REF: 5310BF

Date: 28/7/22

Valid To: 28/7/23

BUSHFIRE HAZARD ASSESSMENT

MASTER PLAN
ST PETERS ANGLICAN COLLEGE

LOT 1 DP1037342
61 TRAIN STREET, BROULEE NSW 2536

LGA: Eurobodalla

Applicant: St Peters Anglican College

HARRIS ENVIRONMENTAL CONSULTING

KATE@HEC.ECO

HARRIS ENVIRONMENTAL CONSULTING

Version Control

Date Created	26/7/22			
Version Number	Name	Issue Detail	Date Modified	Status
1.0	BB	Draft	26/7/22	Complete
1.1	GB	DA Report	28/7/22	Complete
1.2	KH	DA Report	28/7/22	Complete

Bushfire Hazard Assessment

Property Address:	61 Train Street, Broulee NSW, Lot 1 DP 1037342
Description of Proposal:	St Peters Anglican College Master Plan
Plan Reference:	COX Architecture St Peter's Anglican College, Draft DA Rev 1, 22-07-2022
Highest BAL Rating:	BAL 19
Performance-Based Solution	YES – 10kW/m2 setbacks to the western forest hazard. BAL 19 proposed alterations and additions P6.
Bushfire Assessment Reference:	5310BF
Report Date:	26/7/22
Accreditation Scheme/Certification No:	FPAA Australia Bushfire Planning & Design Scheme BPAD L3 26947

ASSESSOR & QUALIFICATIONS

Kate Harris

BPAD L3 26947
GRAD DIP BUSH FIRE PROTECTION, UWS
GRAD DIP ENVIRO MANG HERTS, UK
GRAD DIP NAT RES UNE
BSC APP SC, AGRICULTURE HAC

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

ABN 541 287 40 549

Phone: (02) 42 360 954
Mobile: 0403 237 072
Email: kate@hec.eco
Web: www.harrisenvironmental.com.au

DISCLAIMER

The recommendations provided in the summary of this report are a result of the analysis of the proposal in relation to the requirements of Planning for Bushfire Protection 2019. Utmost care has been taken in the preparation of this report; however, there is no guarantee of human error. The intention of this report is to address the submission requirements for Development Applications on bushfire prone land. There is no implied assurance or guarantee the summary conditions will be accepted in the final consent, and there is no way Harris Environmental Consulting is liable for any financial losses incurred should the recommendations in this report not be accepted in the final conditions of consent. This bushfire assessment provides a risk assessment of the bushfire hazard as outlined in the PBP 2019 and AS3959 2018. It does not provide protection against any damages or losses resulting from a bushfire event.

TABLE OF CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

St Peters Anglican College engaged Harris Environmental Consulting to prepare a Bushfire Assessment Report to support the proposed alterations and additions to the existing educational facility located at 61 Train Street, Broulee, NSW 2536.

On 21 January 2022, a site inspection confirmed that the subject site is impacted by classified Bush Fire Prone Land (BFPL) as detailed on the Eurobodalla Shire Councils' BFPL Map.

The proposed alterations and additions to the existing educational facility are classified as a Special Fire Protection Purpose (SFPP) development under section 100B of the *Rural Fires Act 1997.* All SFPP development on BFPL is required to comply with *Planning for Bushfire Protection 2019* (PBP) and incorporate a suitable package of bushfire protection measures commensurate with the assessed level of risk.

An assessment undertaken pursuant to the methodologies detailed in PBP 2019 confirmed the proposed development complies with the relevant provisions For SFPP infill development.

A summary of compliance and bush fire protection measures is detailed below:

PBP 2019 – Compliance:

Bushfire Protection Measure	Recommendations
Asset Protection Zones	New Buildings: SFPP 10kW/m2 APZ per Table A1.12.1 of PBP 2019. ≥47 metres north, ≥38 metres east, and ≥65 metres south and west (method 2). Alterations and additions (P6): BAL 19 APZS per Table A1.12.5 of PBP2019. ≥40 metres south and west, ≥21 metres north, and ≥16 metres east.
Construction Standard	New Buildings BAL 12.5 per AS 3959-2018. Alterations and additions (P6): BAL 19 per AS 3959-2018
Property Access	All new access to comply with Table 6.8b of PBP 2019
Services	All new and the modification of any existing water, electricity and gas services to comply with Table 6.8c of PBP 2019
Emergency Management	Prepare/update the St Peters Anglican College Bush Fire Emergency Management and Evacuation Plan consistent with Table 6.8d of PBP 2019
Landscaping	To comply with Table 6.8a and Appendix 4 of PBP 2019.

1. PROPOSAL

St Peters Anglican College engaged Harris Environmental Consulting to prepare a Bushfire Assessment Report to support the proposed alterations and additions to the existing educational facility located at 61 Train Street, Broulee, NSW 2536. The legal title of the property is Lot 1 in DP1037342.

On 21 January 2022, a site inspection confirmed that the subject site is impacted by classified Bush Fire Prone Land (BFPL) as detailed on the Eurobodalla Shire Councils' BFPL Map (Certified 2021).

The proposed works associated with the Master Plan include:

- P1. Entry concourse.
- P2. Nature play area.
- P3. Extended bus drop-off.
- P5. New Classroom - Junior learning areas.
- P6. Alterations and additions to the Campus Performing Arts Centre - Specialist music areas.
- P7. New administration and community hub building.
- P9. External learning area.
- P10. New sports & recreation centre.
- P12. Hardcourts, tennis courts & cricket.
- P13. Staff parking area.
- P14. Open air chapel.(open air non combustible structure and not included in this assessment).

The Master plan also includes the decommissioning of temporary demountable structures installed after the site was impacted during the Bush Fires in 2019-20.

The proposed development is classified as a Special Fire Protection Purpose (SFPP) development under section 100B of the *Rural Fires Act* (1997). All SFPP development on BFPL are required to comply with *Planning for Bushfire Protection 2019* (PBP).

Where new building works are proposed within existing SFPP developments, the proposed development should seek to achieve a better bush fire outcome than if the development did not proceed. A better bush fire outcome can be achieved by implementing a package of bushfire protection measures and emergency management and evacuation planning procedures for the site commensurate with the assessed level of risk.

Figure 1 Site location

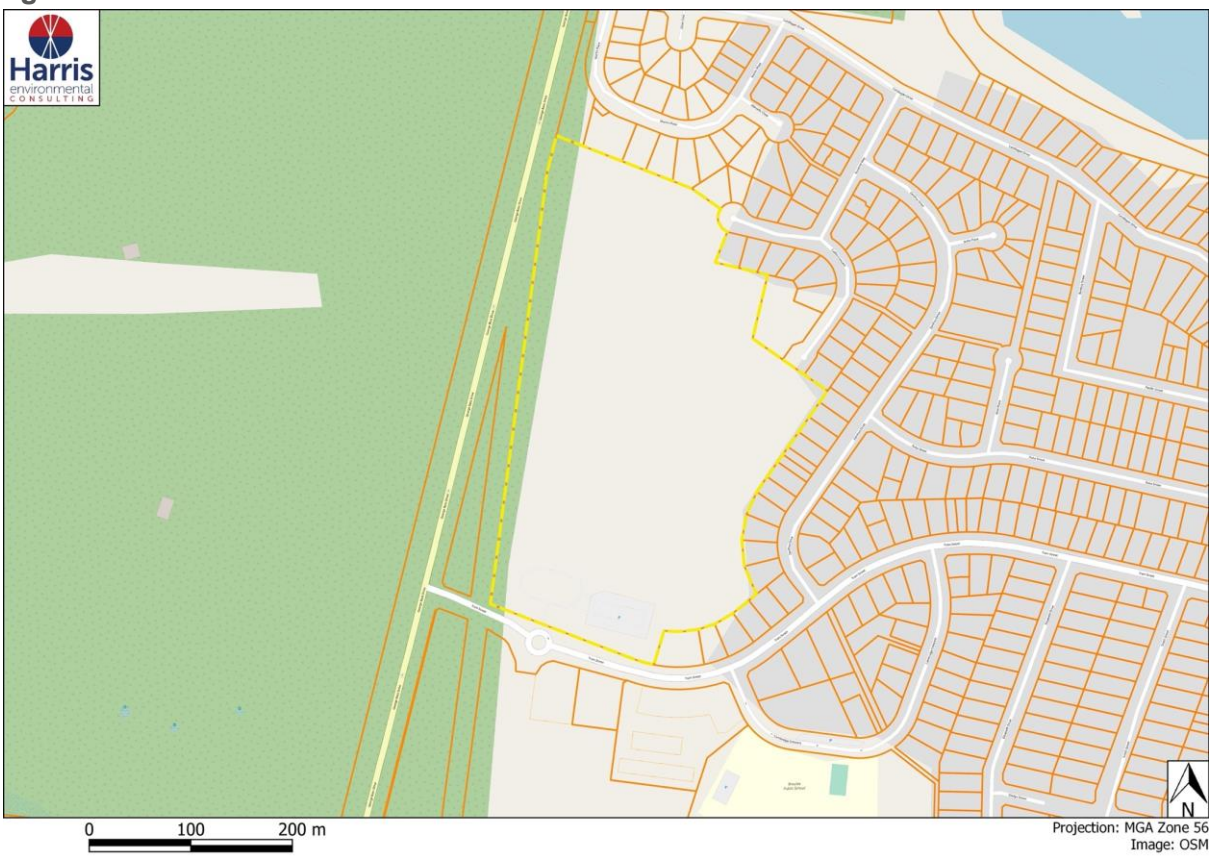
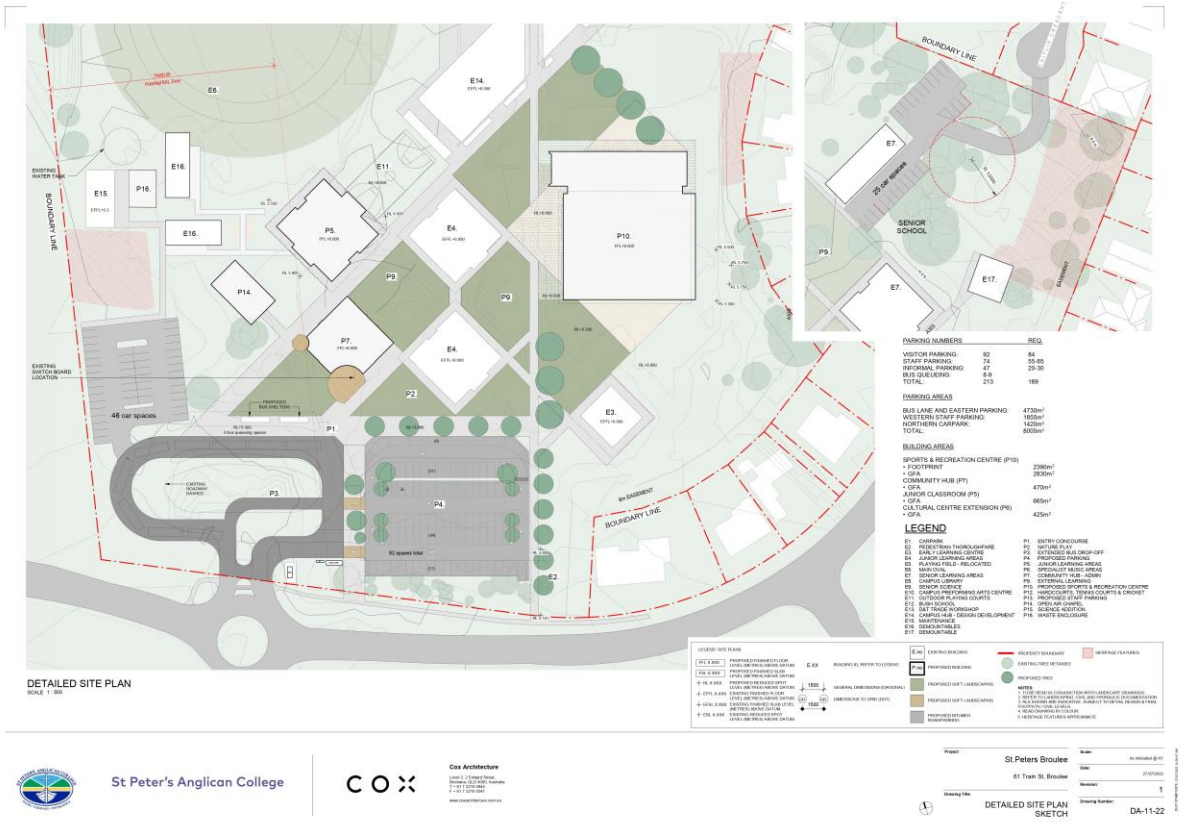
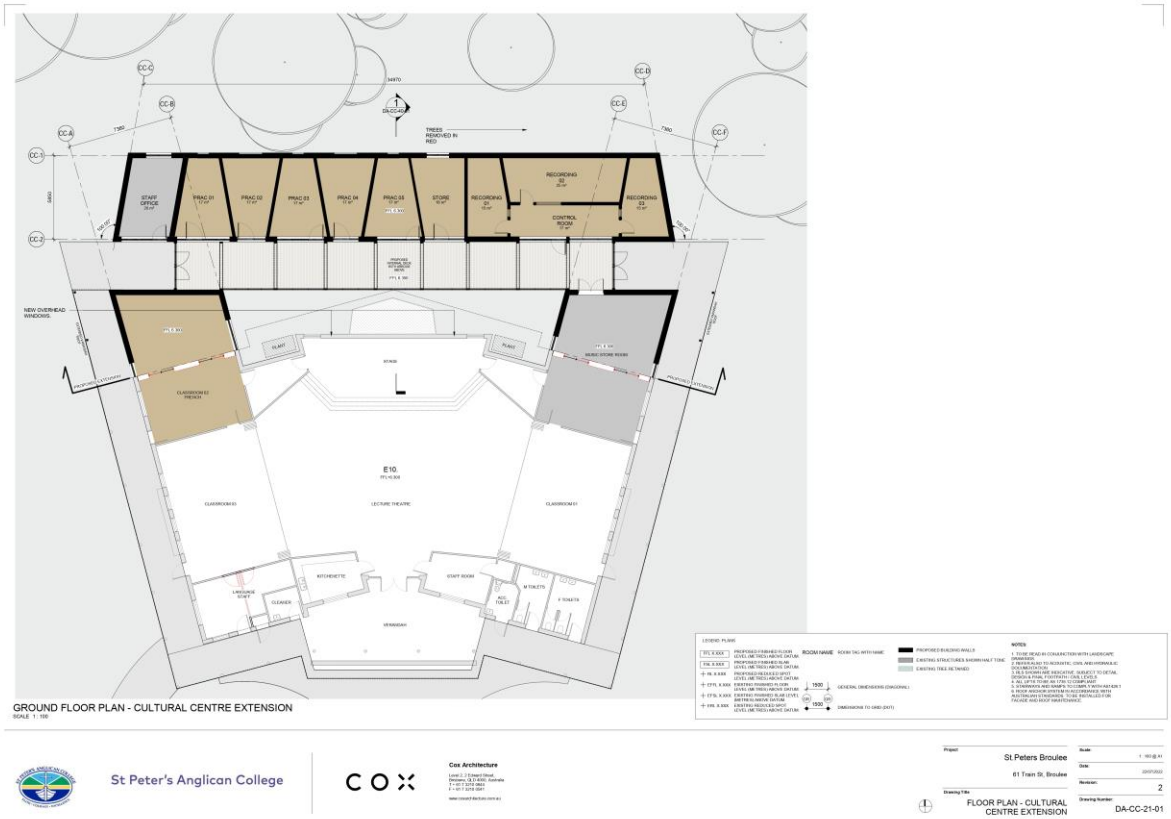


Figure 2 Broad-scale aerial view of the subject site

Figure 3 Close up view of the subject site

Figure 4 Plan





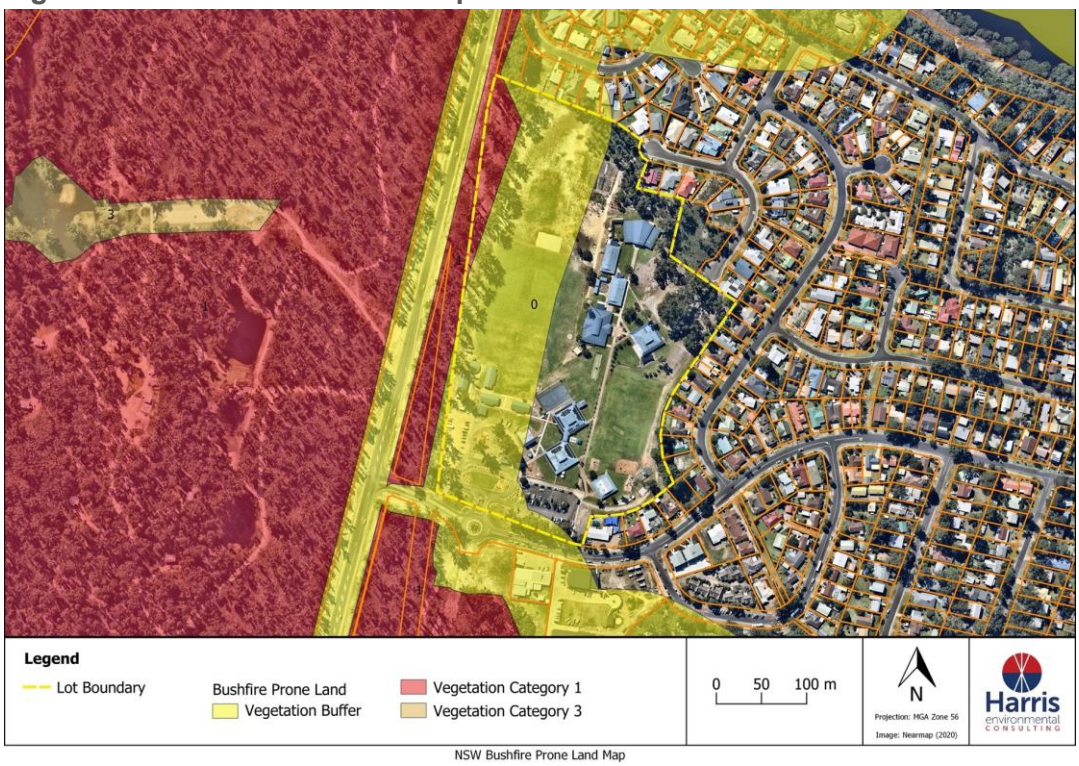
2 PLANNING LAYERS

The following planning layers are described in Table 1 and shown in the Figures below:

Table 1 Planning Layers

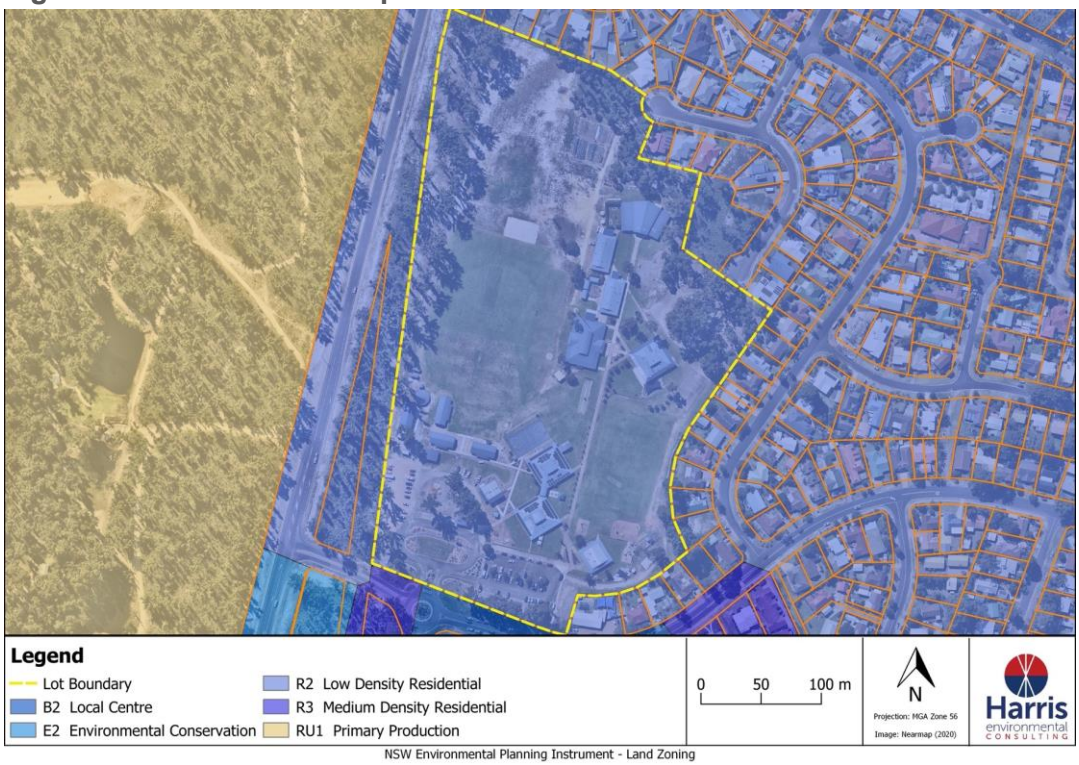
MAP	FIGURE	DESCRIPTION
Bush Fire Prone Land Map	Figure 5	The vegetation surrounding the subject site is mapped on the Eurobodalla Shire Council *Bush Fire Prone Land Map* as Vegetation Category 1 and Vegetation Buffer. Vegetation Category 1 is considered the highest risk for bush fire and is represented as red on the bush fire prone land map and will be given a 100m buffer. This vegetation category has the highest combustibility and likelihood of forming fully developed fires, including heavy ember production. The Bush Fire Prone Land Map is a trigger for considering bushfires for new development. The map is not intended as a detailed measure of risk. The bushfire risk assessment for the proposed development has been undertaken pursuant to PBP 2019.
LEP Zone Map	Figure 6	The subject lot is zoned as R2 - Low Density Residential, under the *Eurobodalla Local Environmental Plan 2012*.
Vegetation Mapping	Figure 7	The classified vegetation has been mapped on the Shoalhaven Biometric Vegetation Map (VIS_ID3900) as a Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions.
Biodiversity Values Map	Figure 8	Areas of land within the subject site are mapped on the Biodiversity Values Map under the *Biodiversity Conservation Act 2016.*

Figure 5 Bushfire Prone Map



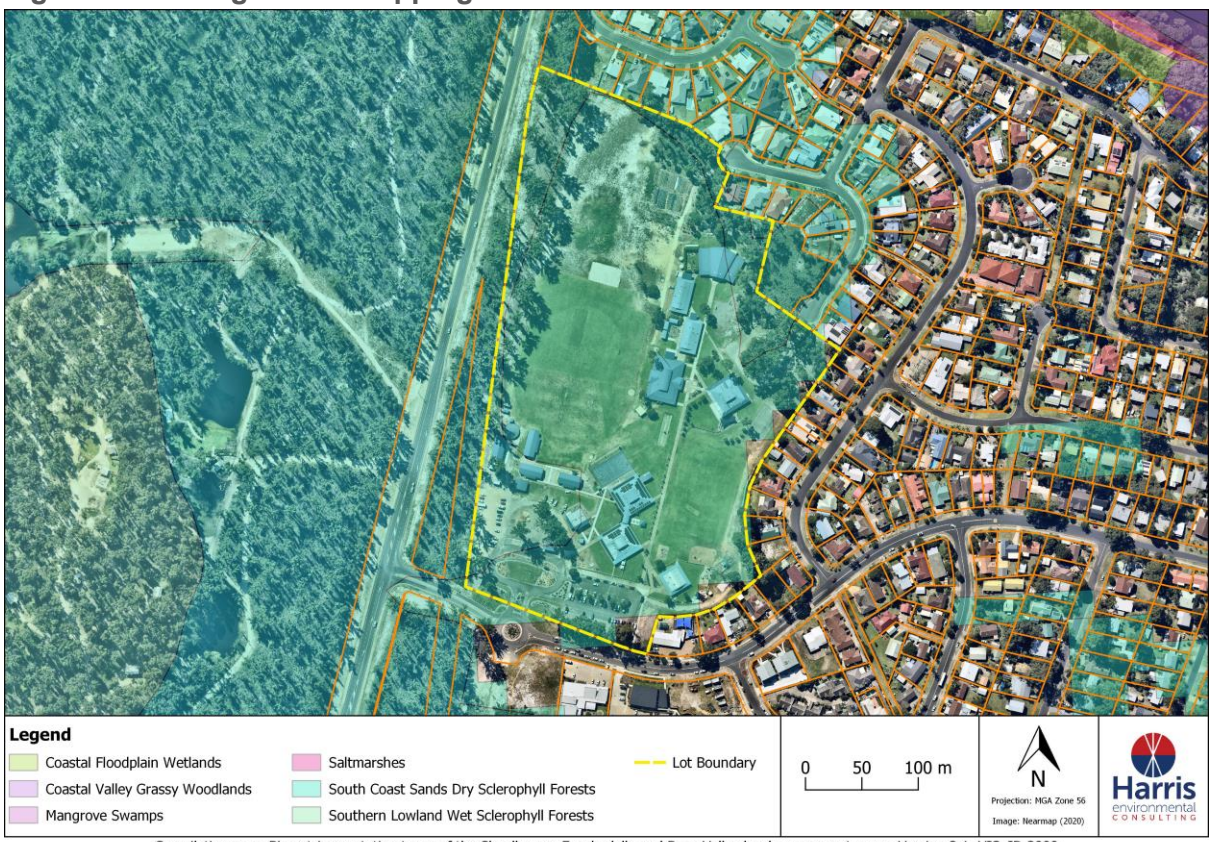
NSW Bushfire Prone Land Map

Figure 6 LEP Zone Map



NSW Environmental Planning Instrument - Land Zoning

Figure 7 Vegetation Mapping



Compilation map: Biometric vegetation types of the Shoalhaven, Eurobodalla and Bega Valley local government areas. Version 2.1. VIS_ID 3900

Figure 8 Biodiversity Values Map

Biodiversity Values Map and Threshold Tool

3. SITE DESCRIPTION

The subject site is situated to the east of George Bass Drive within the Township of Broulee, roughly 20km south of Batemans Bay and 14.5km north of Moruya. The land use to the north, east and south is consistent with urban residential and unmanaged primary production land to the west. The site was impacted during the Bush Fires of 2019-20, and several structures were damaged or destroyed.

3.1 Classified Vegetation

A review of the Biometric Vegetation Map (VIS_ID3900) identified the predominant vegetation community within 140 metres of the subject site to be Plant Community Type (PCT) 659 - Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions. A site inspection on 21 January 2022 confirmed the vegetation community detailed in the Biometric Vegetation Map.

PCT 659 converts to a South Coast Sand Dry Sclerophyll forest (Keith 2004) and is classified as a forest for the purpose of identifying Asset Protection Zones (APZ) requirements per Tables 6.8a, A1.12.1 and A1.12.5 of PBP 2019.

The classified vegetation situated to the northeast consists of an isolated and segmented parcel of regenerating Bangalay Sand Forest. The size and shape of the classified vegetation will significantly influence bushfire behaviour and is less likely to support fully developed bush fires. Pursuant to Appendix 1.11 of PBP 2019, the classified vegetation to the northeast of the lot has been assessed as a remnant hazard.

3.2 Effective Slope

Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* and PBP 2019 identify that the slope of the land under the classified vegetation is much more important than the slope between the site and the edge of the classified vegetation.

The effective slope under the classified hazard was assessed onsite and confirmed using elevation datasets sourced from Spatial Services NSW.

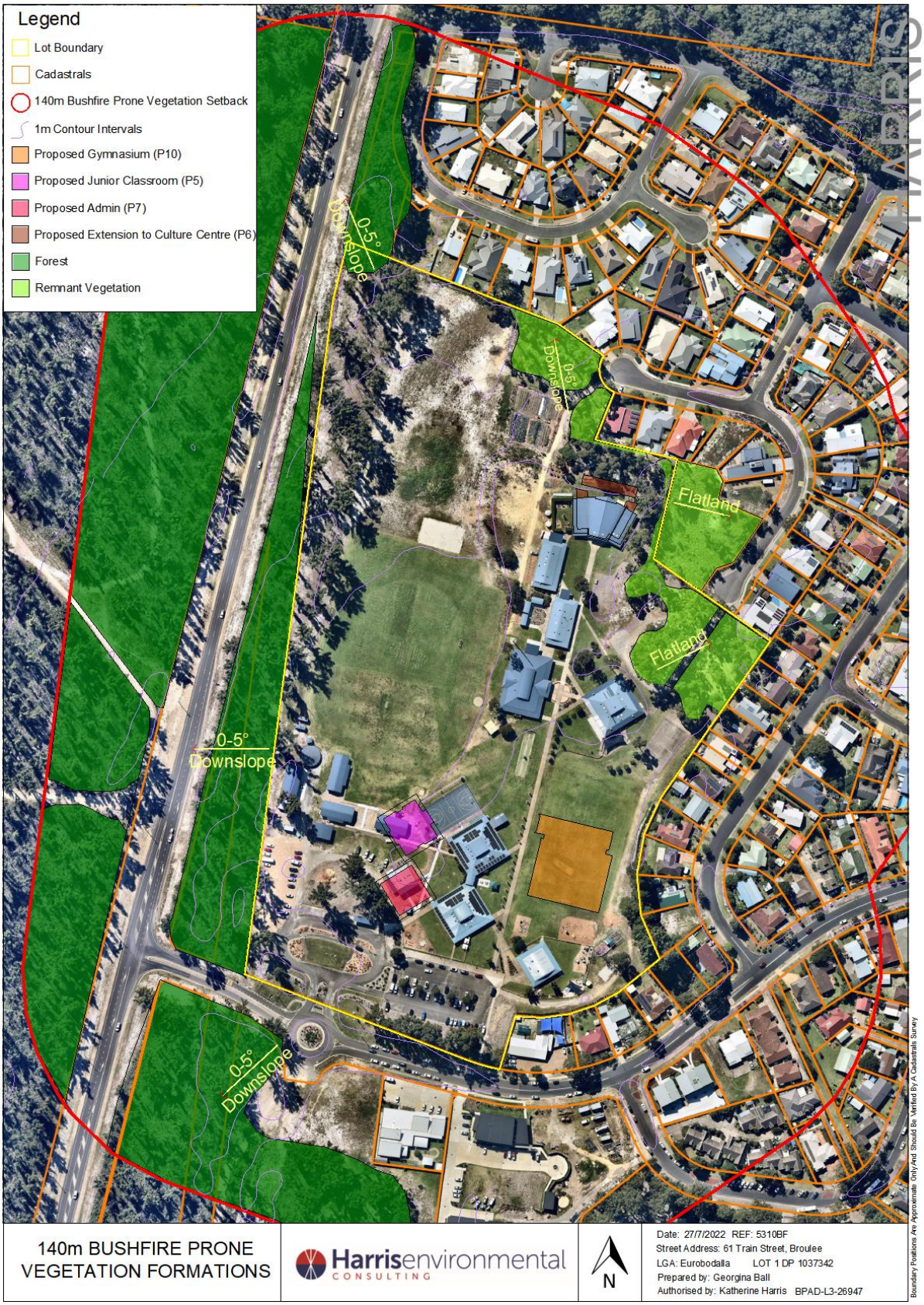
The site topography is generally level. The effective slope under the classified vegetation situated within 100 metres north and west of the proposed development is downslope, as illustrated in Figure 9 and detailed in Table 2.

Figure 9 2 metre contours - site topography

Table 2 Vegetation Classification and Effective Slope

	Vegetation Formation	Effective Slope
North	Remnant	0-5° Downslope
North East & Southeast of P6	Remnant	Flat
East	Managed land	Flat
South	Forest	Flat
West	Managed land Forest	0-5° Downslope

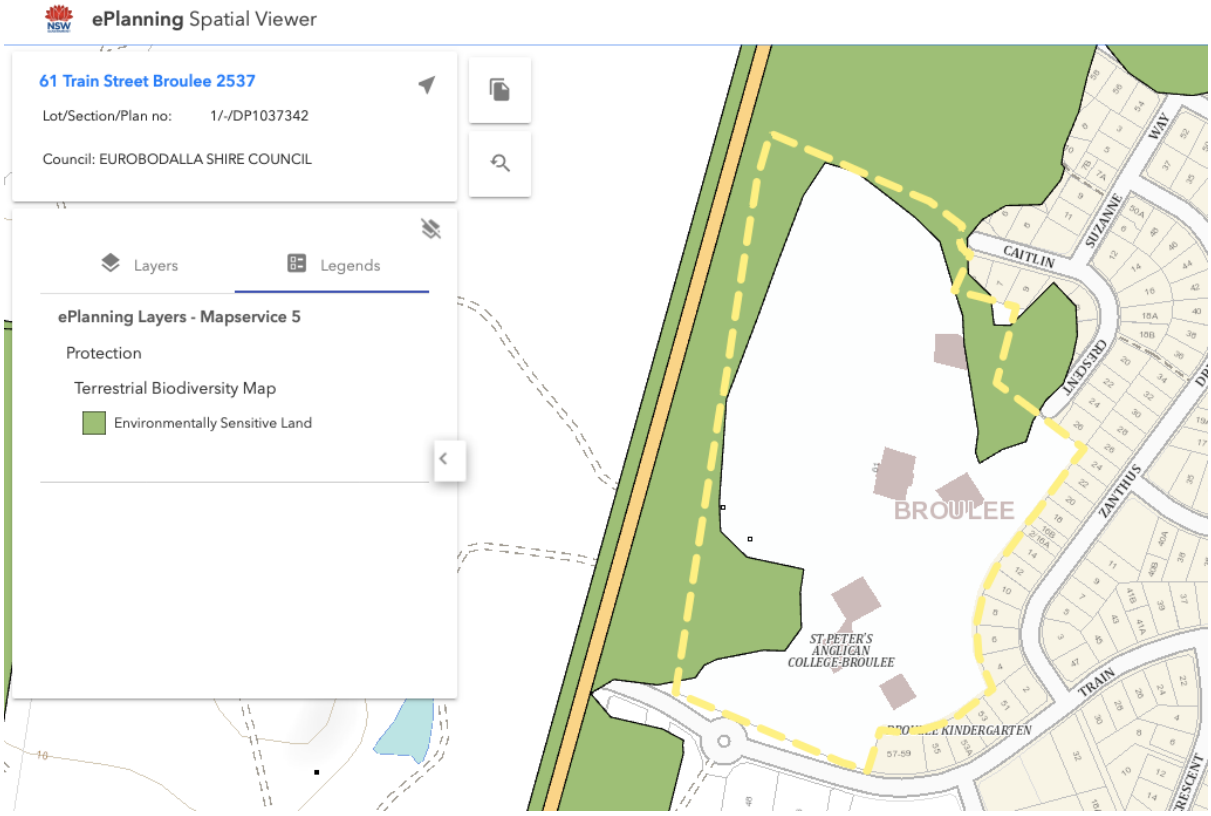
Figure 10 Bushfire Prone Vegetation within 140 metres



3.3 Significant Environmental Features

The unmanaged vegetation along the western property boundary and the northeastern corner of the subject site is identified as Environmentally Sensitive Land on the Terrestrial Biodiversity Values Map under the *Eurobodalla Local Environmental Plan 2012* and is mapped on the Biodiversity Values Map prepared by the Department of Planning, Industry and Environment. All potential impacts associated with the proposed development have been assessed by Lodge Environmental. Refer to the ecological report for additional information.

Figure 11 Significant environmental features



3.4 Threatened Species, Population or Ecological Community

No information relating to threatened species and populations was made available at the time of assessment.

Plant Community Type (PCT) 659 - Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions is listed as an Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016.*

All potential impacts associated with the proposed development have been assessed by Lodge Environmental. Refer to the ecological report for additional information.

3.5 Aboriginal Heritage

A basic search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) on Saturday, 23 July 2022, using a 50-metre buffer, has shown that the site contains one Aboriginal site recorded in or near the subject site, and no Aboriginal places have been declared in or near the subject site.

Niche Environmental and Heritage identified five additional features within the site during a preliminary Aboriginal Cultural Heritage Study. Three of the five features are situated within the required APZs for the proposed development. To ensure works associated with establishing and maintaining the required APZs does not impact Aboriginal sites or places, A Vegetation Management Plan (VMP) should be prepared in consultation with all stakeholders.

4. BUSHFIRE THREAT ASSESSMENT

The bushfire hazard assessment was undertaken in accordance with the methodology outlined in Appendix 1 of PBP 2019. The subject site is situated in the Far South Coast fire region of NSW, and bush fire protection measures and construction standards were determined using the following bush fire weather parameters:

- Fire Danger Index (FDI) 100 - Eurobodalla Local Government Area;
- Flame temperature - 1200 Kelvin – APZs for new works
- Flame temperature - 1090 Kelvin – APZS for alterations and additions to existing development.

4.1. Asset Protection Zones (APZ)

The intent of an Asset Protection Zone (APZ) for infill development is to minimise the risk of bush fire attacks and provide a safe operational environment for emergency service personnel undertaking operations, including supporting or evacuating occupants. While it is recognised that infill development can be constrained, the proposal should provide sufficient APZs around buildings to ensure radiant heat levels are below critical limits and prevent direct flame contact.

Tables A1.12.1 and A1.12.5 of PBP 2019 and a method two assessment has been used to determine the minimum APZ requirements for the proposal. Figures 12 & 13 and Table 3 show the proposed APZs and Bushfire Attack Level (BAL) ratings.

To determine flame length for the western elevation Method 2 AS3959 has been used to calculate the radiant heat emission and flame length utilising the Bushfire Attack Assessor Program licensed by Newcastle Bushfire Consulting (*NBC 2020*). Full details of the assessment are on page 44 below the plans and the summarised findings presented in Table 4. The effective slopes are determined from the effective slope and fire runs.

As shown in Table 4, the proposed developments can achieve 10kW/m^2. The Flame Length is 20.84 m on the western elevation and 10kW/m2 is 65 m.

Table 3 Minimum APZ and BAL ratings

	North	East	South	West
Classified vegetation	Remnant	Remnant	Managed Land Forest	Managed Land Forest
Effective slope	0-5° Downslope	Flatland	Flat	0-5° Downslope
Min APZ for (10kW/m2) per Table A1.12.1 of PBP 2019 and Method 2	≥47m BAL 12.5	≥38 metres BAL 12.5	≥65 metres** BAL 12.5	≥65 metres** BAL 12.5
Min APZ for BAL 19 per Table A1.12.5 of PBP for P6	≥21 metres BAL 19	≥16 metres BAL 19	≥40 metres BAL 19	≥40 metres BAL19

** per the result of the Method 2 assessment.

Table 4 Flame Length using Method 2 (NBC, 2020)

	Western Elevation
Fuel load	South Coast Sands DSF
Vegetation Slope	1 degrees downslope
Site Slope	Level
Distance to Vegetation from facade	74 m
Radiant Heat Flux (kW/m^2)	8.1 kW/m^2
Flame Length	**20.84 m**
10kW/m^2	**65 m**
Level of Construction	**BAL 12.5**

Figure 12 10kw/m² APZs for P5, P7 and P10.

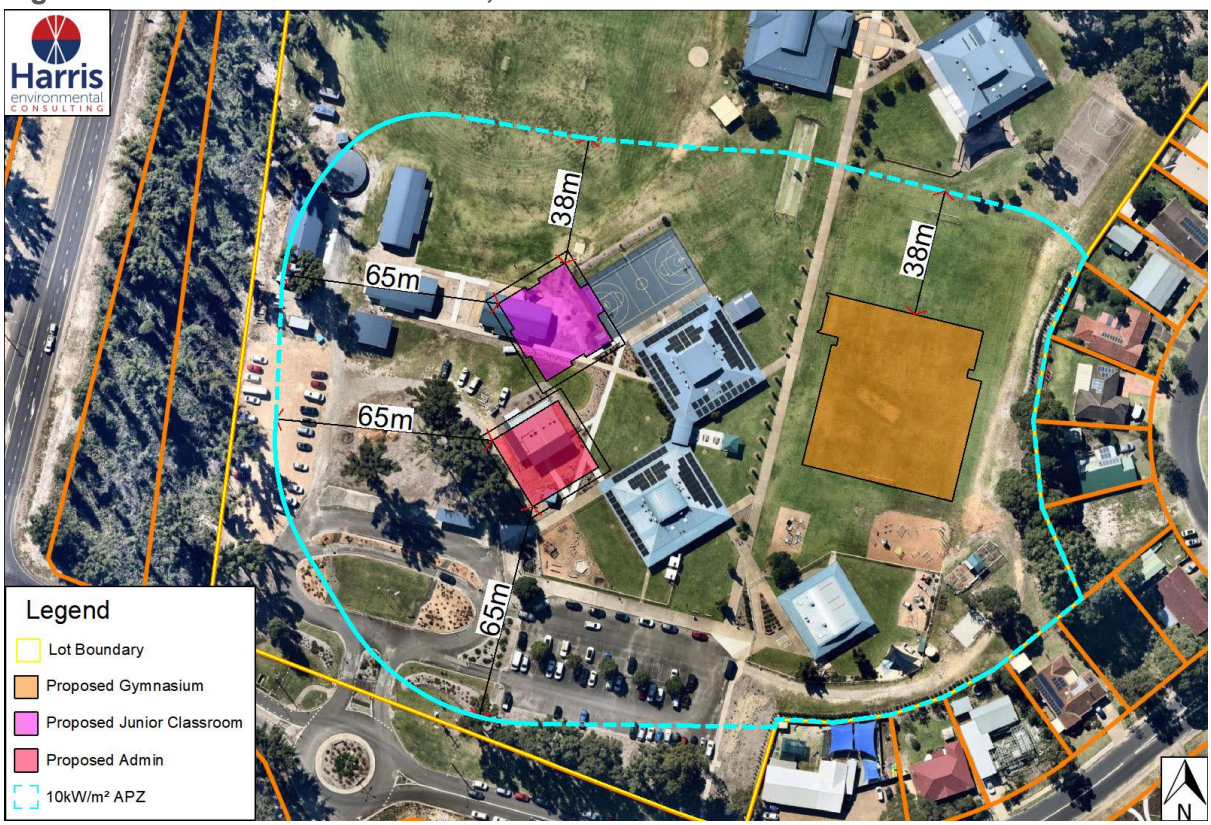


Figure 13 BAL 19 APZs for P6

4.2. Relevant Construction Standard

The Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* and the NASH Standard *Steel Framed Construction in Bushfire Areas* (2014) are the enabling standards that address the performance requirements of both parts 2.3.4 and Part GF5.1 of the *Building Code of Australia* for the Construction of Class 1, 2 and 3 buildings, Class 4 parts of a building, Class 9 buildings that are SFPPs, and associated Class 10a buildings and decks situated on bush fire prone areas.

The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC;

- Clause 3.10 of AS 3959 is deleted, and any sarking used for BAL-12.5, BAL-19, BAL-29, or BAL-40 shall:
    - be non-combustible, or
    - comply with AS/NZS 4200.1,

- Be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL;

- Clause 5.7 and 6.7 of AS 3959 are replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space only needs to comply with the wall requirements for the respective BAL.

All proposed new buildings should be designed and constructed to comply with sections 3 and 5 **(BAL 12.5)** of Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* or the relevant BAL 12.5 requirements of the NASH Standard - *Steel Framed Construction in Bushfire Areas (incorporating amendment A - 2015)* and section 7.5 of PBP 2019.

The proposed alterations and additions to the Campus Performing Arts Centre building (P6) should be designed and constructed to comply with sections 3 and 6 **(BAL 19)** of Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas,* Section 7.5 of PBP 2019 and or the relevant BAL 19 requirements of the NASH Standard - *Steel Framed Construction in Bushfire Areas (incorporating amendment A - 2015)*.

4.3. Safe Operational Access

PBP 2019 requires the provision of safe operational access to structures and water supply for emergency services while residents are seeking to evacuate from an area.

The subject site has direct access and street frontage onto Train Street to the south and Caitlin Crescent to the north. Both roads are sealed all-weather, two-way public roads. The capacity of internal and external public road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles. Internal access roads provide access throughout the site and suitable turning arrangements consistent with appendix 3 of PBP 2019.

All proposed new internal roads illustrated in the Master Plan should be designed and constructed in accordance with the relevant requirements detailed in Table 6.8b of PBP 2019.

4.4. Adequate Water and Utility Services

The subject site is connected to reticulated water. In addition, the site has recently installed a new static water supply (≥100,000L) and acquired a fire fighting water cart fitted with pumps and hoses (Figure 14).

Figure 14 Static water supply and fire fighting water cart

The provision of all new and the modification of any existing water, electricity and gas services should comply with Table 6.8c of PBP 2019.

Any bottled gas will be installed and maintained in accordance with Australian Standard AS/NZS 1596:2014 *The storage and handling of LP Gas* and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

4.5. Landscaping

All landscaping within the required APZ should be designed to minimise flame contact and radiant heat to buildings and the potential for wind-driven embers to cause ignitions.

When landscaping, vegetation should be located greater than two metres from any part of the roofline of a building or shed. Garden beds of flammable shrubs should not be located under trees and should be no closer than ten metres from an exposed window or door. Trees should have lower limbs removed up to two metres above the ground.

Appendix 4 of PBP 2019 provides guidelines for landscaping and Bushfire Provisions within the APZ.

4.6. Emergency Management

A Bush Fire Emergency Management and Evacuation Plan should be prepared for St Peters Anglican College. The Plan should be consistent with the NSW RFS publication: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Pla*n and Australian Standard AS3745 2010 *Planning for Emergencies in Facilities*.

St Peters Anglican College should ensure all staff, students and day visitors are familiar with the RFS Bush Fire Alert Levels and the Plans' procedures.

The Plan should be reviewed and updated annually following an audit of bush fire protection measures, including maintaining asset protection zones, water supplies and access roads within the site. An up to date copy of the Plan should be provided to the Local Emergency Management Committee.

5. CONCLUSION AND RECOMMENDATIONS

The proposed development will result in alterations and additions to an existing SFPP development. All works will comply with the relevant provisions of PBP 2019 and the construction standards detailed in AS3959. The following recommendations are considered an appropriate package of bushfire protection measures commensurate with the assessed level of risk and should be incorporated into the proposed development.

Asset Protection Zones

5.1. From the commencement of building works and for the life of the development to ensure ongoing protection from the impact of bush fires, the Asset Protection Zones detailed in section 4.1 should be established and maintained as an inner protection area (IPA).in accordance with the Vegetation Management Plan.

When establishing and maintaining an IPA, the following requirements apply:

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2 metres above the ground;
- tree canopies should be separated by 2 to 5 metres;
- preference should be given to smooth-barked and evergreen trees;
- large discontinuities or gaps in vegetation should be provided to slow down or break the progress of fire towards buildings;

- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover;
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation;
- grass should be kept mown (as a guide, grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

Construction Standards

5.2. All proposed new buildings should be designed and constructed to comply with section 3 and section 5 (BAL 12.5) of Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* or the relevant BAL 12.5 requirements of the NASH Standard - *Steel Framed Construction in Bushfire Areas (incorporating amendment A - 2015)* and section 7.5 of *Planning for Bush Fire Protection 2019*.

5.3. The proposed alterations and additions to the Campus Performing Arts Centre building (P6) should be designed and constructed to comply with sections 3 and 6 **(BAL 19)** of Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas,* Section 7.5 of *Planning for Bush Fire Protection 2019* and or the relevant BAL 19 requirements of the NASH Standard - *Steel Framed Construction in Bushfire Areas (incorporating amendment A - 2015)*.

Services

5.4. The provision of all new and the modification of any existing water, electricity and gas services should comply with the following in accordance with Table 6.8c of *Planning for Bush Fire Protection 2019*:

a) A minimum 10,000 litres of static water supply for firefighting purposes must be provided for each occupied building where no reticulated water is available or where a hydrant is not located within 70 metres of an occupied building;
b) an outlet for firefighting purposes is located within the IPA or non-hazard side and away from structures (5-20 metres);
c) 65mm Storz connection with a ball valve is fitted to the outlet;
d) the ball valve, pipes and tank penetration are adequate for the full 50mm inner diameter water flow through the Storz fitting and are constructed of a metal material;
e) underground tanks have an access hole of 200mm to allow tankers to refill directly from the tank;
f) a hardened ground surface for truck access is supplied within 4 metres of the water outlet or access hole;
g) above-ground tanks are manufactured from concrete or metal;
h) raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber. The fire-resisting timbers are Silvertop Ash, Blackbutt, Red or River Gum, Spotted Gum, Red Ironbark, Kwila (Merbau) or Turpentine;
i) unobstructed access is provided at all times;
j) underground tanks are marked;
k) tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;
l) all exposed water pipes external to the building are metal, including any fittings;

m) where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall have a 19mm internal diameter;
n) where provided all fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005;
o) A Static Water Supply (SWS) sign shall be obtained from the local NSW Rural Fire Service (RFS) and positioned for ease of identification by RFS personnel and other users of the SWS. In this regard:
    i. Markers must be fixed in a suitable location to be highly visible; and
    ii. Markers should be positioned adjacent to the most appropriate access for the water supply.
p) Where practicable, electrical transmission lines are underground;
q) where overhead, electrical transmission lines are proposed as follows:
    i. lines are installed with short pole spacing (30 metres) unless crossing gullies, gorges or riparian areas; and
    ii. no part of a tree is closer to a power line than the distance set out in accordance with the specifications in the ISSC3 *Guideline for Managing Vegetation Near Power Lines.*
r) reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;
s) all fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side;
t) connections to and from gas cylinders are metal;
u) polymer-sheathed flexible gas supply lines are not used; and
v) above-ground gas service pipes are metal, including and up to any outlets.

Access

5.5. The proposed new access roads within the subject site should comply with the following requirements of Table 6.8b of *Planning for Bush Fire Protection 2019*:

a) SFPP access roads are two-wheel drive, all-weather roads;
b) roads have a minimum 5.5-metre carriageway width measured kerb to kerb;
c) one-way only access roads are no less than 3.5 metres wide and have designated parking bays.
d) curves of roads have a minimum inner radius of 6 metres;
e) road cross fall does not exceed 3 degrees;
f) roads have a minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches.
g) traffic management devices are constructed to not prohibit access by emergency services vehicles;
h) access roads must provide suitable turning areas in accordance with Appendix 3;
i) the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways indicate load rating.
j) hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
k) hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; and
l) there is suitable access for a Category 1 fire appliance within 4 metres of the static water supply where no reticulated supply is available.

Landscaping

5.6. All Landscaping within the required asset protection zones should comply with Appendix 4 of *Planning for Bush Fire Protection 2019.* In this regard, the following principles are to be incorporated:

a) A minimum 1 metre wide area (or to the property boundary where the setbacks are less than 1 metre), suitable for pedestrian traffic, must be provided around the immediate curtilage of buildings;
b) Planting is limited near buildings;
c) Planting does not provide a continuous canopy to buildings (i.e. trees or shrubs are isolated or located in small clusters);
d) Landscape species are chosen to ensure tree canopy cover is less than 15% (IPA), and less than 30% (OPA) at maturity and trees do not touch or overhang buildings;
e) Avoid species with rough fibrous bark or which retain/shed bark in long strips or retain dead material in their canopies;
f) Use smooth bark tree species which generally do not carry fire up the bark into the crown;
g) Avoid planting deciduous species that may increase fuel at surface/ ground level (i.e. leaf litter);
h) Avoid climbing species to walls and pergolas;
i) Locate combustible materials such as woodchips/mulch and flammable fuel stores away from buildings;
j) Locate combustible structures such as garden sheds, pergolas and materials such as timber garden furniture away from buildings; and
k) Low flammability vegetation species are used.

Emergency Management

5.7. A Bush Fire Emergency Management and Evacuation Plan should be prepared consistent with *Development Planning - A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014*.

The Plan must:

- identify permissible activities that may occur within the site on days of forecasted catastrophic or extreme fire weather;
- identify trigger points for implementation of the emergency evacuation plan; and
- identify the procedure to contact the NSW RFS District Office / NSW Fire Brigade and inform them of proposed actions (i.e. early evacuation/onsite refuge).

All buildings identified as places of onsite refuge should:

- provide for the maximum capacity of the site (being the total number of all staff, students, and day visitors or event attendees etc.);
- be sign-posted as places of refuge; and
- comply with the occupancy levels permissible for a Class 9b Assembly Building and 'area per person' requirements (1 square metre per person) as specified under the *Building Code of Australia*.

6. REFERENCES

Geoscience Australia (2019). ELVIS - Elevation - Foundation Spatial Data. Available at: http://elevation.fsdf.org.au/

Keith, D. (2004). "*Ocean Shores to Desert Dunes*" Department of Environment and Conservation, Sydney

National Association of Steel-Framed Housing (2014) NASH Standard Steel Framed Construction in Bushfire Areas

NSW Department of Planning and Environment. Planning Portal. Accessed at: https://www.planningportal.nsw.gov.au/

NSW Office of Environment and Heritage (2020). Biodiversity Value Map. Accessed at: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

NSW Rural Fire Service (2019). *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*. *November 2019*

Standards Australia (2018). *AS3959, Construction of buildings in bushfire-prone areas.*

Tozer MG, Turner K, Keith DA, Tindall D, Pennay C, Simpson C, MacKenzie B, Beukers P, Cox S (2010). *Native Vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands*. Cunninghania 11:359-406.

NSW Department of Planning, Industry and Environment (2022). Compilation map: Biometric vegetation types of the Shoalhaven, Eurobodalla and Bega Valley local government areas. Version 2.1. VIS_ID 3900. Accessed January 2022. Sourced from: https://data.nsw.gov.au/data/dataset/5c361fb9-c327-44b7-a161-16eeefce20e0

7. PLANS

St. Peters Anglican College - Sports and Recreation Centre, Community Hub, Junior Classroom and Extension to Preforming Arts Centre

61 Train Street, Broulee
922038

DRAWING LIST

SHEET No.	SHEET NAME	Current Revision
DA - 01 Cover Sheets		
DA-01-00	COVER SHEET - DRAWING INDEX	1
DA - 11 Site Plans		
DA-11-01	CAMPUS SITE PLAN	3
DA-11-02	CAMPUS PLAN - STAGING OF PROPOSED WORKS	1
DA-11-03	DEMOLITION PLAN	3
DA-11-21	DETAILED SITE PLAN	4
DA - 21 Sports & Recreation Centre		
DA-SR-21-01	FLOOR PLAN - SPORTS AND RECREATION CENTRE	2
DA-SR-21-02	ROOF PLAN - Sports & Recreation Centre	1
DA-SR-21-10	NOTIFICATION PLAN - SPORTS AND RECREATION CENTRE	1
DA-SR-30-01	ELEVATIONS - SPORTS AND RECREATION CENTRE	1
DA-SR-30-02	ELEVATIONS - SPORTS AND RECREATION CENTRE	1
DA-SR-40-01	SECTIONS - SPORTS AND RECREATION CENTRE	1
DA - 22 Community Hub		
DA-CH-21-01	FLOOR PLAN - COMMUNITY HUB	2
DA-CH-21-02	ROOF PLAN - COMMUNITY HUB	1
DA-CH-21-10	NOTIFICATION PLAN - COMMUNITY HUB	1
DA-CH-30-01	ELEVATIONS 01 - COMMUNITY HUB	1
DA-CH-30-02	ELEVATIONS 02 - COMMUNITY HUB	1
DA-CH-40-01	SECTIONS - COMMUNITY HUB	1
DA - 23 Junior School Classroom		
DA-JS-21-01	FLOOR PLAN - JUNIOR CLASSROOM	1
DA-JS-21-02	ROOF PLAN - JUNIOR CLASSROOM	1
DA-JS-21-10	NOTIFICATION PLAN - JUNIOR CLASSROOM	1
DA-JS-30-01	ELEVATIONS 01 - JUNIOR CLASSROOM	1
DA-JS-30-02	ELEVATIONS 02 - JUNIOR CLASSROOM	1
DA-JS-40-01	SECTIONS - JUNIOR CLASSROOM	1
DA - 24 Cultural Centre Extension		
DA-CC-21-01	FLOOR PLAN - CULTURAL CENTRE EXTENSION	2
DA-CC-21-02	ROOF PLAN - CULTURAL CENTRE EXTENSION	1
DA-CC-21-10	NOTIFICATION PLAN - CULTURAL CENTRE EXTENSION	1
DA-CC-30-01	ELEVATIONS 01 - CULTURAL CENTRE EXTENSION	1
DA-CC-30-02	ELEVATIONS 02 - CULTURAL CENTRE EXTENSION	1
DA-CC-40-01	SECTIONS - CULTURAL CENTRE EXTENSION	1
DA - 90 Materials & Finishes		
DA-90-01	MATERIALS & FINISHES	2
DA-90-02	SHADOW DIAGRAMS - SPORTS & RECREATION CENTRE	2

St Peter's Anglican College

COX

Cox Architecture

Project: St Peters Broulee
61 Train St, Broulee

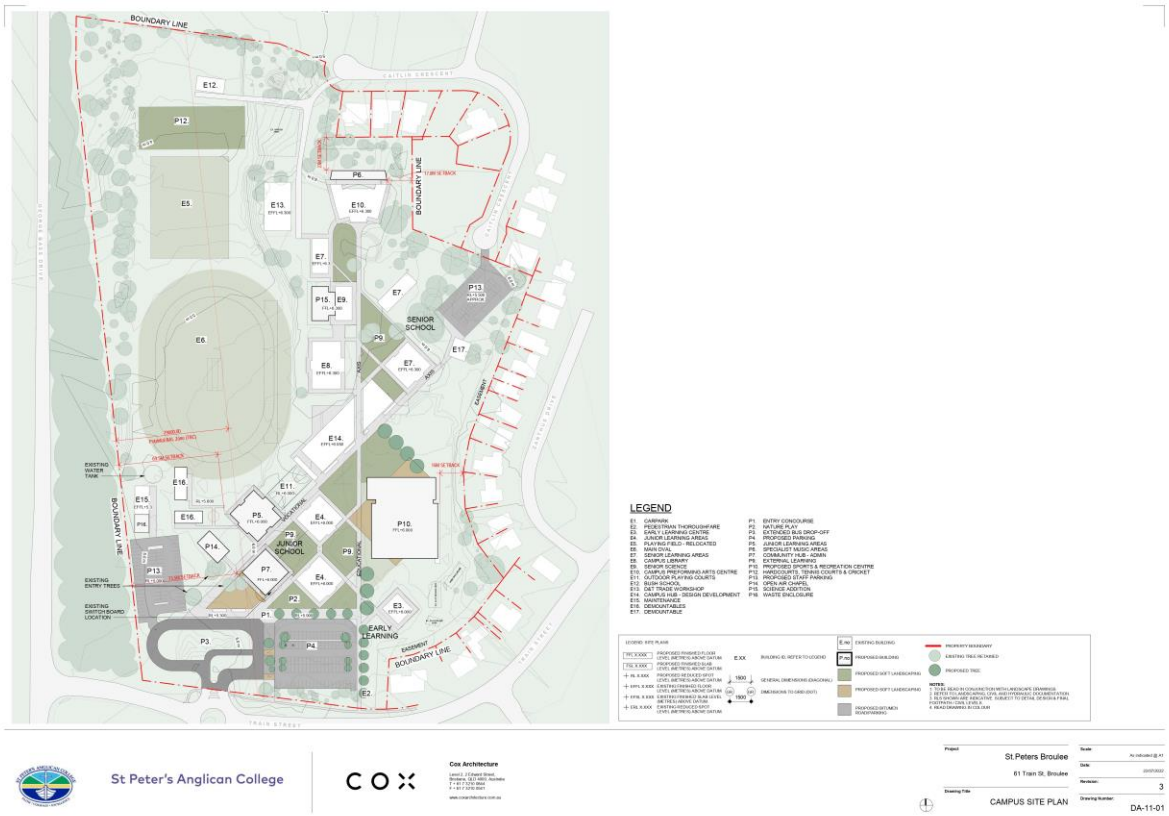
Drawing Title: COVER SHEET - DRAWING INDEX

Scale: @ A1

Date:

Revision: 1

Drawing Number: DA-01-00



St Peter's Anglican College

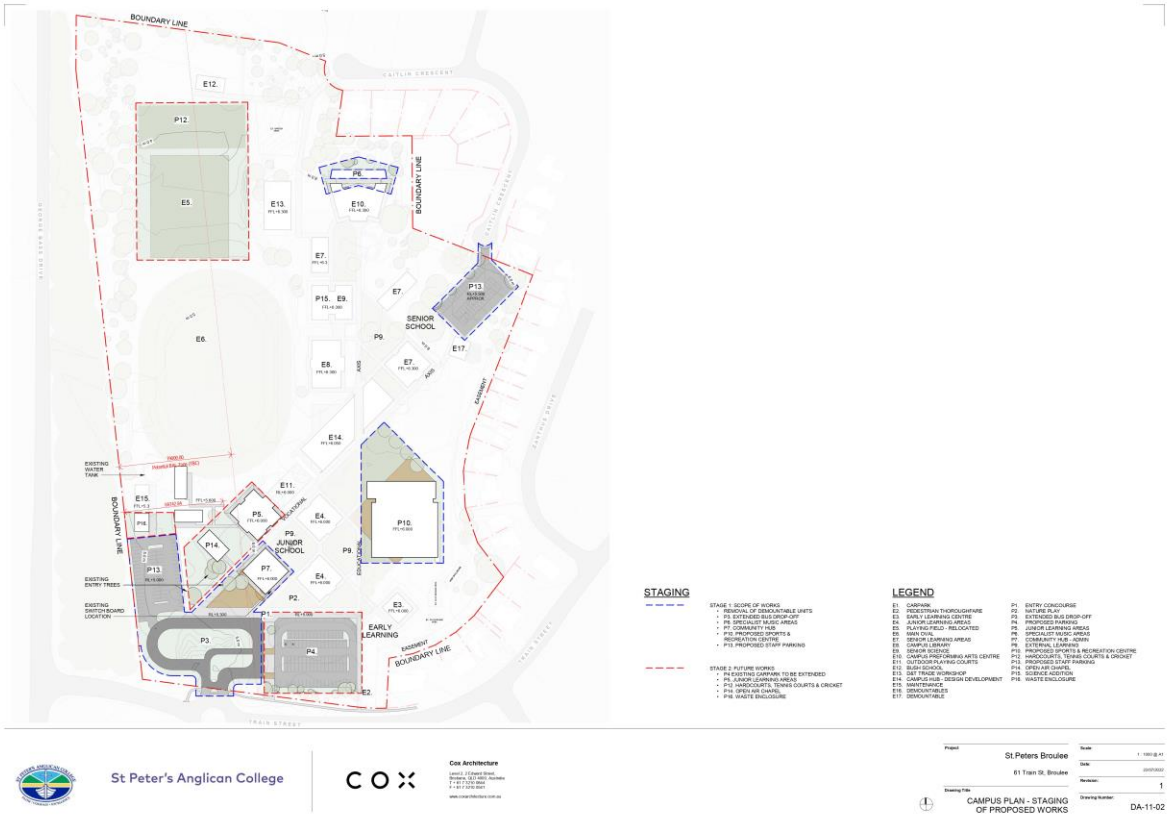
COX

Cox Architecture

St.Peters Brouilee
61 Train St, Brouilee

CAMPUS SITE PLAN

DA-11-01



St Peter's Anglican College

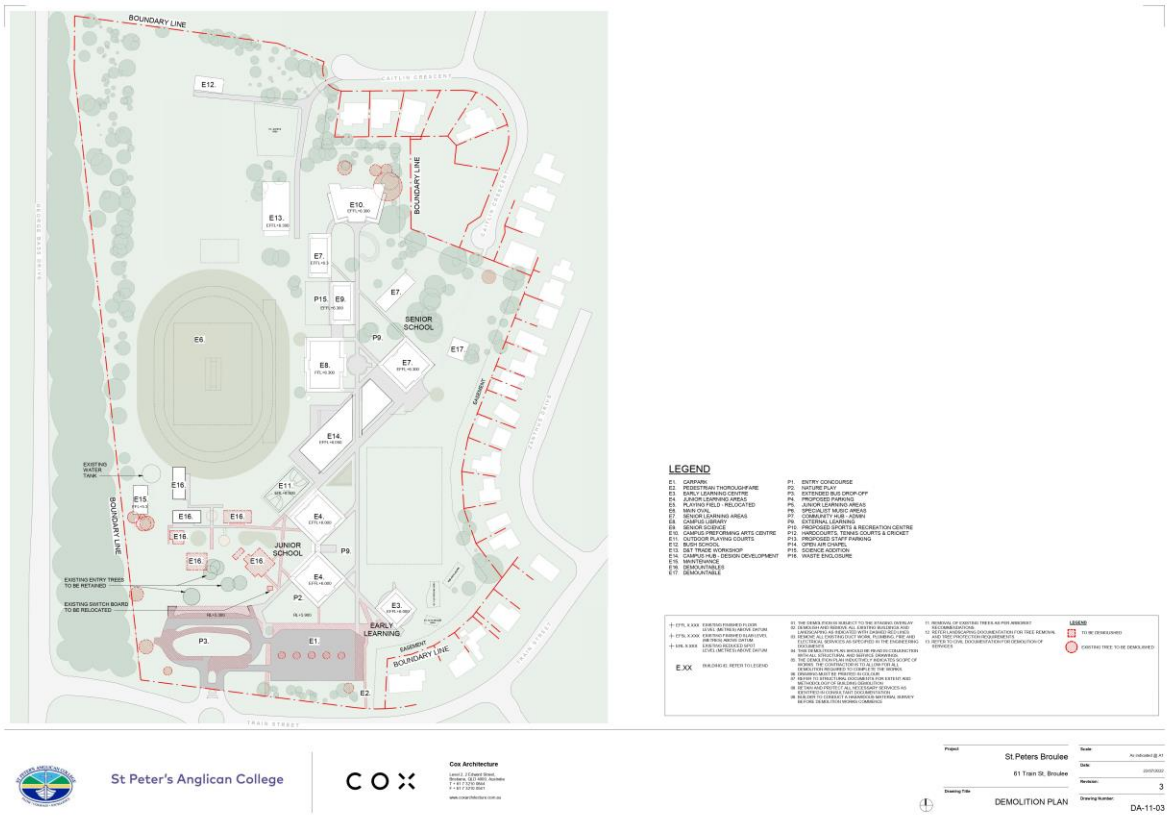
COX

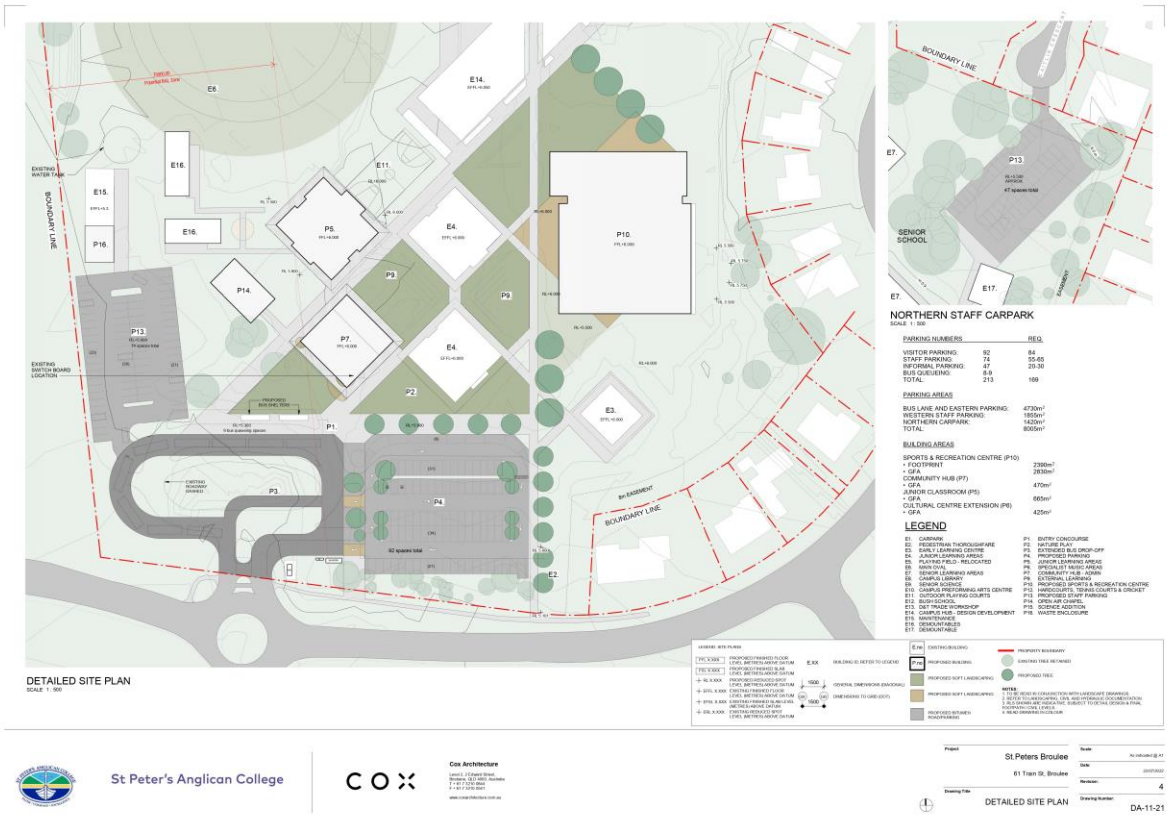
Cox Architecture

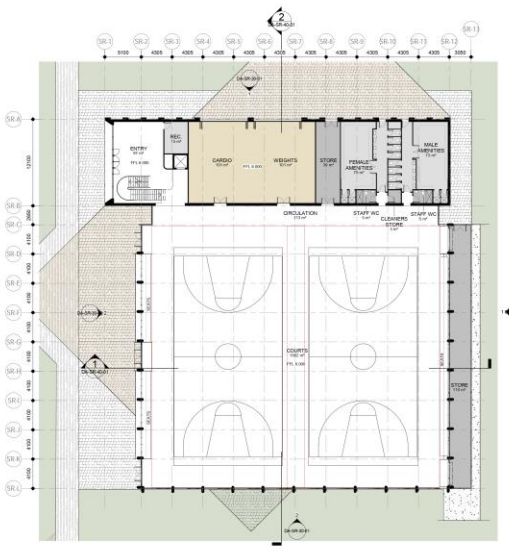
St.Peters Brouilee
61 Train St, Brouilee

CAMPUS PLAN - STAGING OF PROPOSED WORKS

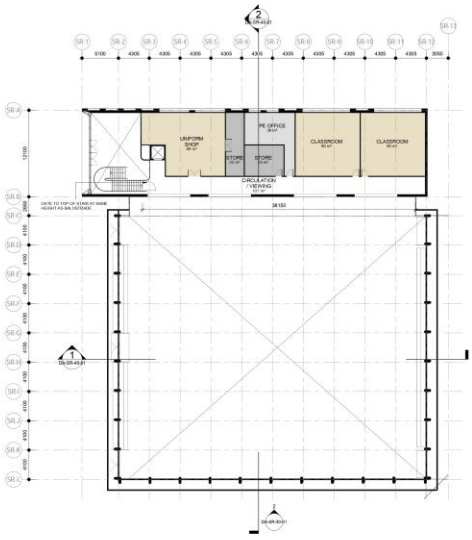
DA-11-02


BOUNDARY LINE
SENIOR SCHOOL
JUNIOR SCHOOL
EARLY LEARNING
EASEMENT
TRAIN STREET
LEGEND
St Peter's Anglican College
COX
Cox Architecture
St.Peters Broulee
61 Train St, Broulee
DEMOLITION PLAN
DA-11-03


BOUNDARY LINE
SENIOR SCHOOL
EASEMENT
NORTHERN STAFF CARPARK
PARKING NUMBERS
PARKING AREAS
BUILDING AREAS
LEGEND
DETAILED SITE PLAN
St Peter's Anglican College
COX
Cox Architecture
St.Peters Broulee
61 Train St, Broulee
DETAILED SITE PLAN
DA-11-21



GROUND FLOOR PLAN - Gymnasium
SCALE 1 : 200

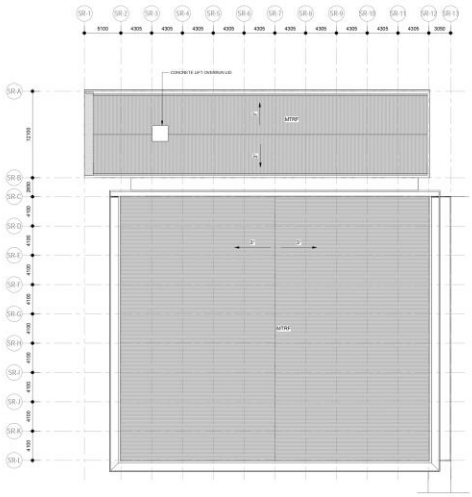


LEVEL 1 FLOOR PLAN
SCALE 1 : 200

St Peter's Anglican College

COX Architecture

Project	St.Peters Broulee
	61 Train St, Broulee
Drawing Title	FLOOR PLAN - SPORTS AND RECREATION CENTRE
Scale	As indicated@A1
Date	20/07/2022
Revision:	2
Drawing Number:	DA-SR-21-01



ROOF PLAN - SPORTS AND RECREATION CENTRE
SCALE 1 : 200

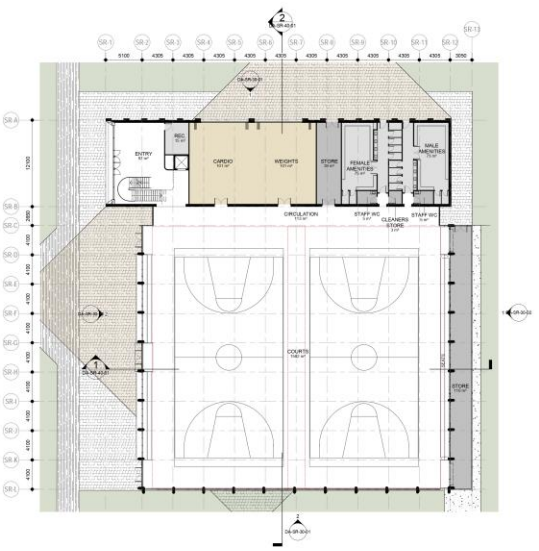
ABBREVIATION LEGEND

MTRF METAL ROOF SHEETING

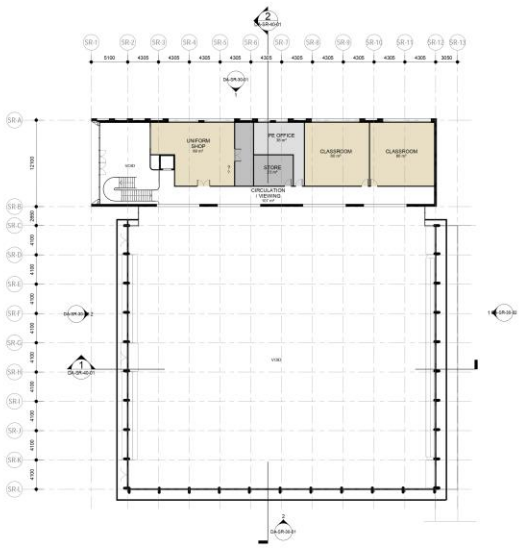
St Peter's Anglican College

COX Architecture

Project	St.Peters Broulee
	61 Train St, Broulee
Drawing Title	ROOF PLAN - Sports & Recreation Centre
Scale	1 : 200@A1
Date	20/07/2022
Revision:	1
Drawing Number:	DA-SR-21-02



GROUND FLOOR PLAN PN - SPORTS AND RECREATION CENTRE



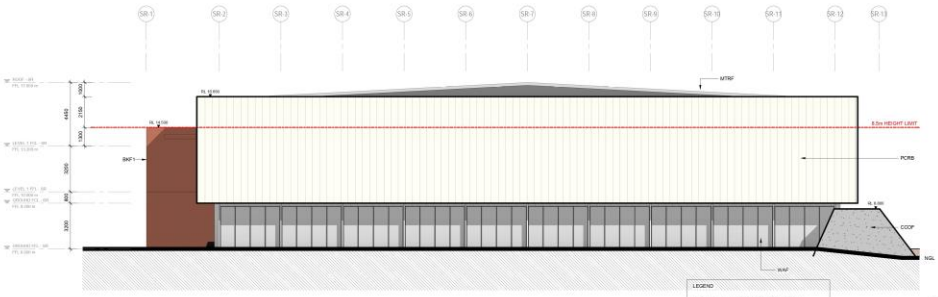
LEVEL 1 FLOOR PLAN PN - SPORTS AND RECREATION CENTRE

St Peter's Anglican College

COX Cox Architecture

Project	St Peters Brouilee 61 Train St, Brouilee
Drawing Title	NOTIFICATION PLAN - SPORTS AND RECREATION CENTRE
Scale	As indicated @ A1
Date	20/07/2022
Revision	1
Drawing Number	DA-SR-21-10

NORTH ELEVATION - SPORTS AND RECREATION CENTRE



SOUTH ELEVATION - SPORTS AND RECREATION CENTRE

LEGEND

ROOM NAME ROOM TAG WITH NAME

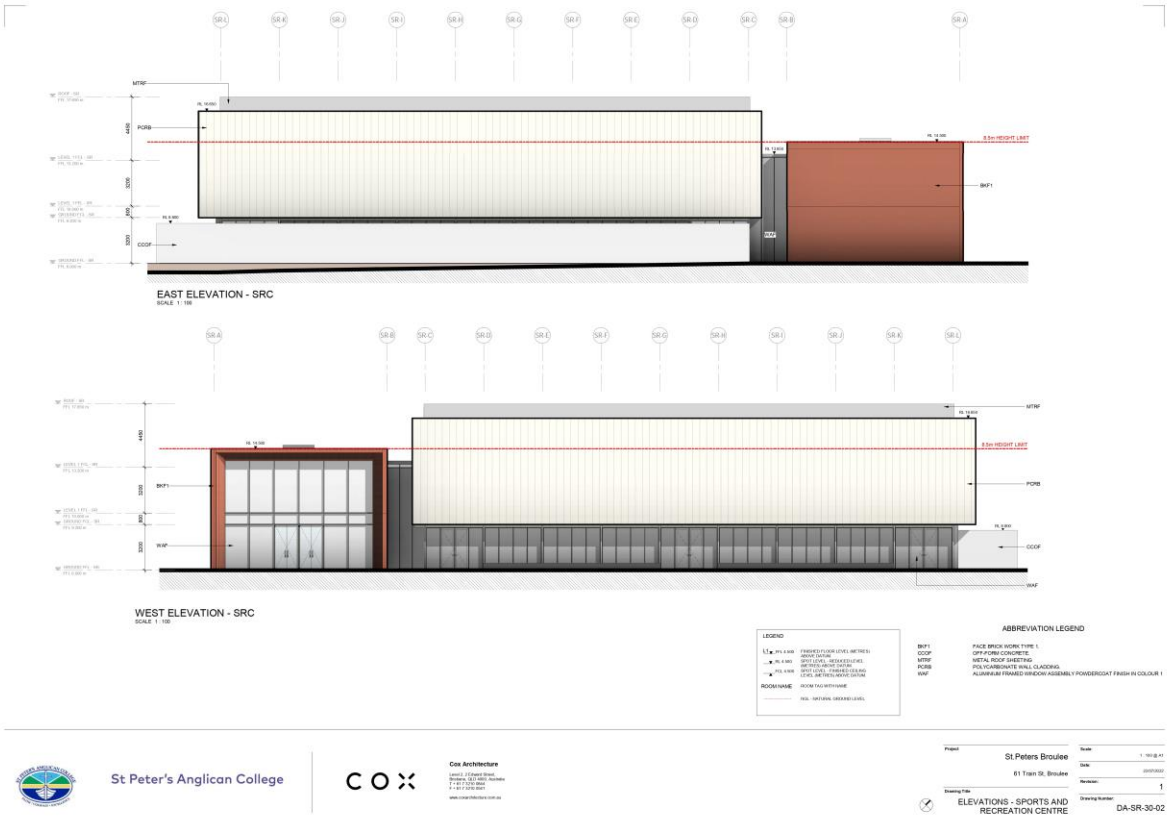
ABBREVIATION LEGEND

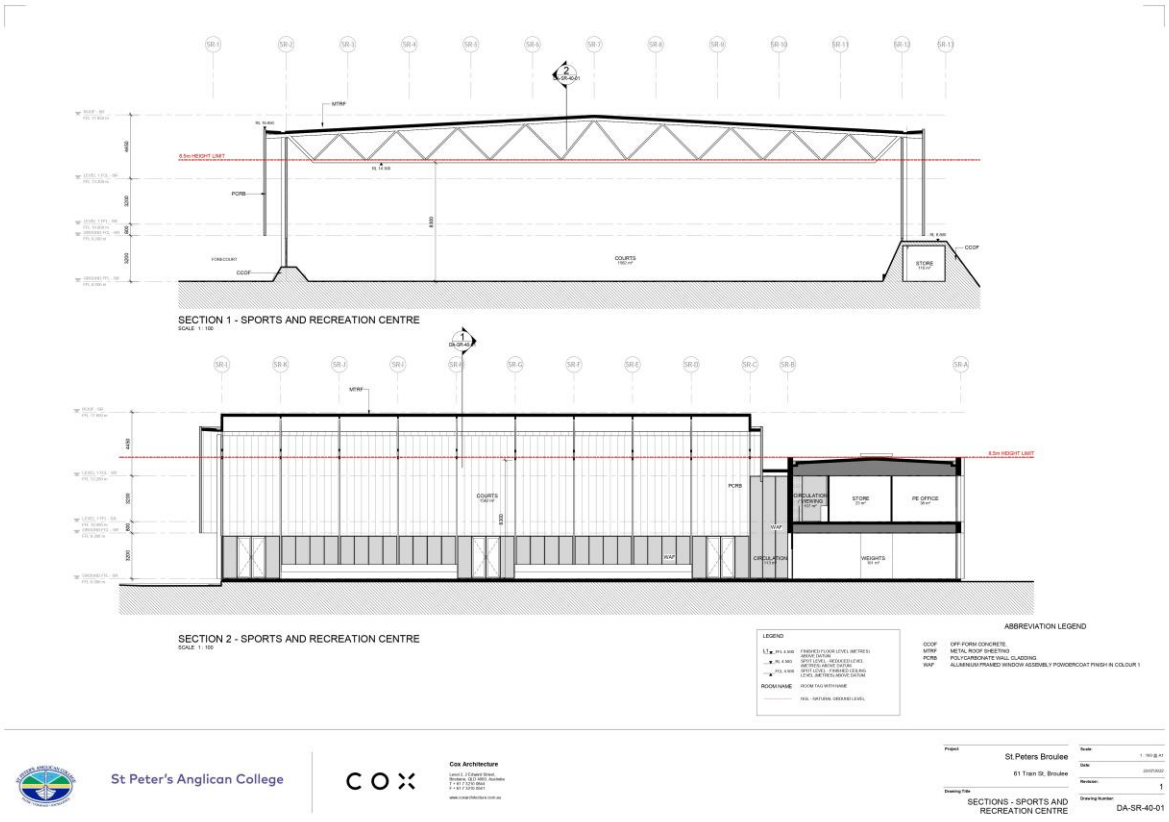
BKF1	FACE BRICK WORK TYPE 1.
COOF	OFF-FORM CONCRETE.
MTRF	METAL ROOF SHEETING
PCRS	POLYCARBONATE WALL CLADDING.
WAF	ALUMINIUM FRAMED WINDOW ASSEMBLY POWDERCOAT FINISH IN COLOUR 1

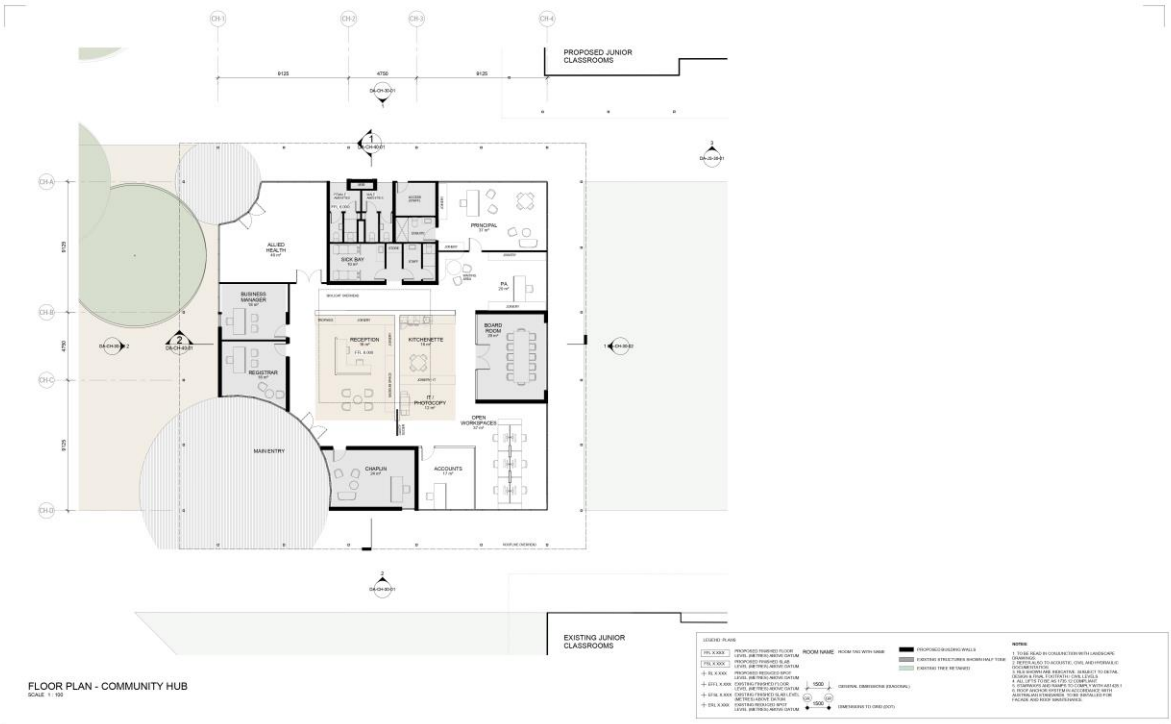
St Peter's Anglican College

COX Cox Architecture

Project	St Peters Brouilee 61 Train St, Brouilee
Drawing Title	ELEVATIONS - SPORTS AND RECREATION CENTRE
Scale	1 : 100 @ A1
Date	20/07/2022
Revision	1
Drawing Number	DA-SR-30-01


EAST ELEVATION - SRC
WEST ELEVATION - SRC
ABBREVIATION LEGEND
St Peter's Anglican College
COX
St.Peters Broulee
61 Train St, Broulee
ELEVATIONS - SPORTS AND RECREATION CENTRE
DA-SR-30-02


SECTION 1 - SPORTS AND RECREATION CENTRE
SECTION 2 - SPORTS AND RECREATION CENTRE
ABBREVIATION LEGEND
St Peter's Anglican College
COX
St.Peters Broulee
61 Train St, Broulee
SECTIONS - SPORTS AND RECREATION CENTRE
DA-SR-40-01



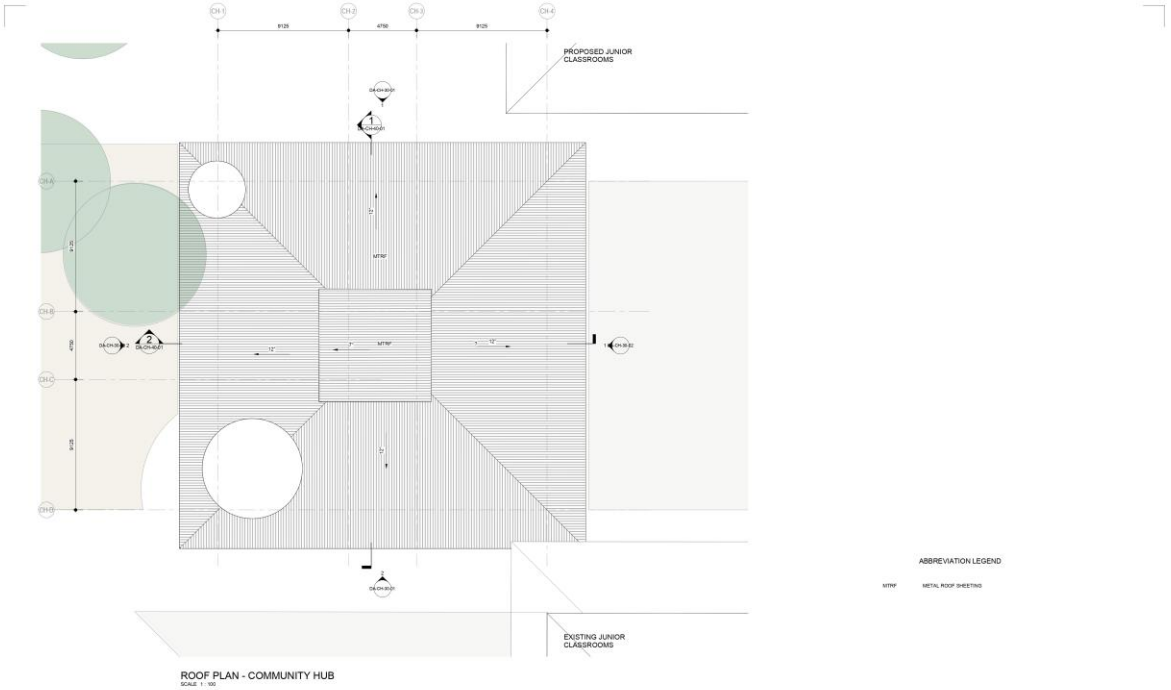
FLOOR PLAN - COMMUNITY HUB
SCALE 1 : 100

St Peter's Anglican College

COX

Cox Architecture

Project	St Peters Broulee
	61 Train St, Broulee
Drawing Title	FLOOR PLAN - COMMUNITY HUB
Scale	1 : 100 @ A1
Date	20/07/2022
Revision	2
Drawing Number	DA-CH-21-01



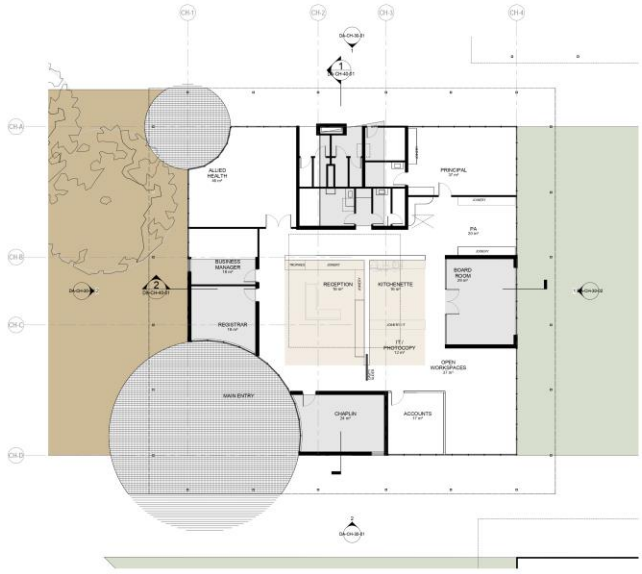
ROOF PLAN - COMMUNITY HUB
SCALE 1 : 100

St Peter's Anglican College

COX

Cox Architecture

Project	St Peters Broulee
	61 Train St, Broulee
Drawing Title	ROOF PLAN - COMMUNITY HUB
Scale	1 : 100 @ A1
Date	20/07/2022
Revision	1
Drawing Number	DA-CH-21-02



GROUND FLOOR PN - COMMUNITY HUB

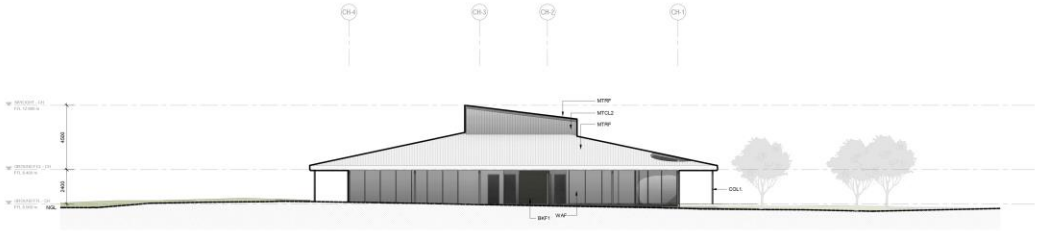
St Peter's Anglican College

COX Cox Architecture

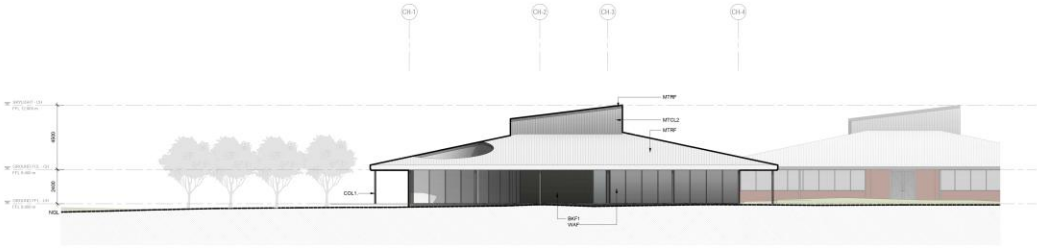
Project: St Peters Brouilee
61 Train St, Brouilee

Drawing Title: NOTIFICATION PLAN - COMMUNITY HUB

Drawing Number: DA-CH-21-10



NORTH ELEVATION - COMMUNITY HUB



SOUTH ELEVATION - COMMUNITY HUB

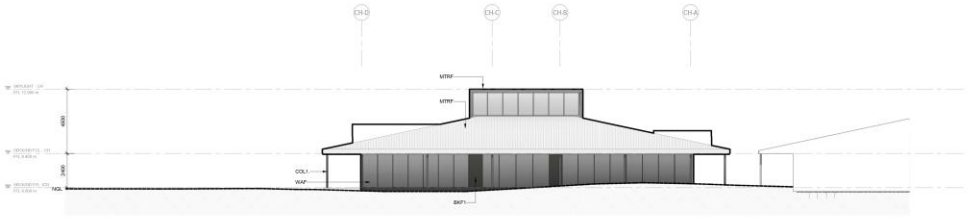
St Peter's Anglican College

COX Cox Architecture

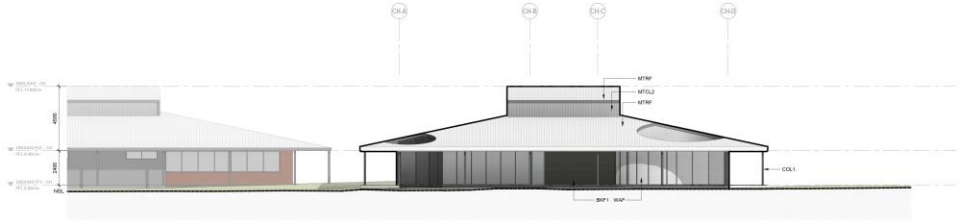
Project: St Peters Brouilee
61 Train St, Brouilee

Drawing Title: ELEVATIONS 01 - COMMUNITY HUB

Drawing Number: DA-CH-30-01



EAST ELEVATION - COMMUNITY HUB



WEST ELEVATION - COMMUNITY HUB

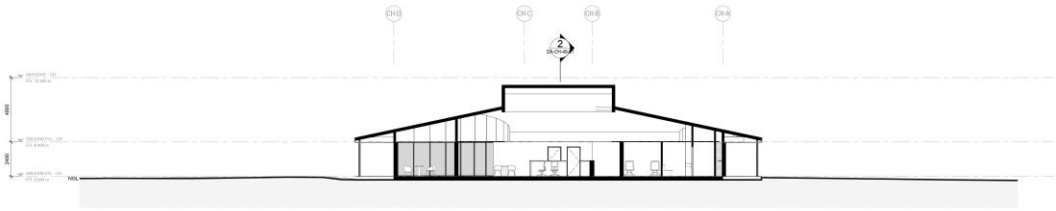
St Peter's Anglican College

COX Cox Architecture

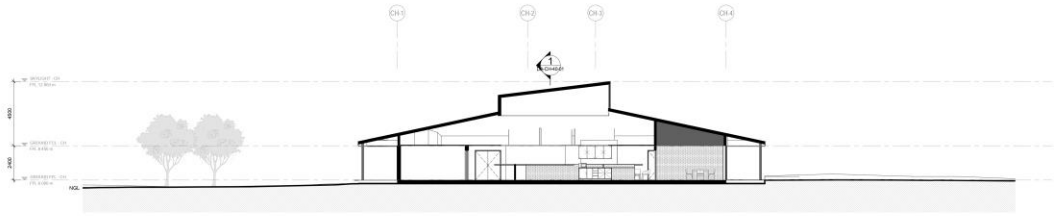
St Peters Broulee
61 Train St, Broulee

ELEVATIONS 02 - COMMUNITY HUB

DA-CH-30-02



SECTION 1 - COMMUNITY HUB



SECTION 2 - COMMUNITY HUB

ABBREVIATION LEGEND

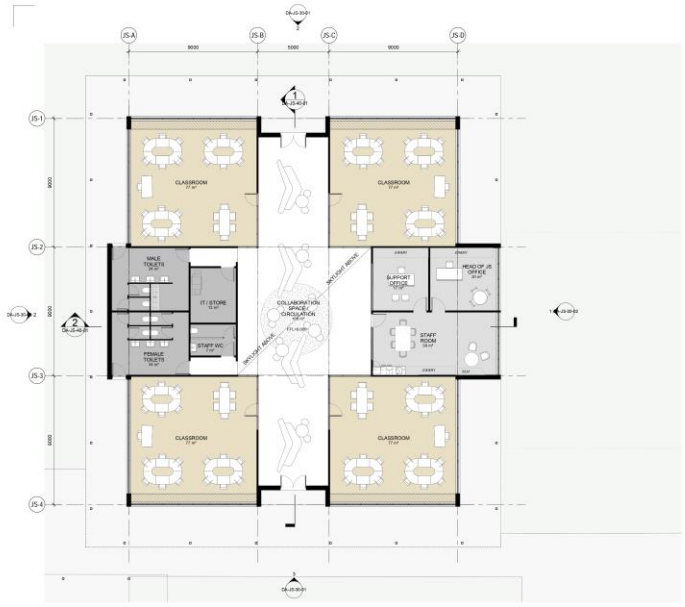
St Peter's Anglican College

COX Cox Architecture

St Peters Broulee
61 Train St, Broulee

SECTIONS - COMMUNITY HUB

DA-CH-40-01



St Peter's Anglican College

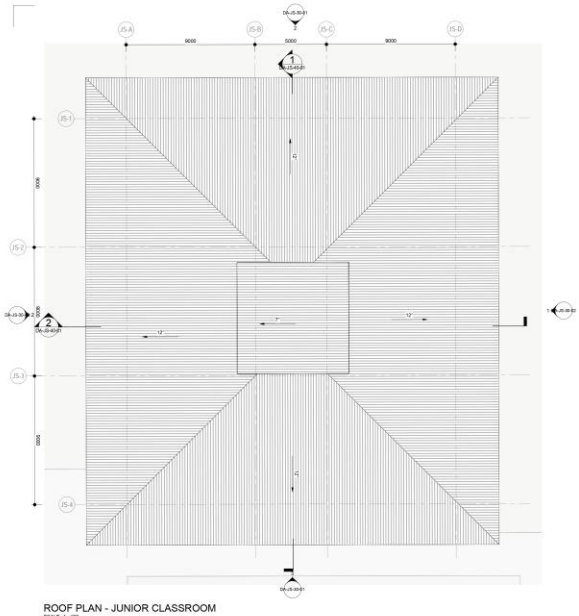
COX

Cox Architecture

St Peters Broulee
61 Train St, Broulee

FLOOR PLAN - JUNIOR CLASSROOM

DA-JS-21-01



St Peter's Anglican College

COX

Cox Architecture

St Peters Broulee
61 Train St, Broulee

ROOF PLAN - JUNIOR CLASSROOM

DA-JS-21-02

St Peter's Anglican College

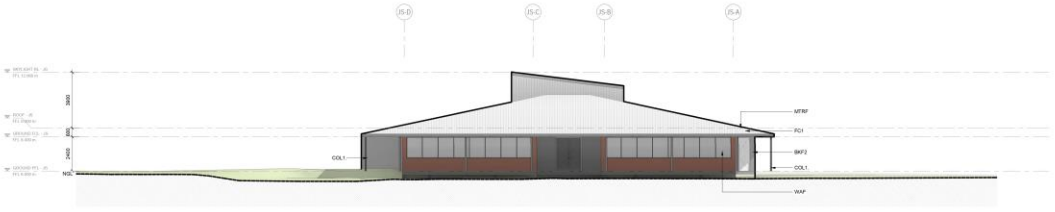
COX

Cox Architecture

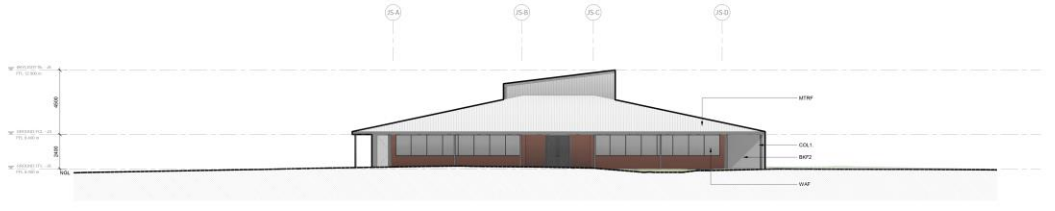
Project: St Peters Broulee
61 Train St, Broulee

Drawing Title: NOTIFICATION PLAN - JUNIOR CLASSROOM

Drawing Number: DA-JS-21-10



NORTH ELEVATION - JUNIOR CLASSROOM
SCALE 1 : 100



SOUTH ELEVATION - JUNIOR CLASSROOM
SCALE 1 : 100

ABBREVIATION LEGEND

BKF2	FACE BRICK WORK TYPE 2
COL1	STEEL COLUMN TO STRUCTURAL ENGINEERS DETAILS, POWDERCOAT FINISH IN COLOUR 1
FC1	FIBRE CEMENT CLADDING PAINTED FINISH COLOUR 1
MTRF	METAL ROOF SHEETING
WAF	ALUMINIUM FRAMED WINDOW ASSEMBLY POWDERCOAT FINISH IN COLOUR 1

St Peter's Anglican College

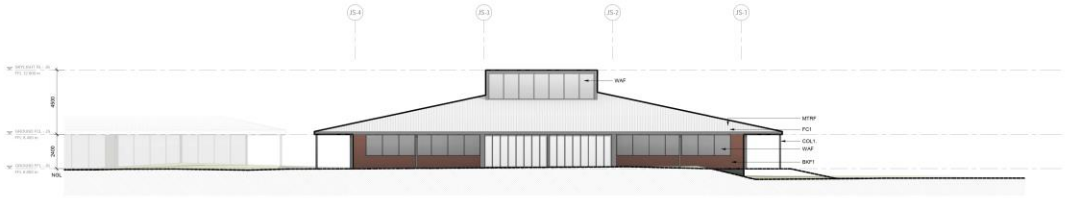
COX

Cox Architecture

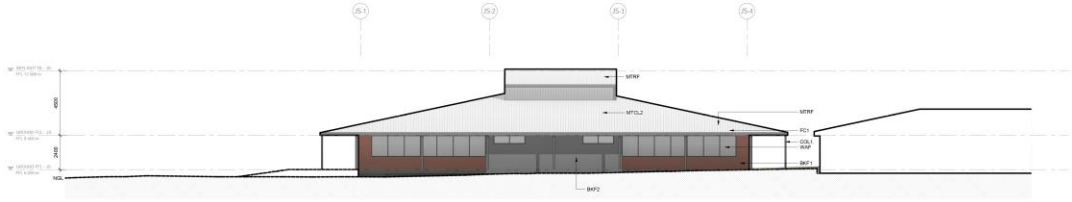
Project: St Peters Broulee
61 Train St, Broulee

Drawing Title: ELEVATIONS 01 - JUNIOR CLASSROOM

Drawing Number: DA-JS-30-01



EAST ELEVATION - JUNIOR CLASSROOM



WEST ELEVATION - JUNIOR CLASSROOM

ABBREVIATION LEGEND

BKF1	FACE BRICK WORK TYPE 1
BKF2	FACE BRICK WORK TYPE 2
COL1	STEEL COLUMN TO STRUCTURAL ENGINEER'S DETAILS, POWDERCOAT FINISH IN COLOUR 1
FC1	FIBRE CEMENT CLADDING PAINTED FINISH COLOUR 1
MTCL2	METAL CLADDING TYPE 2
MTRF	METAL ROOF SHEETING
WAF	ALUMINIUM FRAMED WINDOW ASSEMBLY POWDERCOAT FINISH IN COLOUR 1

St Peter's Anglican College

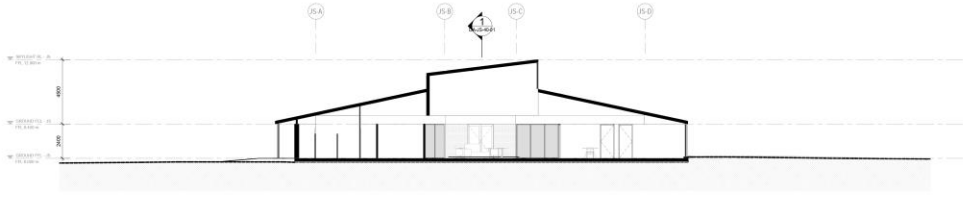
COX Cox Architecture

Project: St Peters Brouilee, 61 Train St, Brouilee

ELEVATIONS 02 - JUNIOR CLASSROOM

DA-JS-30-02

SECTION 1 - JUNIOR CLASSROOM



SECTION 2 - JUNIOR CLASSROOM

ABBREVIATION LEGEND

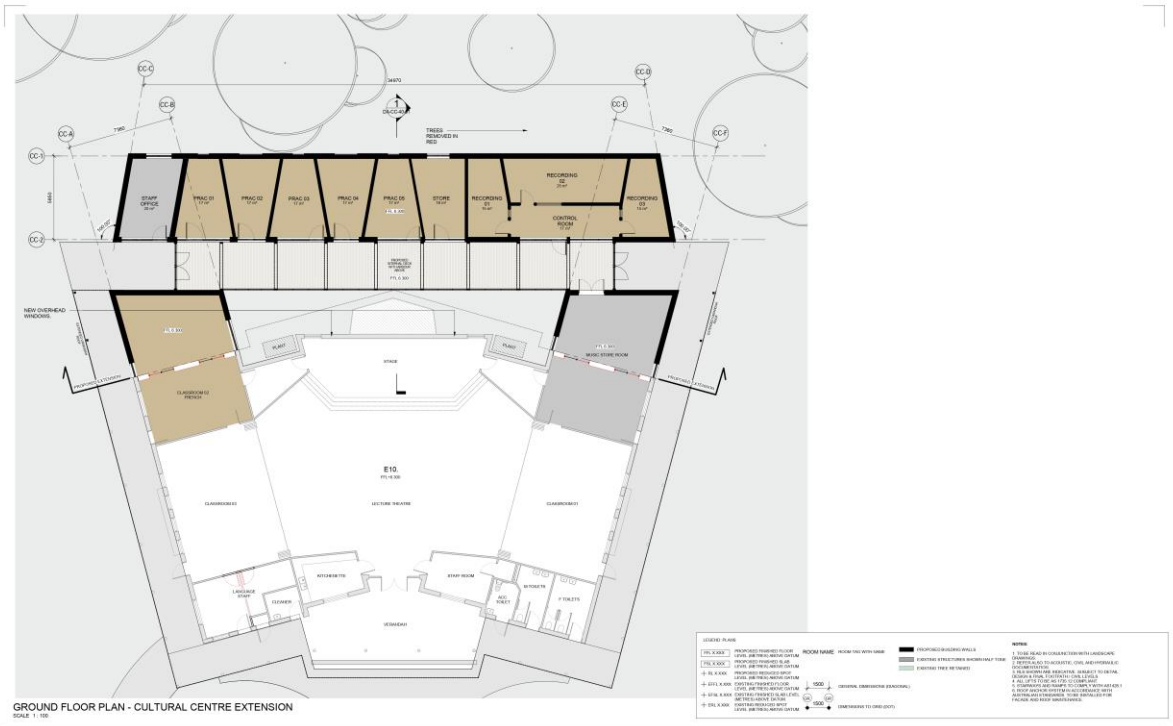
St Peter's Anglican College

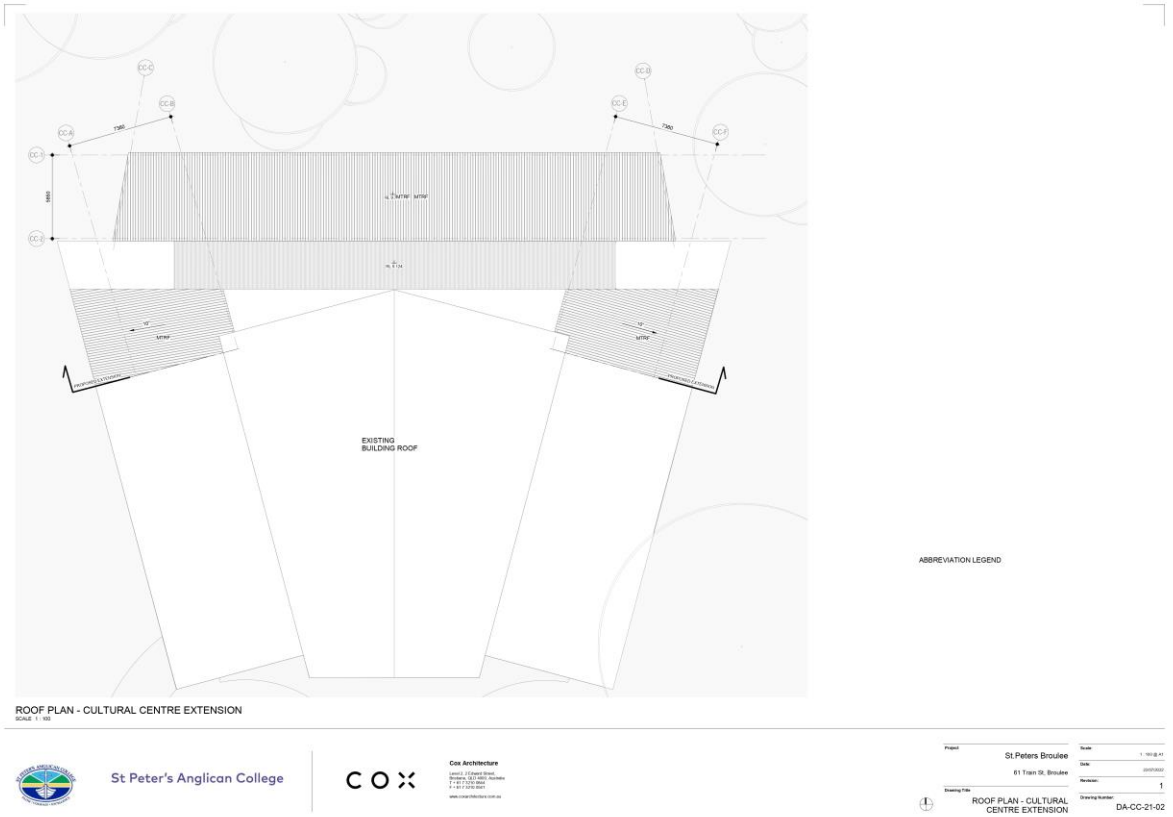
COX Cox Architecture

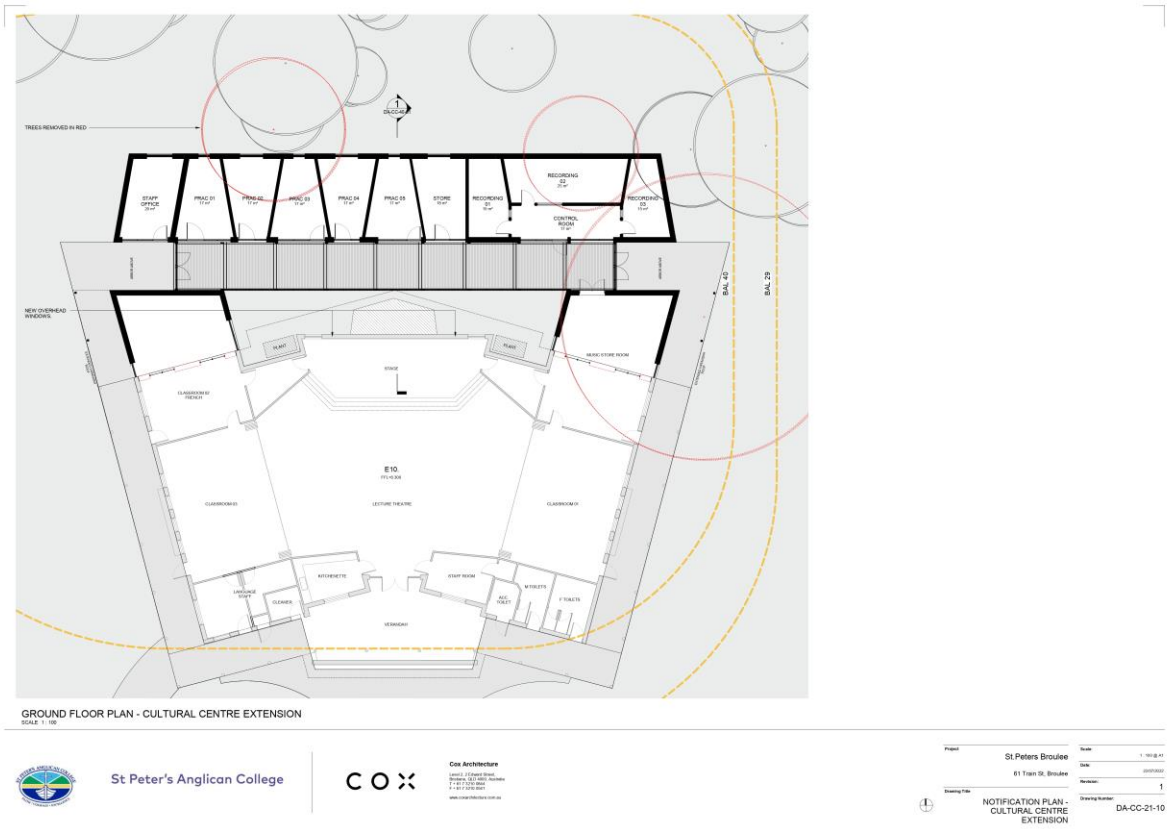
Project: St Peters Brouilee, 61 Train St, Brouilee

SECTIONS - JUNIOR CLASSROOM

DA-JS-40-01


GROUND FLOOR PLAN - CULTURAL CENTRE EXTENSION
St Peter's Anglican College
COX
Cox Architecture
St Peters Broulee
61 Train St, Broulee
FLOOR PLAN - CULTURAL CENTRE EXTENSION
DA-CC-21-01


EXISTING BUILDING ROOF
ROOF PLAN - CULTURAL CENTRE EXTENSION
ABBREVIATION LEGEND
St Peter's Anglican College
COX
Cox Architecture
St Peters Broulee
61 Train St, Broulee
ROOF PLAN - CULTURAL CENTRE EXTENSION
DA-CC-21-02



GROUND FLOOR PLAN - CULTURAL CENTRE EXTENSION
SCALE 1 : 100

St Peter's Anglican College

COX

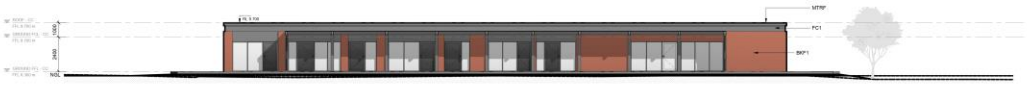
Cox Architecture

Project: St Peters Brouilee
61 Train St, Brouilee

Drawing Title: NOTIFICATION PLAN - CULTURAL CENTRE EXTENSION

Drawing Number: DA-CC-21-10

NORTH ELEVATION - COMMUNITY CENTRE EXTENSION
SCALE 1 : 100



SOUTH ELEVATION - COMMUNITY CENTRE EXTENSION
SCALE 1 : 100

LEGEND
ROOM NAME

ABBREVIATION LEGEND

BKF1	FACE BRICK WORK TYPE 1
COL1	STEEL COLUMN TO STRUCTURAL ENGINEER'S DETAILS, POWDERCOAT FINISH IN COLOUR 1
FC1	FIBRE CEMENT CLADDING PAINTED FINISH COLOUR 1
MTRF	METAL ROOF SHEETING
WAF	ALUMINIUM FRAMED WINDOW ASSEMBLY POWDERCOAT FINISH IN COLOUR 1

St Peter's Anglican College

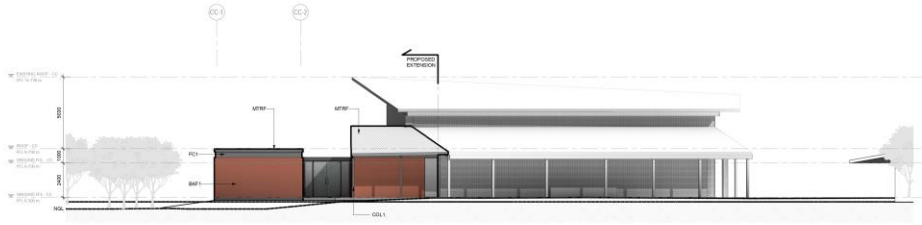
COX

Cox Architecture

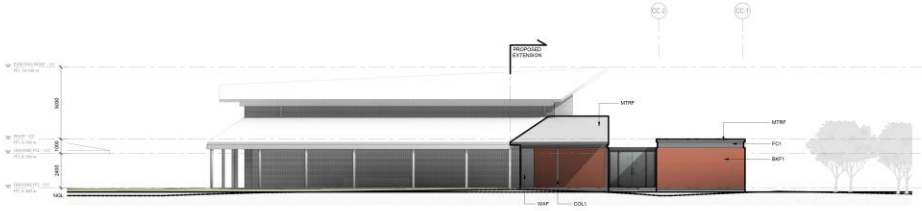
Project: St Peters Brouilee
61 Train St, Brouilee

Drawing Title: ELEVATIONS 01 - CULTURAL CENTRE EXTENSION

Drawing Number: DA-CC-30-01



EAST ELEVATION - COMMUNITY CENTRE EXTENSION
SCALE 1 : 100



WEST ELEVATION - COMMUNITY CENTRE EXTENSION
SCALE 1 : 100

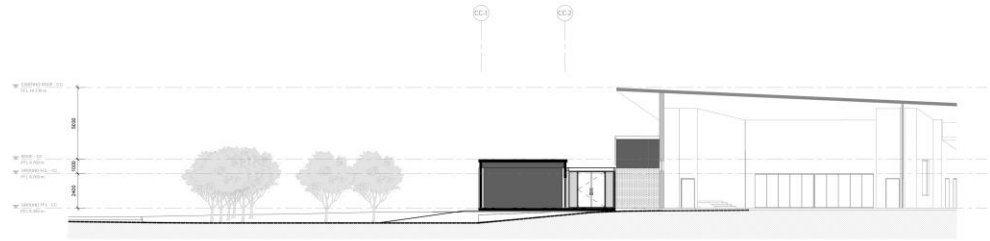
ABBREVIATION LEGEND

BKF1	FACE BRICK WORK TYPE 1.
COL1	STEEL COLUMN TO STRUCTURAL ENGINEER'S DETAILS, POWDERCOAT FINISH IN COLOUR 1
FC1	FIBRE CEMENT CLADDING PAINTED FINISH COLOUR 1
MTRF	METAL ROOF SHEETING
WAF	ALUMINIUM FRAMED WINDOW ASSEMBLY POWDERCOAT FINISH IN COLOUR 1

St Peter's Anglican College

COX Cox Architecture

Project	St Peters Brouilee
	61 Train St, Brouilee
Drawing Title	ELEVATIONS 02 - CULTURAL CENTRE EXTENSION
Scale	1 : 100 @ A1
Date	20/07/2022
Revision	1
Drawing Number	DA-CC-30-02



SECTION 1 - CULTURAL CENTRE EXTENSION
SCALE 1 : 100

SECTION 2 - CULTURAL CENTRE EXTENSION
SCALE 1 : 100

ABBREVIATION LEGEND

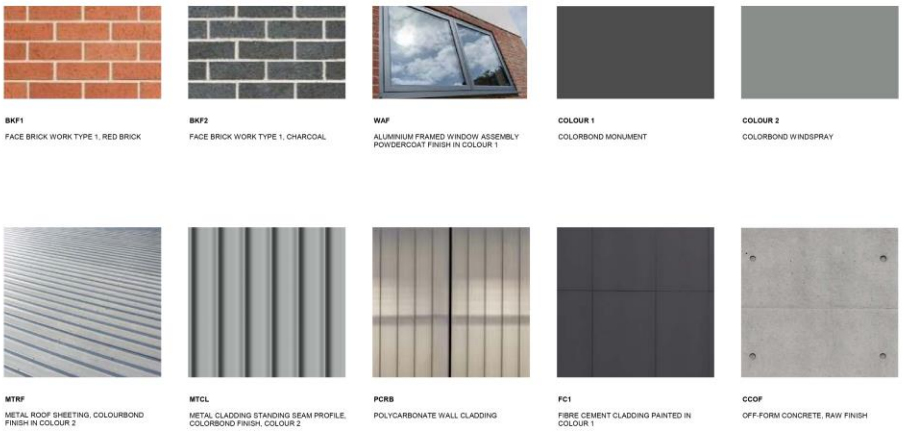
LEGEND

ROOM NAME ROOM TAG WITH NAME

St Peter's Anglican College

COX Cox Architecture

Project	St Peters Brouilee
	61 Train St, Brouilee
Drawing Title	SECTIONS - CULTURAL CENTRE EXTENSION
Scale	1 : 100 @ A1
Date	20/07/2022
Revision	1
Drawing Number	DA-CC-40-01

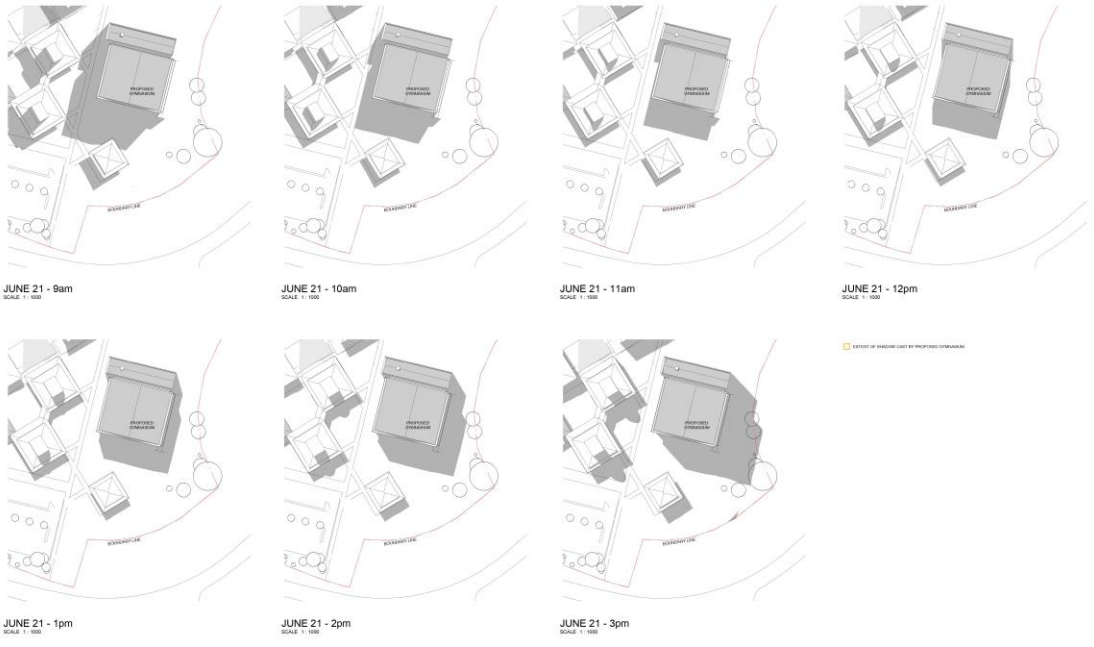


St Peter's Anglican College

COX

Cox Architecture

St Peters Broulee
61 Train St, Broulee
MATERIALS & FINISHES
DA-90-01



St Peter's Anglican College

COX

Cox Architecture

St Peters Broulee
61 Train St, Broulee
SHADOW DIAGRAMS - SPORTS & RECREATION CENTRE
DA-90-02

Method 2 Results

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 26/07/2022 **Assessment Date:** 26/07/2022

Site Street Address: 61 Train Street, Broulee

Assessor: Katherine Harris; Harris Environmental Consulting

Local Government Area: Eurobodalla **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: West

Vegetation Information

Vegetation Type:	South Coast Sands DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrubby)		
Vegetation Slope:	1 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	20.5	**Overall Fuel Load(t/ha):**	30.9
Vegetation Height(m):	2	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	0 Degrees	**Site Slope Type:**	Level
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	74

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K):**	1200

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100

Program Outputs

Level of Construction:	BAL 12.5	**Peak Elevation of Receiver(m):**	10.15
Radiant Heat(kW/m2):	8.1	**Flame Angle (degrees):**	77
Flame Length(m):	20.84	**Maximum View Factor:**	0.096
Rate Of Spread (km/h):	2.64	**Inner Protection Area(m):**	50
Transmissivity:	0.754	**Outer Protection Area(m):**	24
Fire Intensity(kW/m):	42079		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	24	31	43	57	65	6

Photo 1: Classified vegetation (Forest) situated to the west of the proposed development looking north from the George Bass Drive and Train Street intersection.

Photo 2: Remnant vegetation situated to the north east of the proposed development looking north from the Campus Performing Arts Centre

Photo 3: Remnant vegetation situated to the northeast of the proposed development looking east from the Campus Performing Arts Centre.