

Oxford Falls Grammar School (OFGS) Main Works Biodiversity Assessment

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Executive summary

Context

Niche Environment and Heritage (Niche) was commissioned by EPM Projects Pty Ltd (EPM Projects) on behalf of Oxford Falls Grammar School (OFGS) to undertake a Biodiversity Assessment for a proposed Library/ Administration building with an associated car park within OFGS (proposed works).

Aims

This Biodiversity Assessment includes a review of the ecological constraints of the subject area and an assessment of the impacts of the proposed works on threatened biodiversity. The report meets the assessment requirements for threatened biodiversity listed under the *Biodiversity Conservation Act 2016* (BC Act) and matters of national environmental significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Methods

Field surveys were undertaken on 18 December 2019 by Niche ecologist Sarah Hart and heritage consultant Samuel Ward. The survey involved identification of tree species and size, vegetation condition, and presence and relative abundance of key habitat features (e.g. tree hollows, nests and flowering resources). Targeted fauna survey methods were not considered necessary given the relatively minor vegetation disturbance associated with the proposed works and the limited habitat present. This level of survey is considered suitable given the nature of the proposed impacts.

Key results

Vegetation within the subject site consisted of five planted native trees and an area of lawn. Trees consisted of five Port Jackson Figs (*Ficus rubiginosa*). All five trees surveyed are greater than 5 m in height. The trees to be removed are labelled 1 to 5 (Tree Report 2019, Figure 2).

No key habitat features such as hollows or nests were recorded during the survey. No evidence of threatened species (such as flying fox scats) was recorded within the subject site. The trees to be removed are unlikely to produce large quantities of fruit or flowers. As such, the tree is considered unlikely to provide important habitat for threatened species, such as roosting or significant foraging habitat for Grey-headed Flying-foxes.

While the subject area was considered to provide potential habitat for a number of threatened fauna, most of these would use such habitat rarely and would not be reliant upon it for survival or important breeding habitat.

The waterway and riparian zone is a highly modified 1st order stream with revegetated banks consisting of exotic and planted native species. The channel is small with steep banks and a narrow Vegetated Riparian Zone which is constrained by existing infrastructure. There is no significant erosion or sedimentation present in the channel or banks.

Impact assessment

The proposed works would result in the removal of approximately 0.2 ha of vegetation (five trees and adjoining sporting field) within OFGS. Additional potential impacts to the ecology, waterway and riparian zone are likely to be negligible provided management of impacts are consistent with the recommendations and mitigation measures of this report. As the proposed works would not result in a significant impact on threatened biodiversity, offsets are not required.

Glossary and list of abbreviations

Term or abbreviation	Definition
BAM	Biodiversity Assessment Method
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
CEEC	Critically endangered ecological community
DoEE	Department of Environment and Energy
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (previously OEH)
Education SEPP	<i>Educational Establishments and Child Care Facilities</i>
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPM Projects	EPM Projects Pty Ltd
Flora and fauna of conservation significance	Threatened species or populations listed on the schedules of the BC Act and/or listed as matters of national environmental significance under the EPBC Act
KTP	key threatening processes
LEP	Local Environmental Plan
Local occurrence	Refers to the distribution of an ecological community within the subject area and continuous with it
Local population	The population of a particular threatened species that occurs in the locality
Locality	The area within 10 km of the subject area
MNES	Matters of national environmental significance
Niche	Niche Environment and Heritage
OEH	Office of Environment and Heritage NSW, now the Environment, Energy and Science Group in the Department of Planning, Industry and Environment
RDP	Rapid Data Points
SEPP	State Environment Planning Policy
SEPP 44	<i>State Environmental Planning Policy No. 44 – Koala Habitat Protection</i>
SIS	Species impact Statement
TEC	Threatened ecological community as listed on the BC Act and or EPBC Act. Collective term to describe vulnerable, endangered and critically endangered ecological communities.
Threatened biodiversity	Threatened species, populations and ecological communities as listed on the BC and or EPBC Acts. Collective term to describe vulnerable, endangered and critically endangered biodiversity.

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1. Introduction

1.1 Context

Niche Environment and Heritage (Niche) was commissioned by EPM Projects Pty Ltd (EPM Projects) on behalf of Oxford Falls Grammar School (OFGS) to undertake a Biodiversity Assessment for the proposed construction of a new administration and library building with associated carpark within the school (proposed works). OFGS is located at 1078 Oxford Falls Rd, Oxford Falls NSW 2100 (Lot 100/-/DP1240806) in the Northern Beaches Local Government Area (LGA) (the subject area, Figure 1).

1.2 The Project

The proposed works involve removal of five Port Jackson Figs (*Ficus rubiginosa*) (Plate 1) and a small area of previously maintained lawn (Figure 2). No hollow bearing trees will be removed as a result of the works. The proposed works will involve construction of a building and associated carparking along the southern boundary of the school. A section of pathway will also be constructed within a small area of the riparian zone of a 1st order unnamed tributary of Middle Creek (the creek).

1.3 Purpose of this report

The proposed works will be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Clause 36 of *State Environmental Planning Policy (Educational Establishments and Child Care Facilities)* (Education SEPP).. As such, this Biodiversity Assessment will supplement a Review of Environmental Factors (REF).

This Biodiversity Assessment meets the assessment requirements of State (EP&A Act and *Biodiversity Conservation Act 2016* (BC Act)) and Commonwealth (*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)) legislation, governing the conservation of threatened biodiversity.

1.4 Subject area

The subject area is to the west of the creek and existing buildings and includes the eastern section of the sporting field (Figure 2). A summary of the major geophysical features of the subject area is presented in Table 1.

Table 1: Geophysical context of the subject area

Geographical feature	Description
Bioregion	Sydney Basin
IBRA subregion	Pittwater
Mitchell Landscape	Belrose Coastal Slopes
Local government area	Northern Beaches Council
Watercourses	First order stream running SSE from Middle Creek
Nearby conservation areas	<ul style="list-style-type: none"> Red Hill Reserve Oxford Falls Peace Park

1.5 Legislative context

The following legislation has been considered in this assessment:

- EP&A Act
- BC Act

- EPBC Act
- Education SEPP
- *Water Management Act 2000* (WM Act)
- *Northern Beaches Council Development Control Plan -Waterways and Riparian Lands*

The legislative context for the assessment is outlined in the following sections.

1.5.1 NSW Environmental Planning and Assessment Act 1979

The EP&A Act provides an assessment framework for planning approval in NSW and includes provision for consideration of environmental impacts via associated legislation (such as the BC Act) and planning instruments. The proposed works will be assessed under Part 5 of the EP&A Act, which provides proponents with two options for biodiversity impact assessment and offsetting:

1. Preparation of a REF including a biodiversity assessment that may apply assessments of significance (five-part tests) under the BC Act to determine whether significant impacts on threatened biodiversity are likely. If a significant impact is considered unlikely there may be no further requirement for ecological assessment or any offset requirement.

If a significant impact is deemed likely, then a Species Impact Statement (SIS) comprising extensive study into all threatened species (not only those significantly impacted) would be required; in addition, it is likely that preparation of a biodiversity offset strategy would be required utilising the Biodiversity Assessment Methodology (BAM) to determine offsets.

2. Public authorities operating under Part 5 of the EP&A Act may choose to opt in to the Biodiversity Offset Scheme (BOS) and BAM. This would require preparation of a Biodiversity Development Assessment Report (BDAR) under the BC Act. The BDAR would outline avoidance and mitigation measures as well as offset requirements for all vegetation clearing, regardless of whether significant impacts on threatened biodiversity were likely to occur. Project approval would then require offsetting as per the requirements of the BDAR or, to a lesser degree, as agreed upon after consultation with the Minister administering the BC Act.

This assessment considers the likelihood of proposed works triggering a significant impact for a REF under the first assessment pathway.

1.5.2 NSW Biodiversity Conservation Act 2016

The BC Act prescribes legal status for biota of conservation significance in NSW. The BC Act aims to, 'conserve biological diversity and promote ecologically sustainable development'. It provides for:

- The listing of threatened species and populations are listed under Schedule 1
- The listing of threatened ecological communities is listed under Schedule 2
- The listing of 'key threatening processes' (KTPs) under Schedule 4
- The preparation and implementation of recovery plans and threat abatement plans
- Requirements for the preparation of a species impact statement (SIS).

Threatened species, populations and ecological communities' listings gazetted under the BC Act are relevant to this assessment. Threatened biodiversity impacted by proposed works must be assessed under Section 1.7 of the EP&A Act which refers to Part 7 of the BC Act for assessment of significance.

Impacts to threatened species as a result of the proposed works are considered unlikely and therefore, assessments of significance have not been prepared.

1.5.3 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo an assessment and approval process. Under the EPBC Act, an action includes a Project, undertaking, development or activity. An action that 'has, will have or is likely to have a significant impact on MNES' is deemed to be a controlled action and may not be undertaken without prior approval from the Commonwealth Minister for the Department of Environment and Energy (DoEE). MNES include threatened species and ecological communities and migratory species.

Impacts to threatened species as a result of the proposed works are considered unlikely and therefore, assessments of significance were not undertaken. A referral is not considered to be required for the proposed works.

1.5.4 State Environmental Planning Policy (Educational Establishments and Child Care Facilities)

In accordance with Clause 36 of the Education SEPP, the proposed works comprise development permitted without consent and can be assessed under Part 5 of the EP&A Act, with OFGS being the determining authority. Niche understands that EPM Projects have obtained advice and support for the pathways chosen for this development.

1.5.5 State *Water Management Act 2000*

Controlled activities

Controlled activities carried out in, on or under waterfront land are regulated by the *Water Management Act 2000* (WM Act). The NSW Department of Planning, Industry and Environment/ Water (DPIE/Water) administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will occur to waterfront land as a consequence of carrying out the controlled activity.

Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary. The development is within 40 m of a waterway and therefore, requires a Controlled Activity Approval.

Guidelines for riparian corridors on waterfront land

DPIE/Water has developed guidelines for development on waterfront land that address development, the interaction with riparian corridors and appropriate development and management in these areas. These guidelines will need to be considered as part of a Controlled Activity Approval.

1.5.6 Northern Beaches Council - Development Control Plan – Waterways and Riparian Lands

A Waterways Impact Statement is required for any development works located within waterways and riparian lands as per the requirements of Council's Protection of Waterways and Riparian Land Policy (PL 740) and the Warringah Development Control Plan 2011. The waterway in the vicinity of the subject area is not mapped as Waterways and Riparian Land in Council's DCP and therefore, a Waterways Impact Statement is not required for the proposed works.

2. Methodology

2.1 Database and literature sources

Relevant databases were reviewed prior to the site inspection to identify data gaps and inform survey design. Database searches for a 10 km radius around the subject area were conducted in June 2019 to identify threatened biodiversity and migratory species with known occurrences in the locality. The following databases and literature were reviewed:

- DPIE BioNet, Atlas of NSW Wildlife (OEH 2019a)
- DoEE EPBC Act Protected Matters Report (DoEE 2018)
- Threatened Species Profiles for threatened species, endangered populations and threatened ecological communities (TECs) listed under the BC Act (OEH 2019b)
- Species Profile and Threats Database (DoEE 2018).

Existing vegetation mapping was examined prior to the site inspection (DPIE 2016) to determine the plant community types (PCTs) likely to be present in the subject area.

2.2 Field survey

A site inspection was undertaken to verify existing vegetation mapping, determine flora and fauna habitat of the subject area and a search for evidence of threatened species known to occur in the locality. As this was primarily a habitat-based assessment, limited targeted threatened species surveys were conducted. The potential presence of threatened species was determined largely by the presence of suitable habitat. The site inspection was conducted on the 18th December 2019 by Niche ecologist Sarah Hart and heritage consultant Samuel Ward.

Habitat characteristics and parameters that were assessed included:

- Identification of tree species and size
- Vegetation condition
- Presence and relative abundance of key habitat features (e.g. tree hollows, nests and flowering resources)
- Riparian vegetation and habitats.

Targeted fauna survey methods were not considered necessary given the relatively minor vegetation disturbance associated with the proposed works and the limited habitat present.

The subject area has experienced significant past disturbance associated with previous development of the school and surrounding amenities (sporting field). The existing sporting field was originally constructed from excavated material and has been maintained as a sporting field since. The survey methodology was designed to determine the ecological value of vegetation on site. Due to ongoing and historical disturbance (mowing, planting and construction of the sporting field) survey methods in the subject area were modified to account for its small size and disturbed nature.

2.2.1 Tree species identification and size

Trees were identified by a qualified arborist (Tree Report 2019) and confirmed by an ecologist down to species and estimated heights of all trees.

2.2.2 Vegetation condition

The vegetation within the subject area has been described based on the following:

- Infestations of weeds
- Species richness
- Proximity of perimeter to core ratio and large adjacent patches
- All structural layers (e.g. trees, shrubs, grasses, ground cover)
- The patch condition compared to benchmark condition or stable after disturbance.

2.2.3 Fauna habitat assessment

Fauna habitat characteristics and parameters that were assessed in the subject area included:

- Dominant vegetation, composition and structure
- Composition of ground layer (bare earth, litter etc.)
- Presence and relative abundance of key habitat features (e.g. tree hollows, large logs, exfoliating rock, flowering resources, aquatic features)
- Condition and disturbance factors.

2.2.4 Riparian habitat assessment

Riparian habitat characteristic and parameters that were assessed in the subject area included:

- Water appearance, snags, pools of water, run and riffles,
- Bank stability/ erosion sedimentation
- Introduced species and/or presence of macrophytes and algae.

2.3 Threatened flora and fauna likelihood of occurrence

A list of subject threatened flora and fauna within the locality (10 km radius) was determined from database searches detailed in Section 2.1. The list of potentially impacted species is determined from consideration of this list.

In order to adequately determine the relevant level of assessment to apply to potentially affected species, further analysis of the likelihood of those species occurring within the subject area was completed.

Five categories for 'likelihood of occurrence' (Table 2) were attributed to species after consideration of criteria such as known records, presence or absence of important habitat features on the subject area, results of the site inspections and professional judgement. This process was completed on an individual species basis.

Species considered further in formal assessments of significance (BC Act, EPBC Act) were those in the 'Known', 'High' or 'Moderate' categories and where adverse impacts for the species could reasonably occur from the development. Species listed as a 'Low' or 'None' likelihood of occurrence are those for which there is limited, or no habitat present within the subject area.

Table 2: Likelihood of occurrence criteria

Likelihood rating	Threatened flora criteria	Threatened and migratory fauna criteria
Known	The species was observed within the subject area.	The species was observed within the subject area.
High	It is likely that a species inhabits or utilises habitat within the subject area.	It is likely that a species inhabits or utilises habitat within the subject area.
Moderate	Potential habitat for a species occurs on the site. Adequate site inspection would determine if	Potential habitat for a species occurs on the site and the species may occasionally utilise that

	there is a 'high' or 'low' likelihood of occurrence for the species within the subject area.	habitat. Species unlikely to be wholly dependent on the habitat present within the subject area.
Low	It is unlikely that the species inhabits the subject area.	It is unlikely that the species inhabits the subject area. If present at the site, the species would likely be a transient visitor. The site contains only very common habitat for this species which the species would not rely on for its on-going local existence.
None	The habitat within the subject area is unsuitable for the species.	The habitat within the subject area is unsuitable for the species.

2.4 Limitations

A limited set of survey methods have been employed in this investigation. Methods were tailored to the nature of expected impacts, habitat quality and the significance of the site in order to provide sufficient data to undertake informed impact assessments.

Numerous threatened plant and animal species are cryptic or difficult to detect. For instance, some cryptic plant species are more easily detected at certain times of the year, such as during flowering events. Some fauna can only be detected during certain seasons (e.g. migration patterns or intra-torpor periods). These limitations are reduced by undertaking a habitat assessment, and assuming cryptic species are present if suitable habitat is present within the subject area.

For this report, fauna survey was limited to assessment of habitat values. Habitat assessments are conservative and default to an assumed presence where there is insufficient knowledge to determine otherwise. Assumed presence of a species requires the impact of the development/activity on that species to be assessed.

3. Existing environment

3.1 Arborist report (Tree Report 2019)

The five trees to be removed (Table 3, Plate 1 & Plate 2) are located within the proposed development footprint or will impact more than 10% of the tree. The entire tree requires removal.

Table 3: Tree Report summary

Tree ID	Scientific Name	Height	Spread	Health
1	<i>Ficus rubiginosa</i>	7	8	Good
2	<i>Ficus rubiginosa</i>	8	8	Fair
3	<i>Ficus rubiginosa</i>	7	6	Fair
4	<i>Ficus rubiginosa</i>	9	10	Good
5	<i>Ficus rubiginosa</i>	9	9	Good

3.2 Flora

3.2.1 Vegetation communities

Five planted Port Jackson Fig and areas of lawn occur in the subject area (Plate 1 and Plate 2). The native trees to be removed do not align to a plant community type as per the DPIE database, based on the following:

- The native trees are planted and do not align to any vegetation communities mapped in the local area
- The vegetation does not contain a native understorey or ground cover
- The area of disturbance has been previously cleared, consists of regularly mown lawn and planted garden beds, and therefore contains very low resilience. While the resilience of grassed areas varies, all grassy areas contain less than 50% native cover and are therefore not considered native vegetation
- A narrow riparian corridor to the east of the proposed works will not be directly disturbed by see Section 3.4.

No threatened communities were recorded in the subject area during the site inspection.

Vegetation mapping identifies three Plant Community Types (PCTs) in the vicinity of the subject area (Figure 3):

- PCT 1250 Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, southern Sydney Basin Bioregion
- PCT 1783:Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast
- PCT 1824:Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin.

3.2.2 Threatened ecological communities

There are no threatened ecological communities in the subject area or in its vicinity (Figure 3).

3.2.3 Threatened flora

No threatened flora were recorded in the subject area during the site inspection.

A total of 38 threatened flora listed on the BC and/or EPBC Act were identified as subject species in this assessment (Appendix 1). Based on the habitat present in the subject area and proximity of known records, none of the threatened flora are considered to have a 'High' or 'Moderate' likelihood of occurrence. Most of these are conspicuous species and are considered unlikely to have remained undetected during the site inspection if present within the subject area, particularly given the small size of the subject area. These species are therefore considered unlikely to be present in the subject area.

3.3 Fauna

No key habitat features such as hollows or nests were recorded during the site inspection. No evidence of threatened species (such as flying fox scats) was recorded within the subject area. While this assessment does not examine impacts to threatened species, it should be noted that the trees to be removed are only a small part of the foraging habitat in the surrounding area and unlikely and are considered unlikely to provide important habitat for threatened species, such as roosting or significant foraging habitat for many species.

3.3.1 Fauna habitats

Tree Hollows

No tree hollows were recorded within the subject area during the site inspection. No hollow trees require clearing as part of proposed works.

Logs

No logs occurred throughout the subject area, which comprises a maintained landscaped area with mown lawn.

Surface rock

Rocky habitat was absent in the subject area. No caves, overhangs or exfoliating rocks were present. There was limited preferred habitat for reptiles throughout the subject area. This consisted toward the creek along the vegetated riparian zone (see Section 3.4).

Leaf litter

The subject area contained minimal vegetation at the base of trees (this is common with figs) and minimal dead leaves from surrounding trees as the subject area is maintained by the school groundskeeper.

3.3.1.1 Threatened and migratory fauna

No threatened or migratory fauna were recorded in the subject area during the site inspection, however, it should be noted that targeted surveys were not conducted as part of the site inspection.

A total of 86 threatened or migratory fauna listed on the BC and/or EPBC Act were identified as subject species in this assessment (Appendix 1). This list was derived from the database searches outlined in Section 2.1. From this list of subject species, a total of four species are considered to have a 'High' or 'Moderate' likelihood of occurrence: *Pteropus poliocephalus* (Grey-headed Flying-fox) *Miniopterus australis*

(Little Bentwing-bat), *Varanus rosenbergi* (Rosenberg's Goanna) and *Ninox strenua* (Powerful Owl). The remaining species were given a 'Low' or 'No' likelihood of occurrence (Table 3, Appendix 1).

The Grey-headed Flying-fox, Rosenberg's Goanna and the Powerful Owl all identified with a moderate potential to occur within the subject area, as relatively mobile species which would have negligible amounts of foraging habitat impacted by the proposed works. The Little Bentwing-bat identified as a high potential to occur within the subject area but is also a relatively mobile species which would have negligible amounts of foraging habitat impacted by the proposed works. The subject area supports five canopy trees, no mid-storey and minimal ground cover species, none of which are limiting or important habitat for the above-mentioned threatened species.

Table 4: Threatened fauna with high or moderate likelihood of occurrence

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.	Moderate	Low – as only five trees are to be removed there is no limiting habitat being removed
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.	High	Low- no limiting habitat within subject area
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	This species is a Hawkesbury-Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests.	Moderate	Low – no limiting habitat being removed
<i>Ninox strenua</i>	Powerful Owl	V	-	Occupies wet and dry eucalypt forests and rainforests. Can occupy both unlogged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm.	Moderate	Low – no limiting habitat being removed

3.4 Waterways and riparian zone

The waterway is an unnamed 1st order tributary of Middle Creek which flows through the site from south east to north west (Figure 2). The stream consisted primarily of shallow pools and had low water levels and limited flow at the time of survey. The stream bed consisted of boulders, cobbles, sand and fine sediment. Native and exotic macrophytes were observed in some sections of the creek with some non-filamentous algae present on rocks.

The waterway had a small channel with approximately 2m modal width and has steep banks (2m-3m) (Plate 3). The banks are well vegetated and appear stable with no significant erosion or sedimentation present in the channel and banks. The riparian vegetation had a mixture of native and exotic groundcover and shrub species (Plate 4). The midstorey and canopy is dominated by *Casurina cunninghami*, *Angophora costata*, *Syzygium australis*, *Lephostemon confertus* and *Cyathea cooperi*. The canopy cover was low (approximately 40%) on the south east, however, the vegetation became more open with native grasses, sedges and understory species such as *Lomandra longifolia*, *Gahnia* sp., *Nephrolepis exaltata* (Fishbone fern) and non-native species such as *Tradescatia fluminensis* (Wandering Jew), *Delairea odorata* (Cape Ivy vine) in the south east of the site.

4. Impact Assessment

4.1 Potential impacts of the proposed works

An assessment of the potential impacts of the proposed works on biodiversity is provided in Table 5.

Impacts are categorised as direct or indirect as described in DPIE (2017), which states:

“Direct impacts are those that directly affect habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.”

Indirect impacts occur when proposed works-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.”

A likelihood rating of Known, High, Moderate, Low or None has been assigned to each of the potential impacts listed in Table 5, which illustrates that proposed works would lead to the following impacts:

- Direct impact
 - Removal or modification of native vegetation
- Indirect impacts
 - Loss of shade/shelter
 - Increased human activity within or directly adjacent to sensitive habitat areas.

Table 5: Assessment of direct and indirect impacts as a result of proposed works

Impact	Extent of impact as a result of proposed works
Direct impacts	
Removal or modification of native vegetation	Known: approximately 0.2 ha of vegetation (five trees and adjoining sporting field) within OFGS would be removed as part of proposed works.
Loss of individuals of a threatened species	None: No threatened species are likely to be removed as part of proposed works.
Removal or modification of threatened species habitat other than native vegetation (micro-habitat features)	None: the subject area to be impacted does not contain tree hollows or other important habitat features which may be used by threatened species.
Death through trampling or vehicle strike	Low: The subject area has been maintained by a school grounds keeper and not suitable for small fauna to occur. The Project is highly unlikely to cause death through trampling or vehicle strike.
Death through poisoning	Low: no poisons are proposed to be used as part of proposed works. Harmful substances used in construction would all be controlled as per required Australian Standards.
Fragmentation	Low: the removal of 0.2 hectares of vegetation (five trees and adjoining sporting field in the subject area) is highly unlikely to fragment the landscape, due to the existing large mature trees

Impact	Extent of impact as a result of proposed works
	being avoided by the proposed works in the surrounding environment.
Indirect impacts	
Predation by domestic and/or feral animals	Low: proposed works are not likely to increase the presence of domestic or feral animals in the local area as it is within fenced off school grounds.
Loss of shade/shelter	Known: the removal of vegetation in the subject area would result in a loss of shade and shelter for local fauna. This impact is considered low considering there is similar habitat in the immediate vicinity that would not be impacted by proposed works.
Loss of individuals through starvation	Low: the habitat to be removed in the subject area is not considered likely to cause loss of individuals through starvation, given the small area of impact and the similar amount of habitat nearby that would not be impacted by the proposed works. Foraging habitat for fauna would remain in abundance in the locality.
Loss of individuals through exposure	Low: habitat to be removed in the subject area occurs as a line of trees within the school grounds along the southern boundary. Extensive areas of habitat nearby would not be impacted by the proposed works (Figure 1). Shelter habitat for fauna would remain in abundance in the locality. Therefore, the proposed works are not considered likely to cause loss of individuals through exposure.
Edge effects (noise, light, traffic)	Low: no new edges would be created as a result of proposed works. The Project would remove approximately 0.2 ha of vegetation (five trees and adjoining sporting field) and maintain surrounding vegetation throughout the school grounds and therefore, would not create more edge effects to other vegetation in the vicinity.
Deleterious hydrological changes	Low: proposed works are unlikely to cause alterations to existing flow regimes or result in un-contained nutrient-laden sedimentation.
Weed invasion	Low: unlikely to be greater than current impact. Controls regarding clearing of weeds have been recommended.
Increased human activity within or directly adjacent to sensitive habitat areas	Known: removal of approximately 0.2 ha of vegetation (five trees and adjoining sporting field) for the new building will increase human activity, however, the adjacent vegetation will not be impacted.

4.2 Key threatening processes

As part of an assessment of impacts under the BC and EPBC Acts, consideration must be given as to whether the action proposed constitutes, or is part of, a KTP or is likely to result in the operation of or increase the impact of a KTP on threatened biodiversity. The KTPs listed in Table 6 are known to exist or have the potential to be exacerbated by the proposed works.

Table 6: Key threatening processes operating presently or historically in the subject area

Key Threatening Process	BC Act	EPBC Act	Operating presently or historically	Increased by Project
Clearing of native vegetation	✓	✓	Yes	Yes –minor increase
Invasion of native plant communities by exotic perennial grasses	✓	X	Yes	No

4.3 Affected threatened ecological communities

As discussed in Section 3.2.2 there was no TEC identified during the site inspection.

4.4 Affected flora

No threatened flora were identified during the site inspection. Due to the conspicuous nature of potential threatened flora found in the area and the lack of native groundcover vegetation, it is unlikely that threatened flora went undetected, if present, during the site inspection. No threatened flora are likely to be impacted by the proposed works and therefore, threatened flora have not been considered further (Appendix 1).

4.5 Affected fauna

The assessment of affected threatened fauna in Section 3.3.1.1 concluded that four threatened fauna have potential to occur within the subject area *Pteropus poliocephalus* (Grey-headed Flying-fox), *Miniopterus australis* (Little Bentwing-bat), *Varanus rosenbergi* (Rosenberg's Goanna) and *Ninox strenua* (Powerful Owl). Further analysis of the habitat present and characteristics of each species determined that no threatened fauna have a potential to be adversely impacted by proposed works. The habitats in the subject area that would be impacted by proposed works are not considered to provide limiting habitat for any local fauna.

The proposed removal of approximately 0.2 ha of native vegetation (five trees and adjoining sporting field) is not likely to impact any threatened or migratory fauna given the following:

- No hollows were identified or would be removed
- Impacts to surrounding habitats are likely to be minimal or non-existent.
- The habitats to be removed do not represent limiting habitat given the good quality habitat in the vicinity of the subject area
- The proposed works are not likely to increase fragmentation or edge effects.

Threatened fauna or migratory species are not likely to be impacted by the proposed works and therefore, have not been considered further.

4.6 Potential impacts to waterway and riparian zone

The waterway is a 1st order stream that has been heavily modified and revegetated with native species from a local nursery, this species composition does not comprise species that are characteristic of PCTs in the vicinity of the subject area. A 10m buffer on each side of the creek is provided in Figure 4. This shows that the Vegetated Riparian Zone (VRZ) and the riparian corridor is limited by existing infrastructure; with the fence, field and building already within this zone.

The waterway is likely to provide minimal habitat to common frogs, macroinvertebrates and small fish. However, the habitats in the subject area that would be impacted by proposed works are not considered to provide limiting habitat for any local aquatic species

The proposed development will not remove any native or non-native riparian vegetation in this zone. A pathway will encroach on top of the bank to approximately 5m on the southwestern section of the creek (Appendix 3 – Developments Plans). However, this is not expected to significantly affect the riparian zone or waterway. Furthermore, this type of development is consistent with the Riparian Corridor Matrix provided in Guidelines for Riparian Corridors on Waterfront Land (NSW Office of Water 2012).

Erosion and sedimentation are not expected to affect the waterway as part of the development if appropriate prevention measures are in place. These measures are expected to be in accordance with industry standards - Managing Urban Stormwater: Soils and construction - Volume 1 (Landcom 2004).

5. Recommendations

This section details how proposed works would, in the first instance, avoid impacts to biodiversity, then use mitigation measures where avoidance is not possible.

5.1 Avoid

The following recommendations have been implemented to avoid impacts to flora, fauna and their habitats:

- Clearing will be restricted to the 0.2ha of native vegetation occurring within the development footprint. Surrounding trees and bushland areas will not be impacted as part of proposed works. See arborist report (Tree Report 2019) and Site Plan (AJ+C 2019) for detailed descriptions of works to be undertaken.
- No vegetation is to be cleared from the VRZ.

5.2 Minimise/mitigate

The following recommendations should be implemented to minimise impacts to flora, fauna and their habitats:

- If unexpected threatened fauna or flora species are discovered, stop works immediately and a qualified Ecologist should be notified to undertake further assessment.
- Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed.
- To prevent the spread of weed seed, all weed material removed should be disposed of in a suitable waste facility and not mulched on site. This is to avoid the reintroduction and further spread of weeds in the area. Weed management should be undertaken in accordance with Department of Primary Industries (DPI) *Biosecurity Act 2015*.
 - **General Biosecurity Duty:** *All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*
- Machinery should be washed following best practice hygiene protocols prior to being brought to site to prevent the spread of weed seed, pathogens and fungi. Hygiene protocols should be in accordance with DPI *Biosecurity Act 2015*.
- If nests or other breeding structures within trees are found by the tree contractor prior to clearing, works should not proceed until a project ecologist has been contacted and has inspected and/or relocated any resident fauna.
- If fauna are injured during tree felling, a project ecologist or WIRES should be contacted immediately to tend to the injured animal. Injured fauna should be taken to a local vet for treatment.
- Erosion and sedimentation control measures should be implemented to limit degradation of riparian zone and waterway. These measures are expected to be in accordance with industry standards - Managing Urban Stormwater: Soils and construction - Volume 1 (Landcom 2004).

5.3 Offsets

As proposed works would not result in a significant impact on threatened biodiversity, offsets are not required.

6. Conclusion

The proposed works would remove approximately 0.2 ha of vegetation (five native trees and adjoining sporting field). Threatened flora and ecological communities were not recorded in the subject area and are unlikely to occur. No limiting habitat for threatened fauna occurs within the subject area and no threatened fauna are likely to be impacted by proposed works. The proposed works comprise Development Permitted without Consent under the Education SEPP. The development is consistent with guidelines for riparian corridor on waterfront land and there is expected to be minimal impact to the riparian corridor and waterway.

Recommendations have been made to avoid and minimise potential impacts to native vegetation, flora and fauna occurring in the subject area.

As proposed works would not result in a significant impact on threatened biodiversity, offsets are not required.

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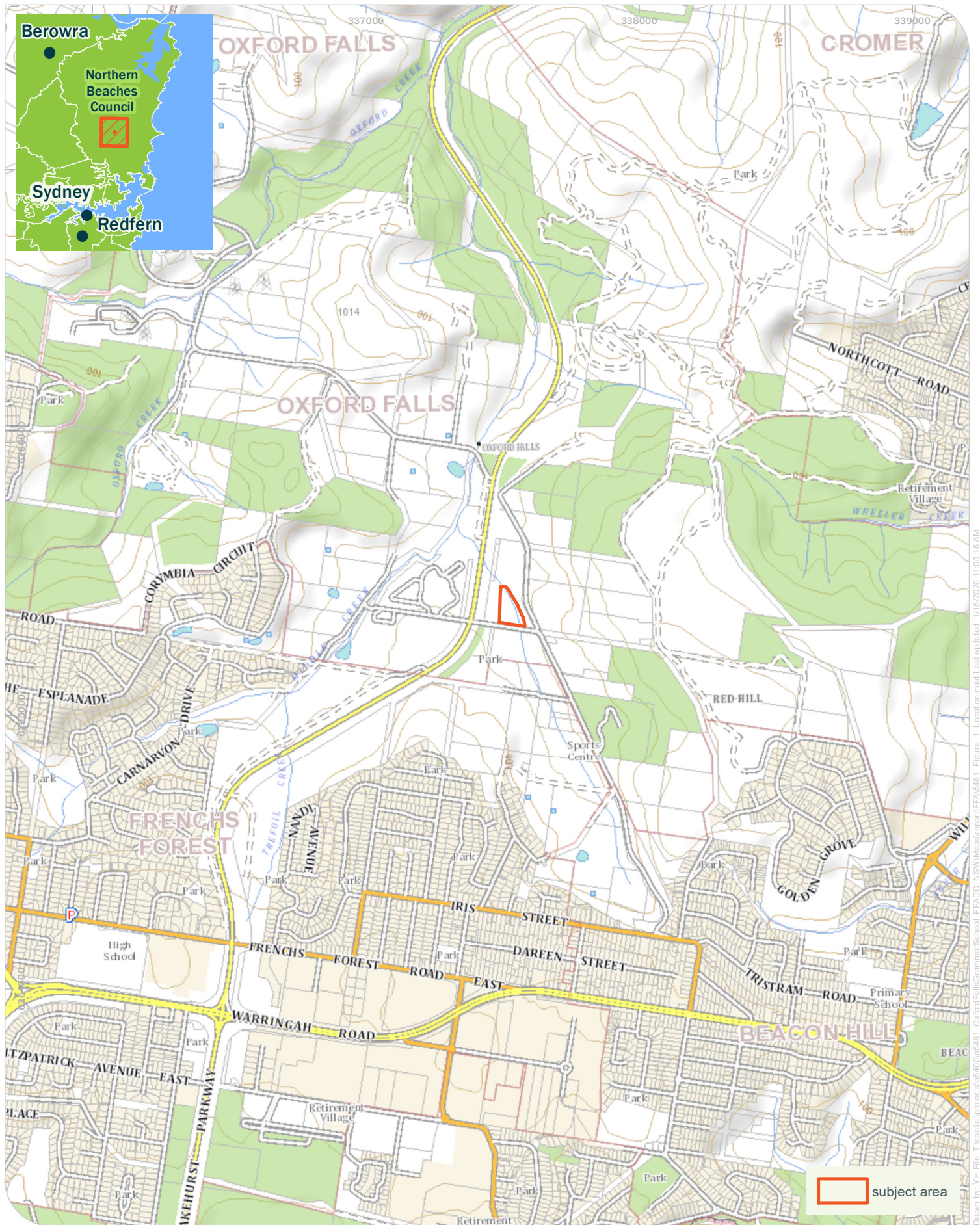
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Figures

Figure 1: Location Map



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Figure 2: subject area



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Figure 3: Vegetation Mapping



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Figure 4: Ecological constraints

Appendix 1 – Likelihood of occurrence

Threatened flora and fauna

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
Amphibians						
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with more sandy environments of the coast and adjacent ranges from the Sydney Basin south the eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis.	None	None – no limiting habitat on site
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Inhabits a very wide range of water bodies including marshes, dams and streams, particularly those containing emergent vegetation such as bullrushes or spikerushes. It also inhabits numerous types of man-made water bodies including quarries and sand extraction sites. Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow, have a grassy area nearby and diurnal sheltering sites available.	None	None – no limiting habitat on site
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V	Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops between 280 and 1000 m on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent ponds, temporary pools and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site. Calling occurs in all months of the year, often in association with heavy rains. The tadpoles are distinctive, being large and very dark in colouration.	None	None – no limiting habitat on site
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	Associated with streams in dry sclerophyll and wet sclerophyll forests and rainforests of more upland areas of the Great Dividing Range of NSW and down into Victoria. Breeding occurs along forest streams with permanent water where eggs are deposited within nests excavated in riffle zones by the females and the tadpoles swim free into the stream when large enough to do so. Outside of breeding, individuals range widely across the forest floor and can be found hundreds of metres from water	None	None – no limiting habitat on site

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Pseudophryne australis</i>	Red-crowned Toadlet	V	-	Occurs on wetter ridge tops and upper slopes of sandstone formations on which the predominant vegetation is dry open forests and heaths. This species typically breeds within small ephemeral creeks that feed into larger semi-perennial streams. After rain these creeks are characterised by a series of shallow pools lined by dense grasses, ferns and low shrubs and usually contain leaf litter for shelter. Eggs are terrestrial and laid under litter, vegetation or rocks where the tadpoles inside will reach a relatively late stage of development before waiting for flooding waters before hatching will occur.	None	None – no limiting habitat on site
Birds						
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E,M	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.	Low	None
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	Dusky Woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris.	Low	None
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	The Australasian Bittern is widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes.	Low	None
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
				open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights.		
<i>Calidris canutus</i>	Red Knot	-	E, M, MA, C, K, J	The Red Knot is a non-breeding migratory visitor from Arctic regions of Siberia. In NSW it is recorded in small numbers replenishing fat stores along some of the major river estuaries and sheltered embayments of the coastline, in particular the Hunter River estuary, after which the birds proceed to Victoria by October.	None	None
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	-	The Curlew Sandpiper is distributed around most of the coastline of Australia. It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes the inland	None	None
<i>Collocephalon fimbriatum</i>	Gang-gang Cockatoo	EP	-	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine snow gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.	Low	None
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	Inhabits forest with low nutrients, characteristically with key Allocasuarina spp. Tends to prefer drier forest types with a middle stratum of Allocasuarina below Eucalyptus or Angophora. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead. Endangered population in the Riverina.	Low	None
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both, in all climatic zones of Australia. Usually in areas with rough-barked trees, such as stringybarks or ironbarks, but also in paperbarks or mature Eucalypts with hollows.	Low	None
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands.	Low	None
<i>Esacus magnirostris</i>	Beach Stone-curlew	CE	-	In NSW, the species occurs regularly to about the Manning River, and the small population of north-eastern NSW is at the limit of the normal range of the species in Australia. Beach Stone-curlews are found exclusively along the coast, on a wide range of beaches, islands, reefs and in	None	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
				estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach Stone-curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves.		
<i>Fregetta grallaria</i>	White-bellied Storm-Petrel		V	The White-bellied Storm-Petrel (Tasman Sea) breeds on small offshore islets and rocks in the Lord Howe Island group, including Roach Island and Balls Pyramid.	None	None
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.	Low	None
<i>Grantiella picta</i>	Painted Honeyeater	V	-	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits boree, brigalow and box-gum woodlands and box-ironbark forests.	Low	None
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	-	In NSW the Sooty Oystercatcher occupies rocky headlands, reefs and offshore islands along the entire coast, apparently as a single continuous population.	None	None
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	-	M	Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna.	Low	None
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. May nest in farmland, woodland and forest in tall trees.	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	M	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	Low	None
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	Usually found on coastal plains below 200 m. Often found along timbered watercourses, in wetlands with fringing trees and shrub vegetation. The sites where they occur are characterized by dense waterside vegetation.	Low	None
<i>Lathamus discolor</i>	Swift Parrot	E	E	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	Low	None
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by <i>Eucalyptus longifolia</i> , <i>Corymbia maculata</i> , <i>E. elata</i> or <i>E. smithii</i> . Individuals appear to occupy large hunting ranges of more than 100km ² . They require large living trees for breeding, particularly near water with surrounding woodland -forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.	Low	None
<i>Macronectes giganteus</i>	Southern Giant Petrel	E	E	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW. Over summer, the species nests in small colonies amongst open vegetation on antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.	None	None
<i>Macronectes halli</i>	Northern Giant-petrel	V	V	Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer.	None	None
<i>Neophema pulchella</i>	Turquoise Parrot	V	-	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust.	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Ninox connivens</i>	Barking Owl	V	-	Generally found in open forests, woodlands, swamp woodlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country.	Low	None
<i>Ninox strenua</i>	Powerful Owl	V	-	Occupies wet and dry eucalypt forests and rainforests. Can occupy both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm.	Moderate	Low – no limiting habitat being removed
<i>Numenius madagascariensis</i>	Eastern Curlew	-	CE, MA, M	A primarily coastal distribution. Found in all states, particularly the north, east, and south-east regions including Tasmania. Rarely recorded inland. Mainly forages on soft sheltered intertidal sand flats or mudflats, open and without vegetation or cover. Breeds in the northern hemisphere.	None	None
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)		V	The fairy prion (southern) breeds on Macquarie Island and a number of other subantarctic islands outside of Australia. The subspecies digs burrows among rocks or low vegetation in which to nest. Burrows may be dug below mat forming herbs.	None	None
<i>Pandion cristatus</i>	Eastern Osprey	V	M, MA	Found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	Low	None
<i>Petroica boodang</i>	Scarlet Robin	V	-	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	Low	None
<i>Phoebastria fusca</i>	Sooty Albatross	V	-	In Australian waters, this species is generally recorded in winter off the south coast from Tasmania to Western Australia, while there are occasional sightings off the NSW coast, north of Grafton. This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the majority of its time at sea, and rarely occurs in continental shelf waters.	None	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Pterodroma leucoptera</i>	Gould's Petrel		E	Pelagic marine species, spending much of its time foraging at sea and coming ashore only to breed. The Australian subspecies breeds and roosts on two islands off NSW, Cabbage Tree and Boondelbah Islands. They nest predominantly in natural rock crevices among the rock scree and also in hollow fallen palm trunks, under mats of fallen palm fronds and in cavities among the buttresses of fig trees.	None	None
<i>Pterodroma neglecta</i>	Kermadec Petrel	V	V	Breeds on Balls Pyramid, near Lord Howe Island, and on Phillip Island. Its pelagic distribution is poorly known. It generally occurs in subtropical and tropical waters from about 20° S to 35° S, although it may disperse north of the equator. It occasionally reaches the eastern coast of mainland Australia.	None	None
<i>Ptilinopus magnificus</i>	Wompoo Fruit-dove	V	-	Distributed north of the Hunter River in NSW on the coast and coastal ranges. Inhabits rainforest, monsoon forest, adjacent eucalypt forest and brush box forest.	Low	None
<i>Ptilinopus regina</i>	Rose-crowned Fruit-dove	V	-	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south to Victoria. Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	Low	None
<i>Ptilinopus superbus</i>	Superb Fruit-dove	V	-	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	Low	None
<i>Rostratula australis</i>	Australian Painted Snipe	E	E, M	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	Low	None
<i>Sternula nereis</i>	Fairy Tern	-	V	Distribution includes the southern half of NSW coast. Fairy Terns utilise a variety of habitats including offshore, islands in estuaries or lakes, wetlands, beaches and spits.	None	None
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Often found in tall old-growth forests, including temperate and subtropical rainforests. In NSW mostly found on escarpments with a mean altitude less than 500 metres. Nests and roosts in	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
				hollows of tall emergent trees, mainly eucalypts often located in gullies. Nests have been located in trees 125 to 161 centimetres in diameter.		
Insects						
<i>Pommerhelix duralensis</i>	Dural Land Snail	E	E	The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. The species is definitely found within the Local Government Areas of The Hills Shire, Hawkesbury Shire and Hornsby Shire. Records from the Blue Mountains City, Penrith City and Parramatta City may represent this species. Occurrence in Wollondilly Shire is considered unlikely in light of current knowledge.	Low	None
Mammals						
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Will often nest in tree hollows but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5ha area over a 5-month period.	Low	None
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests. This species roosts in caves and mines in groups of between 3 and 37 individuals.	Low	None
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Spotted-tailed Quoll are found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	Low	None
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high. Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor. This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites.	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E	-	Prefers sandy soils with scrubby vegetation and-or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.	Low	None
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.	High	Low- no limiting habitat
<i>Myotis macropus</i>	Southern Myotis	V	-	The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Low	None
<i>Petauroides volans</i>	Greater Glider	-	V	The Greater Glider occurs in eucalypt forests and woodlands. The Greater Glider occurs in eucalypt forests and woodlands. The species nests in hollows and are typically found in older forests. Generally the home range for the greater glider is between 0.7-3 hectares and tends to have a population density of 0.01-5 individuals per hectare. The home ranges of females can overlap with males and females however for the males the home ranges never overlap.	None	None
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	Found in rocky areas in a wide variety of habitats including rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops in semi-arid country. Commonly sites have a northerly aspect with numerous ledges, caves and crevices.	None	None
<i>Phascolarctos cinereus</i>	Koala	V	V	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall.	Low	None
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.	Moderate	Low – no limiting habitat being removed
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	Prefer moist gullies in mature coastal forests and rainforests, between the Great Dividing Range and the coast. They are only found at low altitudes below 500 m. In dense environments they utilise natural and human-made opening in the forest for flight paths. Creeks and small rivers are favoured foraging habitat. This species roosts in hollow tree trunks and branches.	Low	None
Reptiles						
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	V	Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows to find shelter during hotter parts of summer.	Low	None
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	This species is a Hawkesbury-Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests.	Moderate	Low – no limiting habitat being removed
Plants						
<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	Grows mainly in heath and dry sclerophyll forest in sandy soils. Mainly south of Dora Creek-Morriset area to Berrima and the Illawarra region, west to the Blue Mountains, also recorded from near Kurri Kurri in the Hunter Valley and from Morton National Park.	None	None
<i>Acacia pubescens</i>		V	V	Concentrated around the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravelly soils, often with ironstone. Grows in open woodland and forest, in a variety of plant	None	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
				communities, including Cooks River-Castlereagh Ironbark forest, Shale-Gravel Transition forest and Cumberland Plain woodland.		
<i>Acacia terminalis</i> subsp. <i>terminalis</i>	Sunshine Wattle	E	E	Very limited distribution, mainly in near-coastal areas from the northern shores of Sydney Harbour S to Botany Bay, with most records from the Port Jackson area and the eastern suburbs of Sydney. Coastal scrub and dry sclerophyll woodland on sandy soils. Habitat is generally sparse and scattered.	None	None
<i>Allocasuarina glareicola</i>		E	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Grows in Castlereagh woodland on lateritic soil. Found in open woodland with <i>Eucalyptus parramattensis</i> , <i>Eucalyptus fibrosa</i> , <i>Angophora bakeri</i> , <i>Eucalyptus sclerophylla</i> and <i>Melaleuca decora</i> . Common associated understorey species include <i>Melaleuca nodosa</i> , <i>Hakea dactyloides</i> , <i>Hakea sericea</i> , <i>Dillwynia tenuifolia</i> , <i>Micromyrtus minutiflora</i> , <i>Acacia elongata</i> , <i>Acacia brownei</i> , <i>Themeda australis</i> and <i>Xanthorrhoea minor</i> .	None	None
<i>Asterolasia elegans</i>		E	E	Occurs north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby local government areas. Also likely to occur in the western part of Gosford local government area. Known from only seven populations, only one of which is wholly within a conservation reserve. Occurs on Hawkesbury sandstone in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest.	None	None
<i>Caladenia tessellata</i>	Thick-lip Spider Orchid	E	V	The Tessellated Spider Orchid is found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct.	Low	None
<i>Callistemon linearifolius</i>		V	-	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. Grows in dry sclerophyll forest on the coast and adjacent ranges.	None	None
<i>Chamaesyce psammogeton</i>		E	-	Found sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Queensland (and Lord Howe Island). Populations have been recorded in Wamberal Lagoon Nature Reserve, Myall Lakes National Park and Bundjalung National Park. Grows on fore-dunes and exposed headlands, often with <i>Spinifex sericeus</i> .	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>).	Low	None
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E	Recorded from rainforest gullies scrub and scree slopes from the Gloucester district to the Wollongong area and inland to Mt Dangar.	None	None
<i>Darwinia biflora</i>		V	V	Recorded in Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas. The northern, southern, eastern and western limits of the range are at Maroota, North Ryde, Cowan and Kellyville, respectively. Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. The vegetation structure is usually woodland, open forest or scrub-heath.	None	None
<i>Deyeuxia appressa</i>		E	E	A highly restricted NSW endemic known only from two pre-1942 records in the Sydney area (Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown and Killara, near Hornsby). Almost nothing is known about the species' habitat and ecology. Flowers spring to summer and is mesophytic (grows in moist conditions).	Low	None
<i>Epacris purpurascens</i> var. <i>purpurascens</i>		V	-	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South. Found in a range of habitat types, most of which have a strong shale soil influence.	None	None
<i>Eucalyptus camfieldii</i>	Heart-leaved Stringybark	V	V	Restricted distribution in a narrow band with the most northerly records in the Raymond Terrace Area south to Waterfall. Localised and scattered distribution includes sites at Norah Head (Tuggerah Lakes), Peats Ridge, Mt Colah, Elvina Bay Trail (West Head), Terrey Hills, Killara, North Head, Menai, Wattamolla and a few other sites in Royal National Park. Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas.	None	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. Seedling recruitment is common, even in disturbed soils, if protected from grazing and fire.	None	None
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	E	E	Grows in dry sclerophyll forest and moss gardens over sandstone. Flowers February to March. Has been recorded between Ulladulla and Port Stephens. Currently the species is known from just over 200 plants across 13 sites. The species has been recorded in Berowra Valley Regional Park, Royal National Park and Lane Cove National Park and may also occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments.	Low	None
<i>Grevillea caleyi</i>		E	E	Restricted to an 8 km square area around Terrey Hills, approximately 20 km north of Sydney. Occurs in three major areas of suitable habitat, namely Belrose, Ingleside and Terrey Hills-Duffys forest within the Ku-ring-gai, Pittwater and Warringah Local Government Areas. All sites occur on the ridgetop between elevations of 170 to 240m a.s.l, in association with laterite soils and a vegetation community of open forest, generally dominated by Eucalyptus sieberi and Corymbia gummifera. Commonly found in the endangered Duffys forest ecological community.	None	None
<i>Grevillea shiressii</i>	Grevillea shiressii	V	V	Grows along creek banks in wet sclerophyll forest with a moist understorey in alluvial sandy or loamy soils.	None	None
<i>Haloragodendron lucasii</i>		E	E	Occurs on Hawkesbury Sandstone in moist sandy loam soil. The species prefers sheltered aspects and inhabits gentle slopes below cliff lines near creeks in low open woodland or open forest. Its distribution is correlated with high soil moisture and phosphorus levels.	Low	None
<i>Hibbertia superans</i>	Hibbertia superans	E	-	Flowering time is July to December. The species occurs on sandstone ridgetops often near the shale-sandstone boundary. Occurs in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides.	None	None
<i>Kunzea rupestris</i>	Kunzea rupestris	V	V	Grows in shallow depressions on large flat sandstone rock outcrops. Characteristically found in short to tall shrubland or heathland.	None	None
<i>Lasiopetalum joyceae</i>	Lasiopetalum joyceae	V	V	Grows in heath on sandstone.	None	None
<i>Leptospermum deanei</i>	Leptospermum deanei	V	V	woodland on lower hill slopes or near creeks. Sandy alluvial soil or sand over sandstone. Occurs in riparian scrub, woodland and open forest.	None	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. Scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north.	None	None
<i>Melaleuca deanei</i>	Deane's Paperbark	V	V	Grows in wet heath on sandstone in coastal districts from Berowra to Nowra.	None	None
<i>Microtis angusii</i>	Angus's Onion Orchid	E	E	It is not easy to define the preferred natural habitat of this orchid as the Ingleside location is highly disturbed. The dominant species occurring on the site are introduced weeds <i>Coolatai</i> grass and <i>Acacia saligna</i> . The Ingleside population occurs on soils that have been modified but were originally those of the restricted ridgetop lateritic soils in the Duffys forest - Terrey Hills - Ingleside and Belrose areas. These soils support a specific and distinct vegetation type, the Duffys forest Vegetation Community which is listed as an EEC under the TSC Act and ranges from open forest to low open forest and rarely woodland.	Low	None
<i>Persicaria elatior</i>		V	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	None	None
<i>Persoonia hirsuta</i>	Hairy Geebung	E	E	Distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. A large area of occurrence, but occurs in small populations, increasing the species's fragmentation in the landscape. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations. Probably killed by fire (as other <i>Persoonia</i> spp. are) but will regenerate from seed.	None	None
<i>Persoonia mollis</i> subsp. <i>maxima</i>	<i>Persoonia mollis</i> subsp. <i>maxima</i>	E	E	Occurs in sheltered aspects of deep gullies or on the steep upper hillsides of narrow gullies on Hawkesbury Sandstone. These habitats support relatively moist, tall forest vegetation communities, often with warm temperate rainforest influences. Flowers are likely to be pollinated predominantly by native bees. Self-pollination is usually unsuccessful.	None	None
<i>Pimelea curviflora</i> var. <i>curviflora</i>		V	V	Confined to the coastal area of Sydney between northern Sydney in the south and Maroota in the north-west. Former range extended south to the Parramatta River and Port Jackson region including Five Dock, Bellevue Hill and Manly. Occurs on shaley-lateritic soils over sandstone and shale-sandstone transition soils on ridgetops and upper slopes amongst woodlands.	None	None
<i>Pimelea spicata</i>	Spiked Rice-flower	E	E	Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in two disjunct areas; the Cumberland Plain (Narellan, Marayong, Prospect Reservoir areas) and the Illawarra	Low	None

Scientific Name	Common Name	BC Act	EPBC Act	Habitat	Likelihood of Occurrence	Potential for impact
				(Landsdowne to Shellharbour to northern Kiama). In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the inland Cumberland Plain sites it is associated with grey box and Ironbark. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey.		
<i>Prostanthera densa</i>	Villous Mintbush	V	V	Villous Mintbush is generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea.	None	None
<i>Prostanthera junonis</i>		E	E	The species is restricted to the Somersby Plateau. It occurs on both the Somersby and Sydney Town soil landscapes on gently undulating country over weathered Hawkesbury sandstone within open forest-low woodland-open scrub. It occurs in both disturbed and undisturbed sites.	None	None
<i>Prostanthera marifolia</i>		CE	CE	Occurs in localised patches in or in close proximity to the endangered Duffys forest ecological community. Located on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses, a soil type which only occurs on ridge tops and has been extensively urbanised.	None	None
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	Found only in NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State forest. On the south coast the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral rainforest. On the central coast it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities	None	None
<i>Tetratheca glandulosa</i>	<i>Tetratheca glandulosa</i>	V	V	Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gynea, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone bench. Soils are generally shallow, consisting of a yellow, clayey-sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops. Vegetation structure varies from heaths and scrub to woodlands-open woodlands, and open forest.	None	None

Appendix 2 – Plates



Plate 1: Sporting field with maintained lawn grasses and Port Jackson Figs in background



Plate 2: Port Jackson Figs along southern boundary fence



Plate 3: Channel of Middle creek tributary



Plate 4: Vegetated riparian zone along Middle creek tributary

Appendix 3 – Developments Plans



DRAWING LIST

- REF101 SITE PLAN
- REF201 GROUND LEVEL PLAN
- REF202 LEVEL 1 PLAN
- REF203 ROOF PLAN
- REF311 ELEVATIONS - SHEET 1
- REF312 ELEVATIONS - SHEET 2
- REF321 SECTIONS
- REF401 SHADOW DIAGRAMS
- REF601 PERSPECTIVES

ABBREVIATIONS

A/C	AIR CONDITIONING	FP	FIRE INDICATOR PANEL	REF	REFRIGERATOR
AFSL	ABOVE STRUCTURAL FLOOR LEVEL	FLR	FLOOR	RA	RETURN AIR
AL	ALUMINIUM	FP	FIBROUS PLASTER	RAO	RADIUS
AO	ACCESS OPENING	FRL	FIRE RESISTANCE LEVEL	RC	REINFORCED CONCRETE
AP	ACCESS PANEL	FRL	FLOOR WASTE TO SEWER	RCH	RANGE HOOD
AT	ACUSTIC TILE	GALV	GALVANISED	RH	ROBE HOOK
B	BOLLARD	GD	GATED DRAIN	RHS	RECTANGULAR HOLLOW SECTION
BAL	BALESTRADE	GL	GLAZING	RL	RENDER JOINT (V-JOINT)
BDY	BOUNDARY	GND	GROUND	RL	REDUCED LEVEL
BN	BORNDIE	GPO	GENERAL PURPOSE (POWER) OUTLET	RSW	RIGHT OF WAY
BHD	BULKHEAD	GR	GRAB RAIL	RS	ROLLER SHUTTER
BK	BRICK	GRANO	GRANOLITHIC	RW	RETAINING WALL
BLG	BUILDING	GRC	GLASS REINFORCED CONCRETE/CEMENT	RWH	RAINWATER HEAD
BLK	BLOCKWORK	GT	GATE	RWP	RAINWATER OUTLET TO STORMWATER
BN	BALNOISE	GTP	GREASE TRAP	RWP	RAINWATER PIPE
BCE	BRICK-ON-EDGE	HYD	HYDRANT	SA	SUPPLY AIR
BSN	BASIN	HC	HOSE COOK	SC	STEEL COLUMN
BTH	BATH	HMR	HIGH MOISTURE RESISTANT	SCR	SUNSCREEN
BWK	BRICKWORK	HR	HANDRAIL	SCT	SUSPENDED CEILING TILE
BWU	BUILDING WATER UNIT	HTR	HEATER	SD	SEWER DRAIN
CB	CONCRETE BLOCK	HW	HOT WATER	SFL	STRUCTURE FINISHED LEVEL
CCTV	CLOSED CIRCUIT TELEVISION	HND	HARDWOOD	SHB	SHOWER BATH
CD	CLOTHES DRYER	HNU	HOT WATER/LANT	SHR	SHOWER
CFC	COMPRESSED FIBROUS CEMENT	ID	INSIDE DIAMETER	SHS	SQUARE HOLLOW SECTION
CHS	CIRCULAR HOLLOW SECTION	IL	INVERT LEVEL	SK	SKIRTING
CI	CAST IRON	INCL	INCLUDE	SKL	SKYLIGHT
CIP	CAST IRON PIPE	INT	INTERNAL	SKK	SKIN
CJ	CONTROL JOINT	IO	INSPECTION OPENING	SP	SEWER PIT
CL	CENTRE LINE	J	JOINT	SPRC	SPECIFICATION
CNR	CLEANER	JT	JOINT	SPL	SPLASHBACK
COL	COLUMN	KB	KERB	SRL	SHOWER ROSE
CONC	CONCRETE	KG	KERB AND GUTTER	SS	STAINLESS STEEL
CP	CHROME-PLATED	KIT	KITCHEN	ST	STONE
CPT	CURB/BOARD	L	LOUIRE	SVP	SEWER VENT PIPE
CPT	CARPET	LDY	LAUNDRY	SW	STORM WATER
CS	CEMENT RENDER	LS	LOUIRE SCREEN	SWP	STORMWATER PIT
CSK	COUNTERSINK	M	MIRROR	T	TILE
CT	COOK TOP	MC	METAL CLADDING	TEL	TELEPHONE
CTR	CENTRE	MDF	MEDIUM DENSITY FIBREBOARD	TGSI	TACTILE INDICATORS
CW	COLD WATER	MP	MANHOLE	TMB	TIMBER
D	DOOR	MSC	MISCELLANEOUS	TOH	TOP OF HOH
DB	DISTRIBUTION BOARD	MJ	MISCELLANEOUS JOINT	TOK	TOP OF KERB
DF	DRINKING FOUNTAIN	NLM	NELMINE	TOW	TOP OF WALL
DG	DRAIN GROOVE	MO	MOISTURE RESISTANT	TP	TAP
DA	DIAMETER	MR	MOISTURE RESISTANT	TPH	TOILET PAPER HOLDER
DM	DIMENSION	MRS	METAL ROOF SHEETING	TR	TOWEL RAIL
DP	DORMER	MS	MILD STEEL	TRZD	TERRAZZO
DPC	DAMP-PROOF COURSE	MSB	MAIN SATCHBOARD	TUB	LAUNDRY TUB
DPN	DAMP-PROOF MEMBRANE	MV	MECHANICAL VENT	TV	TELEVISION
DWG	DRAWING	MW	METALWORK	TYP	TYPICAL
DS	DUCTED SKIRTING	NGL	NATURAL GROUND LEVEL	UGS	UNDERGROUND
DW	DRAIN	NC	NOT IN CONTRACT	US	UNDERSIDE
EA	EACH	ND	NUMBER	UB	UNIVERSAL BEAM
EDE	ELECTRICAL DISTRIBUTION BOARD	NGM	NOMINAL	UC	UNIVERSAL COLUMN
EJ	EXPANSION JOINT	NTS	NOT TO SCALE	URN	URN
EQ	EQUAL	OD	OUTSIDE DIAMETER	V	VINYL
ESB	ELECTRICAL SWITCHBOARD	OF	OVERFLOW/RAINWATER	VB	VANITY BORN
EX	EXISTING (PRIOR TO)	OFC	OFF-FORM CONCRETE	VOS	VERIFY ON SITE
EXT	EXTERNAL	CHD	OVERHEAD DOOR	VP	VENT PIPE
F	FRIED GLAZING	OP	OPENING	W	WINDOW
FB	FACE BRICK	OVEN	OVEN	WB	WEATHERBOARD
FBL	FACE BLOCK	P	PAINT (FINISH)	WC	WATER CLOSET
FCL	FINISHED CEILING LEVEL	PAV	PAVING	WR	WALK-IN ROBE
FCU	FAN COIL UNIT	PB	PLASTERBOARD	WM	WASHING MACHINE
FEN	FENCE	PC	PRECAST CONCRETE	WO	WALL OVEN
FFL	FINISHED FLOOR LEVEL	PBS	POSSIBLE BALLAST	WP	WASTE PIPE
FGL	FINISHED GROUND LEVEL	PFC	PARALLEL FLANGE CHANNEL	WPM	WATERPROOF MEMBRANE
FHR	FIRE HOSE REEL	PLY	PLYWOOD	WR	WANDROSE
		PTD	PAPER TOWEL DISPENSER	WS	WALL STIFFENER

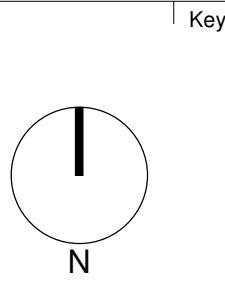
FOR REVIEW OF ENVIRONMENTAL FACTORS

OXFORD FALLS GRAMMAR SCHOOL LIBRARY / ADMIN BUILDING

1078 OXFORD FALLS ROAD
OXFORD FALLS, NSW 2100

Revisions	No.	Date	Description
1	19/12/19	DRAWING	ISSUE TO REF
2	11/03/20		

Checked: NZ
Approved: JW

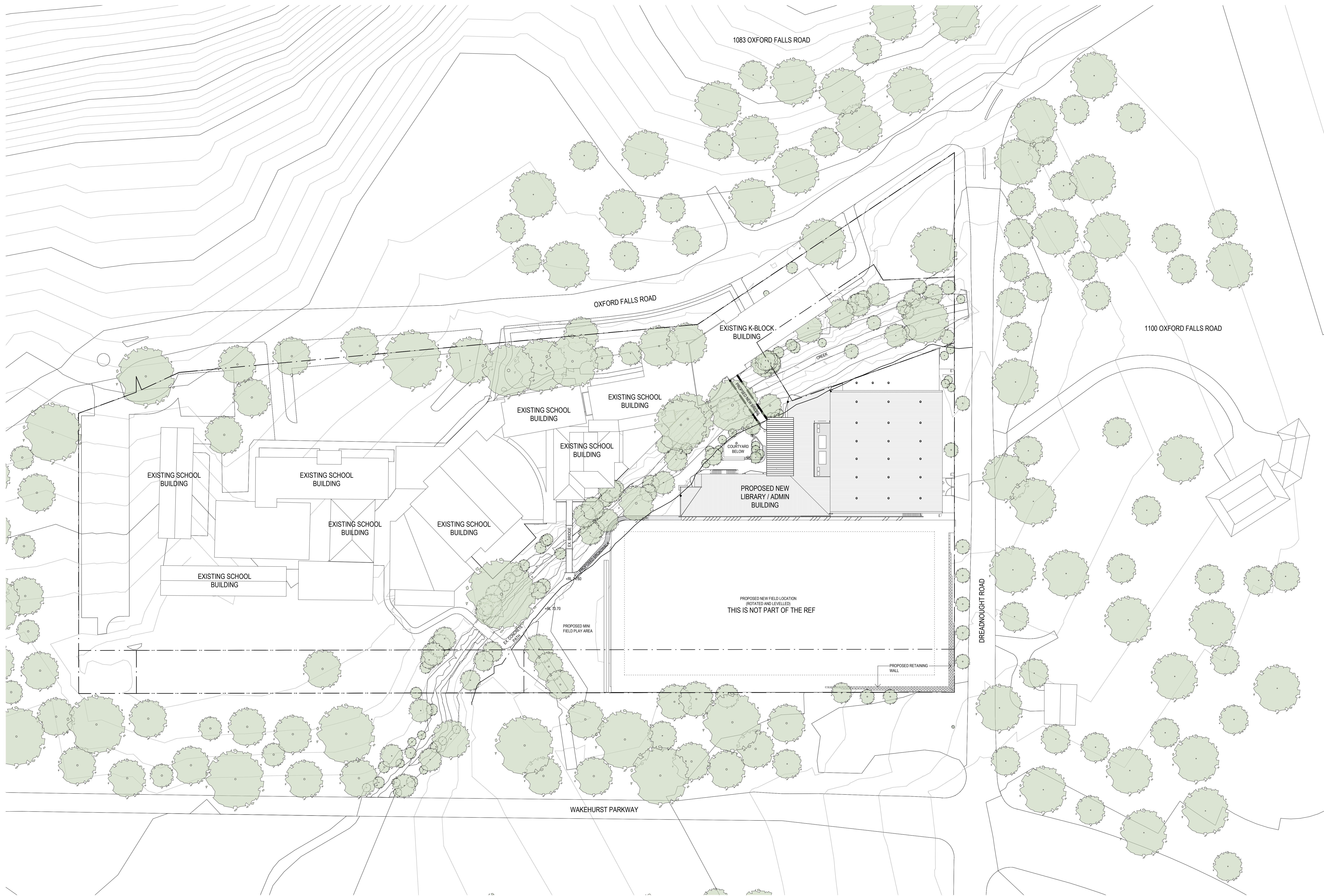


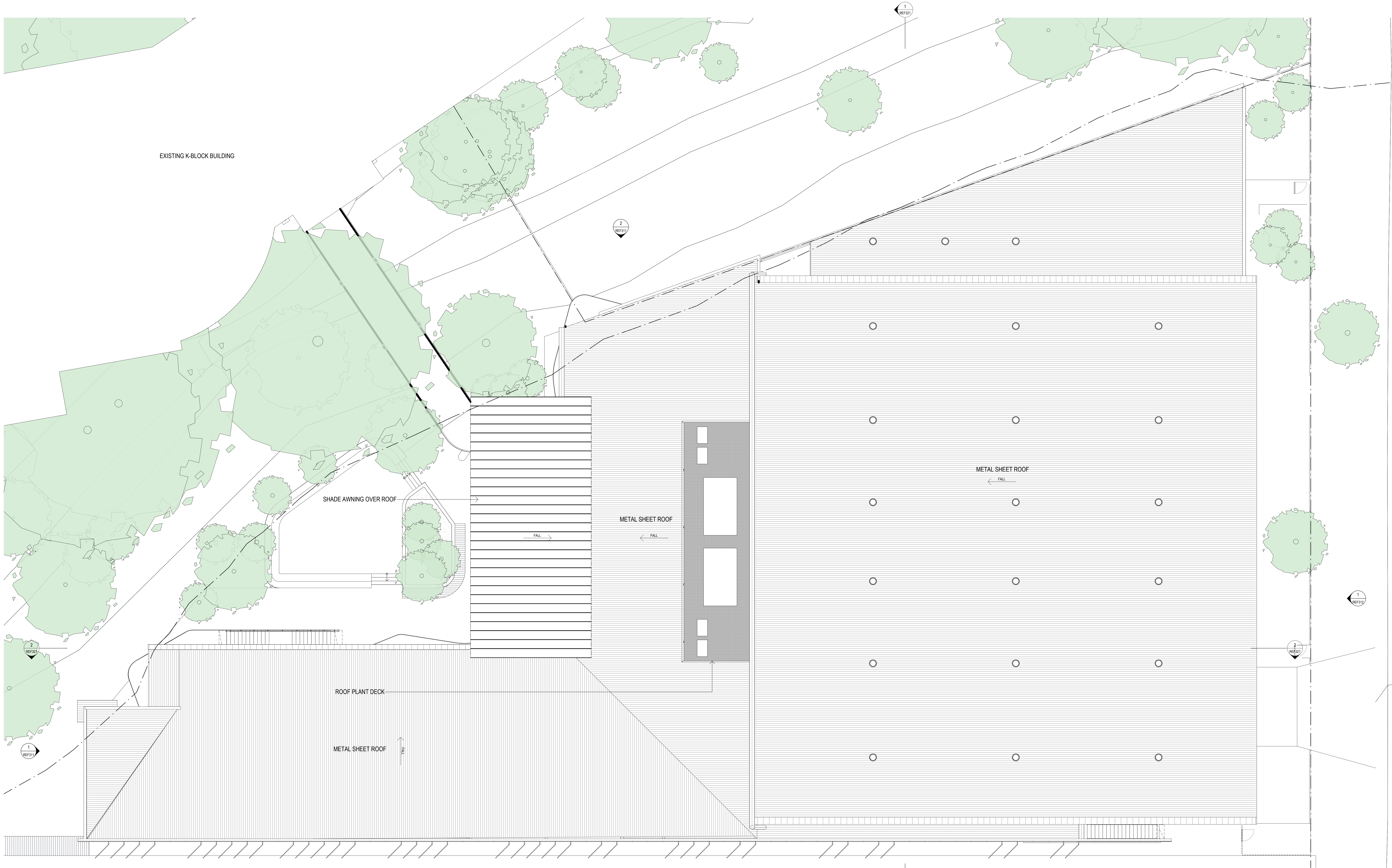
Architect: **AJ+C**
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Project: **OXFORD FALLS GRAMMAR SCHOOL LIBRARY / ADMIN BUILDING**
1078 OXFORD FALLS ROAD
OXFORD FALLS, NSW 2100
Proj. No. 18025

Drawing Title: **COVER SHEET**
Project Status: **NOT FOR CONSTRUCTION**

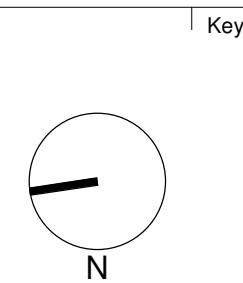
Scale: Drawing No. **REF001** Issue **2**





Revisions		
No.	Date	Description
1	19/12/19	DRAFT REF
2	11/03/20	ISSUE TO REF

Checked: NZ
Approved: JW



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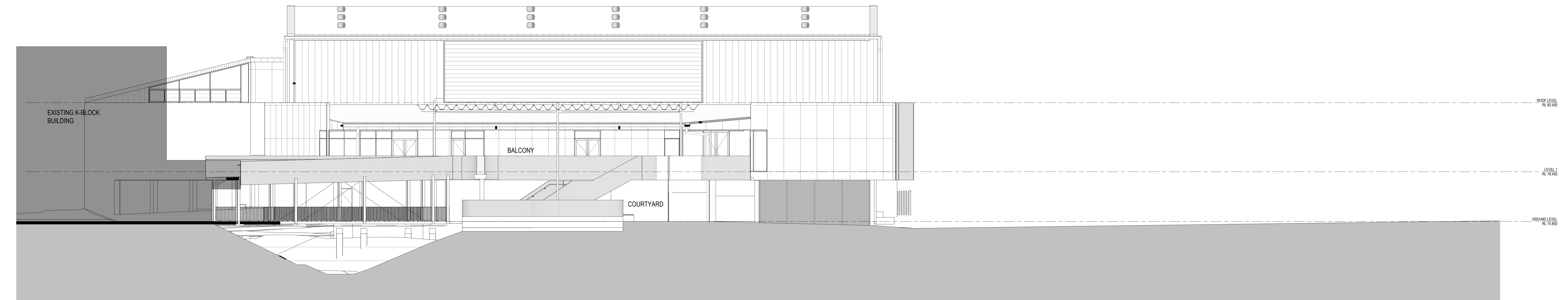
Project
OFGS LIBRARY / ADMIN BUILDING
1078 OXFORD FALLS ROAD
OXFORD FALLS, NSW 2100
Proj. No. 18025

Drawing Title
ROOF PLAN
Project Status
NOT FOR CONSTRUCTION

Scale
1 : 100 @A0 REF203
Drawing No.
2
Issue
2



2 EAST ELEVATION 1:100



1 NORTH ELEVATION 1:100

Revisions	No.	Date	Description	Checked	Approved
1	11/12/19		ISSUE FOR CONSULTANT COORDINATION		
2	19/12/19		SNWT REF		
3	11/03/20		ISSUE TO REF	NZ	JW

Key

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Project

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1078 OXFORD FALLS ROAD
OXFORD FALLS, NSW 2100

Proj. No. 18025

Drawing Title

ELEVATIONS - SHEET 1

Project Status

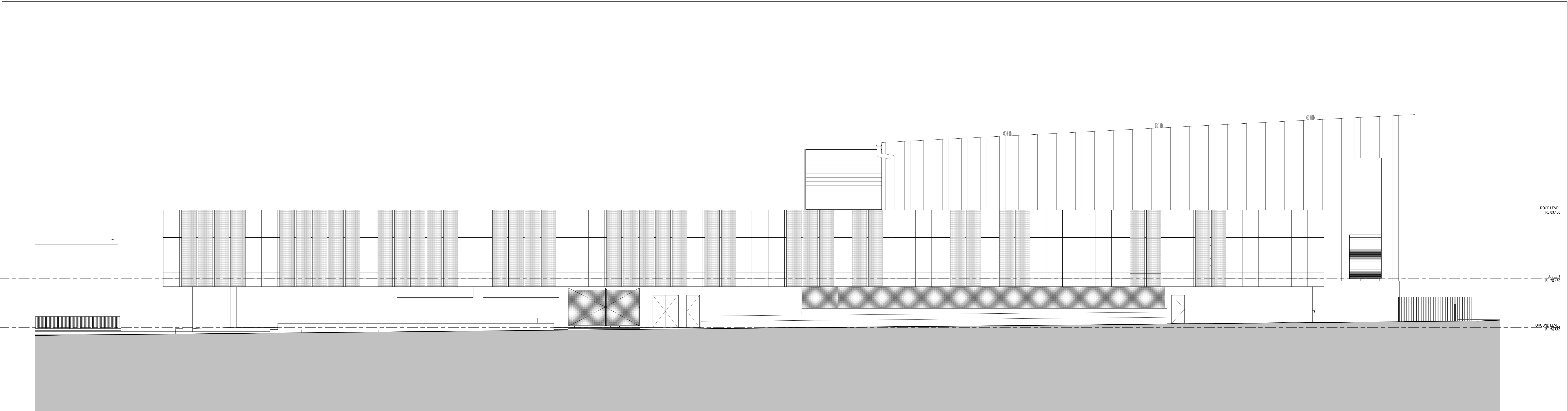
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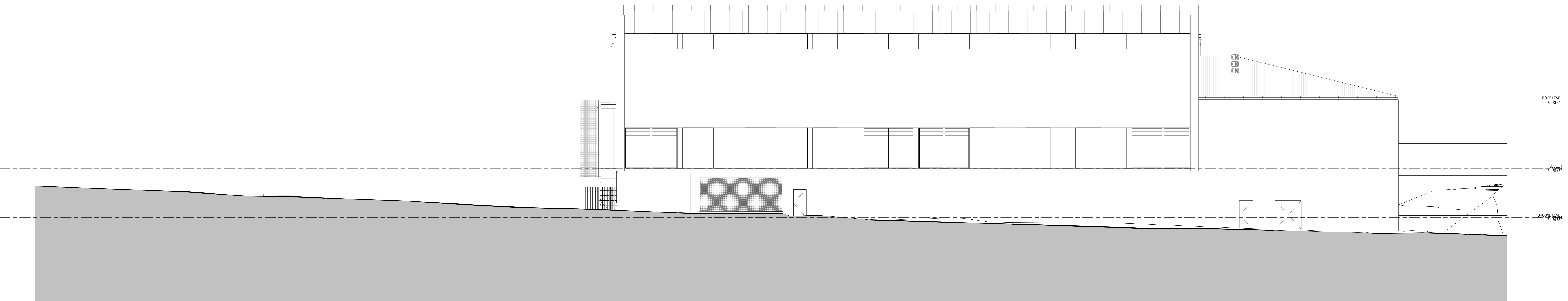
1 : 100 @A0 REF311

Issue

3



2 WEST ELEVATION 1:100



1 SOUTH ELEVATION 1:100

Revisions		Description	Checked	Approved
No.	Date			
1	11/12/19	ISSUE FOR CONSULTANT COORDINATION		
2	19/12/19	ISSUE TO REF		
3	11/03/20	ISSUE TO REF	NZ	JW

Key

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OXFORD FALLS, NSW 2100

Proj. No. 18025

Drawing Title

ELEVATIONS - SHEET 2

Project Status

NOT FOR CONSTRUCTION

Scale

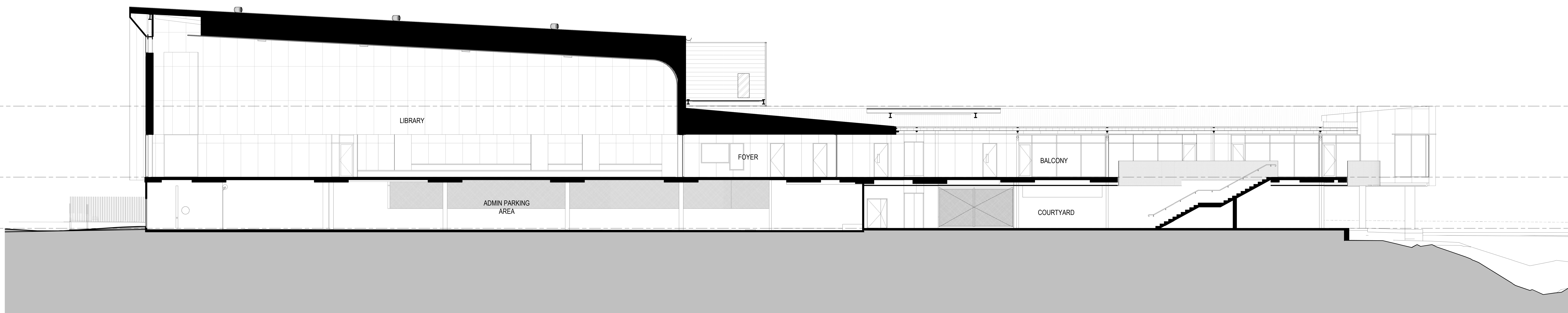
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Drawing No.

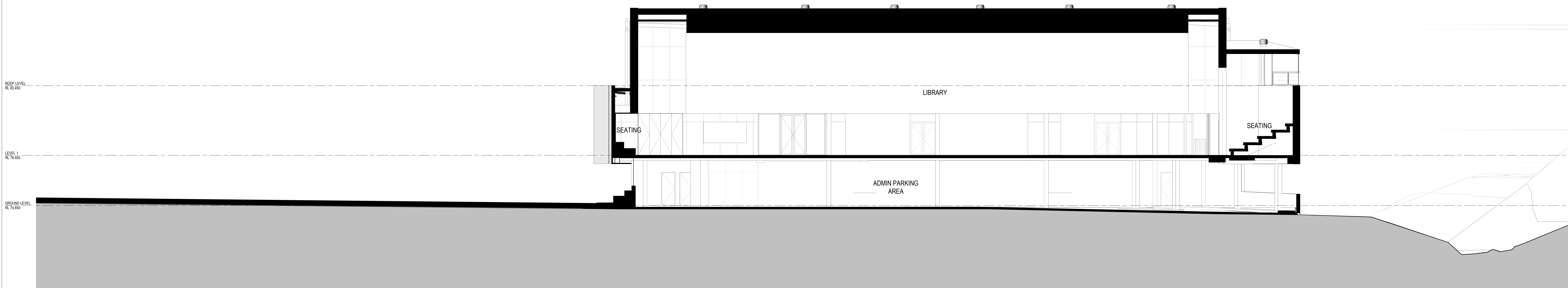
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Issue

3



2 SECTION A 1:100



1 SECTION B 1:100

Revisions No.	Date	Description	Checked	Approved
1	11/12/19	ISSUE FOR CONSULTANT COORDINATION		
2	19/12/19	DRAFT REF		
3	11/03/20	ISSUE TO REF	NZ	JW

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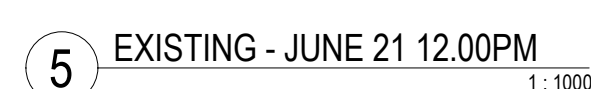
Project
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1078 OXFORD FALLS ROAD
OXFORD FALLS, NSW 2100

Proj. No. 18025

Drawing Title
SECTIONS

Project Status
NOT FOR CONSTRUCTION

Scale	Drawing No.
1 : 100 @A0	REF321



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Drawing Title
SHADOW DIAGRAMS

Project Status
NOT FOR CONSTRUCTION

Scale	Drawing No.	Issue
1 : 1000 @A0	REF401	2



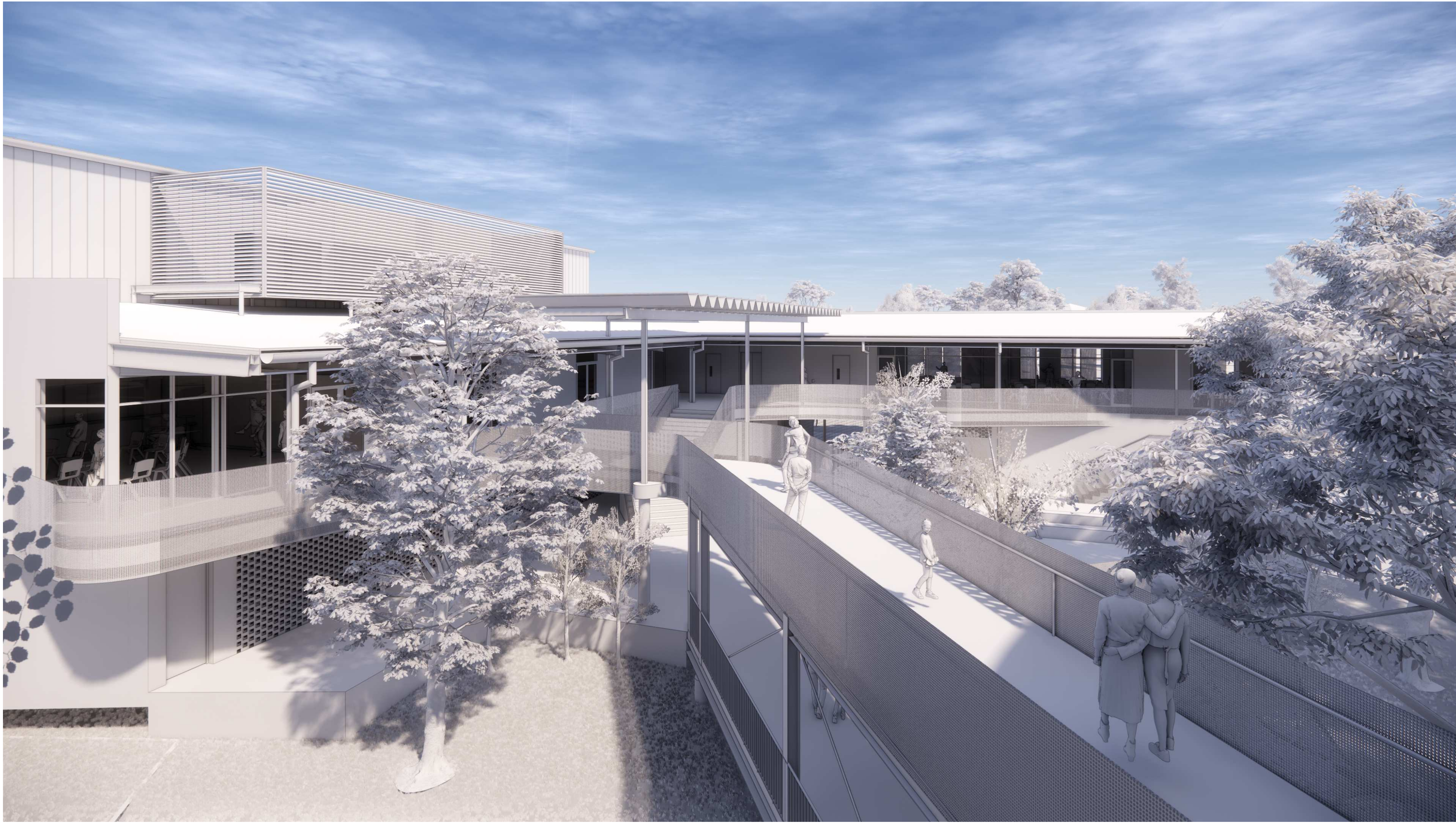
5 PERSPECTIVE FROM PROPOSED FIELD
1:1



1 PERSPECTIVE FROM DREADNOUGHT ROAD
1:1



2 PERSPECTIVE FROM BALCONY TO COURTYARD
1:1



3 PERSPECTIVE FROM K-BLOCK
1:1

Revisions	No.	Date	Description	Checked	Approved
1	19/12/19	DRAWING	ISSUE TO REF	NZ	JW
2	11/03/20				

Key



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Proj. No. 18025

Drawing Title
PERSPECTIVES

Project Status
NOT FOR CONSTRUCTION

Scale
Drawing No.
REF601

Issue
2

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Newcastle
Mudgee
Port Macquarie
Brisbane
Cairns



Our services

Ecology and biodiversity

Terrestrial
Freshwater
Marine and coastal
Research and monitoring
Wildlife Schools and training

Heritage management

Aboriginal heritage
Historical heritage
Conservation management
Community consultation
Archaeological, built and landscape values

Environmental management and approvals

Impact assessments
Development and activity approvals
Rehabilitation
Stakeholder consultation and facilitation
Project management

Environmental offsetting

Offset strategy and assessment (NSW, QLD, Commonwealth)
Accredited BAM assessors (NSW)
Biodiversity Stewardship Site Agreements (NSW)
Offset site establishment and management
Offset brokerage
Advanced Offset establishment (QLD)