BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT WAIVER

NEWCASTLE JOCKEY CLUB PROPOSED NEW STABLES COMPLEX – 125 CHATHAM STREET, BROADMEADOW NSW 2292

CLIENT: de Witt Consulting c/- AVIDPM Project Management Services

DATE: 5 August 2021

PREPARED BY: Alan Midgley

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- Department of Agriculture, Water and the Environment (DAWE) for access to the Protected Matters Search Tool of the Australian Government
- NSW Department of Planning, Industry and Environment, for access to the BioNet Atlas of NSW Wildlife.

de Witt Ecology staff involved in this project were:

- Alan Midgley (Fieldwork and Reporting)
- Alejandro Barreto (Report Review and GIS)

Glossary

Abbreviation	Meaning
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BCD	Biodiversity Conservation Division
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
CBD	Central Business District
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GHFF	Grey-headed Flying Fox
HBT	Hollow-bearing tree
LGA	Local Government Area
LoO	Likelihood of Occurrence
NJC	Newcastle Jockey Club
SSD	State Significant Development
SSI	State Significant Infrastructure
TECs	Threatened Ecological Communities

1. INTRODUCTION

The *Biodiversity Conservation Act 2016* (BC Act) requires that a State Significant Development (SSD) or State Significant Infrastructure (SSI) application must be accompanied by a Biodiversity Development Assessment Report (BDAR) unless the Secretary of the Department of Planning, Industry and Environment (DPIE) and the Chief Executive of the Biodiversity Conservation Division (BCD) determine that the proposed development is not likely to have any significant impact on biodiversity values. This determination is referred to as a BDAR Waiver.

Due to the very limited removal of native vegetation proposed (i.e. a small number of planted trees) within a mostly cleared environment and the fact this proposal is classified as SSD, de Witt Ecology have prepared a BDAR Waiver based on the suitability of this pathway for the project.

The purpose of the BDAR Waiver is to demonstrate that the proposal is unlikely to have any significant impact on biodiversity values within the study area.

2. PROPOSAL OVERVIEW

Newcastle Jockey Club is proposing a development ancillary to an existing recreation facility (major) (Newcastle Jockey Club) in Broadmeadow, NSW.

The proponent, Newcastle Jockey Club (NJC), proposes the construction of new horse stables and training facilities to serve the existing racecourse on the site (Appendix 5) (here after referred to as the proposal). The proposal includes the following:

- Demolition of existing equine pool and select built structures (Figure 1).
- Construction of seven x two storey stable blocks capable of accommodating up to 520 horses.
- Construction of horse walkers.
- Site office.
- Equipment shed.
- Equine pool.
- Wash bays, sand roll bays and feed bays.
- Storage and equipment sheds.
- Driveways and parking.
- Associated ramps, stormwater detention basins, waste storage, landscaping and fencing.

Due to the capital investment value the proposal is classified as State Significant Development (SSD). In order to complete proposed works, the removal of existing trees and vegetation is required in select areas of the site. In addition, twelve existing structures will require demolition (Figure 1; Appendix 6).

This Biodiversity Development Assessment Report (BDAR) Waiver identifies the potential biodiversity impacts of the proposal, being the removal of native trees / vegetation and demolition of twelve existing structures required as a result of the proposed works within the NJC. The investigation area which is associated with this proposed development is hereafter termed the study area.

For the purposes of this BDAR Waiver, biodiversity is as defined under Section 1.5 of the *Biodiversity Conservation Act 2016* (BC Act), and 'biodiversity values' includes vegetation integrity, habitat suitability and those values prescribed under Section 1.4 of the Biodiversity Conservation Regulation 2017 (BC Regs 2017).

2.1. PROPONENT NAME AND CONTACT DETAILS

- Proponent Name: Newcastle Jockey Club (NJC).
- Proponent Contact: Matt Benson (Chief Executive).
- Proponent Address: Darling St, Broadmeadow NSW 2292.
- Project ID: Newcastle Jockey Club BDAR Waiver.

2.2. APPLICATION PREPARATION

Field investigations were conducted by Alan Midgley (PhD) and Amy Rowles (B.Sc., Hons I). Reporting was conducted by Alan Midgley and reviewed by Alejandro Barreto (B. Biotech. [Botany]).

Alan is an ecologist with accreditation under the Biodiversity Assessment Methodology (BAM). Alan has relevant skills in flora and fauna identification and the preparation of a variety of ecology-based report types. Amy is a fauna ecologist who has extensive terrestrial field experience, with specialisation in microbat ecology, gleaned from her involvement in both consulting and research projects.

Alejandro is a Senior Ecologist and has over nine years' experience in the ecology sector, subsequently gaining an extensive knowledge of exotic and endemic NSW flora, fauna, ecological communities and migratory species. Alejandro is also an accredited assessor under the BAM. He has conducted biodiversity assessments for State Significant Developments and smaller developments, as well as BC Act offset calculations.

2.3. SITE DETAILS

The land ownership and Lot/DP numbers for the study area owned by the NJC are indicated in the following table.

Table 1: Land ownership and Lot/DP numbers for the study area

Lot/DP	Land Owner
13//227704	Newcastle Jockey Club
14//227704	Newcastle Jockey Club
82//1138209	Newcastle Jockey Club

The applicable Local Government Area (LGA) is Newcastle City Council.

2.4. DESCRIPTION OF EXISTING DEVELOPMENT SITE

The Newcastle Jockey Club site is located on Darling St, Broadmeadow NSW 2292, approximately 3.5 kilometres west of Newcastle's CBD. The study area has an area of approximately 3.6 ha and is occupied by an existing stables complex, administration building, an equine pool, maintenance building and a machinery shed currently utilised by NJC for day to day activities. It has a long frontage with Chatham Street (to the west) and Darling Street (to the south). Newcastle racecourse adjoins to the north with associative building infrastructure to the east. Residential allotments occur further to the south and west along Chatham Street and Darling Street.

2.5. PROPOSED DEVELOPMENT

The existing stables are nearing the end of their lifespan, and NJC has identified a critical requirement to upgrade the facility to industry best practice, as well as increasing the facility to cater for approximately 520 horses. NJC has identified the corner of Darling and Chatham Streets as the ideal location for the new stables complex, which is the location of the existing race day tie-up stalls and crucially, is adjacent to the crossing which affords ready access to the training facilities for the horses.

The proposed facility will be a significant improvement for thoroughbreds, trainers, support staff and suppliers of the existing facilities. The design seeks to provide a high level of thermal comfort and natural ventilation through passive means, improved opportunity for water capture and reuse, solar power utilisation, improved waste management, occupational health and safety enhancements and reduced dependence on road transportation.

The proposal includes demolition on site of an existing equine pool and twelve exiting structures (Figure 1), driveways, float parking and established landscaping, all of which will be demolished to accommodate the development. A large portion of the site is vacant, used as informal overflow parking during race day events.

The proposed development will be situated within a heavily disturbed and predominantly cleared urban area. The NJC study area is shown in Figure 1 and the proposed concept plan is shown in Appendix 5.

LEGEND

- Study Area
- Buildings to be Demolished
- Rapid Data Point (RDP)

Tree Locations

- To be removed
- To be retained
- Hollow-bearing tree (HBT)

Anabat Location

- Anabat Detector Only
- Stag Watch / Fly-out Survey with Anabat Detector

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FIGURE 1

Newcastle Jockey Club Location and Ecological Features

0 50 100 150 m

JOB ADDRESS:	125 CHATHAM STREET, BROADMEADOW NEW SOUTH WALES | AUSTRALIA				
CLIENT:	de Witt Consulting c/- AVIDPM Project Management Services				
A3 SCALE:	1:1,500	DRAWN:	AB	JOB REF:	EC057
PLAN DATE:	04/08/2021	CHECKED:	AM	ISSUE:	02

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3. METHODOLOGY

3.1. DESKTOP ASSESSMENT

Initial desktop investigations were conducted using the NSW Wildlife Atlas data search tool and the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) Protected Matters search tool to identify threatened flora, fauna and ecological communities with the potential to occur within a 10 km buffer of the study area.

A preliminary Likelihood of Occurrence (LoO) assessment was prepared for species identified through these database searches and was updated following field survey validation (i.e. habitat assessments). The field validated LoO assessment identifies species with a 'moderate or greater likelihood of occurring' (Appendix 1 and 2).

A threatened species Test of Significance (as required under Section 7.3 of the BC Act) and/or an EPBC Act Assessment of Significance was prepared for species identified as requiring further assessment (Appendix 3).

Field survey data, concept plans and a Scoping Report completed by de Witt Consulting (2021) was reviewed in combination with aerial imagery to analyse the extent of native vegetation cover.

3.2. FIELD SURVEYS

Site inspections were carried out by de Witt Ecologist, Alan Midgley, on 11th May 2021 with the purpose of identifying if any of the trees proposed for removal contained hollows or any other significant habitat features e.g. nests. Any hollow-bearing trees recorded were flagged with pink flagging tape and marked with a unique aluminium tag. Mid-storey and groundcover vegetation was also assessed during the field survey to determine any ecological values of these areas. Site inspections also focused on the potential incidence of threatened flora, fauna and/or ecological communities listed under the BC Act and EPBC Act. Opportunistic sightings and secondary indications of fauna were also recorded.

3.2.1. Fieldwork Variation

Submission and subsequent review of this BDAR Waiver by the Biodiversity Conservation Division (BCD) within the Department of Planning, Industry and Environment (DPIE) resulted in a request for further information regarding potential threatened microbat habitat within the study area. Three threatened microbat species have been determined to require further investigations, including

- Eastern Coastal Freetail Bat (*Micronomus norfolkensis*).
- Little Bent-winged Bat (*Miniopterus australis*).
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*).

This request relates to hollow-bearing trees proposed for removal and assessment under the 'Impacts to threatened species habitat for non-native vegetation and human made structures' component of the BDAR Waiver application process.

This includes:

- Recommendation that the two hollow-bearing trees requiring removal as part of the proposed works (Trees 8 and 11; Figure 1) are subjected to a fly out / stag watch survey in accordance with Page 75 of the *Draft Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (Department of Environment and Conservation [DEC] 2004).
- Recommendation that a daytime microbat roost search is conducted around and within any built structures to be demolished in accordance with the *'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method* (Office of Environment and Heritage [OEH] 2018).

BCD have stated that while the site is unlikely to provide breeding habitat, both the Eastern Coastal Freetail Bat and the Little Bent-winged Bat have the potential to utilise the tree hollows as roosting habitat and all three species have the potential to utilise buildings proposed for demolition as roosting habitat.

BCD have specified that from these surveys, the proponent will need to demonstrate that there is no evidence of threatened microbats utilising these potential roosting habitats.

In consideration of BCD's request and relevant recommended guidelines (DEC [2004] and OEH [2018]), an additional site inspection was carried out by Ecologists Amy Rowles and Alan Midgley, on 2nd August 2021, with the purpose of identifying potential microbat roosting habitats. The fieldwork consisted of the following:

- Hollow-bearing trees 8 and 11 were stag watched from 4.45pm – 6.15pm in conjunction with microbat detectors used to detect any bats exiting hollows (Corymbia Ecology 2021).
- Twelve buildings that are proposed for removal were inspected for potential microbat habitat (Figure 1). Where possible cavities were searched, using a torch, however not all potential cavities were able to be searched due to logistical constraints. As not all cavities could be visually inspected, a microbat call detector was carried during the inspection, however this would only detect microbats that were active and making calls. Four detectors were positioned around the buildings proposed for demolition to capture potential microbat activity at dusk (Figure 1) (Corymbia Ecology 2021).

4. RESULTS

4.1. DESKTOP ASSESSMENT

Desktop assessments identified 150 fauna species and 32 flora species listed as threatened or migratory under the BC Act and/or EPBC Act as occurring or potentially occurring within the locality. A full list of these species with their likelihood of occurrence is listed in Appendix 1 and 2.

The LoO assessment identified four species with a moderate or greater likelihood of occurrence, as listed below in Table 3. These species required further assessment under the BC Act (as per Section 7.3 of the BC Act) to assess the level of impacts expected. These Assessments of Significance (AoS) are provided in Appendix 3.

Table 3: Threatened species with a moderate or higher likelihood of occurrence

Scientific Name	Common Name	BC Act	EPBC Act
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	
Miniopterus australis	Little Bent-winged Bat	V	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	

4.2. FIELD SURVEYS

Field investigations determined that the study area is comprised of managed gardens and lawns with occasional planted trees and existing structures within an urban context (Plates 1-7). Manged gardens and lawns did not offer any significant habitat features, featuring a dominance of mostly exotic flora species with occasional native species, including *Callistemon salignus* (Willow Bottlebrush), *Ligustrum lucidum* (Broad-leaf Privet), *Ochna serrulata* (Mickey Mouse Plant), *Melaleuca ericifolia* (Swamp Paperbark), *Eragrostis tenuifolia* (Elastic Grass), *Cenchrus clandestinus* (Kikuyu Grass), *Stenotaphrum secundatum* (Buffalo Grass), *Soliva sessilis* (Bindyi), *Hypochaeris radicata* (Catsear), *Trifolium repens* (White Clover) and *Cynodon dactylon* (Couch).

Twenty-one trees were recorded within the study area, of which 16 are native and five are exotic (Figure 1; Appendix 4). Trees 3 and 4, which were *Eucalyptus robusta*, were observed to be heavily in flower during the field investigation. These trees potentially provide foraging resources for a range of highly mobile fauna species, including Rainbow Lorikeet (*Trichoglossus haematodus*), which were observed feeding on the extensive flower blossom provided by these trees. Three of these trees (Trees 2, 8 and 11) contain small-medium sized hollows which provides potential nesting / breeding habitat for a range of fauna species.

Tree 2, is suspected to be *Eucalyptus scoparia* (Wallangarra White Gum), which is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. This species is endemic to northern NSW and does not occur in the locality naturally. This species has been widely planted as a medium to large ornamental street tree throughout the broader region. This tree is located outside the proposal impact area and will be retained.

The remaining trees observed within the study area offered only minor habitat value.

Tree attributes for relevant trees assessed during this investigation are provided in Table 4 below.

Table 4: Trees assessed proposed for removal and retainment

Tree #	Species	Exotic	Habitat Value	Removal	Plate # (See Appendix 4)
1	*Corymbia maculata* (Spotted Gum)		Nil	Retain	8
2 (Site Tree Tag 'HBT1')	Suspected *Eucalyptus scoparia* (Wallangarra White Gum)		Hollow-bearing (3 x small hollows, 1 x medium hollow) Sparsely flowering	Retain	9
3	*Eucalyptus robusta* (Swamp Mahogany)		Heavily in flower Rainbow Lorikeets feeding	Retain	10
4	*Eucalyptus robusta* (Swamp Mahogany)		Heavily in flower Rainbow Lorikeets feeding	Retain	11
5	*Lophostemon confertus* (Brush Box)		Nil	Yes	12
6	*Eucalyptus saligna* (Sydney Blue Gum)		Nil	Yes	13
7	*Eucalyptus saligna* (Sydney Blue Gum)		Nil	Yes	14
8 (Site Tree Tag 'HBT2')	*Eucalyptus saligna* (Sydney Blue Gum)		Hollow-bearing (1 x medium trunk hollow)	Yes	15
9	*Callistemon viminalis* (Weeping Bottlebrush)		Moderate flower	Retain	16
10	*Eucalyptus saligna* (Sydney Blue Gum)		Nil	Yes	17
11 (Site Tree Tag 'HBT3')	*Eucalyptus botryoides* (Bangalay)		Hollow-bearing (1 x small trunk hollow)	Yes	18
12	*Eucalyptus botryoides* (Bangalay)		Nil	Yes	19
13	*Melaleuca quinquenervia* (Broad-leaved Paperbark)		Moderate flower	Yes	20
14	*Melaleuca quinquenervia* (Broad-leaved Paperbark)		Moderate flower	Yes	21
15	*Ficus microcarpa* (Chinese Banyan)	*	Marginal fruiting, otherwise nil	Yes	22
16	*Ficus microcarpa* (Chinese Banyan)	*	Marginal fruiting, otherwise nil	Yes	23
17	*Ficus microcarpa* (Chinese Banyan)	*	Marginal fruiting, otherwise nil	Yes	24
18	*Ficus macrophylla* (Moreton Bay Fig)		Marginal fruiting, otherwise nil	Retain	25
19	Cluster of *Livistona australis* (Cabbage Fan Palm)		Nil	Retain	26
20	*Ficus microcarpa* (Chinese Banyan)	*	Marginal fruiting, otherwise nil	Retain	27
21	*Ficus microcarpa* (Chinese Banyan)	*	Marginal fruiting, otherwise nil	Retain	28

Threatened Ecological Communities (TECs), listed under the BC and EPBC Act, were not recorded in the study area. Other than the suspected *E. scoparia* individual recorded outside the area of impact, no other threatened flora or fauna species were detected during survey efforts.

Photographs taken during the field survey are provided in Appendix 4.

4.2.1. Microbat Fieldwork

Bat calls were not recorded in the vicinity of hollow-bearing trees 8 and 11 during stag watch / fly-out surveys (Corymbia Ecology 2021).

Inspections of twelve buildings proposed for demolition resulted in no evidence of current use by microbats (Figure 1). Nevertheless, some of these structures did contain cavities that may be suitable for microbats to use for roosting purposes (Corymbia Ecology 2021). These are identified in Table 5 below. Contextual building site photos are provided in Appendix 4 where relevant.

Microbats regularly move to alternative roost sites and therefore it is possible for microbats to use these structures at other times even though they were not detected during the survey. The habitat provided by the buildings proposed for demolition is most likely to provide temporary habitat for microbat individuals rather than a large established colony (Corymbia Ecology 2021).

Table 5: Structures searched for presence of bat roosts (Corymbia Ecology 2021)

Structure Number (Figure 1)	Structure	Potential bat roost habitat	Plate # (See Appendix 4)
1	Ticket booth at Chatham Street gate	No potential roost cavities	N/A
2	Colourbond machinery shed	No potential roost cavities	N/A
3	Commentary tower	Small crevices on the eaves on the east side of the building into a ceiling space. No sign of current activity (no staining and presence of spider webs). Ceiling space could not be inspected.	Plate 38
4	Stables	The stables contained Besser block walls which did not extend to the full height of the roof. In some of these walls, the cavities were not filled with cement and therefore narrow vertical cavities open at the top were present. Although not high-quality habitat, these spaces may still be occasionally used by microbats. The roof structures did not contain suitable roosting habitat, with the exception of the eastern end of Stable 9, where some store rooms have insulation under the tin, providing a cavity for microbats to roost. Mud bird nests, often used by bats, were not present in these buildings.	Plates 29-32, 37
5	Stables		
6	Stables		
7	Stables		
8	Stables		
9	Stables and store rooms		
10	Maintenance building	This is a brick building with some gaps on the eaves along the northern face of the building. The ceiling is raked in this building, therefore there is no large ceiling cavity available, only a small space between the insulation and tin. Vents on the eastern and western ends of the building open into the main building space and not into an enclosed cavity. The cavity between the double brick either side of the roller door was inspected with no sign of microbats.	Plate 33-35
11	Pool shed	Some eaves are missing on the northern side of the shed, allowing access into the roof space.	Plate 36
12	Entry gates and tower	This structure does not contain any cavities. Individual microbats are known to roost in roller doors, so care should be taken when dismantling this structure.	N/A

Microbat detectors positioned around the buildings proposed for demolition recorded three microbat passes. Two passes were recorded by a detector positioned on the west side of the stables. One at 6.09pm and another at 6.15pm. The first call was a Gould's Wattled Bat *Chalinolobus gouldii* and the second is also likely to have been the same species. However, the call characteristics were less clear and there is a small possibility that the individual may have been a freetail bat (*Mormopterus ridei* or *Micronomus norfolkensis*). The other pass was recorded on the east side of the stables, 12 seconds after the first and was likely the same microbat passing over. The detectors placed in the vicinity of the maintenance building and pool shed did not record any microbat calls.

Overall, very low microbat activity was recorded, which was expected due to the time of year that the survey was conducted (winter) and the low-quality habitat in the local vicinity. Although microbat activity is reduced in winter, individuals of the population do forage on warmer nights in winter. The conditions at dusk were suitable for some bat activity (no rain and approximately 16^{o}C, however moderate gusts of wind did reduce this ambient temperature).

5. IMPACTS ON BIODIVERSITY VALUES

Impacts on biodiversity values are addressed in the following section of this Report, as detailed in Table 6 below.

Table 6: Impacts on biodiversity values from the proposed disturbances

Biodiversity Value	Meaning	Relevance	Section addressed
Vegetation abundance	Occurrence and abundance of vegetation at a particular site	N/A	5.1
Vegetation integrity	Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state	N/A	5.2
Habitat suitability	Degree to which the habitat needs of threatened species are present at a particular site	N/A	5.3
Threatened species abundance	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site	N/A	5.3
Habitat connectivity	Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range	N/A	5.4
Threatened species movement	Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle	N/A	5.4
Flight path integrity	Degree to which the flight paths of protected animals over a particular site are free from interference	N/A	5.5
Water sustainability	Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.	N/A	5.6

5.1. OCCURRENCE AND ABUNDANCE OF VEGETATION WITHIN THE STUDY AREA

This section relates to Section 1.4(b) of the BC Regs 2017.

The study area for the proposal lies within an existing heavily disturbed and managed urban greenspace containing occasional planted native / exotic mature trees (refer to Appendix 4 for tree and site photographs). The ground layer consists of managed lawn / garden environments and impervious surfaces.

Of the twelve trees proposed for removal, two contain small-medium sized hollows (Trees 8 and 11) which provides potential nesting / breeding habitat for a range of fauna species.

Trees 3 and 4 (to be retained), which were *Eucalyptus robusta*, were observed to be heavily in flower during the field investigation. These trees potentially provide foraging resources for a range of highly mobile fauna species.

Tree 2, is suspected to be *Eucalyptus scoparia* (Wallangarra White Gum), which is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. This species is endemic to northern NSW and does not occur in the locality naturally. This species has been widely planted as a medium to large ornamental street tree throughout the broader region. This tree is located outside the proposal impact area and will be retained.

Field surveys did not detect any TECs within and adjacent to the study area.

5.1.1. Impact Avoidance

Consistent with the Application Documentation, the proposal will require the removal of 12 trees, of which nine are native and three are exotic, in both southern and central areas of the Study Area (Figure 1; Appendix 6). Two of these trees contain hollows (Trees 8 and 11) which provides potential nesting / breeding habitat for a range of fauna species. Due to the locality of the proposal within an urban context, it is unlikely that the hollows available provide preferred habitat for any threatened species which may occur in the area. The removal of these trees as a result of the proposal cannot be avoided.

It is recommended that vegetation clearing is to be undertaken using a two-stage process:

- Stage 1 includes removal of all non-habitat trees and under-storey vegetation with HBTs left standing for a minimum of 48 hours.
- Stage 2 vegetation clearing (clearance of HBTs) is to be supervised by a suitably trained and equipped ecologist. The ecologist will work in conjunction with machinery operators to remove habitat trees in the least disruptive manner.
- Any wildlife rescued during vegetation clearing is to be relocated to the closest available area of suitable habitat if uninjured. If wildlife is injured or orphaned during vegetation clearing they must be taken to the nearest available veterinarian or wildlife carer immediately. All vegetation clearing will cease until the ecologist returns to re-commence clearing supervision.
- Information on ecological features to be included in site inductions and pre-start meetings.

Tree 2, is suspected to be *Eucalyptus scoparia* (Wallangarra White Gum), which is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. This tree is proposed for retainment consistent with the Application Documentation (Appendix 6) and should remain unaffected by this proposal.

Although microbat use of buildings proposed for demolition was not recorded during the survey, there is still potential that microbats may be present at the time of demolition. If any microbats are encountered during the demolition process, it is recommended that a stop work action is implemented and an ecologist is engaged immediately to provide advice on any appropriate remedial measures that should be implemented on a fit-for-purpose basis.

It is recommended to install appropriate exclusion fencing to any construction areas where there is some potential for accidental encroachment. Inclusion of appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' is advised. The employment of this approach is recommended to ensure trees to be retained and the suspected *Eucalyptus scoparia* recorded east of the development area is retained and not accidently impacted upon.

The proposal includes substantial landscaping using native flora species, where practicable, including areas along the Chatham Street frontage. This may assist in providing some marginal potential habitat for fauna species which may frequent the area, chiefly for foraging purposes.

As such, the likelihood of impacts on native flora and fauna as a result of the proposal are considered to be negligible.

5.2. VEGETATION INTEGRITY

This section relates to Section 1.5(2)(a) of the BC Act.

The composition, structure, and function of vegetation within the study area and adjacent areas has been subject to a history of disturbance and urbanisation, greatly altering it from a natural state.

The study area has been subject to land degradation including, but not limited to:

- Land clearing and fragmentation consistent with a densely populated urban centre; and
- Surface water flow obstruction and alteration.

As a result, the vegetation within the study area now exists as planted mature trees with a ground layer of managed lawns / gardens and impervious surfaces. Overall, the vegetation integrity is considered to be low.

5.3. HABITAT SUITABILITY AND THREATENED SPECIES ABUNDANCE

This section relates to Section 1.5(2)(b) of the BC Act and Section 1.4(a) of the BC Regs respectively.

The field survey detected one suspected *Eucalyptus scoparia* (Wallangarra White Gum) (Tree 2), which is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. This species is endemic to northern NSW and does not occur in the locality naturally. This species has been widely planted as a medium to large ornamental street tree throughout the broader region. This tree is located outside the proposal impact area and will be retained. No other threatened species or TECs were detected within and adjacent to the study area.

Of the 12 trees proposed for removal, two contain hollows. Due to the locality of the proposal within an urban context, it is unlikely that the hollows available provide preferred habitat for any threatened species which may occur in the area. Nevertheless, these HBTs do offer some marginal potential habitat for threatened microbat species which may occur in the area, despite not being recorded during stag watch / fly-out survey. The stag watch / fly-out survey indicates that these HBTs do not currently provide significant threatened microbat habitat.

Buildings proposed for demolition did contain some cavities that may be suitable for threatened microbats to use for roosting purposes. However, no evidence of current use by threatened microbats was observed during the inspection. Overall, the survey indicates that the site does not currently provide significant threatened microbat habitat.

Some trees on site were in flower at the time of survey, and those proposed to be removed could offer foraging resources for highly-mobile threatened fauna species such as the Grey-headed Flying Fox (GHFF). The *Eucalyptus robusta* (Swamp Mahogany) trees, which are a key feed tree for this species will be retained as part of the proposal.

Due to the disturbed nature of the study area, the habitat available is considered to offer only low habitat value for flora and fauna.

The study area is void of karsts, cliffs, rocks, and other geological features of significance. As such, there are no anticipated potential impacts on these habitat features.

Impacts of the proposal will be limited to:

- Clearance of native and non-native vegetation, including two HBTs;
- Demolition of twelve existing structures;
- Minor land disturbance during construction; and
- Minor dust emissions during construction.

The outcome of the Assessment of Significance (AoS) (Appendix 3) is that project impacts are unlikely to lead to a significant impact on any threatened entity, and therefore entry into the Biodiversity Offsets Scheme (BOS) or a BDAR are not anticipated to be required.

5.4. HABITAT CONNECTIVITY AND THREATENED SPECIES MOVEMENT

This section relates to Section 1.4(c) of the BC Regs.

- The footprint for the proposal lies within a heavily disturbed and predominantly cleared urban / greenspace area where much of the surrounding area has been subject to urban land practices.
- The trees within the study area are separated from nearby vegetation and ecological communities, and do not offer habitat connectivity through the landscape. Trees on site would be potentially used by highly-mobile threatened species only, and those that do not rely on habitat connectivity to traverse the landscape.

Due to the disturbed nature of the study area and lack of significant connective vegetation through the surrounding landscape, the proposal is not considered to contribute to a loss of habitat connectivity of remnant vegetation or communities or fragment the movement of threatened species across their range.

5.5. FAUNA FLIGHT PATH INTEGRITY

This section relates to Section 1.4(e) of the BC Regs 2017.

Protected species flight paths are not likely to be impacted by the proposal.

Mature planted trees occur within the wider region, and fauna generally travel and migrate through existing connected vegetation of higher potential foraging and roosting habitat value, also minimising predation pressures. The proposed tree removal will occur within existing disturbed areas, and many trees will remain available on site for usage by aerial species. The proposal is not expected to present a significant barrier to the movement of native fauna or impact potential flight path integrity.

Although impacts upon fauna flight path integrity are not anticipated, the following controls will be implemented:

- Construction and tree clearance works to occur during daylight hours to minimise noise disturbance; and
- Dust suppression and sediment transport will be managed throughout construction duration.

5.6. WATER SUSTAINABILITY

This section relates to Section 1.4(f) of the BC Regs.

Access and movement of natural water will not be altered significantly by the proposal more than what is currently occurring within a disturbed urban setting.

The proposal is not expected to cause significant alteration to existing natural water bodies or hydrological processes that sustain threatened species or TECs.

6. CONCLUSION

The works associated with the proposal lie within existing disturbed areas in an urban setting.

Field surveys detected one suspected *Eucalyptus scoparia* (Wallangarra White Gum) (Tree 2), which is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. This species is endemic to northern NSW and does not occur in the locality naturally. This species has been widely planted as a medium to large ornamental street tree throughout the broader region. This tree is located outside the proposal impact area and will be retained. No other threatened species or TECs were detected within and adjacent to the study area. The likelihood of impacts on threatened species, communities or their habitats as a result of the proposal is considered negligible. The outcome of the Assessment of Significance (AoS) is that project impacts are unlikely to lead to a significant impact on the Grey-headed Flying-fox or relevant threatened microbats, and therefore entry into the Biodiversity Offsets Scheme (BOS) or a BDAR is not anticipated to be required.

Due to the disturbed nature of the study area and the removal of only 12 trees (two being hollow-bearing) and twelve existing structures within an urban setting required, the works associated with the proposal are not considered likely to contribute to a loss of habitat connectivity of remnant vegetation or communities, or interrupt the movement of threatened species across their range.

The infrastructure proposed by the development is not expected to present a barrier to the movement of native fauna or impact potential flight path integrity.

The study area is void of karsts, cliffs, rocks and other geological features of significance. As such, there are no anticipated impacts on these potential habitat features.

Based on the scope of works proposed and its classification as SSD, we believe that this BDAR Waiver provides a fit-for-purpose assessment of potential biodiversity impacts and is worthy of favourable consideration.

7. REFERENCES

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APPENDICES

APPENDIX 1 – FLORA

The following table includes a list of the threatened flora species that have potential to occur within the study area. The list of species is sourced from the NSW BioNet Wildlife Atlas and the Protected Matters Search Tool (DAWE; accessed May 2021).

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria
High	• Species/ecological communities recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 10 kilometres or from the relevant catchment/basin.
Moderate	• Records of terrestrial biota within 10 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 10 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area. • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 20 years)	Likelihood of occurrence in study area	Impact Assessment
Angophora inopina	V	V	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. Occurs most frequently in red bloodwood – scribbly gum woodland, wet heath, red mahogany – paperbark sedge woodland and stringybark – red bloodwood forest.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Caladenia tessellata (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.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Commersonia prostrata	E	E	Occurs on sandy, sometimes peaty soils in a wide variety of habitats: snow gum woodland at Rose Lagoon; blue leaved stringybark open forest at Tallong; and in brittle gum low open woodland at Penrose; scribbly gum - swamp mahogany ecotonal forest at Tomago.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 20 years)	Likelihood of occurrence in study area	Impact Assessment
Cryptostylis hunteriana (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 (Eucalyptus sclerophylla), Silvertop Ash (E. sieberi), Red Bloodwood (Corymbia gummifera) and Black Sheoak (Allocasuarina littoralis); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (C. subulata) and the Tartan Tongue Orchid (C. erecta).	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Cynanchum elegans (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.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Diuris praecox (Rough Doubletail)	V	V	Occurs between Ourimbah and Nelson Bay. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey. Exists as subterranean tubers most of the year. It produces leaves and flowering stems in winter.	2321	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 20 years)	Likelihood of occurrence in study area	Impact Assessment
Eucalyptus camfieldii	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.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Eucalyptus parramattensis subsp. decadens	V	V	Generally occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Euphrasia arguta	CE	CE	Occur in eucalypt forest with a mixed grass and shrub understorey within Nundle State forest. Sites have either been logged in the last few decades, or appear to have regrown from past clearing.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Genoplesium insignis (Variable Midge Orchid)	E	-	Grows in patches of kangaroo grass amongst shrubs and sedges in heathland and forest. Associated vegetation at Chain Valley Bay is described as dry sclerophyll woodland dominated by scribbly gum, red bloodwood, smooth-barked apple and black she-oak.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 20 years)	Likelihood of occurrence in study area	Impact Assessment
Grevillea parviflora subsp. parviflora (Small-flowered Grevillea)	V	V	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Often occurs in open, slightly disturbed sites such as along tracks.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Grevillea shiressii	V	V	Grows along creek banks in wet sclerophyll forest with a moist understorey in alluvial sandy or loamy soils.	40	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Melaleuca biconvexa (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.	6	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Persicaria elatior	V	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Phaius australis (Southern Swamp Orchid)	E	E	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Prasophyllum **sp. Wybong** (A leek orchid)	-	CE	Endemic to NSW. It is known from seven populations in eastern NSW near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell and Tenterfield.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Pterostylis gibbosa (Illawarra Greenhood)	E	E	Grows in open forest or woodland, on flat or gently sloping land with poor drainage. Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra).	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 20 years)	Likelihood of occurrence in study area	Impact Assessment
Pultenaea maritima	V	-	The species occurs in grasslands, shrublands and heath on exposed coastal headlands.	3	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Rhizanthella slateri	V, EP (Great Lakes)	E	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Rhodamnia rubescens (Scrub Turpentine)	CE	-	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. This species is characterised as highly to extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	3	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Rhodomyrtus psidioides (Native Guava)	CE	-	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. This species is characterised being extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

APPENDIX 2 – FAUNA

Appendix 2.1 Fauna species recorded from the study area

Below is a list of fauna species recorded from the study area during the present assessment and a list of threatened fauna species recorded or predicted to occur within 10 kilometres of the study area.

Notes to tables:

Status – EPBC Act: CE – Critically Endangered EN – Endangered VU – Vulnerable	**Status – BC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V – vulnerable (Part 1, Schedule 2)
Status – FM Act: C1 – critically endangered E1 – endangered E2 – endangered E4 – presumed extinct V1 – vulnerable	**Status – Non-indigenous species** * pest species not native to the area

Table: Vertebrate fauna recorded from the study area (current assessment)

Scientific name	Common name	Comm. status	NSW status
Rhipidura leucophrys	Willy Wagtail	-	-
Manorina melanocephala	Noisy Miner	-	-
Corvus coronoides	Australian Raven	-	-
Vanellus miles	Masked Lapwing	-	-
Eolophus roseicapillus	Galah	-	-
Egretta novaehollandiae	White-faced Heron	-	-
Grallina cyanoleuca	Magpie-lark	-	-
Sturnus tristis	Common Myna	-	-
Anthochaera carunculata	Red Wattlebird	-	-
Entomyzon cyanotis	Blue-faced Honeyeater	-	-
Columba livia	Rock Dove	-	-
Cracticus nigrogularis	Pied Butcherbird	-	-
Hirundo neoxena	Welcome Swallow	-	-
Cracticus tibicen	Australian Magpie	-	-
Trichoglossus haematodus	Rainbow Lorikeet	-	-

Appendix 2.2 Threatened fauna species likelihood

The following table includes a list of the significant fauna species that have potential to occur within the study area. The list of species is sourced from the NSW BioNet Wildlife Atlas and the Protected Matters Search Tool (DAWE; accessed May 2021).

Notes to table:

#	species predicted to occur by the DAWE database (not recorded on other databases)
##	species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched
Year	recorded on databases listed above
2021	recorded during current survey

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 10 kilometres or from the relevant catchment/basin.
Moderate	• Records of terrestrial species within 10 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 10 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Frogs						
Heleioporus australiacus (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.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Litoria aurea (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.	3	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Mixophyes balbus (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	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Uperoleia mahonyi (Mahony's Toadlet)	CE	CE	Mahony's Toadlet is endemic to the mid-north coast of New South Wales (NSW) and to date has been found between Kangy Angy and Seal Rocks. Current observations indicate Mahony's Toadlet inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand.	0	Low. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Birds						
Anseranas semipalmata (Magpie Goose)	V	-	Mainly found in shallow wetlands less than 1 m deep, with a dense growth of rushes or sedges.	1	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Anthochaera phrygia (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.	0	Low. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Ardenna carneipes (Flesh-footed Shearwater)	V	-	The Flesh-footed Shearwater mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Botaurus poiciloptilus (Australasian Bittern)	E	E	The Australasian Bitterns 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.	0	Negligible. Aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Burhinus grallarius (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 open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Calidris canutus (Red Knot)	-	E	The Red Knot is common in all the main suitable habitats around the coast of Australia. Very large numbers are regularly recorded in north-west Australia, with 80 Mile Beach and Roebuck Bay being particular strongholds. The only places it is not found in significant numbers are the northern part of the Great Australian Bight in South Australia and Western Australia, and along much of the NSW coast, where wader habitat is rather scarce (excluding the Hunter Estuary). It is widespread along the coast south of Townsville and along the coasts of NSW and Victoria. In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.	4	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Calidris canutus (Red Knot)	-	E	The Red Knot is common in all the main suitable habitats around the coast of Australia. Very large numbers are regularly recorded in north-west Australia, with 80 Mile Beach and Roebuck Bay being particular strongholds. The only places it is not found in significant numbers are the northern part of the Great Australian Bight in South Australia and Western Australia, and along much of the NSW coast, where wader habitat is rather scarce (excluding the Hunter Estuary). It is widespread along the coast south of Townsville and along the coasts of NSW and Victoria. In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.	4	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Calidris ferruginea (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	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Calidris ferruginea (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	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Calidris tenuirostris (Great Knot)	V	-	In NSW, the species has been recorded at scattered sites along the coast to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith. Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Callocephalon fimbriatum (Gang-gang Cockatoo)	V	-	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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Calyptorhynchus lathami (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.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Charadrius leschenaultii (Greater Sand-plover)	V	-	Occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons. Non-breeding in Australia.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Charadrius mongolus (Lesser Sand-plover)	V	-	Inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Non-breeding in Australia.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Daphoenositta chrysoptera (Varied Sittella)	V	-	Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby under storey 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.	2	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Diomedea antipodensis (Antipodean Albatross)	V	V	The species ranges across the southern Pacific Ocean, east to the coast of Chile and west to eastern Australia. The Antipodean Albatross breeds biennially in colonies on ridges, slopes and plateaus of isolated subantarctic islands, usually in vegetation such as grass tussocks. This species regularly occurs in small numbers off the NSW south coast from Green Cape to Newcastle during winter where they feed on cuttlefish.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Diomedea antipodensis gibsoni (Gibson's Albatross)	V	-	The species is regularly encountered on trans-Tasman shipping routes and at seas off Sydney, and regularly occurs off the NSW coast usually between Green Cape and Newcastle. This species is known only to breed on the Adams, Disappointment and Auckland Islands in the subantarctic Auckland Island group. Potential forage in NSW waters during the winter is considered significant for the species.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Diomedea epomophora (Southern Royal Albatross)	V	V	Breeding occurs on Adams, Enderby and Auckland Islands (Auckland Islands group), Campbell Island, and on Taiaroa Head (Otago Peninsula, South Island), New Zealand. This otherwise pelagic species is most commonly recorded in New Zealand and South American waters in the non-breeding season, but may circumnavigate all the way around the Southern Ocean	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Diomedea exulans (Wandering Albatross)	E	-	The Wandering Albatross is marine, pelagic and aerial.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Diomedea sanfordi (Northern Royal Albatross)	E	E	Marine, subtropical to sub-Antarctic oceans; occasionally further south into the Antarctic.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Erythrotriorchis radiatus (Red Goshawk)	CE	-	The Red Goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia.	0	Low. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Falco hypoleucos (Grey Falcon)	E	-	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	0	Low. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Fregetta grallaria grallaria (White-bellied Storm-Petrel)	-	V	The White-bellied Storm-Petrel occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia. It breeds, in Australian territory, on offshore islets and rocks in the Lord Howe Island group. It nests in crevices between large volcanic rocks, and in burrows excavated in banks. Breeding colonies are often situated along dykes .	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Glossopsitta pusilla (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.	3	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Grantiella picta (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.	0	Low. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Haematopus fuliginosus (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.	11	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Haematopus longirostris (Pied Oystercatcher)	E	-	The Pied Oystercatcher inhabits marine littoral habitats, including islands. It occupies muddy, sandy, stony or rocky estuaries, inlets and beaches, particularly intertidal mudflats and sandbanks in large marine bays.	4	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Haliaeetus leucogaster (White-bellied Sea-Eagle)	V	M	Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna.	5	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Hieraaetus morphnoides (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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Hirundapus caudacutus (White-throated Needletail)	-	M	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	0	Low. The site is heavily disturbed and doesn't provide preferred potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Lathamus discolor (Swift Parrot)	E	CE	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.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Limosa lapponica (Bar-tailed Godwit)	-	M	Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Lophoictinia isura (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 Eucalyptus longifolia, Corymbia maculata, E. elata or E. smithii. Individuals appear to occupy large hunting ranges of more than 100km2. 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.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Macronectes giganteus (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.	2	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Macronectes giganteus (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.	2	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Macronectes halli (Northern Giant-petrel)	V	V	Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Ninox connivens (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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Ninox strenua (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.	66	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Numenius madagascariensis (Eastern Curlew)	-	CE	The Eastern curlew spends its breeding season in northeastern Asia, including Siberia to Kamchatka, and Mongolia. Its breeding habitat is composed of marshy and swampy wetlands and lakeshores. Most individuals winter in coastal Australia, with a few heading to South Korea, Thailand, Philippines and New Zealand, where they stay at estuaries, beaches, and salt marshes. It uses its long, decurved bill to probe for invertebrates in the mud. It may feed in solitary but it generally congregates in large flocks to migrate or roost. Its call is a sharp, clear whistle, cuuue-reee, often repeated.	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Pachyptila turtur subantarctica (Fairy Prion)	V	V	The fairy prion is the smallest prion and it measures between 23 and 28 cm (9.1–11.0 in) long.[2] Its plumage is blue-grey on its upperparts, and white underneath. They have a dark "M" on their upperparts extending to their wingtips, and their tail is wedge-shaped with a dark tip. They have a blue bill and feet. The diet consists mainly of planktonic crustaceans and other tiny sea animals, which they feed at night from the water's surface. They breed colonially and prefer small islands. The nest is situated in soil, hidden by vegetation and is dug with the bill or feet, or it is in a hollow in a crevice. When coming back to their nest at night, they will coo softly and listen for their mate. The fairy prion is found throughout oceans and coastal areas in the Southern Hemisphere. Their colonies can be found on Chatham, Snares and Antipodes Islands of New Zealand, Bass Strait Islands of Australia, Falkland Islands, Marion Island, the Crozet Islands and Macquarie Island. Outside of the breeding season, the fairy prion is most often found feeding over deep waters, far from shore. During stormy weather it may come towards coastal habitats. It breeds on oceanic islands, where it nests in crevices on cliffs and rock falls or in burrows in soil, although it may also nest in scrub, herblands, tussock or pasture.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Pandion cristatus (Osprey)	V	-	Ospreys are 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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Phoebetria fusca (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.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Pomatostomus temporalis (Grey-crowned Babbler (eastern subspecies))	V	-	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open box-gum woodlands on the slopes, and box-cypress-pine and open box woodlands on alluvial plains.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Pterodroma leucoptera leucoptera (Gould's Petrel)	V	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, and the at-sea distribution is poorly known.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Pterodroma neglecta neglecta (Kermadec Petrel)	V	V	Pelagic seabird that occurs in tropical, subtropical and temperate waters of the Pacific Ocean. It breeds on islands, atolls and islets in the southern Pacific Ocean. Breeding habitat in Australia includes Balls Pyramid and Phillip Island.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Ptilinopus magnificus (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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Ptilinopus regina (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.	1	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Ptilinopus superbus (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.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Rostratula australis (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.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Sterna fuscata (Sooty Tern)	V	-	The Sooty Tern is found over tropical and sub-tropical seas and on associated islands and cays around Northern Australia. In NSW only known to breed at Lord Howe Island. Large flocks can be seen soaring, skimming and dipping but seldom plunging in off shore waters. Breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands.	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Sternula albifrons (Little Tern)	E	-	Almost exclusively coastal, preferring sheltered environments; however may occur several hundred kilometres from the sea in harbours, inlets and rivers.	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Sternula nereis nereis (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.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche bulleri (Pacific Albatross)	V	V	Inhabits tropical to sub-Antarctic waters, shelf edge and pelagic, preferring warmer waters, of south seas where currents from the north make it warmer.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche bulleri platei (Northern Buller's Albatross)	0	V	Marine, pelagic species that occurs in subtropical and subantarctic waters of the South Pacific Ocean. In Australia, the species occurs over inshore, offshore and pelagic waters (Blaber 1986; Carter 1977; Rogers 1969) and off the coast of south-east Tasmania. Prefers waters of the East Australia Current where sea surface-temperatures are greater than 16.5 °C.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche cauta (Shy Albatross)	V	V	Marine species occurring in subantarctic and subtropical waters, reaching the tropics in the cool Humboldt Current off South America.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche cauta steadi (Black-browed Albatross)	V	V	The Black-browed Albatross has a circumpolar range over the southern oceans, and are seen off the southern Australian coast mainly during winter. Inhabits antarctic, subantarctic, subtropical marine and coastal waters over upwellings and boundaries of currents.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Thalassarche eremita (Chatham Albatross)	E	E	Breeds solely on a small, precipitous rock in the Chatham Islands called 'The Pyramid', to the east of New Zealand. When not breeding, the Chatham albatross migrates across the South Pacific and can be found off the coast of Peru and Chile	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche impavida (Campbell Albatross)	-	V	While most of its time is spent at sea, the Campbell albatross returns to land to breed, nesting on ledges and steep slopes which are covered with short grasses, tussocks and mud.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche melanophris (Black-browed Albatross)	-	V	Uses wide range of marine habitats from inshore shallows, bays and channels to the edge of the continental shelf and beyond to pelagic ocean environs.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thalassarche salvini (Salvin's Albatross)	-	V	Breeds on just a few small barren and rocky islands, and otherwise occupies the open oceans	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Thinornis rubricollis rubricollis (Hooded Plover)	CE	V	The Hooded Plover occurs on sandy beaches and inland saltlakes of south-eastern and south-western Australia. Within NSW, the Hooded Plover occurs along the southern coast, north to Jervis Bay. In souther-eastern Australian, the Hooded Plover is found mostly on long stretches of sandy shore, backed by tussock and creeper covered dunes with nearby inland lakes.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Tyto longimembris (Grass Owl)	V	-	Found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Tyto novaehollandiae (Masked Owl)	V	-	Inhabits a diverse range of wooded habitat that provide tall or dense mature trees with hollows suitable for nesting and roosting. Mostly recorded in open forest and woodlands adjacent to cleared lands. Nest in hollows, in trunks and in near vertical spouts or large trees, usually living but sometimes dead. Nest hollows are usually located within dense forests or woodlands. Masked owls prey upon hollow-dependent arboreal marsupials, but terrestrial mammals make up the largest proportion of the diet.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Tyto tenebricosa (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 hollows of tall emergent trees, mainly eucalypts often located in gullies. Nests have been located in trees 125 to 161 centimetres in diameter.	6	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Xenus cinereus (Terek Sandpiper)	V	-	The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons.	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Mammals						
Balaenoptera musculus (Blue Whale)	E	E	Breeds in warm water at low latitudes, preferring open seas rather than coastal waters.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Cercartetus nanus (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 .	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Chalinolobus dwyeri (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.	0	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide preferred potential habitat for this species.	Nil. Not recorded during the current field survey.
Dasyurus maculatus maculatus (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.	2	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Eubalaena australis (Southern Right Whale)	E	E	Migrate between summer feeding grounds in Antarctica and winter breeding grounds around the coasts of southern Australia, New Zealand, South Africa and South America. They feed in the open ocean in summer. They move inshore in winter for calving and mating.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Megaptera novaeangliae (Humpback Whale)	V	V	The population of Australia's east coast migrates from summer cold-water feeding grounds in subantarctic waters to warm-water winter breeding grounds in the central Great Barrier Reef.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Miniopterus australis (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.	39	Moderate. Recent records occur in the locality. Although the site is heavily disturbed, it does provide potential foraging and roosting habitat for this species. Marginal potential roosting habitat is present in the form of built structures. Preferred cave breeding / roosting habitat does not occur within the study area.	Minor. Not recorded during the current field survey.
Miniopterus schreibersii oceanensis (Eastern Bentwing-bat)	V	-	Eastern Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.	11	Moderate. Recent records occur in the locality. Although the site is heavily disturbed, it does provide potential foraging and roosting habitat for this species. Marginal potential roosting habitat is present in the form of built structures. Preferred cave breeding / roosting habitat does not occur within the study area.	Minor. Not recorded during the current field survey.
Mormopterus norfolkensis (Eastern Freetail-bat)	V	-	Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits.	13	Moderate. Recent records occur in the locality. Although the site is heavily disturbed, it does provide potential foraging habitat and roosting habitat (tree hollows and built structures) for this species.	Minor. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Petauroides volans (Greater Glider)	-	V	The Greater Glider occurs in eucalypt forests and woodlands. Utilise tree hollows	2		
Petaurus norfolcensis (Squirrel Glider)	V	-	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range . Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias . There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA.	17	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Phascolarctos cinereus (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 .	5	Negligible. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Potorous tridactylus tridactylus (Long-nosed Potoroo)	V	V	Inhabits coastal heath and wet and dry sclerophyll forests. Generally found in areas with rainfall greater than 760 mm. Requires relatively thick ground cover where the soil is light and sandy.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.
Pseudomys novaehollandiae (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.	0	Negligible. The site is heavily disturbed and doesn't provide potential habitat for this species. Recent records do not occur in the locality.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Pteropus poliocephalus (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.	313	High. Recent records occur in the locality. Although the site is heavily disturbed, it does provide potential foraging habitat for this species in the form of flowering and fruiting feed trees.	Minor. Not recorded during the current field survey.
Scoteanax rueppellii (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.	3	Low. Although recent records occur in the locality, the site is heavily disturbed and doesn't provide potential habitat for this species.	Nil. Not recorded during the current field survey.
Fish						
Epinephelus daemelii (Black Cod)	-	V	In Australia, the distribution of black cod ranges from southern Queensland through NSW to northern Victoria. However, records from Queensland and Victoria are rare, and the single specimen recorded from South Australian waters is considered a vagrant. The NSW coastline forms the species' main range, both in Australia and internationally. Black cod are known to occur to some degree in all six NSW Marine Parks – Lord Howe, Cape Byron, Solitary Island, Port Stephens, Jervis Bay and Batemans Bay	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Hippocampus whitei (White's Seahorse)	-	MAR	Endemic temperate Australian species found only between Forster and Wollongong NSW. Inhabits shallow inshore areas in estuaries, harbours and bays, where it lives on rocky reefs, sponges, seagrass beds and under piers and jetties to 25m.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Fish						
Carcharias taurus (Grey Nurse Shark)	-	CE	The grey nurse shark occupies the continental shelf and has been reported from the surf zone down to 190 m below sea level. At sites where they aggregate, they are often observed near the bottom at depths of 10 – 40 m in or near steep-sided gutters with sandy substrate or rocky caves. Grey nurse sharks have also been observed congregating in mid-water adjacent to, or above pinnacles or wrecks at depths of 5 – 30 m. The east coast grey nurse shark population extends from mid-Queensland to Narooma in southern NSW.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Carcharodon carcharias (Great White Shark)	-	V	Found in coastal waters around Australia, South Africa, California and northeastern USA. The great white can swim at the surface, as well as more than 250m deep.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Rhincodon typus (Whale Shark)	-	V	The Whale Shark is an oceanic and coastal, tropical to warm-temperate pelagic shark.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Reptiles						

Scientific name (Common Name)	BC Act	EPBC Act	Habitat description*	Records (Last 5 years)	Likelihood of occurrence in study area	Impact Assessment
Caretta caretta (Loggerhead Turtle)	E	-	Loggerhead turtles have a worldwide tropical and subtropical distribution. In Australia, they occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales.	2	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Chelonia mydas (Green Turtle)	V	V	Green turtles occur in seaweed-rich coral reefs and inshore seagrass pastures in tropical and subtropical areas of the Indo-Pacific region.	2	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Dermochelys coriacea (Leathery Turtle)	V	E	Occurs in inshore and offshore marine waters. Rarely breeds in Australia, with the nearest regular nesting sites being the Solomon Islands and Malayan Archipelago. Occasional breeding records from NSW coast, including between Ballina and Lennox Head in northern NSW.	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Eretmochelys imbricata (Hawksbill Turtle)	V	V	Found mainly throughout the world's tropical oceans, predominantly in coral reefs	1	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.
Natator depressus (Flatback Turtle)	V	V	Found only in the waters around Australia, Papua New Guinea and Timor, hence it is also known as the Australian flatback	0	Negligible. Marine / aquatic habitat is absent from the site.	Nil. Not recorded during the current field survey.

* - habitat descriptions have been adapted by qualified ecologists from the DAWE Species Profile and Threats (SPRAT) Database, DPIE Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.

Appendix 2.3 Migratory species (EPBC Act listed)

Includes records from the following sources:

- NSW BioNet Wildlife Atlas
- DAWE database (accessed May 2021)
- Current survey.

Table Migratory fauna species recorded or predicted to occur within 10 kilometres of the study area

Scientific name	Common name	Most recent record
Migratory Marine Birds		
Anous stolidus	Common Noddy	#
Apus pacificus	Fork-tailed Swift	#
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater	2006
Ardenna grisea	Sooty Shearwater	#
Calonectris leucomelas	Streaked Shearwater	#
Diomedea antipodensis	Antipodean Albatross	#
Diomedea epomophora	Southern Royal Albatross	#
Diomedea exulans	Wandering Albatross	#
Diomedea sanfordi	Northern Royal Albatross	#
Fregata ariel	Lesser Frigatebird, Least Frigatebird	#
Fregata minor	Great Frigatebird, Greater Frigatebird	#
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	2019
Macronectes halli	Northern Giant Petrel	#
Phoebetria fusca	Sooty Albatross	#
Sternula albifrons	Little Tern	2002
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	#
Thalassarche cauta	Shy Albatross	#
Thalassarche eremita	Chatham Albatross	#
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	#
Thalassarche melanophris	Black-browed Albatross	#
Thalassarche salvini	Salvin's Albatross	#
Thalassarche steadi	White-capped Albatross	#
Migratory Terrestrial Species		
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	#
Hirundapus caudacutus	White-throated Needletail	#
Monarcha melanopsis	Black-faced Monarch	#
Monarcha trivirgatus	Spectacled Monarch	#
Motacilla flava	Yellow Wagtail	#
Myiagra cyanoleuca	Satin Flycatcher	#
Rhipidura rufifrons	Rufous Fantail	#
Migratory Wetlands Species		
Actitis hypoleucos	Common Sandpiper	#
Arenaria interpres	Ruddy Turnstone	#
Calidris acuminata	Sharp-tailed Sandpiper	#
Calidris canutus	Red Knot, Knot	2019
Calidris ferruginea	Curlew Sandpiper	2019
Calidris melanotos	Pectoral Sandpiper	#
Calidris ruficollis	Red-necked Stint	#
Calidris tenuirostris	Great Knot	#
Charadrius bicinctus	Double-banded Plover	#
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	#
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	#
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	#
Gallinago megala	Swinhoe's Snipe	#

Scientific name	Common name	Most recent record
Gallinago stenura	Pin-tailed Snipe	#
Limicola falcinellus	Broad-billed Sandpiper	#
Limosa lapponica	Bar-tailed Godwit	#
Limosa limosa	Black-tailed Godwit	#
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	2002
Numenius phaeopus	Whimbrel	#
Pandion haliaetus	Osprey	2020
Philomachus pugnax	Ruff (Reeve)	#
Pluvialis fulva	Pacific Golden Plover	#
Pluvialis squatarola	Grey Plover	#
Tringa brevipes	Grey-tailed Tattler	#
Tringa nebularia	Common Greenshank, Greenshank	#
Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	#
Xenus cinereus	Terek Sandpiper	2002

APPENDIX 3 – TEST OF SIGNIFICANCE

The following section provides Test of Significance according to the test outlined in Section 7.3 of the BC Act for all species and communities which have a medium likelihood or greater of occurrence within the study area.

In consideration of occupancy within similar habitat niches, Eastern Coastal Free-tailed Bat, Little Bent-winged Bat and Large Bent-winged Bat have been grouped for assessment in the Test of Significance.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox is listed as vulnerable under the BC Act. The Grey-headed Flying-fox occurs along the eastern seaboard of Australia roosting in large communal aggregations known as 'camps'. These camps are used permanently, annually, or occasionally, varying in size from hundreds to many thousands of individuals, fluctuating according to food resources (Eby and Law 2008; Parry-Jones & Augee 1991; Tidemann 1995). This species forages on nectar and pollen from flowers of canopy trees (particularly Eucalyptus, Melaleuca and Banksia) and fleshy fruits from rainforest trees and vines. This species is highly mobile, dispersing to sites as far as 40 km to forage and returning to the camp in one night, and seasonally they may move hundreds of kilometres in response to variation in food resource productivity which largely explains the extensive migration movement of this species (Eby and Law 2008).

This species was not recorded during the field investigation by de Witt Ecology.

> *(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

This species was not recorded within the study area during field surveys conducted by de Witt Ecology. Flying-fox camps have not been recorded within the vicinity of the Study Area. However, numerous records occur within the locality and it is likely that this species may occasionally forage within the remnant trees and gardens which occur within the Study Area. Nevertheless, as the Study Area exhibits only occasional trees and a managed landscape within a developed area it is unlikely to provide preferred habitat. The *Eucalyptus robusta* (Swamp Mahogany) trees, which are a key feed tree for this species will be retained as part of the proposal. Equivalent or better-quality habitat for this species occurs in the surrounding locality. Therefore, the project is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

> *(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
>
> *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
>
> *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

The Grey-headed Flying-fox is listed as a vulnerable species and is not listed as an Endangered Ecological Community.

> *(c) in relation to the habitat of a threatened species or ecological community:*
>
> *(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*

Approximately 3.5 hectares of managed gardens and lawns with twelve planted trees within an urban context will be removed as a result of the project.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The study area is surrounded by urban development and greenspace areas that contain very occasional scattered patches of vegetation. There is no connectivity between the study area and surrounding areas. The vegetation within and surrounding the study area is already isolated from larger patches of vegetation in the locality.

Overall, the 3.5 hectares of managed gardens and lawns with twelve planted trees within an urban context to be impacted by the proposal will not cause fragmentation to the degree that isolation from other areas of habitat for this species will occur, more than which already exists.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The habitat to be impacted by the project consists of managed gardens and lawns with twelve planted trees within an urban context. Surrounding areas consist of residential dwellings, impervious surfaces and managed greenspaces. In consideration of the equivalent or better-quality habitat available in the locality, the vegetation proposed to be removed is unlikely to be important to the long-term survival of Grey-headed Flying-fox.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

There are no declared areas of outstanding biodiversity value within the study area.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The key threatening processes (KTPs) applicable to the current assessment are identified below and are considered in relevance to the Grey-headed Flying-fox, which has the potential to occur on site.

- Clearing of native vegetation.

The proposal may increase the impact of the KTP "Clearing of native vegetation". However, the proposal will only remove nine native and three exotic planted trees within an urban context, which provides marginal potential habitat for Grey-headed Flying-fox. In consideration of better-quality habitat available in the locality, we consider that this is a very small contribution to this KTP.

Conclusion

The proposal will impact upon approximately 3.5 hectares of managed gardens and lawns and twelve planted trees within an urban context and is unlikely to cause fragmentation to the degree that isolation from other areas of habitat for this species will occur. In consideration of the equivalent or better-quality habitat available in the locality, the vegetation removal proposed is unlikely to place a viable local population at extinction risk or be important to the long-term survival of Grey-headed Flying-fox. The proposal may increase the impact of one KTP, however we consider this a very small contribution to this KTP.

Threatened Microbat Species

Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)

Eastern Coastal Free-tailed Bat is listed as vulnerable under the BC Act. The Eastern Coastal Freetail-bat is found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.

Little Bent-winged Bat (*Miniopterus australis*)

Little Bent-winged Bat is listed as vulnerable under the BC Act. The Little Bentwing-bat occurs along the east coast of Australia from Cape York south to coastal northern NSW. This species generally occupies well-wooded habitats throughout its range, roosting during the day in caves tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day. As with other Bentwing-bats, this species depends on specific nursery sites in which to raise its young. They forage for insects in generally well wooded habitat of a variety of forms from swamp forest, dry forest to rain forest (Churchill 1998, Dwyer 1995).

Large Bent-winged Bat (*Miniopterus orianae oceanensis*)

Occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.

> *(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)

This species was not recorded within the study area during field surveys conducted by de Witt Ecology, however records do occur in the locality of the Study Area, and there is potential that this species may occasionally forage within the habitat on site. Tree hollows and built structures are present within the Study Area providing potential breeding and roosting habitat for this species.

Overall, the 3.5 hectares of managed gardens / lawns with twelve planted trees (two hollow-bearing) and built structures within an urban context, to be impacted is unlikely to provide preferred habitat. Equivalent or better-quality habitat for this species occurs in the surrounding locality. Therefore, the project is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Little Bent-winged Bat (*Miniopterus australis*)

This species was not recorded within the study area during field surveys conducted by de Witt Ecology, however records do occur in the locality of the Study Area, and there is potential that this species may occasionally forage within the habitat on site. Tree hollows and built structures are present within the Study Area providing potential breeding and roosting habitat for this species.

Overall, the 3.5 hectares of managed gardens / lawns with twelve planted trees (two hollow-bearing) and built structures within an urban context, to be impacted is unlikely to provide preferred habitat. Equivalent or better-quality habitat for this species occurs in the surrounding locality. Therefore, the project is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Large Bent-winged Bat (*Miniopterus orianae oceanensis*)

This species was not recorded within the study area during field surveys conducted by de Witt Ecology, however records do occur in the locality of the Study Area, and there is potential that this species may occasionally forage within the habitat on site.

Overall, the 3.5 hectares of managed gardens / lawns with twelve planted trees (two hollow-bearing) and built structures within an urban context, to be impacted is unlikely to provide preferred habitat. Equivalent or better-quality habitat for this species occurs in the surrounding locality. Therefore, the project is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

> *(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
>
> *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
>
> *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Eastern Coastal Free-tailed Bat, Little Bent-winged Bat and Large Bent-winged Bat are listed as a vulnerable species and are not listed as an Endangered Ecological Community.

> *(c) in relation to the habitat of a threatened species or ecological community:*
>
> *(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*

Twelve trees (two hollow-bearing) and approximately 3.5 hectares of managed gardens / lawns and built structures within an urban context will be removed as a result of the project.

> *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

The study area is surrounded by urban development and greenspace areas that contain very occasional scattered patches of vegetation. There is no connectivity between the study area and surrounding areas. The vegetation within and surrounding the study area is already isolated from larger patches of vegetation in the locality.

Overall, the 3.5 hectares of managed gardens / lawns with twelve planted trees (two hollow-bearing) and built structures within an urban context, to be impacted by the proposal will not cause fragmentation to the degree that isolation from other areas of habitat for these species will occur, more than which already exists.

> *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The habitat to be impacted by the project consists of built structures and managed gardens / lawns with twelve planted trees, including two HBTs, within an urban context. Surrounding areas consist of residential dwellings, impervious surfaces and managed greenspaces. In consideration of the equivalent or better-quality habitat available in the locality, the habitat proposed to be removed is unlikely to be important to the long-term survival of these threatened microbats.

> *(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).*

There are no declared areas of outstanding biodiversity value within the study area.

> *(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The proposal may increase the impact of the KTP "Clearing of native vegetation" and 'Loss of hollow-bearing trees'. However, the proposal will only remove 3.5 hectares of managed gardens / lawns with twelve planted trees (two hollow-bearing) and built structures within an urban context, which provides potential foraging and roosting / breeding habitat for microbats. In consideration of the equivalent or better-quality habitat available in the locality, we consider that this is a very small contribution to these KTPs.

Conclusion

The proposal will impact upon existing built structures, twelve trees (two hollow-bearing) and approximately 3.5 hectares of managed gardens and lawns within an urban context and is unlikely to cause fragmentation to the degree that isolation from other areas of habitat for this species will occur. In consideration of the equivalent or better-quality habitat available in the locality, the habitat and vegetation removal proposed is unlikely to place a viable local population at extinction risk or be important to the long-term survival of these species. The proposal may increase the impact of select KTPs, however we consider this a very small contribution to these KTPs.

APPENDIX 4 – PLATES

Plate 1: Managed gardens and lawns in the eastern extent of the Study Area.

Plate 2: Managed lawns within the southern extent of the Study Area.

Plate 3: Looking west along the southern boundary of the Study Area towards planted street trees.

Plate 4: Planted gardens around the existing equine pool.

Plate 5: Looking south from the northern extent of the Study Area.

Plate 6: Looking east, bordering the existing race track, along the northern extent of the Study Area.

Plate 7: Bitumen access road central to the Study Area.

Plate 8: Tree 1 *Corymbia maculata* (Spotted Gum) along the Study Area southern boundary – to be retained.

Plate 9: Tree 2 Suspected *Eucalyptus scoparia* (Wallangarra White Gum) along the Study Area southern boundary containing hollows – to be retained.

Plate 10: Tree 3 *Eucalyptus robusta* (Swamp Mahogany) along the Study Area southern boundary – to be retained.

Plate 11: Tree 4 ***Eucalyptus robusta*** **(Swamp Mahogany) along the Study Area southern boundary – to be retained.**

Plate 12: Tree 5 ***Lophostemon confertus*** **(Brush Box) along the Study Area southern boundary – to be removed.**

Plate 13: Tree 6 ***Eucalyptus saligna*** **(Sydney Blue Gum) along the Study Area southern boundary - to be removed.**

Plate 14: Tree 7 ***Eucalyptus saligna*** **(Sydney Blue Gum) along the Study Area southern boundary - to be removed.**

Plate 15: Tree 8 *Eucalyptus saligna* (Sydney Blue Gum) along the Study Area southern boundary containing hollows - to be removed.

Plate 16: Tree 9 *Callistemon viminalis* (Weeping Bottlebrush) along the Study Area southern boundary - to be retained.

Plate 17: Tree 10 *Eucalyptus saligna* **(Sydney Blue Gum) along the Study Area western boundary – to be removed.**

Plate 18: Tree 11 *Eucalyptus botryoides* **(Bangalay) along the Study Area western boundary containing hollows – to be removed.**

Plate 19: Tree 12 *Eucalyptus botryoides* **(Bangalay) along the Study Area western boundary – to be removed.**

Plate 20: Tree 13 *Melaleuca quinquenervia* **(Broad-leaved Paperbark) central to the Study Area – to be removed.**

Plate 21: Tree 14 ***Melaleuca quinquenervia*** **(Broad-leaved Paperbark) central to the Study Area – to be removed.**

Plate 22: Tree 15 ***Ficus microcarpa*** **(Chinese Banyan) along the Study Area northern boundary – to be removed.**

Plate 23: Tree 16 ***Ficus microcarpa*** **(Chinese Banyan) along the Study Area northern boundary – to be removed.**

Plate 24: Tree 17 ***Ficus microcarpa*** **(Chinese Banyan) along the Study Area northern boundary – to be removed.**

Plate 25: Tree 18 ***Ficus macrophylla*** **(Moreton Bay Fig) along the Study Area eastern boundary – to be retained.**

Plate 26: Tree 19 Cluster of ***Livistona australis*** **(Cabbage Fan Palm) along the Study Area eastern boundary – to be retained.**

Plate 27: Tree 20 *Ficus microcarpa* (Chinese Banyan) along the Study Area eastern boundary – to be retained.

Plate 28: Tree 21 *Ficus microcarpa* (Chinese Banyan) along the Study Area eastern boundary – to be retained.

Plate 29: Broad view of stables to be demolished within the study area.

Plate 30: Stables to be demolished within the study area contained Besser block walls which did not extend to the full height of the roof.

Plate 31: Stable wall containing narrow vertical cavity within the study area.

Plate 32: The eastern end of Building 9 to be demolished showing air vents into the brick wall cavity within the study area.

Plate 33: Vents on the eastern and western ends of Building 10 open into the main building space and not into an enclosed cavity within the study area.

Plate 34: Gaps on the eaves along the northern face of Building 10 to be demolished within the study area.

Plate 35: Gaps on the eaves along the northern face of Building 10 to be demolished within the study area.

Plate 36: Equine pool shed (Building 11) to be demolished within the study area. Parts of the eave is missing on the northern side of the shed, allowing access into the roof space.

Plate 37: Stable 5 to be demolished showing absence of roof cavities within the study area.

Plate 38: Commentary tower to be demolished within the study area had small crevices on the eaves on the east side of the building into a ceiling space.

APPENDIX 5 – CONCEPT DESIGN

NEWCASTLE
RACECOURSE
• EST 1907 •

NJC
NEWCASTLE
JOCKEY CLUB

NEW STABLES COMPLEX DEVELOPMENT

DEVELOPMENT APPLICATION

CNR. CHATHAM & DARLING ST's, BROADMEADOW

N

REGIONAL CONTEXT

SOURCE: SIXMAPS

LOCAL CONTEXT

SOURCE: SIXMAPS

IMPRESSION of PROPOSAL

DRAWING SCHEDULE

A00	COVER SHEET
A01	REGIONAL & LOCAL CONTEXT PLANS
A02	PRECINCT PLAN
A03	FUTURE CAR PARKING PRECINCT PLAN
A04	DEVELOPMENT SITE CONTEXT PLAN
A05	DEVELOPMENT SITE PLAN
A06	OVERALL GROUND FLOOR PLAN
A07	OVERALL FIRST FLOOR PLAN
A08	TYPICAL STABLE GROUND FLOOR PLAN
A09	TYPICAL STABLE FIRST FLOOR PLAN
A10	CHATHAM ST. & DARLING ST. ELEVATIONS
A11	TYPICAL STABLE SECTIONS
A12	PERSPECTIVE VIEW 01
A13	PERSPECTIVE VIEW 02
A14	PERSPECTIVE VIEW 03
A15	PERSPECTIVE VIEW 04
A16	PERSPECTIVE VIEW 05
A17	PERSPECTIVE VIEW 06
A18	PERSPECTIVE VIEW 07
A19	PERSPECTIVE VIEW 08
A20	PERSPECTIVE VIEW 09
A21	PERSPECTIVE VIEW 10

11553 - DA - A00 - 13/07/2021 - rev. A

EJE architecture

11553-DA-NJC Stable Complex.pln

NJC
NEWCASTLE
JOCKEY CLUB

N

REGIONAL CONTEXT PLAN
1:10000 @ A1

N

LOCAL CONTEXT PLAN
@ A1500

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

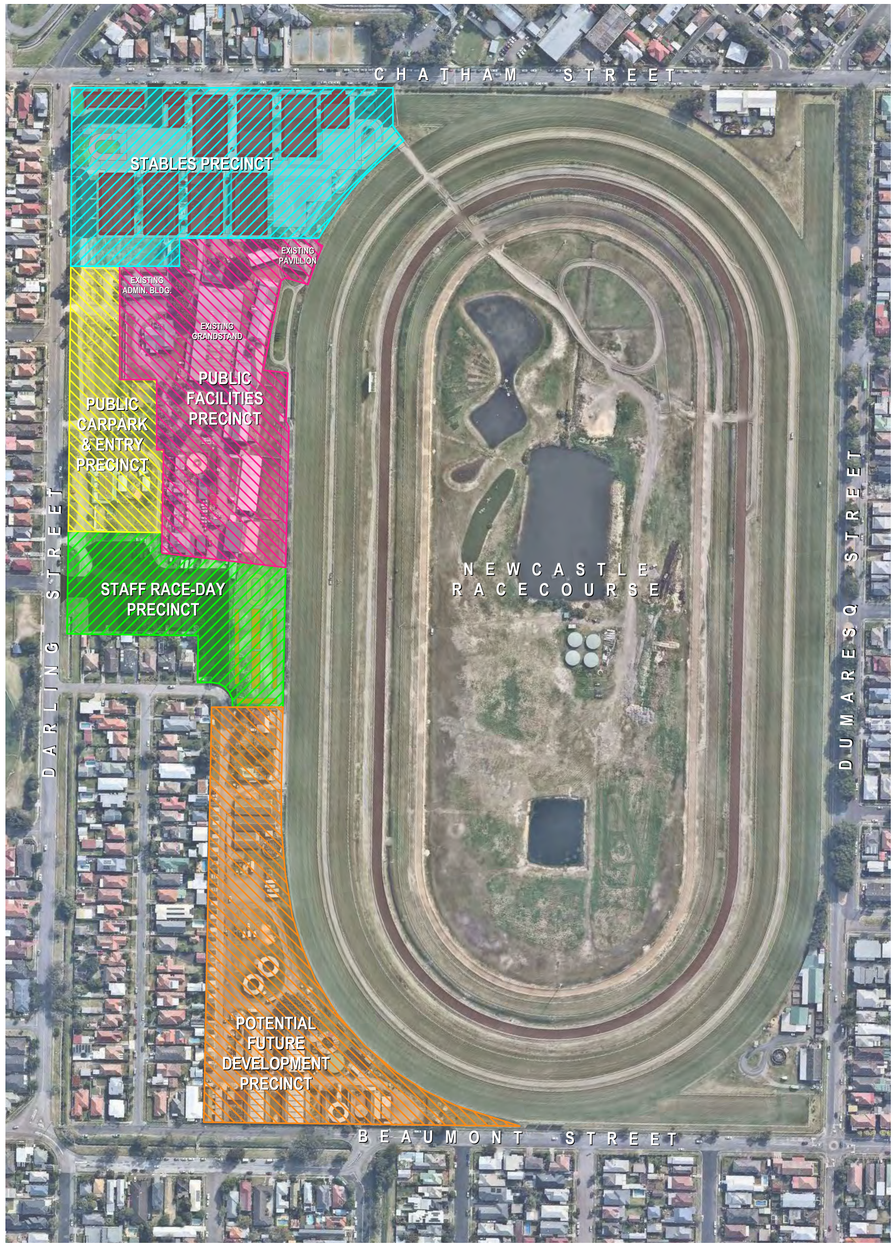
NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX
CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A01 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB



N

PRECINCT PLAN

@ A1:500

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A02 - 13/07/2021 - rev. A

EJE architecture

N

FUTURE CAR PARKING PRECINCT PLAN

1:500 @ A1

*TOTAL NEW CAR SPACES = 528

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

NEWCASTLE JOCKEY CLUB

NEWCASTLE RACECOURSE • EST 1907 •

DEVELOPMENT APPLICATION

11553 - DA - A03 - 13/07/2021 - rev. A

EJE architecture

11553-DA-NJC Stable Complex.pln

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT SITE CONTEXT PLAN

1:500 @ A1

N

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE RACECOURSE • EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A04 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE JOCKEY CLUB

DEVELOPMENT APPLICATION

ADJOINING RESIDENTIAL

CHATHAM STREET

DARLING STREET

GOODS STORAGE SHED 570 m²

SITE OFFICE 135 m²

EQUIPMENT SHED 216 m²

BASIN 01 125 m³

BASIN 02 300 m³

BASIN 03 180 m³

EQUINE & GOODS DROP OFF - PICK UP ZONE

LOADING / UNLOADING ZONE

RAMP 01 (1 in 10)

BLOCK 'D' (40 HORSES) (POOL UNDER) 1,278 m² / LEVEL

BLOCK 'C' (80 HORSES) 1,278 m² / LEVEL

BLOCK 'B' (80 HORSES) 1,278 m² / LEVEL

BLOCK 'A' (80 HORSES) 1,278 m² / LEVEL

BLOCK 'E' (80 HORSES) 1,278 m² / LEVEL

BLOCK 'F' (80 HORSES) 1,278 m² / LEVEL

BLOCK 'G' (80 HORSES) 1,278 m² / LEVEL

COURTYARD 01

COURTYARD 02

COURTYARD 03

COURTYARD 04

COURTYARD 05

VERANDAH

PASSAGEWAY

HORSE WALKER 'A'

HORSE WALKER 'B'

HORSE WALKER 'C'

HORSE WALKER 'D'

HORSE WALKER 'E'

HORSE WALKER 'F'

HORSE WALKER 'G'

MAINTENANCE AMENITIES 75 m²

MAINTENANCE SHED UNDER 300 m²

MAINTENANCE DROP OFF - PICK UP ZONE

TRACKWORK MOUNTING AREA

RAMP 02 (1 in 10)

EXISTING TRACKWORK SUPERVISORS HUT TO BE RELOCATED

RELOCATED EXISTING TRACKWORK SUPERVISORS HUT

EXISITNG TRACK ACCESS

EXISTING TOWER TO BE RELOCATED

RELOCATED EXISTING TOWER

NEW BRIDLE TRACK EXTENSION

EXISTING BUILDINGS TO BE DEMOLISHED

EXISTING TOWER

EXISTING TRACK & FENCING

EXISTING PAVILLION

EXISTING BUILDING

EXISTING ADMIN. BUILDING

EXISTING ENTRY TOWER

NEW ENTRY TOWER

STAFF CARPARK 94 SPACES

ENTRY

EXIT

ENTRY / EXIT

GATES

GATE

GOODS LIFT

GEN. WASTE BINS

SIGNAGE TOWER

SAND ROLL

WASH BAYS

WASH BAY

RWT.

INDICATIVE STAGING LINE
STAGE 1
STAGE 2
INDICATIVE STAGING LINE

DEVELOPMENT SITE PLAN

1:500 @ A1

11553-DA-NJC Stable Complex.pln

NEWCASTLE RACECOURSE • EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A05 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

CHATHAM STREET

DARLING STREET

ENTRY

ENTRY / EXIT

EXIT

EQUINE & GOODS
DROP OFF -
PICK UP ZONE

GOODS
STORAGE
SHED

REMOVAL STORE

SUPPLY STORE

STOCK STORE

TOWER SEANCE

BASIN 01
125 m²

BASIN 02
300 m²

GEN. WASTE BINS

RAMP 01
UP TO FIRST FLOOR (1 in 10)

RAMP 02
UP TO FIRST FLOOR (1 in 10)

MANGR

WORK STATNS

STAFF

RECEP

OFFICE

EQUIPMENT SHED

GOODS LIFT

10-HORSE
WALKER 'C1'

LOWER
LOADING
ZONE

10-HORSE
WALKER 'E1'

SAND ROLL-01

WASH BAYS 01-2

SAND ROLL-02

BLOCK 'E'
(40 HORSES)

BLOCK 'F'
(40 HORSES)

BLOCK 'G'
(40 HORSES)

COURT YARD 04

COURT YARD 05

VERANDAH 02

LOWER PASSAGEWAY

MAINTENANCE
SHED

CHEM STORE

TOOL STORE

OFFICE

RECEP

10-HORSE
WALKER 'G1'

SAND ROLL-07

WASH BAYS 10-11

SAND ROLL-08

MAINTENANCE
DROP OFF -
PICK UP ZONE

EXISTING TRACKWORK
SUPERVISORS HUT
TO BE RELOCATED

RELOCATED EXISTING
TRACKWORK SUPERVISORS
HUT

TRACKWORK
MOUNTING
AREA

EXISTING
TOWER TO BE
RELOCATED

RELOCATED
EXISTING
TOWER

EXISTING
TRACK
ACCESS

EXISTING
TRACK &
FENCE

SAND ROLL-03

WASH BAYS 02-05

SAND ROLL-04

SAND ROLL-05

WASH BAYS 06-09

SAND ROLL-06

10-HORSE
WALKER 'B1'

10-HORSE
WALKER 'F1'

10-HORSE
WALKER 'A1'

EXISTING
TOWER

BLOCK 'D'
(POOL)

POOL SERVICES

STAFF
CARPARK
94 SPACES

BLOCK 'C'
(40 HORSES)

BLOCK 'B'
(40 HORSES)

BLOCK 'A'
(40 HORSES)

COURT YARD 03

COURT YARD 02

COURT YARD 01

VERANDAH 01

A07

EXISTING
BUILDING

EXISTING
BUILDING

EXISTING
BUILDING

NEW
ENTRY
TOWER

S01 A11

S02 A11

S03 A11

EXIT 01
EXIT 02
EXIT 03
EXIT 04
EXIT 05
EXIT 06
EXIT 07
EXIT 08
EXIT 09
EXIT 10
EXIT 11
EXIT 12
EXIT 13
EXIT 14
EXIT 15
EXIT 16
EXIT 17

GATES

STORE 01
STORE 02
STORE 03
STORE 04
STORE 05
STORE 06
STORE 07
STORE 08
STORE 09
STORE 10
STORE 11
STORE 12
STORE 13
STORE 14

N

OVERALL GROUND FLOOR PLAN

1:500 @ A1

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

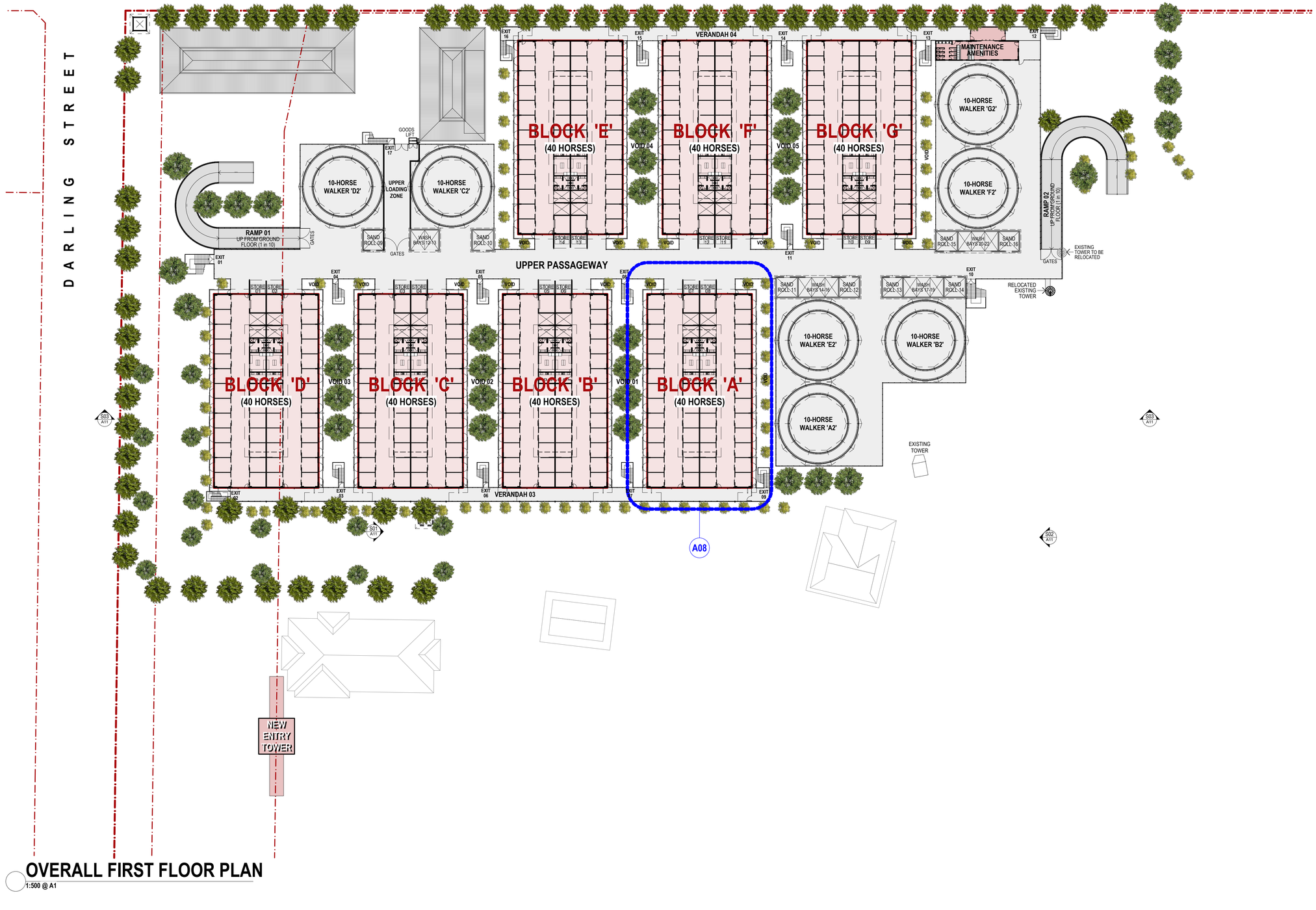
11553 - DA - A06 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

CHATHAM STREET

DARLING STREET



OVERALL FIRST FLOOR PLAN

1:500 @ A1

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE RACECOURSE • EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A07 - 13/07/2021 - rev. A

EJE architecture

PATIO
STORE
STORE
PATIO
STALL #01
FEED STORE
FEED STORE
STALL #40
STALL #02
WASH BAY
WASH BAY
STALL #39
STALL #03
WASH BAY
WASH BAY
STALL #38
STALL #04
AMENITIES
AMENITIES
STALL #37
STALL #05
STORE / L'DRY
STORE / L'DRY
STALL #36
TACK
TACK
STALL #06
OFFICE / STAFF
OFFICE / STAFF
STALL #35
COURTYARD
BLOCK 'A'
STALL #07
STALL #20
STALL #21
STALL #34
STALL #08
STALL #19
STALL #22
STALL #33
STALL #09
STALL #18
STALL #23
STALL #32
STALL #10
STALL #17
STALL #24
STALL #31
STALL #11
STALL #16
STALL #25
STALL #30
STALL #12
STALL #15
STALL #26
STALL #29
STALL #13
STALL #14
STALL #27
STALL #28
VERANDAH

N

TYPICAL STABLE GROUND FLOOR PLAN

1:100 @ A1

NJC
NEWCASTLE
JOCKEY CLUB

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A08 - 13/07/2021 - rev. A

EJE architecture

VOID
BRIDGE
STORE
STORE
BRIDGE
VOID
STALL #01
FEED STORE
FEED STORE
STALL #40
STALL #02
WASH BAY
WASH BAY
STALL #39
STALL #03
WASH BAY
WASH BAY
STALL #38
STALL #04
AMENITIES
AMENITIES
STALL #37
STALL #05
STORE / L'DRY
STORE / L'DRY
STALL #36
TACK
TACK
STALL #06
OFFICE / STAFF
OFFICE / STAFF
STALL #35
BLOCK 'A'
VOID
ACCESS WALKWAY
STALL #07
STALL #20
STALL #21
STALL #34
ACCESS WALKWAY
STALL #08
STALL #19
STALL #22
STALL #33
STALL #09
STALL #18
STALL #23
STALL #32
STALL #10
STALL #17
STALL #24
STALL #31
STALL #11
STALL #16
STALL #25
STALL #30
STALL #12
STALL #15
STALL #26
STALL #29
STALL #13
STALL #14
STALL #27
STALL #28
VERANDAH

TYPICAL STABLE FIRST FLOOR PLAN

1:100 @ A1

N

NJC
NEWCASTLE
JOCKEY CLUB

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

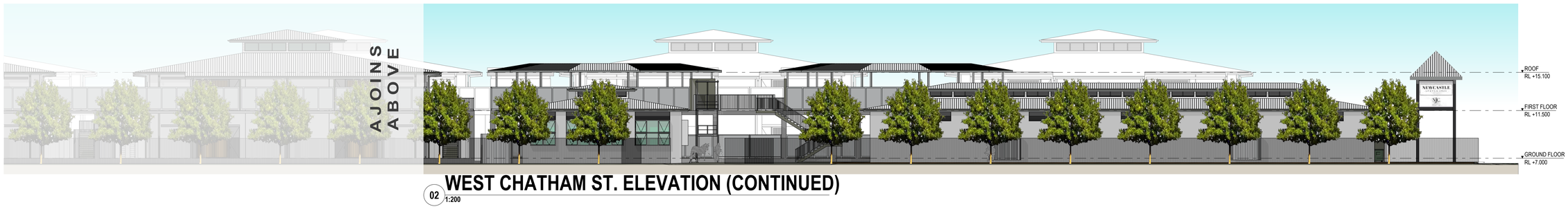
CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A09 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

01 WEST CHATHAM ST. ELEVATION
1:200



02 WEST CHATHAM ST. ELEVATION (CONTINUED)
1:200

03 SOUTH / DARLING ST. ELEVATION
1:200 @ A1

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

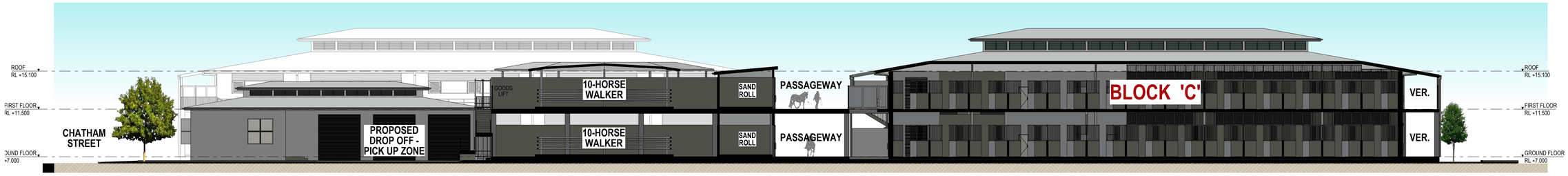
NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX
CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A10 - 13/07/2021 - rev. A

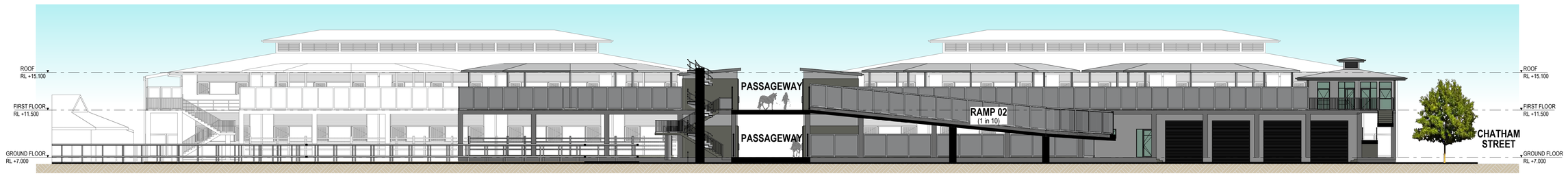
EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB



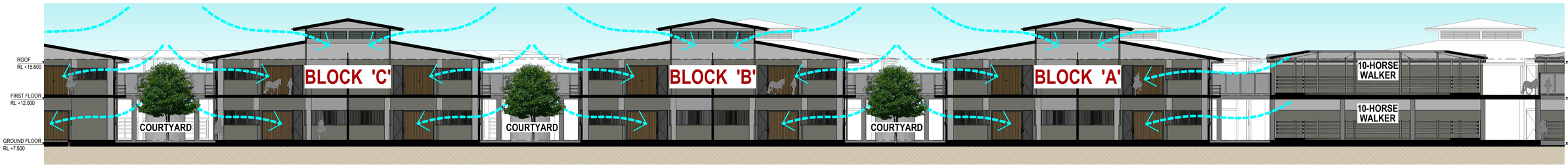
TYPICAL STABLES SECTION 01

01 1:200



TYPICAL STABLES SECTION 02

02 1:200



TYPICAL STABLES SECTION 03

03 1:200 @ A1

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

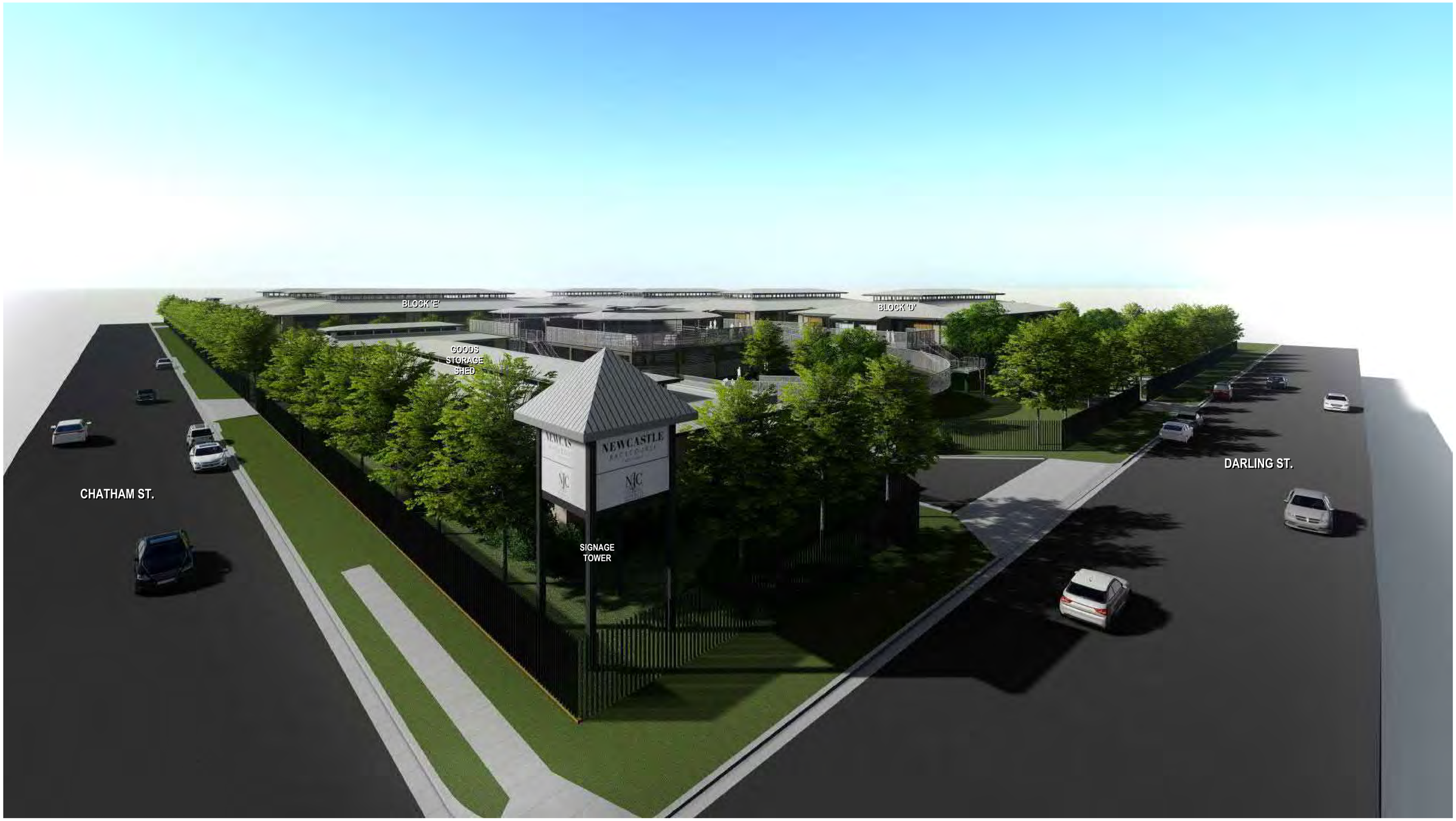
NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A11 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB



VIEW FROM CNR. CHATHAM & DARLING ST's.

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A12 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

AERIAL VIEW FROM CNR. CHATHAM & DARLING ST's. (SOUTH-WEST)

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A13 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

AERIAL VIEW FROM SOUTH-EAST

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

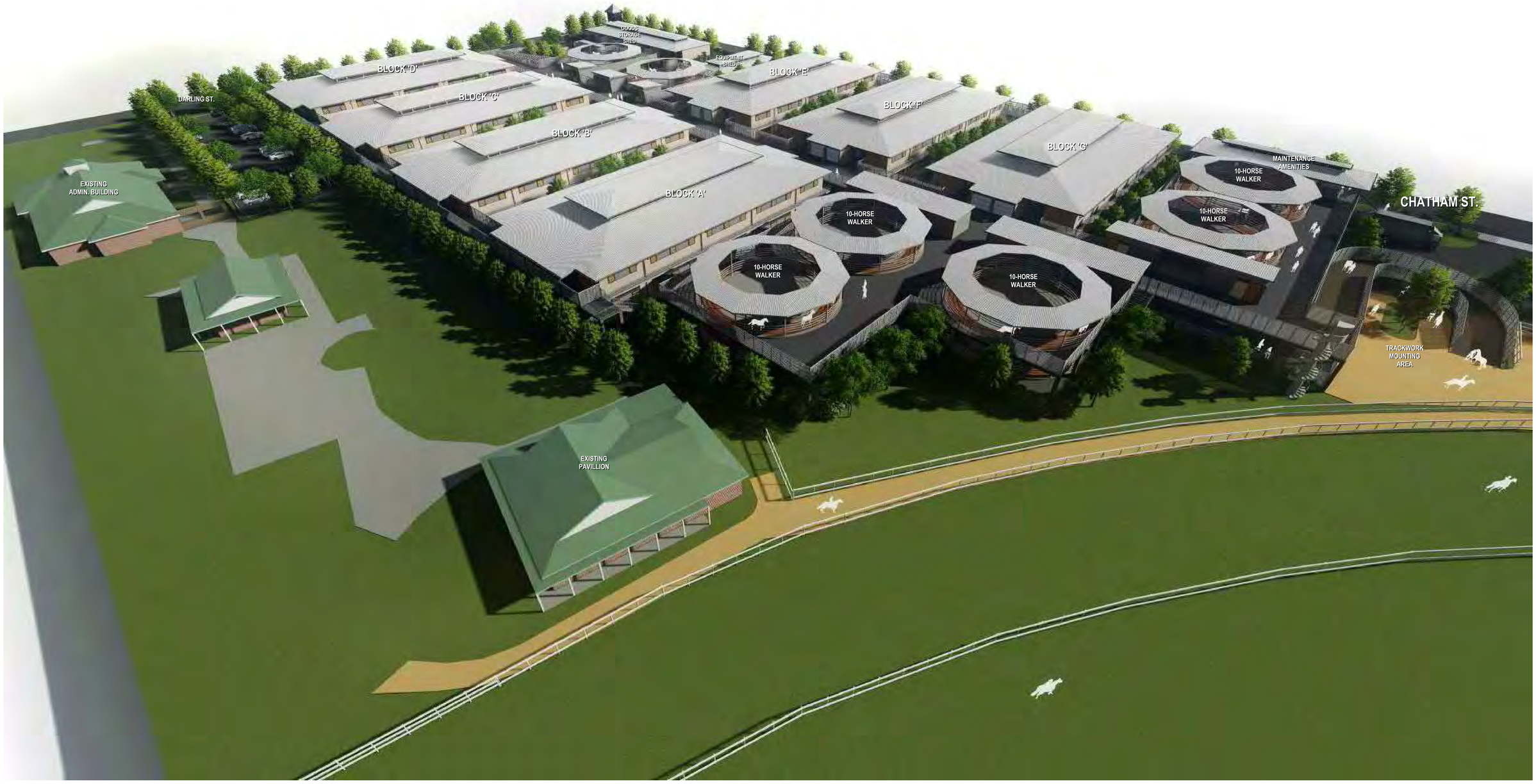
CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A14 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION



AERIAL VIEW FROM NORTH-EAST

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A15 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION

AERIAL VIEW FROM NORTH-WEST

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A16 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

VIEW FROM NORTH-WEST

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE RACECOURSE • EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A17 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION

VIEW FROM NORTH

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

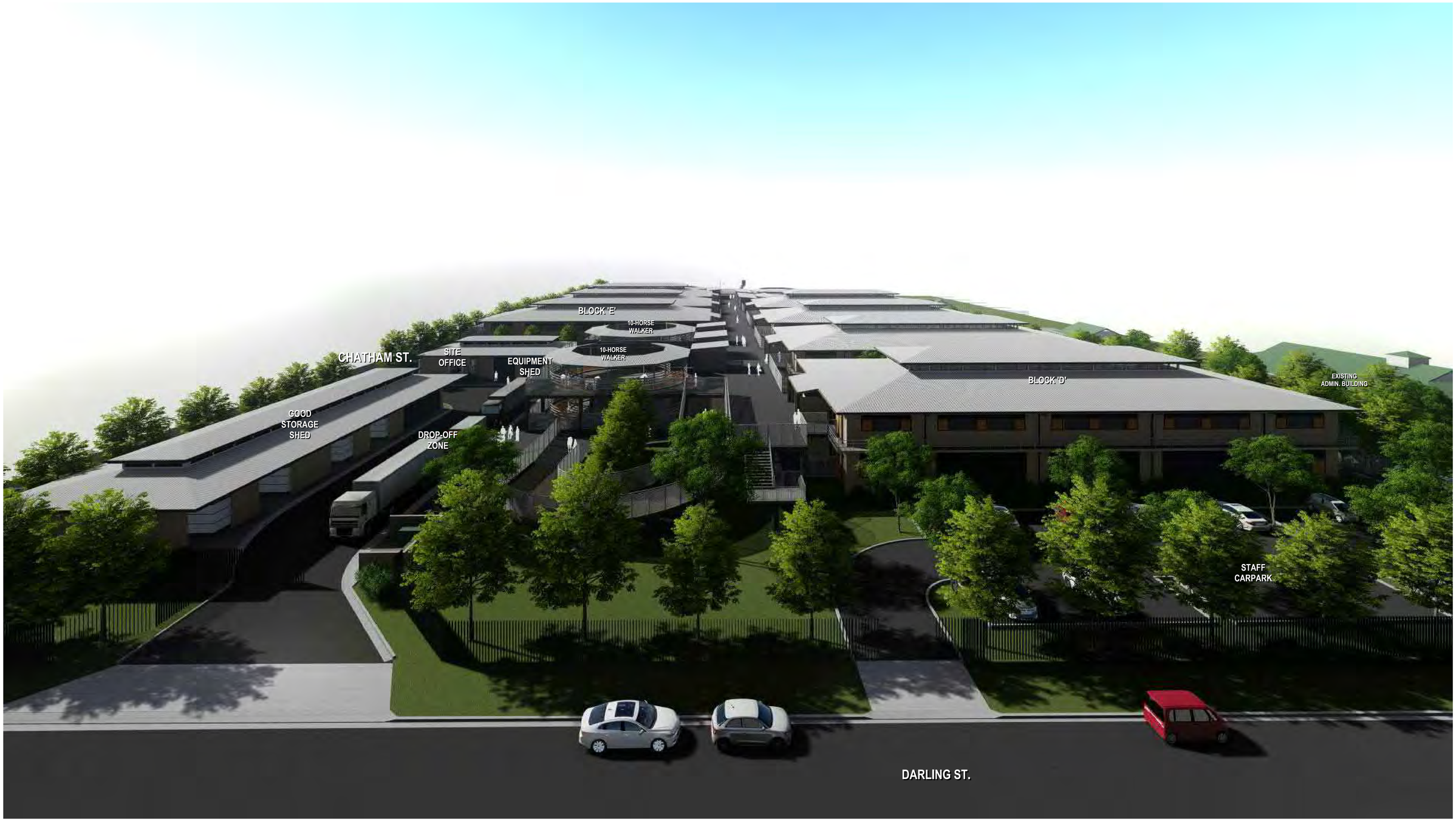
CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A18 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION



VIEW FROM SOUTH

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A19 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

VIEW OF TYPICAL COURTYARD BEETWEEN STABLES

DEVELOPMENT APPLICATION

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A20 - 13/07/2021 - rev. A

EJE architecture

NJC
NEWCASTLE
JOCKEY CLUB

DEVELOPMENT APPLICATION

VIEW OF TYPICAL STABLES VERANDAH

11553-DA-NJC Stable Complex.pln

NEWCASTLE
RACECOURSE
• EST 1907 •

NEW STABLES COMPLEX

CNR. CHATHAM & DARLING ST's, BROADMEADOW

11553 - DA - A21 - 13/07/2021 - rev. A

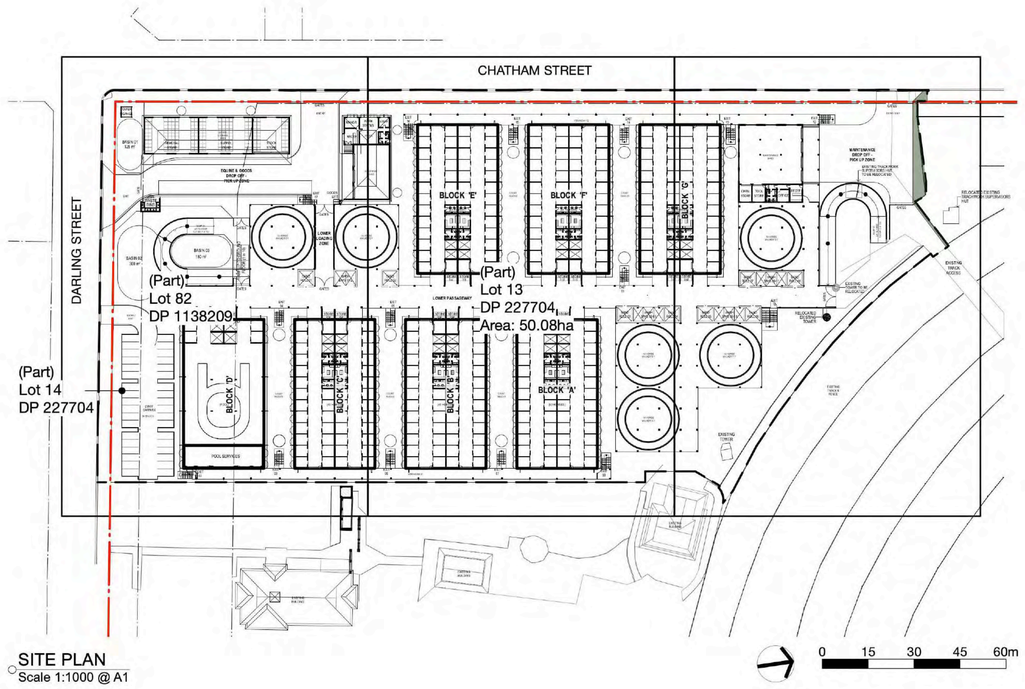
EJE architecture

APPENDIX 6 – APPLICATION DOCUMENTATION

NEWCASTLE JOCKEY CLUB STABLES DEVELOPMENT
LANDSCAPE DEVELOPMENT APPLICATION DOCUMENTATION (DA)
No. 125 CHATHAM STREET, BROADMEADOW, NSW 2292.

LOCALITY PLAN Source: Nearmap, 2020
Scale 1:2000 @ A1

Sheet No.	Drawing Title	Revision	Date
LP01	COVER SHEET	A	30/4/21
LP02	SITE ANALYSIS PLAN	A	30/4/21
LP03	KEY PLAN	A	30/4/21
LP04	LANDSCAPE PLAN 01	A	30/4/21
LP05	LANDSCAPE PLAN 02	A	30/4/21
LP06	LANDSCAPE PLAN 03	A	30/4/21
LP07	THEMING PLAN	A	30/4/21



SITE PLAN
Scale 1:1000 @ A1

moir landscape architecture
Studio 1, 88 Fern Street
PO Box 111
Islington NSW 2296
Phone (02) 4965 3500
Fax (02) 4965 3555
admin@moirla.com.au
www.moirla.com.au

ARCHITECT:
EJE Architecture

ENGINEER:
MPC Consulting Engineers

CLIENT:
Newcastle Jockey Club

No:	DATE:	REVISION:	BY:
A	30/4/21	DRAFT DA FOR ISSUE	AG

NOTE: DRAWING PURPOSES FOR APPROVAL ONLY. NOT FOR CONSTRUCTION.

PROJECT:
Newcastle Jockey Club Stables Development
No. 21 Chatham Street, Broadmeadow, NSW

Status: DRAFT

North

COVER SHEET

SCALE: AS SHOWN
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP01
Rev A

SITE ANALYSIS PLAN
Scale 1:750 @ A1

0 10 20 30 40m


1. View north along Chatham Street


2. View east along Darling Street


3. View towards tie up stalls


4. View from tie up stalls


5. View from tie up stalls


6. View of established fig trees

LEGEND

- Extent of work
- Site boundary
- Lot boundary
- 15.0 — Existing contours
- Existing fence
- FALL — Site cross fall
- E — Existing electricity lines
- OHP — Existing overhead power lines and poles
- SW — Existing stormwater lines
- +57.120 — Existing Spot level
- Existing tree
- Entry / Exit
- Wind direction
- R1 — Adjacent Residential
- R2 — Adjacent Recreation
- 1 — Photograph Marker Location

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ARCHITECT:
EJE Architecture

ENGINEER:
MPC Consulting Engineers

CLIENT:
Newcastle Jockey Club

No:	DATE:	REVISION:	BY:
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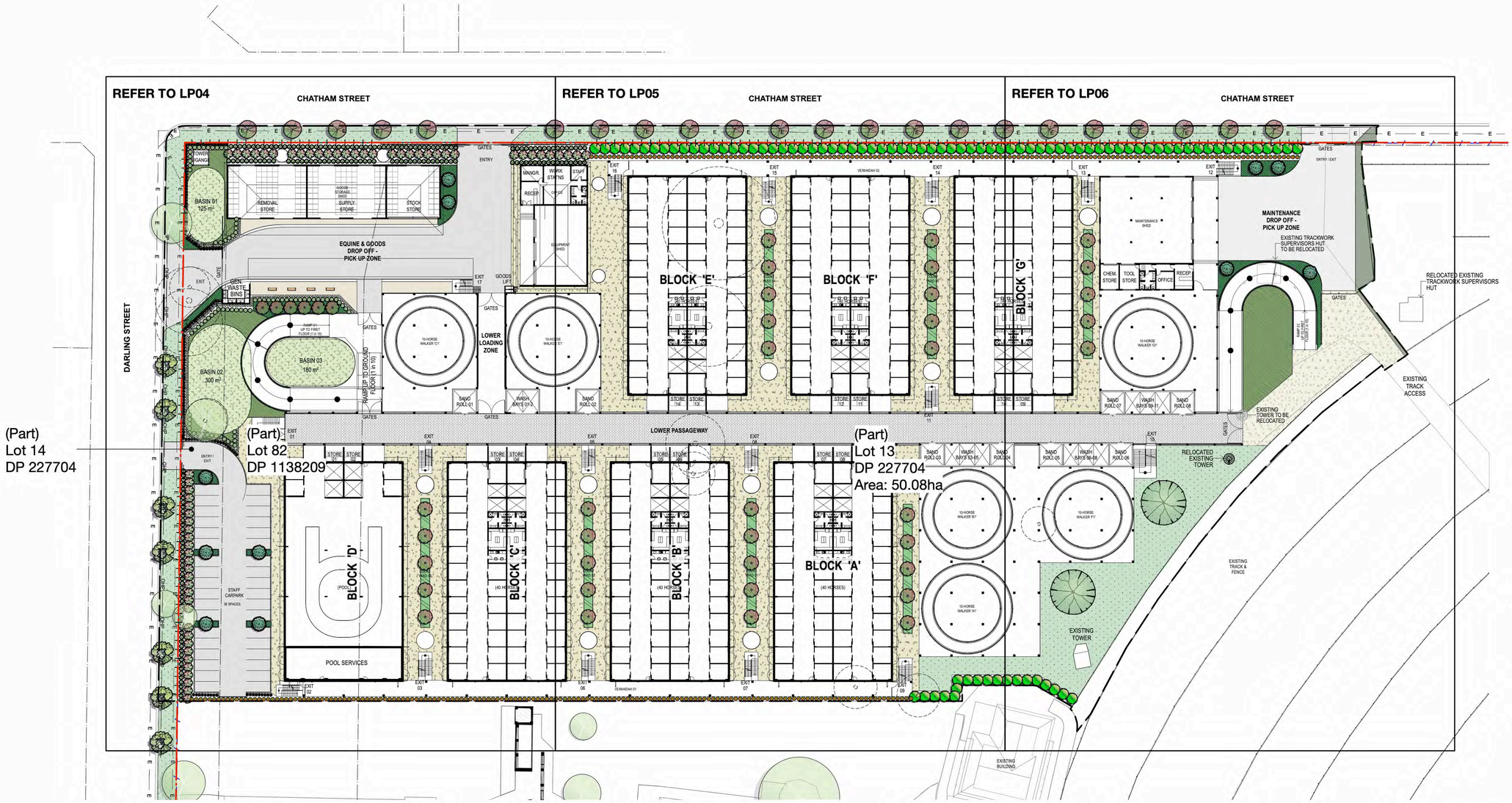
SITE ANALYSIS PLAN

SCALE: 1:750
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP02
Rev A



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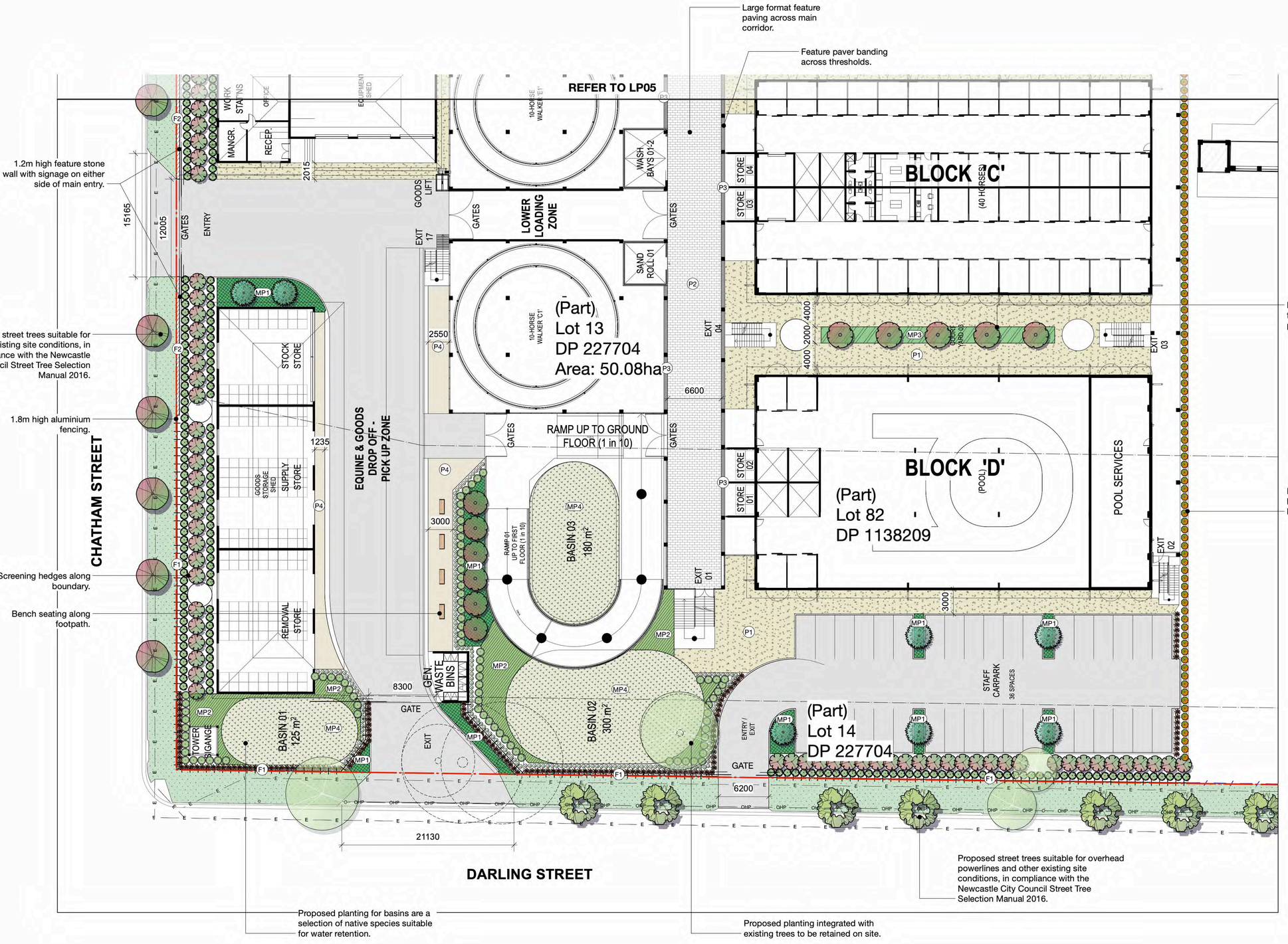
KEY PLAN

SCALE: 1:500
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP03
Rev A



LANDSCAPE CONCEPT PLAN 01

Scale 1:250 @ A1

0 5 10 15 20m

LEGEND

- Extent of work
- Site boundary
- Lot boundary
- E — Existing underground electricity lines
- OHP — Existing overhead power lines and poles
- Rainwater tank
- Existing tree - to be retained & protected
- Existing tree - to be removed
- Internal road
- P1 Decomposed granite footpath
- P2 Paving
- P3 Feature paver banding
- P4 Coloured concrete footpath
- T Turf
- Existing fence
- F1 Fence 1 - 1.8m aluminium fence
- F2 Fence 2 - 1.2m stone feature wall
- 1800L x 600W seat with armrests

TREES

- *Eucalyptus sideroxylon rosea* Red Flowering Ironbark
- *Lophostemon confertus* Brush Box
- *Magnolia grandiflora 'Little Gem'* Little Gem Magnolia
- *Pyrus calleryana 'Capital'* Capital Flowering Pear
- *Tristaniopsis laurina 'Luscious'* Watergum

SHRUBS

- *Acmena smithii 'Allyn Magic'* Dwarf Lilly Pilly
- *Correa alba* White Correa
- *Murraya paniculata* Orange Jessamine
- *Phormium tenax ' Bronze Baby'* Bronze Flax
- *Photinia x fraseri 'Robusta'* Photinia
- *Rhaphiolepis indica 'Snow Maiden'* Indian Hawthorn
- *Westringia fruticosa 'Grey Box'* Grey Box Westringia

MASS PLANTING

- MP1 Mass Planting Type 1 - 3/m²
  - *Dianella caerulea*
  - *Trachelospermum asiaticum 'Flat Mat'*
- MP2 Mass Planting Type 2 - 3/m²
  - *Phormium tenax*
  - *Pennisetum alopecuroides*
  - *Westringia fruticosa 'Mundi'*
- MP3 Mass planting Type 3 - 3/m²
  - *Correa alba*
  - *Westringia fruticosa 'Mundi'*
- MP4 Mass Planting Type 4 - Basin 4/m²
  - *Carex apresa*
  - *Ficinia nodosa*
  - *Gahnia clarkei*
  - *Juncus ustitatus*
  - *Lomandra longifolia 'Tanika'*

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No. 21 Chatham Street, Broadmeadow, NSW

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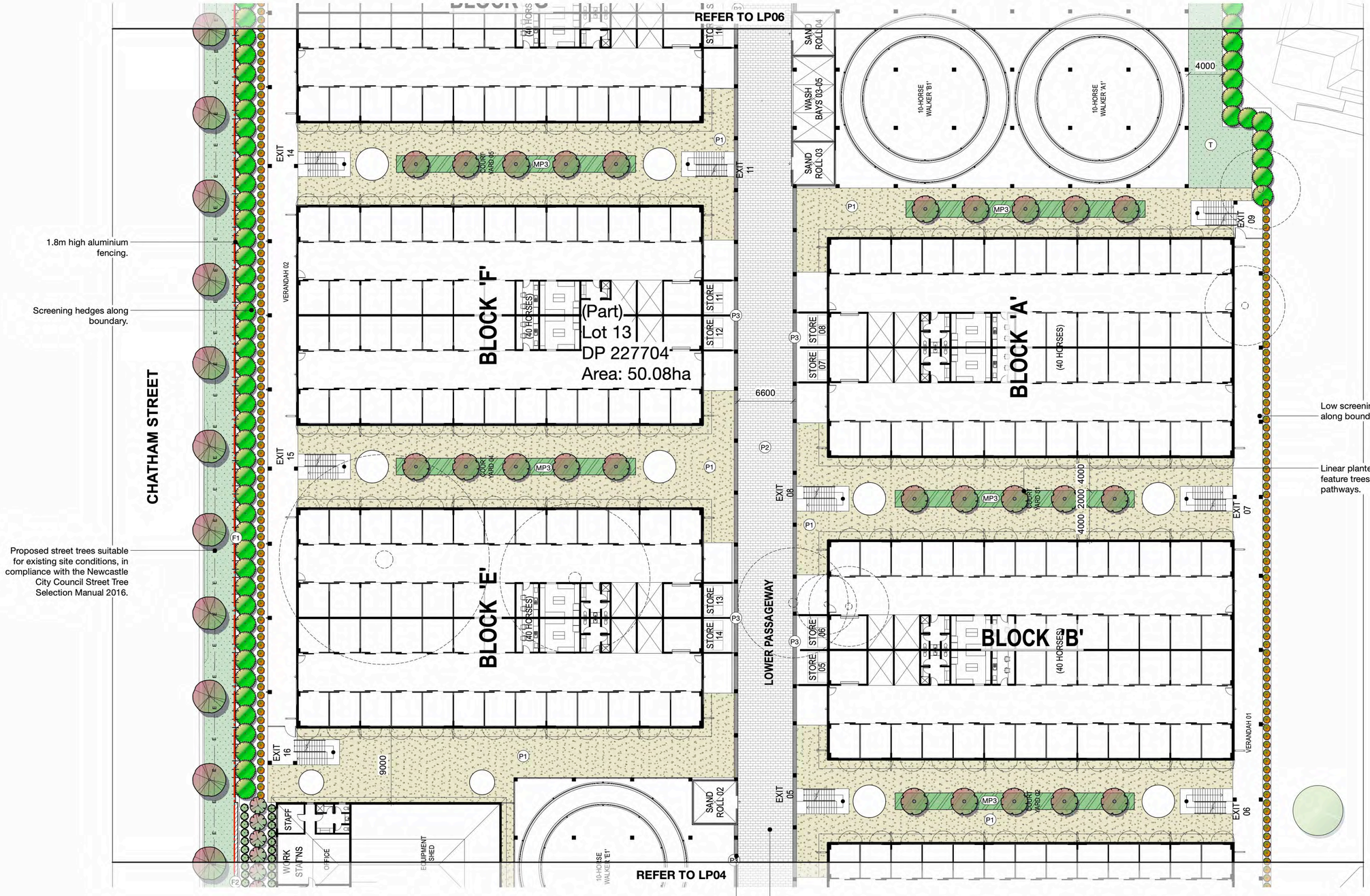
North

LANDSCAPE PLAN 01

SCALE: 1:250
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP04
Rev A



LANDSCAPE CONCEPT PLAN 02
Scale 1:250 @ A1

0 5 10 15 20m

LEGEND

- Extent of work
- Site boundary
- Lot boundary
- E — Existing underground electricity lines
- OHP — Existing overhead power lines and poles
- Rainwater tank
- Existing tree - to be retained & protected
- Existing tree - to be removed
- Internal road
- P1 Decomposed granite footpath
- P2 Paving
- P3 Feature paver banding
- P4 Coloured concrete footpath
- T Turf
- Existing fence
- F1 Fence 1 - 1.8m aluminium fence
- F2 Fence 2 - 1.2m stone feature wall
- 1800L x 600W seat with armrests

TREES

- *Eucalyptus sideroxylon rosea* Red Flowering Ironbark
- *Lophostemon confertus* Brush Box
- *Magnolia grandiflora 'Little Gem'* Little Gem Magnolia
- *Pyrus calleryana 'Capital'* Capital Flowering Pear
- *Tristaniopsis laurina 'Luscious'* Watergum

SHRUBS

- *Acmena smithii 'Allyn Magic'* Dwarf Lilly Pilly
- *Correa alba* White Correa
- *Murraya paniculata* Orange Jessamine
- *Phormium tenax ' Bronze Baby'* Bronze Flax
- *Photinia x fraseri 'Robusta'* Photinia
- *Rhaphiolepis indica 'Snow Maiden'* Indian Hawthorn
- *Westringia fruticosa 'Grey Box'* Grey Box Westringia

MASS PLANTING

- MP1 Mass Planting Type 1 - 3/m²
  - *Dianella caerulea*
  - *Trachelospermum asiaticum 'Flat Mat'*
- MP2 Mass Planting Type 2 - 3/m²
  - *Phormium tenax*
  - *Pennisetum alopecuroides*
  - *Westringia fruticosa 'Mundi'*
- MP3 Mass planting Type 3 - 3/m²
  - *Correa alba*
  - *Westringia fruticosa 'Mundi'*
- MP4 Mass Planting Type 4 - Basin 4/m²
  - *Carex apresa*
  - *Ficinia nodosa*
  - *Gahnia clarkei*
  - *Juncus ustitatus*
  - *Lomandra longifolia 'Tanika'*

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PROJECT: Newcastle Jockey Club Stables Development
No. 21 Chatham Street, Broadmeadow, NSW

Status: DRAFT

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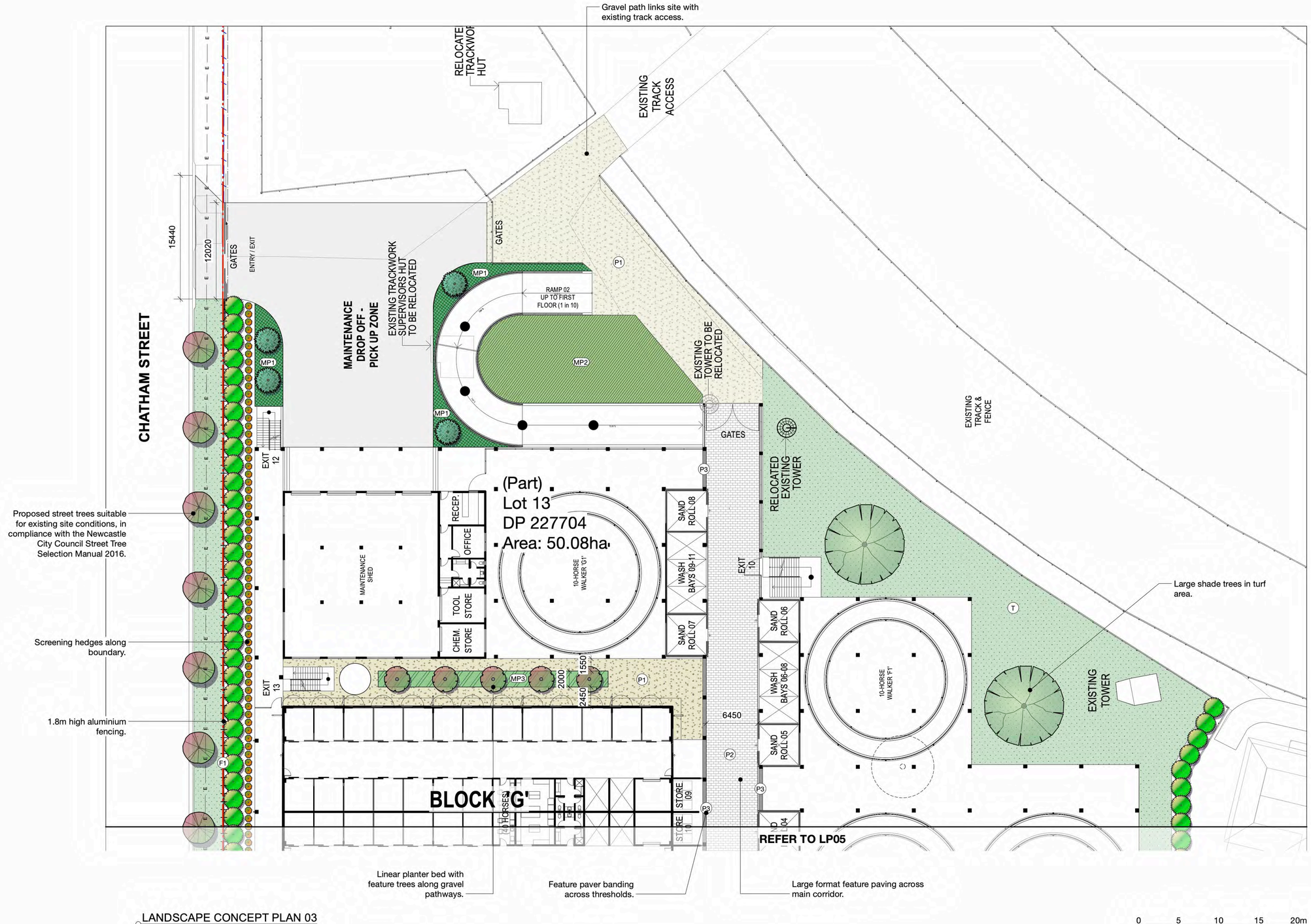
LANDSCAPE PLAN 02

SCALE: 1:250
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP05
Rev A



LANDSCAPE CONCEPT PLAN 03
Scale 1:250 @ A1

LEGEND

- Extent of work
- Site boundary
- Lot boundary
- E — Existing underground electricity lines
- OHP — Existing overhead power lines and poles
- Rainwater tank
- Existing tree - to be retained & protected
- Existing tree - to be removed
- Internal road
- P1 Decomposed granite footpath
- P2 Paving
- P3 Feature paver banding
- P4 Coloured concrete footpath
- T Turf
- Existing fence
- F1 Fence 1 - 1.8m aluminium fence
- F2 Fence 2 - 1.2m stone feature wall
- 1800L x 600W seat with armrests

TREES

- *Eucalyptus sideroxylon rosea* Red Flowering Ironbark
- *Lophostemon confertus* Brush Box
- *Magnolia grandiflora 'Little Gem'* Little Gem Magnolia
- *Pyrus calleryana 'Capital'* Capital Flowering Pear
- *Tristaniopsis laurina 'Luscious'* Watergum

SHRUBS

- *Acmena smithii 'Allyn Magic'* Dwarf Lilly Pilly
- *Correa alba* White Correa
- *Murraya paniculata* Orange Jessamine
- *Phormium tenax ' Bronze Baby'* Bronze Flax
- *Photinia x fraseri 'Robusta'* Photinia
- *Rhaphiolepis indica 'Snow Maiden'* Indian Hawthorn
- *Westringia fruticosa 'Grey Box'* Grey Box Westringia

MASS PLANTING

- MP1 Mass Planting Type 1 - 3/m²
  - *Dianella caerulea*
  - *Trachelospermum asiaticum 'Flat Mat'*
- MP2 Mass Planting Type 2 - 3/m²
  - *Phormium tenax*
  - *Pennisetum alopecouroides*
  - *Westringia fruticosa 'Mundi'*
- MP3 Mass planting Type 3 - 3/m²
  - *Correa alba*
  - *Westringia fruticosa 'Mundi'*
- MP4 Mass Planting Type 4 - Basin 4/m²
  - *Carex apresa*
  - *Ficinia nodosa*
  - *Gahnia clarkei*
  - *Juncus ustitatus*
  - *Lomandra longifolia 'Tanika'*

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No. 21 Chatham Street, Broadmeadow, NSW

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LANDSCAPE PLAN 03

SCALE: 1:250 (ORIGINAL DRAWING AT A1.)
Drawn By: AG
Checked By: MW Approved By: DM
Project No. 1948
Drawing No. LP06
Rev A

TREES

Eucalyptus sideroxylon 'Rosea'
Red Flowering Ironbark

Tristaniopsis laurina 'Luscious'
Water Gum

Lophostemon confertus
Brush Box

Magnolia grandiflora 'Little Gem'
Little Gem Magnolia

Pyrus calleryana 'Capital'
Ornamental Pear

SHRUBS

Acmena smithii 'Allyn Magic'
Dwarf Lilly Pilly

Correa alba
White Correa

Murraya paniculata
Orange Jessamine

Photinia x fraseri 'Robusta'
Photinia Robusta

Raphiolepsis indica 'Snow Maiden'
Indian Hawthorn

Westringia fruticosa 'Grey Box'
Grey Box Coastal Rosemary

GRASSES

Dianella caerulea
Flax Lily

Pennisetum alopecuroides
Chines Fountain Grass

Phormium tenax 'Bronze Baby'
Bronze New Zealand Flax

Phormium tenax
New Zealand Flax

BASIN PLANTING

Carex appressa
Mat Rush

Ficinia nodosa
Knobby Club Rush

Gahnia clarkei
Saw Sedge

Juncus usitatus
Common Rush

Lomandra longifolia 'Tanika'
Spiny-head Mat Rush

GROUND COVERS

Trachelospermum asiaticum 'Flat Mat'
Japanese Star Jasmine

Westringia fruticosa 'Mundi'
Mundi Coastal Rosemary

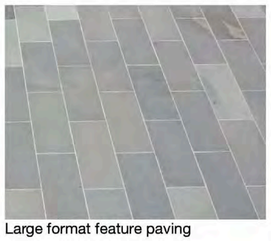
PLANTING SCHEDULE

Code	Botanical Name	Common Name	Mature Height	Mature Spread	Pot Size	Qty
Trees						
EUC sid	*Eucalyptus sideroxylon 'Rosea'*	Red Flowering Iron Bark	15 - 20m	6 - 10m	25 litre	22
LOP con	*Lophostemon confertus*	Brush Box	10 - 15m	8-10m	45 litre	2
MAG gem	*Magnolia grandiflora 'Little Gem'*	Little Gem Southern Magnolia	4 - 6m	2 - 3m	75 litre	41
PYR cap	*Pyrus calleryana 'Capital'*	Capital Flowering Pear	8 - 12m	2 - 3m	25 litre	11
TRI lus	*Tristaniopsis laurina 'Luscious'*	Water Gum	5 - 10m	4 - 6m	25 litre	7
Shrubs						
ACM all	*Acmena smithii 'Allyn Magic'*	Dwarf Lilly Pilly	0.4 - 0.5m	0.3 - 0.5m	200mm	
COR alb	*Correa alba*	White Correa	0.9 - 1.5m	0.9 - 1.2m	200mm	
MUR pan	*Murraya paniculata*	Orange Jessamine	3 - 4m	2 - 3m	200mm	
PHO fra	*Photinia x fraseri 'Robusta'*	Photinia	3m	2m	200mm	
RHA sno	*Rhaphiolepis 'Snow Maiden'*	Indian Hawthorn	0.60 - 0.75m	0.3 - 0.6m	200mm	
WES gre	*Westringia 'Grey Box'*	Grey Box Westringia	0.3 - 0.4m	0.3 - 0.4m	100mm	
Grasses						
PHO bro	*Phormium tenax 'Bronze Baby'*	Bronze Flax	0.5 - 0.7m	0.5 - 0.7m	100mm	
DIA cae	*Dianella caerulea*	Blue Flax Lily	0.45 - 0.6m	0.3 - 0.6m	100mm	
PEN alo	*Pennisetum alopecuroides*	Fountain Grass	0.9 - 1.5m	0.6 - 0.9m	100mm	
PHO ten	*Phormium tenax*	New Zealand Flax	3m	1.5m	200mm	
Ground Covers						
TRA asi	*Trachelospermum asiaticum 'Flat Mat'*	Japanese Star Jasmine	0.3 - 0.4m	3 - 4m	100mm	
WES mun	*Westringia fruticosa 'Mundi'*	Mundi Coastal Rosemary	0.4 - 0.5m	1.5m	100mm	
Basin Plants						
CAR app	*Carex appressa*	Tall Sedge	0.9 - 1.5m	0.3 - 0.6m	100mm	
FIC nod	*Ficinia nodosa*	Knobby Club-rush	0.75 - 0.9m	0.0 - 0.3m	100mm	
GAH cla	*Gahnia clarkei*	Saw Sedge	1.5 - 3m	0.9 - 1.2m	100mm	
JUN usi	*Juncus usitatus*	Common Rush	0.9 - 1.5m	0.6 - 0.9m		
LOM tan	*Lomandra longifolia 'Tanika'*	Spiny-head Mat Rush	0.45 - 0.6m	0.6 - 0.9m	100mm	

SURFACE FINISHES

Coloured concrete foopath

Decomposed granite footpath



Large format feature paving

Feature paver banding in contrasting colour

FURNITURE & FENCING

1.8m high aluminium palisade fencing

Stone feature wall with signage

Timber and metal frame bench seat

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THEMING PLAN

SCALE: 1:500
ORIGINAL DRAWING AT A1.
Drawn By: AG
Checked By: MW Approved By: DM

Project No. 1948
Drawing No. LP07
Rev A