassifern Road to the northeast and secondary access to Narara Street to the south. The site abuts the Main Northern Railway to the west.

The development site is susceptible to possible bushfire impact from vegetation within the subject property to the southwest and northwest of the development area.



Photograph 01 – View southwest of the subject property from Fassifern Road

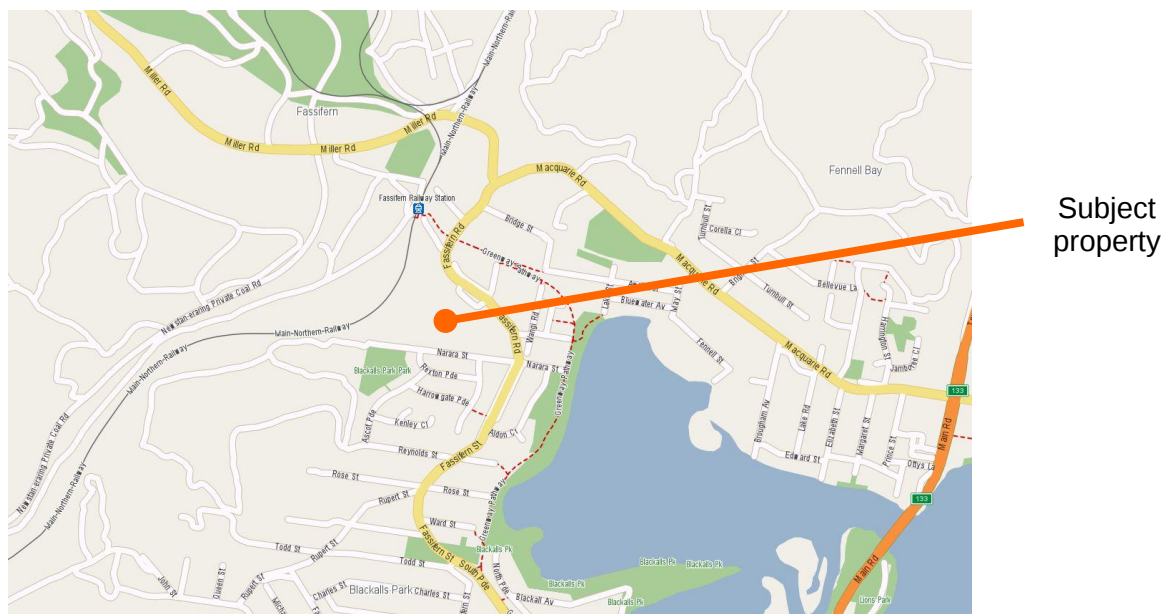


Image 03: Extract from street-directory.com.au

7.03 Vegetation

The predominate vegetation within the subject property around the existing school buildings was found to consist of maintained lawns, hard surfaced areas and gardens.

The vegetation identified as posing a bushfire hazard to the proposed development site is located to the southwest and northwest of the development and is within the subject property. The vegetation posing a hazard was found to consist of trees 10 - 30 metres in height with a 30 - 70% foliage cover and an understorey of shrubs and grasses.

For the purpose of assessment under PBP the vegetation to the southwest and northwest was determined to be Forest.

It is understood that Charlton Christian College is also seeking a rezoning application to have at least the part of the property that the school buildings and surrounding Asset Protection Zones rezoned to a zoning that permits schools.

A cooperative investigation between the schools ecologist and Council's flora and fauna development planner is underway to establish the most appropriate location of the new zone boundary. Should a conclusion be reached that the nominated Asset Protection Zones as described in this report are unachievable a review of this assessment will be required.

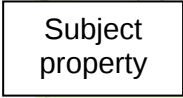


Photograph 02 - View southwest from within the subject property

7.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour must be assessed for at least 100 metres from the proposed works. The most significant bushfire impact from the hazard to the southwest and northwest is expected to be a bushfire travelling up slope toward the proposed works. The slope that would **most significantly** influence bushfire impact was determined onsite using an inclinometer and verified using topographic imagery to be:

- 0 - 5 degrees down slope within the hazard to the southwest and northwest



7.05 Asset Protection Zones

The proposed works will be located ≥ 70 metres from the hazard to the southwest and northwest consisting of maintained land entirely within the subject property.

Recommendations on maintenance of the APZ's within the subject property have been included within the recommendations of this report.

7.06 Fire Fighting Water Supply

The hydrant system is connected to a mains booster valve set. The existing water supply is considered suitable for the replenishment of fire service vehicles.

7.07 Property Access – Fire Services & Evacuation

Clear access to the school is available from Fassifern Road. Persons seeking to egress from the subject property are able to do so freely along the existing road infrastructure. Similarly, fire services have vehicle access to the subject property from Fassifern Road and Narara Street.

The subject site is fully fenced with security fencing so there is no free vehicle access. Access to the site is from strategically placed gates around the site, which also give access to fire trails. The local fire station (Toronto) has keys to access the site.

There are several walking trails throughout the vegetation that could be used as fire breaks and assist with hazard reduction activities.

The proposed extension to the existing internal carpark will allow for an additional vehicle entry/exit point from the school grounds. The proposed car park 1 and car park extension should comply with the requirements for Internal Roads as detailed in section 4.2.7 of PBP.

Avenues of access for fire services and occupant evacuation are considered satisfactory.

8.0 Site & Bushfire Hazard Determination

8.01 Planning for Bush Fire Protection - 2006

'Planning for Bush Fire Protection – 2006' (PBP) is applicable to those lands determined as being within a 'bushfire prone area' in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- *within or within 100m of high or medium bushfire hazards; or*
- *within or within 30m of low bushfire hazards.*

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP as follows:

South western aspect:

- a) Vegetation Structure Forest
- b) Slope 0-5 degrees down slope
- c) A 70 metre APZ is required (for new SFPP)
- d) A ≥ 70 metre APZ is available
- e) The highest Bushfire Attack Level was determined to be 'BAL 12.5'

North western aspect:

1. Vegetation Structure Forest
2. Slope 0-5 degrees down slope
3. A 70 metre APZ is required (for new SFPP)
4. A ≥ 70 metre APZ is available
5. The highest Bushfire Attack Level was determined to be 'BAL 12.5'

8.02 Australian Standard AS 3959 – 2009 'Construction of buildings in bushfire –prone areas'

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2006 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009.

8.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2009
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

8.04 Site Specific Bushfire Hazard Determination

All property development must be assessed on an individual basis as broad-brush approaches of documents such as PBP may not be applicable in every instance. The proposed development located at Charlton Christian College, Fassifern was assessed against the requirements of *Planning for Bush Fire Protection 2006* noting the following:

- a) Water supplies for fire fighting purposes are satisfactory.
- b) The proposed works will achieve the minimum required Asset Protection Zone for new Special Fire Protection Purpose development.
- c) The proposed works will be constructed to the relevant Bushfire Attack Level under AS3959 - 2009.

8.05 Viable Construction Method

The objectives of *Planning for Bush Fire Protection – 2006* are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and both the Rural Fire Service and Council should be in a position to consider such applications.

The highest Bushfire Attack Level to the proposed works was determined to be 'BAL 12.5'. The proposed works must therefore be constructed in accordance with section 3 and 5 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

Some of the proposed works, including the three new General Learning Areas and admin / staff building, were found to be located > 100 metres from the hazard interfaces and as such are within BAL Low. Please refer to the attached plan for a depiction of the buildings >100 metres from the hazard interfaces.

Although some of the proposed works will be within BAL Low and subsequently require no construction provisions Charlton Christian College may choose to construct these new works to BAL 12.5 regardless to mitigate possible smoke and ember attack.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with *Planning for Bush Fire Protection – 2006* and *Australian Standard 3959 - 2009*. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

General

1. That the proposed development complies with the master plan prepared by Stanton dahl architects job no. 1447.12, dwg no. A01/P4, dated 05/02/2013.

Asset Protection Zones

2. That all grounds identified as being 'managed areas' on the master plan prepared by Stanton dahl architects job no. 1447.12, dwg no. A01/P4, dated 05/02/2013 be maintained in accordance with an Asset Protection Zone (Inner Protection Area) as detailed in Appendix 2 of *Planning for Bush Fire Protection 2006* and the NSW Rural Fire Service document 'Standards for Asset Protection Zones'.

Construction

3. That the proposed pre-school, trade training centre, specialist building, awnings and extension to library be constructed to BAL 12.5 under AS3959 – 2009.
4. That the proposed pre-school, trade training centre, specialist building, awnings and extension to library be constructed to that of the 'Additional Construction Requirements' detailed in A3.7 of the Addendum to Appendix 3 of *Planning for Bush Fire Protection 2006* and NSW Rural Fire Service Fast Facts, Development Control Notes and Practice Notes.

Note: The three new General Learning Areas and admin / staff building are located >100 metres from any bushfire hazard and therefore there are no construction provisions applicable under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

Landscaping

5. That any new landscaping is to comply with Appendix 5 'Landscaping and Property Maintenance' under *Planning for Bush Fire Protection 2006*.

Access

6. That proposed new car park 1 and extension to the existing car park complies with the requirements for Internal Roads as detailed in section 4.2.7 of *Planning for Bush Fire Protection 2006*.

Emergency Management

7. That the bushfire emergency / evacuation plan be updated consistent with the NSW Rural Fire Service Guidelines for the *Preparation of Emergency / Evacuation Plan* to include the new buildings.

10.0 Conclusion

Given that the property is deemed bushfire prone under Lake Macquarie Council's Bushfire Prone Land Map any development would need to meet the requirements of *Planning for Bush Fire Protection – 2006* and of the construction requirements of *Australian Standard 3959 – 2009*. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The vegetation identified as being the potential bushfire hazard is located to the southwest and northwest of the proposed works within the subject property. For the purpose of assessment under PBP the vegetation to the southwest and northwest was determined to be Forest on a 0 – 5 degree down slope.

The minimum required Asset Protection Zones for new Special Fire Protection Purpose development were determined from Table A2.6 of PBP to be 70 metres.

The proposed works will be located ≥ 70 metres from the hazard to the southwest and northwest consisting of maintained land entirely within the subject property. Recommendations on maintenance of the APZ's within the subject property have been included within the recommendations of this report.

The highest Bushfire Attack Level to the proposed works was determined from Table 2.4.2 of AS3959 – 2009 to be 'BAL 12.5'. The proposed works will be constructed in accordance with section 3 and 5 of Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2009.

Some of the proposed works were found to be located > 100 metres from the hazard interfaces and as such are within BAL Low. Please refer to the attached plan for a depiction of the buildings > 100 metres from the hazard interfaces.

The existing water supply and proposed access provisions are considered adequate.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

We are therefore in support of the development.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions



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Disclaimer:

Quote from Planning for Bush Fire Protection 2006, 'Any representation, statement opinion, or advice expressed or implied in this publication is made in good faith on the basis that the State of New South Wales, the NSW Rural Fire Service, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above..'

Similarly the interpretations and opinions provided by Building Code and Bushfire Hazard Solutions in regard to bushfire protection are also given in the same good faith.

11.0 Annexure 01

List of Referenced Documents

- a) *Environmental Planning and Assessment Act - 1979*
- b) *Rural Fires Act 1997 as amended*
- c) *'Planning for Bush Fire Protection'- 2006* - NSW Rural Fire Services & Planning NSW
- d) *'Construction of buildings in bushfire prone areas'* - AS 3959 – 2009 (as - amended) – Standards Australia
- e) *'Ocean Shores to Desert Dunes' David Keith*
- f) *'Lake Macquarie Council's Bushfire Prone Land Map'*
- g) Acknowledgements to:
 - UBD Directories
 - NSW Department of Lands – SixViewer
 - Street-directory.com.au

Attachments

Attachment 01: Master Plan

legend:

- vegetated area
- managed area (apz)
- open landscaped area
- existing buildings
- future awnings
- habitat tree location identified by ecotone
- nest box tree location identified by ecotone
- additional habitat trees identified by parker scanlon
- proposed trees (to be confirmed)
- power pole location
- underground cables

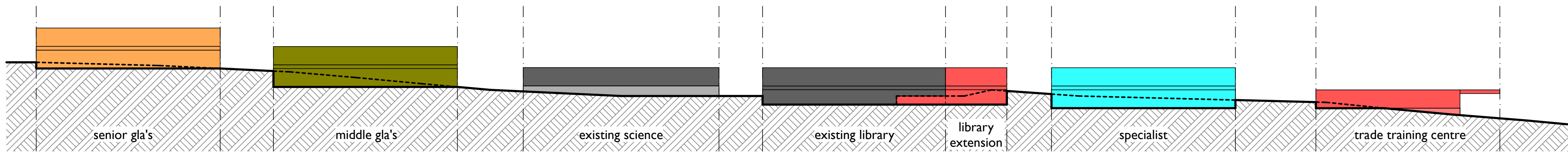
future indicative stages:

- stage 1
- stage 2
- stage 3
- stage 4
- stage 5
- stage 6
- stage 7

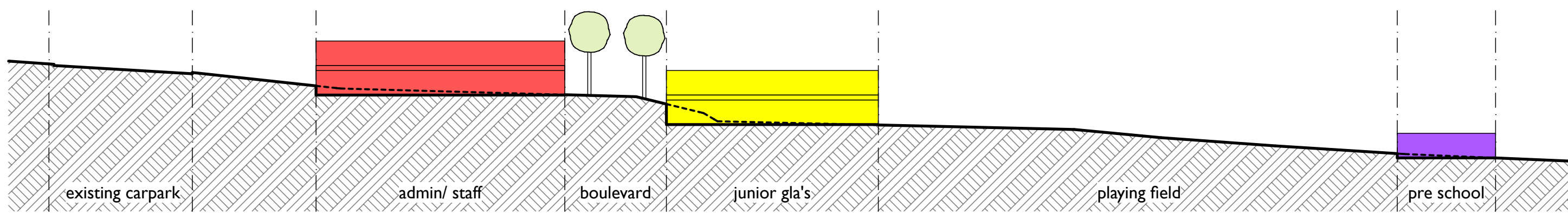
note: contours shown are existing and indicative only, refer to survey for more information



01 masterplan
1:1000 @ A1



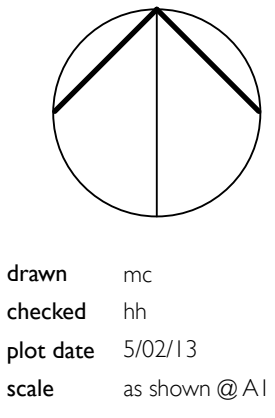
02 indicative circuit elevation
1:500 @ A1



03 indicative street elevation
1:500 @ A1

amendment	date
P4 issued for consultant review	05/02/2013
P3 issued for consultant review	18/01/2013
P2 habitat trees and power poles added	05/12/2012
P1 issue to planner to review	26/11/2012

note: all dimensions are to be verified on site and any discrepancies referred to the architect for determination. figured dimensions are to take precedence over scaled dimensions.



charlton christian college

43 fassfern road fassfern
college master plan

job number 1447.12
dwg. no. / issue & amendment A01/P4

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