

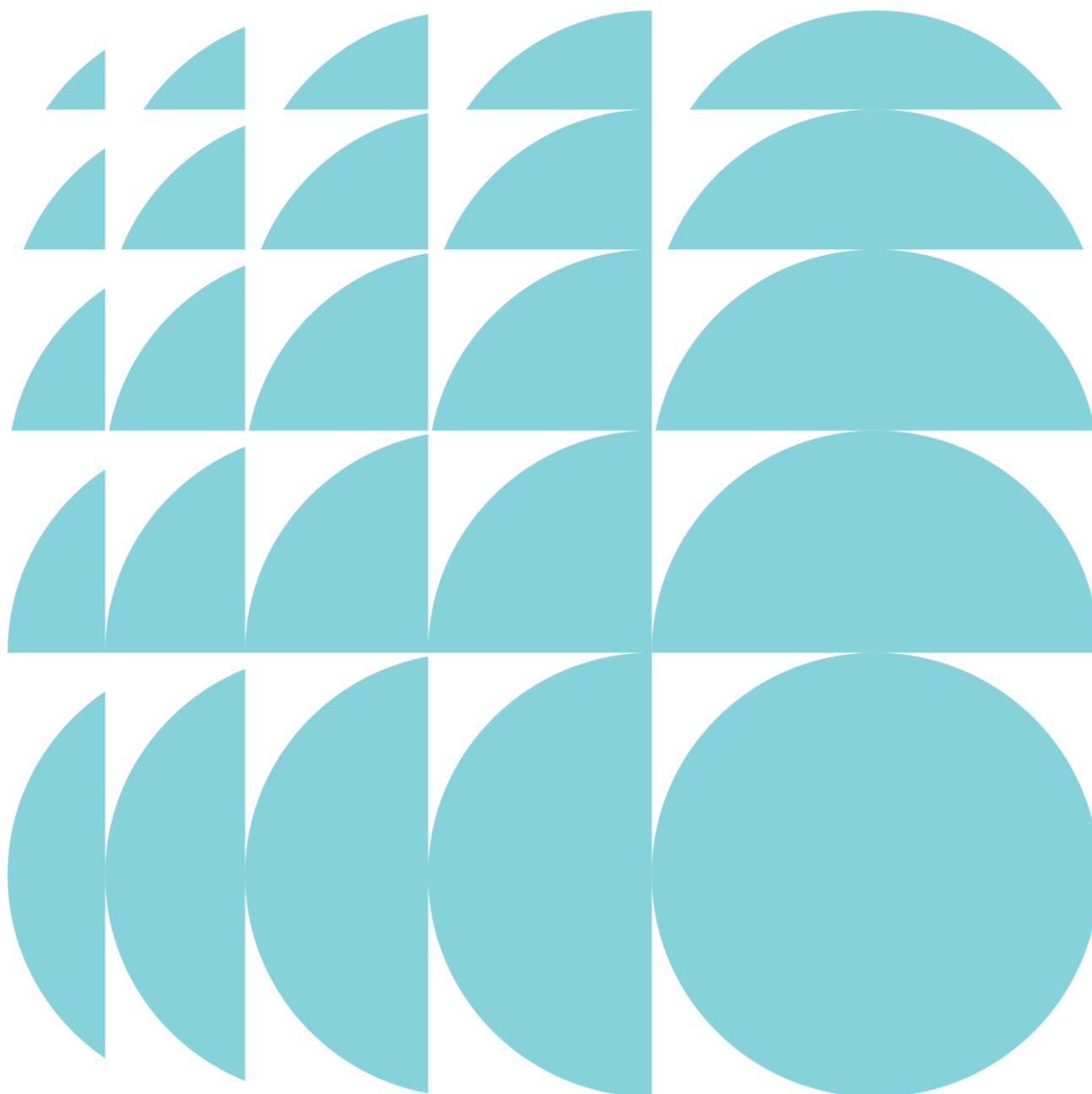
ETHOS URBAN

Environmental Impact Statement

Ivanhoe Estate
Stage 1 State Significant Development Application

Submitted to Department of Planning and
Environment
On behalf of Aspire Consortium

14 March 2019 | 17156



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B Urban Design Report

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N Subdivision Plans

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McKenzie Group
- DD** Fire Safety Strategy
Affinity Fire Engineering
- EE** Vertical Transportation Advice
WSP
- FF** Masterplan Arboricultural Impact Assessment
Eco Logical

Statement of Validity

Development Application Details

Applicant name	Land and Housing Corporation
Applicant address	Locked Bag 4009 Ashfield BC NSW 1800
Land to be developed	Ivanhoe Estate, Macquarie Park
Proposed development	Stage 1 of the Ivanhoe Estate development including site preparation works, servicing, lot amalgamation and subdivision, and construction of the road network and Buildings A1 and C1.

Prepared by

Name	Michael Rowe
Qualifications	BPlan
Address	173 Sussex Street, Sydney
In respect of	State Significant Development - Development Application

Certification

I certify that I have prepared the content of this EIS and to the best of my knowledge:

it is in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000;

all available information that is relevant to the environmental assessment of the development to which the statement relates; and

the information contained in the statement is neither false nor misleading.

Signature



Name Michael Rowe

Date 14/03/2019

Executive Summary

Purpose of this Report

This submission to the Department of Planning and Environment (the Department) comprises an Environmental Impact Statement (EIS) for a Development Application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP& A Act). It relates to Stage 1 of the Ivanhoe Estate development in Macquarie Park.

The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

Because of its importance to the delivery of social and affordable housing to NSW, the Ivanhoe Estate is identified as a State Significant Site in Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011. Development of Ivanhoe Estate with a capital investment value of more than \$20 million is State Significant Development (SSD) for the purposes of the EP&A Act. As the proposed development will have a capital investment value of approximately \$303,169,200 it is SSD.

A request for the issue of Secretary's Environmental Assessment Requirements (SEARs) was sought on 14 November 2017 and SEARs were issued on 12 December 2017. This submission is in accordance with the Department's guidelines for SSD applications lodged under Part 4 of the EP&A Act, and addresses the issues raised in the SEARs.

Overview of the Project

The Development Application (DA) seeks approval for the first stage of works (otherwise known as Stage 1) as part of the Ivanhoe Estate redevelopment. These works are pursuant to the concurrent Ivanhoe Estate Masterplan (SSD 17_8707) and will allow for the timely staging and delivery of works across the Estate in accordance with the Masterplan (discussed further in **Section 5**). Specifically, the SSD DA seeks approval for:

- site preparation works, including tree removal, demolition of roads and services, and earthworks across the Ivanhoe Estate;
- the provision and augmentation of utilities and services infrastructure across the Ivanhoe Estate;
- the construction of all internal roads including public domain within the road reserves, and the bridge crossing and road connection to Lyonpark Road including changes to parking, site access, landscaping and ancillary works at 2-4 Lyonpark Road;
- the consolidation of existing lots and subdivision of the Ivanhoe Estate to reflect the revised road layout, open space, and provide superblocks corresponding to the Masterplan;
- the construction and use of Buildings A1 and C1 comprising residential uses (including social housing), a childcare centre, and retail/community spaces.

The Site

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the City of Ryde Council Local Government Area (LGA). The site is approximately 8.2 hectares in area and currently accommodates 259 social housing dwellings, comprising a mix of terrace and four storey apartment buildings set around a cul-de-sac street layout. The demolition of these existing buildings is being completed by LAHC as a public authority, subject to a separate planning process, and as such the existing structures on site will not be present when completing Stage 1.

Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot which formerly comprised four student accommodation buildings and is in the process of being redeveloped for high-rise residential buildings. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space runs along the south eastern boundary. Vehicle access to the site is currently provided via a round-a-bout on Herring Road.

The Ivanhoe Estate site is comprised of 17 individual lots and are owned and managed by the NSW Land and Housing Corporation.

Planning Context

Section 5.1 of the EIS considers all applicable legislation in detail. The proposal is consistent with the relevant strategic planning policies and the requirements of all relevant State Environmental Planning Policies (SEPPs). The site is zoned partly B4 Mixed Use, RE1 Public Recreation and B7 Business Park under the *Ryde Local Environmental Plan 2014* (Ryde LEP). The proposal is permissible with consent and meets the objectives of each zone. The proposed development complies with the Floor Space Ratio and maximum height of buildings development standards under the Ryde LEP and is consistent with the proposed Ivanhoe Estate Masterplan (SSD 18_8707).

Environmental Impacts and Mitigation Measures

This EIS provides an assessment of the environmental impacts of the project in accordance with the SEARs and sets out the undertakings made by Land and Housing Corporation to manage and minimise potential impacts arising from the development. Mitigation measures are set out in **Section 7.0**.

Consistency with the Concept Plan

Stage 1 represents the first stage of physical works in the delivery of the Ivanhoe Estate Masterplan. These works have been assessed and found to be consistent with the planning and assessment framework established under the Masterplan to which this application is pursuant. Namely, the Stage 1 works are deemed to be in accordance with the maximum parameters and assumed capacity of the building envelopes for C1 and A1, the indicative land uses and tenure mixes, the road layout and public domain treatments, the detailed design of buildings, and the indicative staging of development. As is explored below, resultant environmental impacts are consistent with the assumptions developed under the Masterplan, and the associated mitigation strategies will tie in with the overarching strategies under the Masterplan.

Land Uses

Stage 1 will deliver non-residential uses to cater for the new community and increased population on the site, and a mix of residential typologies (ie: seniors living and dual key apartments) and tenures to meet commitments under the Masterplan for integrated housing solutions that cater for different users. Ground floor non-residential uses such as retail / community spaces and a child care centre will activate key road frontages and public domain areas and ensure that essential services are being delivered in coordination with housing. The development of private and social housing, including independent living units, is also consistent with best practice for mixed tenure estate renewal.

This application demonstrates that the proposed child care centre is capable of complying with the relevant legislation and guidelines, which will be further addressed as part of a separate and future application for the centres detailed design and operation.

Built Form

The detailed design of Building A1 and C1 is consistent with the Ivanhoe Estate Design Guidelines and has been conducted in-line with the Design Excellence Strategy developed for this phase of the development (discussed further below), to ensure the best possible outcome is achieved. Bates Smart and Candalepas Associates have created visually interesting designs that respond to the unique characteristics of the individual blocks, incorporate high-quality and varied materials, and contribute to the developing skyline of Macquarie Park. The proposal will not result in the loss of any valuable views or landscape features, is consistent with the desired future character of the area as identified in NSW Government strategic planning policies and will not result in any unacceptable visual impacts.

Landscape and Public Domain

This first stage of physical works on the site will deliver landscape solutions for Building A1 and C1, sections of the public domain areas and access routes considered under the Masterplan. Maximising the proportion of public domain areas being delivered in this initial stage will benefit the establishment of mature vegetation in the streetscape and around building edges, and provide the new community with places to congregate and socialise. These spaces and their treatment have been developed in accordance with the Ivanhoe Estate Design Guidelines and the landscaping framework established by Hassell under the Masterplan, to ensure the delivery of high-quality spaces that contribute to the urban canopy and provide future residents with the opportunity for recreation and social engagement.

Design Excellence

A Design Excellence Strategy has been developed that outlines the principles and procedures followed during the delivery program for Stage 1 of the Masterplan. The Strategy demonstrates how the architecture and urban design of Stage 1 has achieved a high level of design quality and has been the subject of an independent design review process. Advice and feedback issued as part of the design review process has been addressed in the design development of the proposed buildings and public domain. This Design Excellence Strategy will continue to be implemented through the construction and delivery phase of the development, to safeguard the design integrity of the Estate.

Access

Stage 1 will deliver the road network considered under the Masterplan, including the Shrimptons Creek Bridge and lead-in works for future intersection upgrades that will be the subject of future design and consultation with the relevant road authority. The road network has been designed in accordance with the relevant standards and controls, and incorporates the envisaged shared paths, pedestrian paths and street trees and landscaping. Temporary measures have been also developed to ensure that the staged delivery of the road network will not impede the ability of vehicles to enter and exit the site or impede the operation of the Stage 1 buildings.

Traffic and Parking

Building A1 and C1 are expected to generate 95 vehicles per hour in the AM peak period and 89 vehicles per hour in the PM peak period, which fits comfortably within the assumed peak traffic thresholds that will be generated through the redevelopment of the Estate and can therefore be accommodated within the proposed network. Whilst upgrades to the intersection of Epping Road, Herring Road and Lyonpark Road are considered under this application in terms of the required lead-in works and a series of indicative designs that have been prepared by ADW Johnson, no intersection upgrades are required to accommodate the Stage 1 buildings. SIDRA modelling confirms that the Stage 1 buildings will have a minimal impact on the operation of the local area network with the key intersection of Herring Road and Ivanhoe Place continuing to operate with a similar level of service that is currently experienced.

Car parking and servicing arrangements have been provided in accordance with the rates established under the Masterplan and associated legislation.

Residential Amenity and Overshadowing

Building A1 and C1 achieve an appropriate level of residential amenity in accordance with the *State Environmental Planning Policy 65 (Design Quality of Residential Flat Buildings)* and the design criteria set out in the Apartment Design Guide. Minor non-compliances with the Apartment Design Guide are justified in the circumstances as they contribute to façade articulation and design variation; are appropriately offset in the delivery of extensive deep soil and open space areas under the Masterplan; or result from the orientation of the building to maximise the number of apartments that achieve the recommended 2 hours of direct sunlight during midwinter. Overshadowing impacts on adjoining properties are limited and will not adversely affect the amenity of surrounding residences

Vegetation and Biodiversity

Consistent with the Masterplan, the application seeks to retain areas of native vegetation on the site and remove the vegetation earmarked under the Masterplan where impacts on vegetation are unavoidable. Accordingly, biodiversity offsets in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the *Environment Protection and Biodiversity Conservation Act* Environmental Offsets Policy will be acquired and retired. These offsets will be staged in coordination with the delivery of Building A1 and C1, the road network, and future buildings that will be delivered under separate and future applications. The first stage of construction on the site will not require the retirement of any ecosystem credits. The staged delivery of the road network proposed under this application will require the retirement of credits in accordance with the staging plan contained in the Biodiversity Assessment Report and Offset Strategy prepared by Eco Logical for the Masterplan.

Social and Economic Impacts

The proposal will deliver the first stage of social housing on the site, as well as private dwellings, to contribute to increased supply of housing in the Macquarie Park area. It will provide high quality residential dwellings, including a purpose-designed mixed tenure building, that will benefit from complementary non-residential uses and public domain areas designed to encourage social interaction. The development has been designed in accordance with best practice principles for mixed tenure community integration and will increase opportunities for residents to live close to employment, public transport and education. The implementation of community and place management activities will ensure that Ivanhoe Estate evolves as an equitable, inclusive and productive community.

By providing residential density in close proximity to employment and public transport, it is anticipated the development will generate indirect economic benefits, promote economic activity in the Macquarie Park area, and reduce costs associated with traffic congestion. In addition to this, the Consortium will provide infrastructure, works-in-kind, and monetary contributions, to provide a range of public benefits that are intrinsically linked to the delivery of the Masterplan and Stage 1 by association.

Stormwater and Wastewater Management

In accordance with the commitments under the Masterplan, appropriate Water Sensitive Urban Design measures have been incorporated into the stormwater management system to treat the quality of stormwater prior to discharge, and on-site detention and management measures will reduce the impact of stormwater discharge from the site. Stormwater will be reused on site in private open space areas to reduce demands on potable water.

Infrastructure and Services

Consultation has been undertaken and all relevant utility service providers and authorities have confirmed that the site can be serviced, subject to the infrastructure upgrades outlined in the EIS and the detailed design of a new piped stormwater system through the basement of Building A1. In addition, Stage 1 will deliver the road network and bridge that will be staged and dedicated to Council as public roads. Aspire Consortium will enter into a Voluntary Planning Agreement with the City of Ryde to deliver this infrastructure and other works-in-kind on and off-site.

Noise and Vibration

The operation of Building A1 and C1 will not generate any unacceptable impacts, and any noise emissions resulting from construction works on the site can be appropriately mitigated and managed. Acoustic treatments will be incorporated into future building designs to mitigate against any potential noise impacts.

Wind

Building A1 and C1 are capable of achieving a suitable wind environment, consistent with the relevant safety criterion. The incorporation of mitigation measures such as setbacks, awnings, screening and planting have been included to assist in reducing wind speeds and benefit the creation of a comfortable wind environment.

Air Quality

Air quality on site is suitable for the proposed residential and non-residential uses. The buildings are sufficiently separated and screened from Epping Road by buildings, which means that particulate concentrations will be reduced by over 90% from kerbside levels due to dissipation into the atmosphere. Vegetation surrounding the site and buildings will also assist in filtering air pollution from Herring Road and Epping Road. The risk of air quality impacts as a result of construction works on site are considered to be low, and can be appropriately mitigated and managed.

Geotechnical

The recommended engineering solutions will be implemented during the construction of buildings and infrastructure, to ensure that any potential impacts on the structural integrity of future development as a result of the geotechnical conditions are minimised. No adverse environmental conditions were identified for the site concerning ground water, and the site is not affected by Acid Sulfate Soils or is at an elevation above those associated with Acid Sulfate Soils.

Contamination

In accordance with various site investigations and a Remediation Action Plan developed for the site, it is proposed to excavate a small area of contaminated materials and then dispose of the materials off-site at an appropriately licensed landfill disposal site. The excavated area will then be backfilled, if required, using clean fill materials. Further validation sampling of the remediation area will be required following the excavation and removal of impacted soils.

Ecologically Sustainable Development

Stage 1 will achieve the sustainability targets that were nominated for development under the Masterplan, including a 5 star Greenstar rating for Buildings A1 and C1. Scorecards have been prepared for these buildings, certifying that the initiatives identified in this application are able to meet the benchmark requirements.

Safety

A detailed assessment of the Stage 1 buildings and public domain areas has been completed which confirms that these elements are generally consistent with the principles of Crime Prevention Through Environmental Design and are worthy of support provided the recommendations are implemented.

Conclusion and Justification

This application represents the first step in the delivery of the planned redevelopment of the Ivanhoe Estate and will provide the first integrated social and market housing development on the site. It will replace the existing social housing units on site, provide up to 740 new homes including independent living units and dual key units, and deliver integrated and complementary non-residential uses and public domain areas. The application has been made with consideration of the overarching Ivanhoe Estate Masterplan that shapes and guides future development on the site, and is consistent with the impacts modelled under the Masterplan and the associated overarching strategies developed for the Masterplan.

The EIS addresses the SEARs, and finds that the potential impacts of the development are acceptable and are able to be managed. Given the planning merits of the proposal and its consistency with the concept plan, the proposed development warrants approval by the Minister for Planning.

1.0 Introduction

This Environmental Impact Statement (EIS) is submitted to the Department of Planning and Environment pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in support of an application for State Significant Development (SSD) for Stage 1 of the Ivanhoe Estate redevelopment.

This report has been prepared by Ethos Urban for Aspire Consortium on behalf of NSW Land and Housing Corporation, and is based on the Architectural Plans and Urban Design Report prepared by Bates Smart and Candalepas Associates (**Appendix A** and **B**), and Landscape and Public Domain Report prepared by Hassell (**Appendix C**) and other supporting technical information appended to the report (see the Table of Contents).

This EIS has been prepared in accordance with the requirements of Part 4 of the EP&A Act, Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), and the SEARs for the preparation of the EIS, which are included at **Appendix C**. This EIS should be read in conjunction with the supporting information and plans appended to and accompanying this report.

1.1 Overview of Proposed Development

This SSD DA seeks approval for Stage 1 of the Ivanhoe Estate redevelopment, pursuant to the concurrent Ivanhoe Estate Masterplan in accordance with Section 4.22 of the EP&A Act. The proposal forms the first detailed application for works at Ivanhoe Estate and contributes to the timely staging and delivery of works across the Estate in accordance with the Masterplan (discussed further in **Section 1.2**). Specifically, the SSD DA seeks approval for:

- site preparation works, including tree removal, demolition of roads and services, and earthworks across the Ivanhoe Estate;
- the provision and augmentation of utilities and services infrastructure across the Ivanhoe Estate;
- the construction of all internal roads including public domain within the road reserves, and the bridge crossing and road connection to Lyonpark Road including changes to parking, site access, landscaping and ancillary works at 2-4 Lyonpark Road;
- the consolidation of existing lots and subdivision of the Ivanhoe Estate to reflect the revised road layout, open space, and provide superblocks corresponding to the Masterplan;
- the construction and use of Buildings A1 and C1 comprising residential uses (including social housing), a childcare centre, and retail/community spaces.

1.2 Background to the Development

In September 2015 the Ivanhoe Estate was rezoned by the Department of Planning and Environment as part of the Macquarie University Station (Herring Road) Priority Precinct to transform the area into a vibrant centre that maximises the available transport infrastructure and the precinct's proximity to jobs, retail and education opportunities within the Macquarie Park corridor.

The Ivanhoe Estate is currently owned by LAHC and comprised 259 social housing dwellings and a child care centre, noting that the first stage of demolition is complete and has removed 51 dwellings. Demolition works on the site will be undertaken as a separate planning application by LAHC. The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

The Communities Plus program seeks to leverage the expertise and capacity of the private and non-government sectors. As part of this process, three organisations were short-listed in mid-2016 to submit development proposals for the redevelopment of the Ivanhoe Estate.

In August 2017 Aspire Consortium (the Consortium), comprising Frasers Property Australia and Mission Australia Housing was announced as the successful proponent to develop the site. This Stage 1 DA represents the first step in the delivery of the planned redevelopment of the Ivanhoe Estate and will provide the first integrated social and market housing development on the site. It has been made with consideration of the overarching Ivanhoe Estate Masterplan that will shape and guide future development on the site, as discussed further below.

The Masterplan

On 4 April 2018, an application was lodged with the Department for the Ivanhoe Estate Masterplan (SSD 18_8707). The Masterplan establishes the framework for development on the site, as the overarching Concept Proposal to which all future detailed applications (such as this Stage 1 DA) will be pursuant. It is the intention of the Consortium that the Masterplan and this Stage 1 DA be assessed concurrently, recognising that this Stage 1 DA cannot be determined until consent is granted to the Masterplan.

Following the public exhibition of the Masterplan between 12 April 2018 and 9 May 2018, a number of changes were made to the Masterplan to address comments received in submissions from agencies, authorities, and the general public, for an overall improvement to the publicly exhibited plan for the Estate. The changes comprised:

- deletion of a building, 'Building C2', and the expansion of the Village Green to create a new subterranean community centre and increased open space;
- a reduction in the total Gross Floor Area (GFA);
- increased setbacks between building envelopes and surrounding land;
- the retention of additional trees;
- an improved interface with the Shrimptons Creek riparian corridor;
- the redistribution of GFA in the form of increased building height to enable the above design improvements and a reduction in building heights at other locations; and
- the relocation of selected ground floor uses.

Overall, the Masterplan seeks consent for a new community where social housing is integrated with private and affordable housing, and benefits from good access to transport, employment, improved community facilities and open space. Specifically, consent is being sought for:

- A mixed use development involving a maximum of GFA of 278,000m², including:
 - residential flat buildings comprising private, social and affordable housing
 - seniors housing comprising of a residential care facility and self-contained dwellings
 - a new school
 - child care centres
 - minor retail development
 - community uses
- maximum building heights and GFA for each development block;
- public domain landscape concept, including parks, streets and pedestrian connections;
- provision of the Ivanhoe Estate Design Guidelines to guide the detailed design of the future buildings; and
- vehicular and intersection upgrades.

The Ivanhoe Estate Masterplan is replicated at **Figure 1** below, highlighting Buildings A1 and C1 that will be considered under this Stage 1 DA.

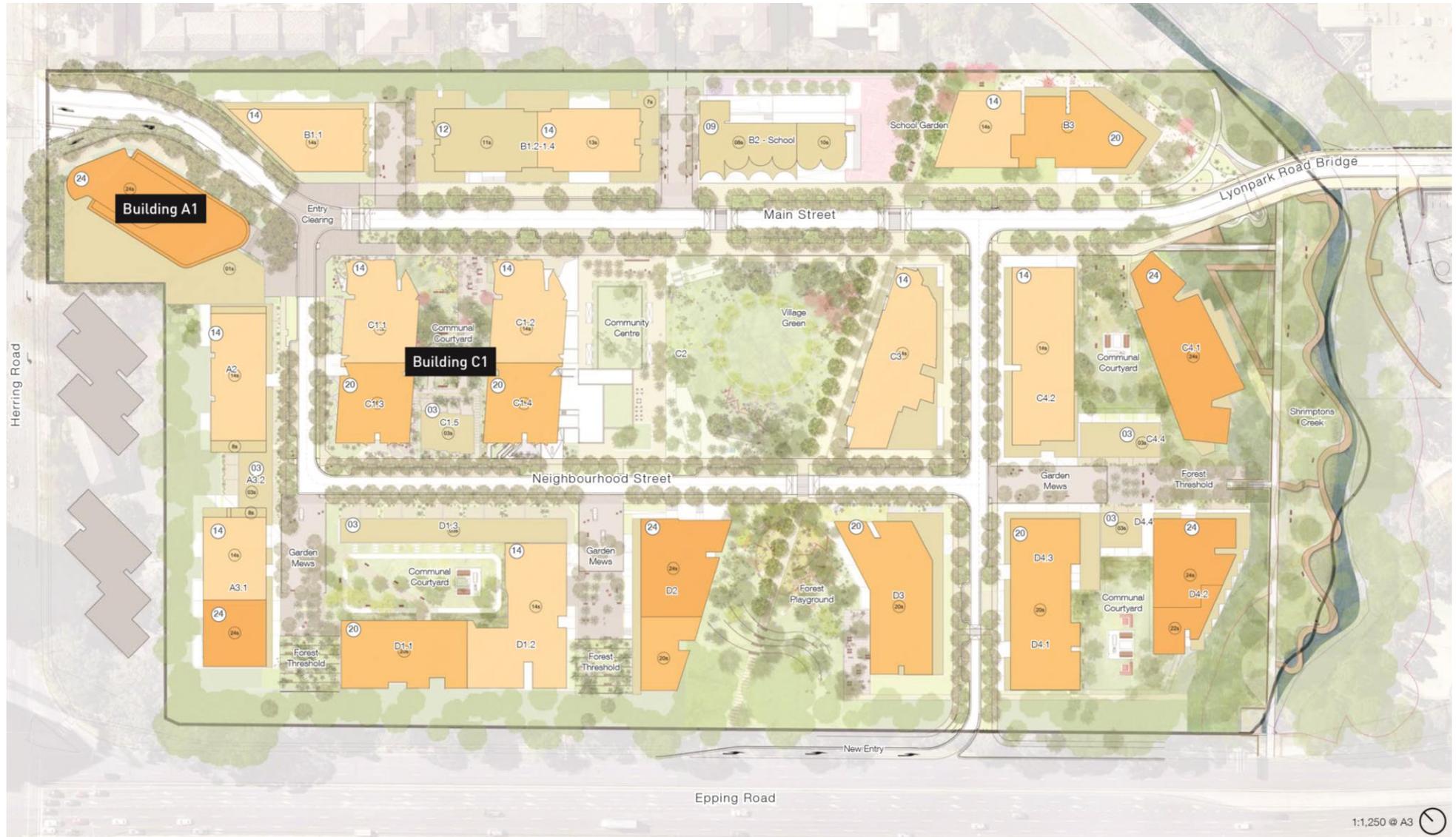


Figure 1 The Ivanhoe Estate Masterplan

Source: Bates Smart

1.3 Future Directions for Social Housing in NSW & Communities Plus

Future Directions for Social Housing in NSW ('Future Directions'), published in 2016, sets out the NSW Government's vision for social housing over the next 10 years. Future Directions is underpinned by the three strategic priorities of:

- more social housing;
- more opportunities, support and incentives to avoid and/or leave social housing; and
- a better social housing experience.

Achieving these strategic priorities will be measured against the following outcomes:

- Increase successful transitions out of social housing by 5%.
- Increase the proportion of young people who successfully move from specialist homelessness services to long term stable accommodation by 10%.

To deliver Future Directions, the NSW Government is collaborating with the private sector, not-for-profit sector and all levels of government. By 2025, Future Directions is seeking to transform the social housing system in NSW from one which is dominated by the public sector to a new system, which is characterised by:

- greater involvement of private and non-government partners in financing, owning and managing a significantly expanded stock of social and affordable housing assets;
- expanded support in the private rental market, reducing demand on social housing and the social housing wait list;
- more competition and diversity in the provision of tenancy management services through the expanded capacity and capability of community housing providers; and
- housing assistance being seen as a pathway to independence and an enabler of improved social and economic participation for tenants living in vibrant and socio-economically diverse communities.

To achieve these goals, Future Directions has set the following strategies:

- significant expansion and redevelopment of stock through partnerships with private sector developers and finance;
- transferring significant tenancy management responsibility to non-government housing providers; and
- "wrap-around" services to support tenants build their capabilities and take advantage of the economic opportunities in strengthening our economy.

Communities Plus is a government program which will facilitate non-government and private sector partnerships to redevelop Land and Housing Corporation sites throughout metropolitan Sydney and regional NSW. Communities Plus is based on an asset management framework that leverages the value of the existing portfolio to accelerate supply. Communities Plus will redevelop Land and Housing Corporation land by engaging private sector developers and community housing providers to design, fund and build social, affordable and private housing. As each development is completed, new social housing properties are handed over to Land and Housing Corporation as payment for the land, making the program entirely self-funding.

One of the key actions of Future Directions is to '*increase redevelopment of Land and Housing Corporation properties to renew and grow supply*', which will be achieved through Communities Plus. This action is guided by the following goals:

- deliver redevelopment projects on Land and Housing Corporation sites throughout NSW through Communities Plus;
- align redevelopment projects with Urban Growth priority renewal areas;

- work with planning agencies and authorities to ensure appropriate rezoning is possible;
- ensure large redevelopments target a 70:30 ratio of private to social housing to enable more integrated communities (generally with an increased number of social housing where practicable).

The Ivanhoe Estate is one of six major sites to be delivered through the Communities Plus program and will deliver approximately 1,000 social housing units and 128 affordable rental units, in addition to private dwellings, seniors living and other community facilities.

1.4 Objectives of the Development

The objectives of the Ivanhoe Estate Masterplan are to:

- Provide a seamlessly integrated community of private housing units, affordable housing units and social housing units where:
 - world class urban and architectural design creates a high quality place;
 - private housing units, affordable housing units and social housing units are indistinguishable and evenly distributed;
 - building design innovation assists management of mixed tenures;
 - urban design creates inclusive, high amenity places to optimise community interaction; and
 - social housing units meet the needs of tenants with built-in flexibility.
- Provide sustainable outcomes for tenants of social housing units and sustainable management of social housing units by:
 - conducting programs supporting social housing units tenants to engage in the community and local education, training and employment opportunities;
 - creating opportunities and programs to improve social outcomes;
 - providing industry leading water and energy efficiency;
 - promoting affordable housing units as a stepping stone for tenants from social housing units; and
 - deliver at least 128 affordable housing dwellings.
- Optimise the value for money return to the New South Wales Government by:
 - optimising land value by delivering social housing units to the NSW Government whilst ensuring that the total number of social housing units does not exceed 30% of the total number of units constructed within the project;
 - delivering no less than 128 affordable housing units; and
 - engaging the developer as a high performing delivery partner.

1.5 The Aspire Consortium Project Team

The Aspire Consortium comprises of leaders in the fields of property development and community housing, and is supported by highly qualified consultants and designers. The Consortium was founded with the purpose of consolidating knowledge to deliver the best outcome for Ivanhoe Estate. **Figure 2** below details the broader team that makes up and supports the Aspire Consortium.



Figure 2 Aspire Consortium project team

1.6 Statutory Context

1.6.1 State Significant Development

SEPP (State and Regional Development) 2011 identifies development that is State Significant Development (SSD). Clause 8(b) of the SEPP identifies that development is SSD for the purposes of the EP&A Act if it specified in Schedule 1 or 2 of the SEPP. Clause 10 of Schedule 2 of the SEPP species that:

10 Development at NSW Land and Housing Corporation Sites

(1) Development on land identified as a NSW Land and Housing Corporation Site on the State Significant Development Sites Map if the development:

- (a) is carried out by or on behalf of the NSW Land and Housing Corporation, and*
- (b) has a capital investment value of more than \$20 million.*

(2) For the purposes of subclause (1), land identified as being within Ivanhoe Estate on the State Significant Development Sites Map is identified as a NSW Land and Housing Corporation Site.

The proposal is SSD as it is located on the identified Ivanhoe Estate site, is carried out on behalf of the NSW Land and Housing Corporation and has a capital investment value of approximately \$303,169,200.

In addition to this, clause 8(2) of the S&RD SEPP states that if a single development application comprises development that is only partly under SSD, the remainder of the development may also be declared SSD for the purpose of the EP&A Act.

1.6.2 Consent Authority

As this SSD DA is made on behalf of LAHC, a public authority, the Minister for Planning, or the Department as his delegate, is the consent authority for this application.

1.6.3 Secretary’s Environmental Assessment Requirements

In accordance with Section 4.39 of the EP&A Act, the Secretary of the Department of Planning and Environment issued the requirements for the preparation of the EIS on 12 December 2017. A copy of the SEARs and where each of these requirements has been addressed in this report and the accompanying technical studies is included at **Appendix D**.

1.6.4 Approvals Framework

Under Section 4.24 of the EP&A Act, whilst a Concept Plan remains in-force, any further detailed application in respect to the site cannot be inconsistent with the consent for the Concept Proposal. This detailed DA has been made with reference to the concurrent Ivanhoe Estate Masterplan and is consistent with, and pursuant to, the Masterplan.

1.6.5 Social and Affordable Housing

One of the key objectives of the proposal is to deliver social and affordable housing in accordance with Future Directions and Communities Plus. Social housing will be available to people who are unable to access suitable accommodation in the private rental market and includes public, Aboriginal and community housing, as well as other housing assistance products such as bond loans.¹

In accordance with *State Environmental Planning Policy (Affordable Rental Housing) 2009* ('ARH SEPP'), affordable housing will be available to:

- Households with a gross income that is less than 120 per cent of the median household income for the time being for the Greater Sydney region and pays no more than 30 per cent of that gross income in rent.
- Households that are eligible to occupy rental accommodation under the National Rental Affordability Scheme and pays no more rent than that which would be charged if the household were to occupy rental accommodation under that scheme.

1.7 Design Review Panel

A project-specific independent Design Review Panel (DRP) has been compiled to oversee the Stage 1 application, and has been tasked with providing independent, impartial advice on the design of buildings, infrastructure, landscapes and public spaces associated with Stage 1. The Consortium and its design team have presented to the DRP on several occasions prior to the lodgement of this application, during which time the DRP issued feedback to assist with design development and resolution. This feedback has been incorporated into the design of buildings and public domain areas where appropriate, and is addressed in the relevant design statements at **Appendix B** and **C**.

¹ NSW Department of Family and Community Services. 2017. 'Social Housing'. Available from: <http://www.housing.nsw.gov.au/social-housing>

2.0 Site Analysis

2.1 Site Location and Context

The site is located in Macquarie Park near the corner of Herring Road and Epping Road within the City of Ryde Council Local Government Area (LGA). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site’s locational context is shown at **Figure 3**.

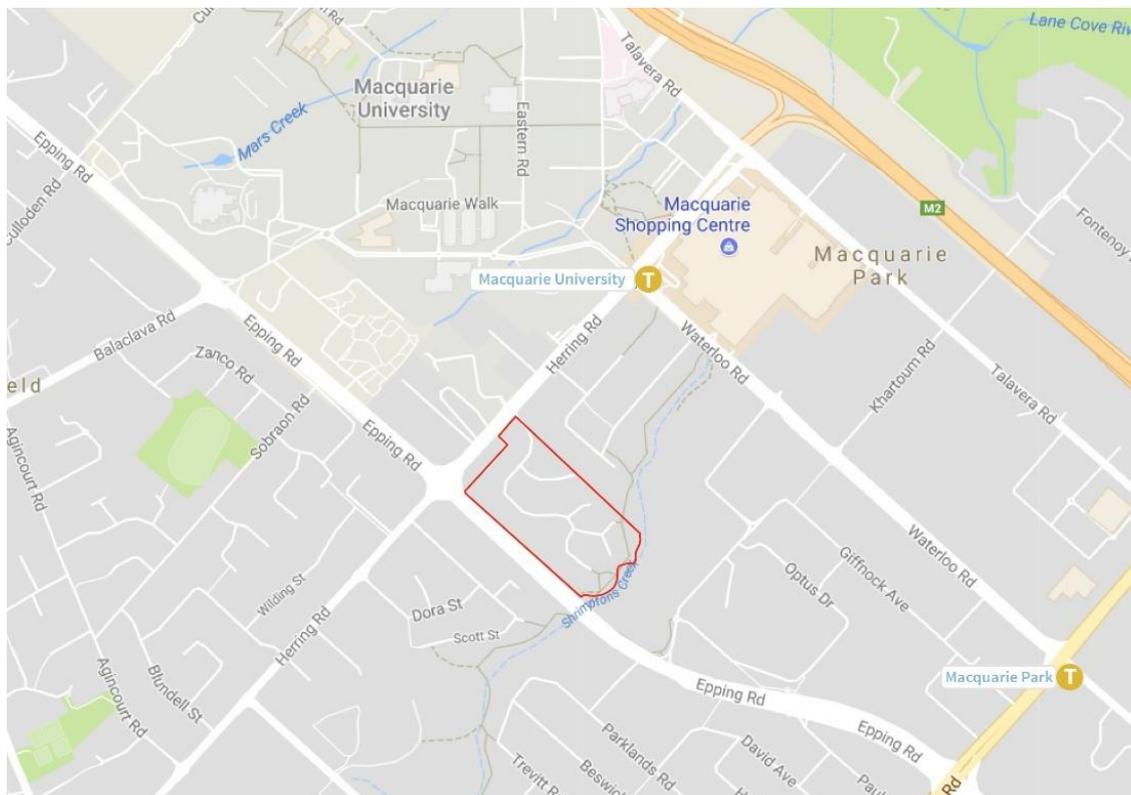


Figure 3 Locational context of Ivanhoe Estate (outlined in red)

Source: Google maps & Ethos Urban

2.2 Site Description

The Ivanhoe Estate site is approximately 8.2 hectares in area and comprises 17 individual allotments, as shown in **Table 1** and **Figure 4**. The entire Ivanhoe Estate site, including all the internal roads, is owned and managed by LAHC. As noted above, the Masterplan site also incorporates adjoining land, being a portion of Shrimptons Creek and Lot 1 DP 859537 (2-4 Lyon Park Road). 2-4 Lyonpark Road is owned by LIF Pty Ltd as trustee for Local Government Super and the owners of Shrimptons Creek is currently being determined by NSW Land and Property Information. In the interim, land ownership for Shrimptons Creek is established in accordance with the *ad medium filium* legal precedent, whereby the owner of a lot adjacent to a creek also owns a portion of the creek up to the centre point.

An aerial photo of the site is included at **Figure 5** below and a survey plan is located at **Appendix E**.

Table 1 Legal Description of the Site

Lot	Deposited Plan	Owner
5	740753	LAHC
6	861433	
7	861433	
8	861433	
9	861433	
10	861433	
11	861433	
12	861433	
13	861433	
14	861433	
15	861433	
16	861433	
17	861433	
18	861433 (internal road)	
19	861433 (internal road)	
20	861433 (internal road)	
100	1223787 (internal road)	
1	859537	LIF Pty Ltd
All of Shrimptons Creek adjacent to Lot 9 DP 861433 up to the centre line the creek.		LAHC
The portion of Shrimptons Creek adjacent to Lot 1 DP 859537 up to the centre line of the creek.		LIF Pty Ltd

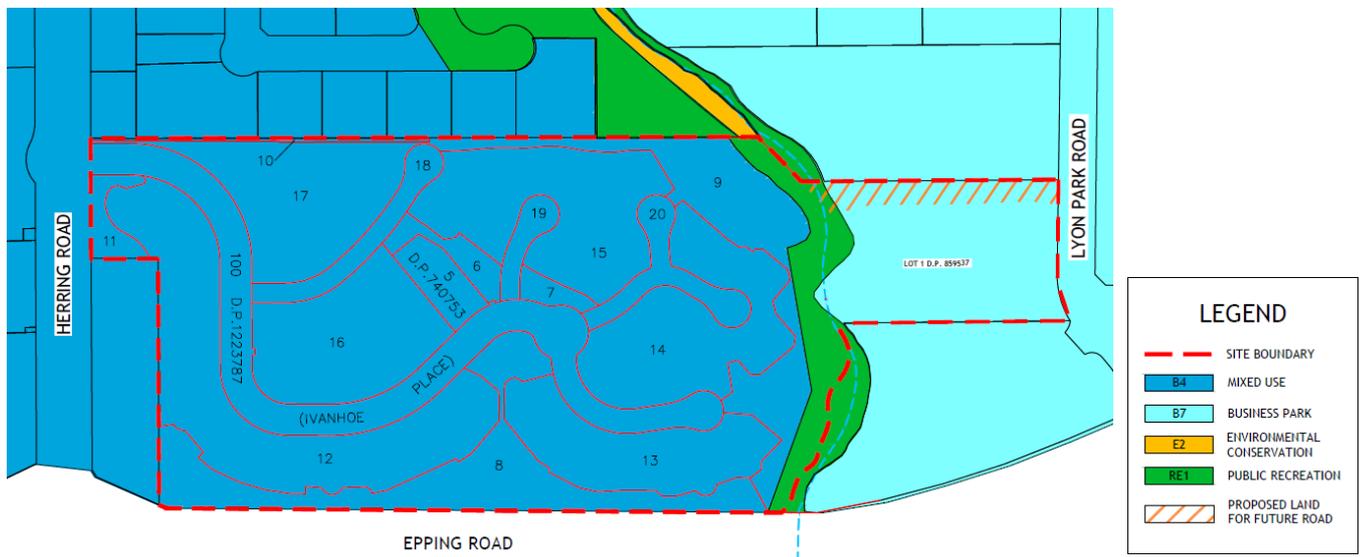


Figure 4 Lot boundaries and zoning

Source: ADW Johnson



Figure 5 Aerial image of the site

Source: Nearmap & Ethos Urban

2.2.1 Existing Development

The Ivanhoe Estate comprised 259 social housing dwellings and a child care centre, noting that the first stage of demolition is complete and has removed 51 dwellings. The dwellings on site encompassed a mix of terrace and four storey apartment buildings set around a cul-de-sac street layout. The Estate adjoins Shrimptons Creek, which includes a shared path and recreation facilities. As discussed in **Section 3** of this report, the demolition of buildings, paths and driveways, fencing and miscellaneous public structures on site is being completed by LAHC as a public authority, subject to a separate planning process. Accordingly, the existing development on site will not be present when completing Stage 1.

The site at 2-4 Lyon Park Road, owned by LIF Pty Ltd, is occupied by a multi-storey commercial office building with three basement parking levels and at-grade parking on the southern and eastern sides of the building.

2.2.2 Topography

The site slopes downwards from Herring Road at approximately RL 71 towards Shrimptons Creek at RL 42, resulting in an overall change in level of 29 metres.

2.2.3 Vegetation and Fauna

There is 3.3 hectares of native vegetation dispersed throughout the site, with dense concentrations along the Epping Road boundary and along the Shrimptons Creek corridor. The vegetation comprises a mixture of native and exotic species, as well as weeds, and accommodates areas of Turpentine-Ironbark open forest and the Smooth-barked Apple-Turpentine-Blackbutt open forest.

The Sydney Turpentine-Ironbark Forest is a threatened ecological community under the *Biodiversity Conservation Act 1995* and is also critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999*. There is 1.64 hectares of Sydney Turpentine-Ironbark Forest located on the site. The Smooth-barked Apple-Turpentine-Blackbutt is not a threatened ecological community.

Any fauna habitat within the site is highly modified due to the existing development and proximity to Epping Road. A habitat and fauna assessment undertaken by Eco Logical Australia found that the only fauna habitat within the site are hollow trees along Epping Road. Further surveys investigated the presence of fauna on the site and this assessment also found that no threatened species were present.

Photos of typical vegetation occurring on the site is included at **Figure 6**, and mapped vegetation zones within the site is shown at **Figure 7**.



Open space and vegetation adjoining Shrimptons Creek



Existing condition of Shrimptons Creek



Epping Road vegetation



Typical street trees

Figure 6 Existing vegetation

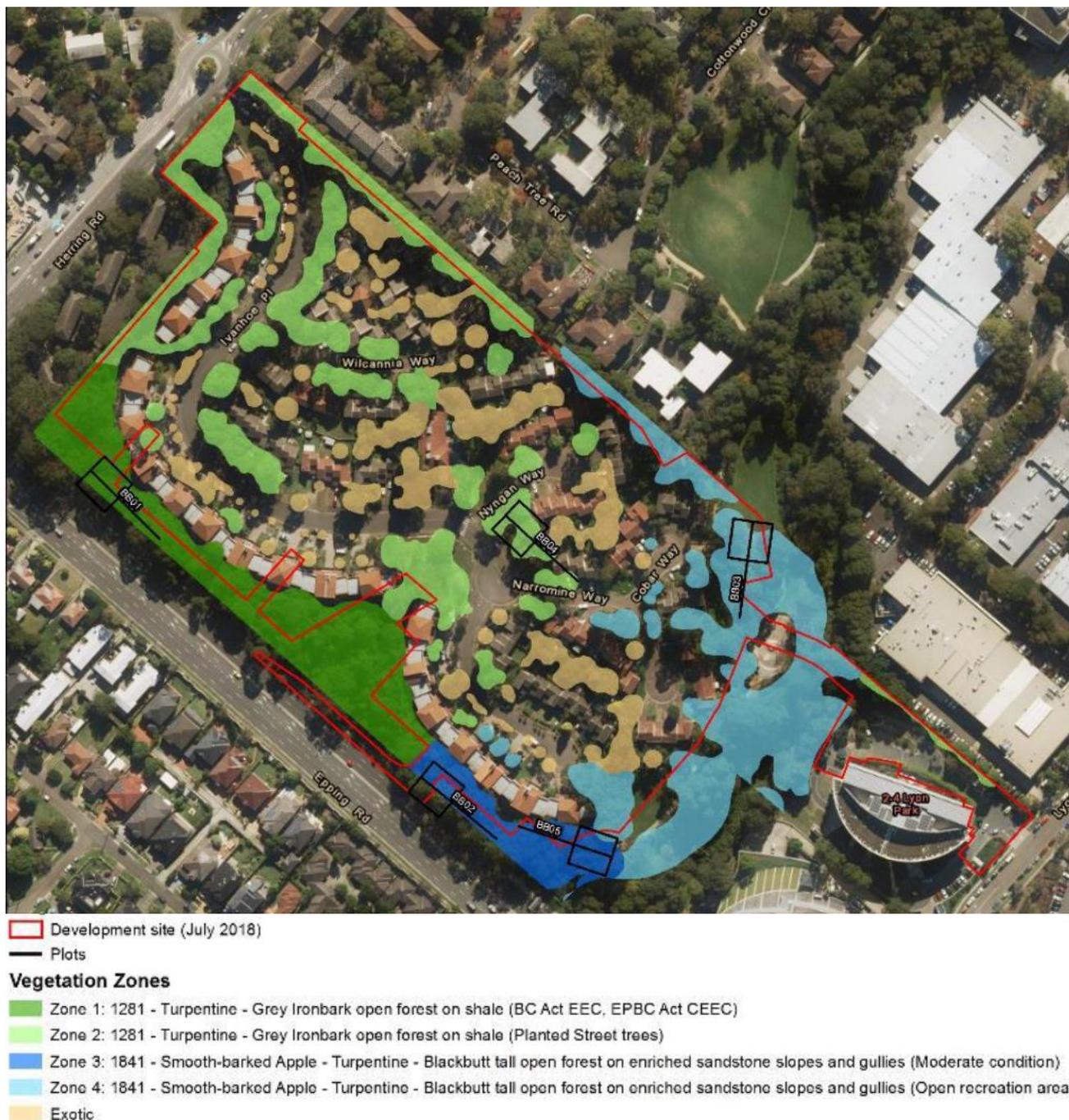


Figure 7 Existing vegetation zones on the site

Source: Eco Logical Australia

2.2.4 Watercourses

Shrimptons Creek is a riparian corridor that flows through the southern part of the Ivanhoe Estate. Shrimptons Creek flows from south to north through the Lane Cove National Park and onwards to the Lane Cove River.

Existing Stormwater Management Infrastructure

Existing street drainage and inter-allotment drainage infrastructure carries runoff from the site into Shrimptons Creek to the south via three culvert outlet locations that discharge into the creek. Stormwater generated by existing residential development to the north-west of the site also drains through the Estate, to the public drainage system in Ivanhoe Place. Existing stormwater infrastructure is described in further detail in the Stormwater and Drainage Assessment prepared by ADW Johnson at **Appendix F**.

Groundwater

It is expected that regional groundwater would be present within the underlying bedrock at depths of greater than 5 to 10 metres. Based on the hydrology of the local area, any groundwater underlying the site is expected to flow in a north-easterly direction toward the Lane Cove River. Existing groundwater conditions are further discussed in the Geotechnical Assessment prepared by Douglas Partners (**Appendix G**) and the Contamination Assessment prepared by DLA Environmental (**Appendix H**).

Existing Flood Conditions

The site is partially affected by flooding during the 100 year ARI and PMF events, which is largely confined to the banks of Shrimptons Creek as well as small areas of localised flooding throughout the site. Peak flood depth during the 100 year ARI event is shown at **Figure 8**. Existing flood impacts are further discussed in the Flood Impact Assessment prepared by BMT WBM at **Appendix I**.

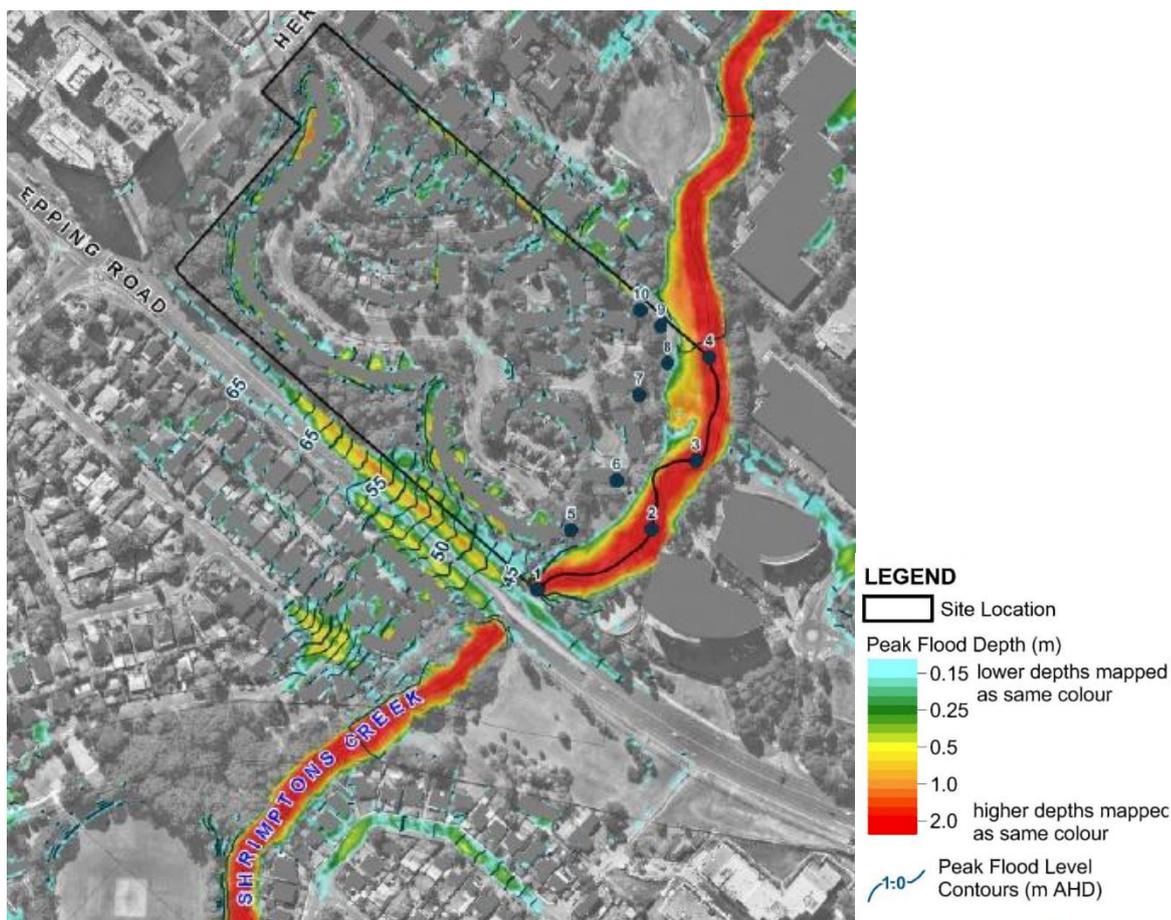


Figure 8 Peak flood depth during 100 year ARI event

Source: BMT WBM

2.2.5 Vehicular and Pedestrian Access

There is a single point of vehicle entry to the existing Ivanhoe Estate site, via a roundabout on Herring Road.

Existing pedestrian access to the site is via Ivanhoe Place, via Herring Road. Pedestrian access to the site is also available from the Shrimptons Creek Trail, which runs parallel to the creek through the site. This pedestrian trail can be accessed from Epping Road, Wilga Reserve or from Waterloo Road.

Vehicular access to the site is shown at **Figure 9**, and the pedestrian link under Epping Road at the boundary of the site is shown in **Figure 10**.

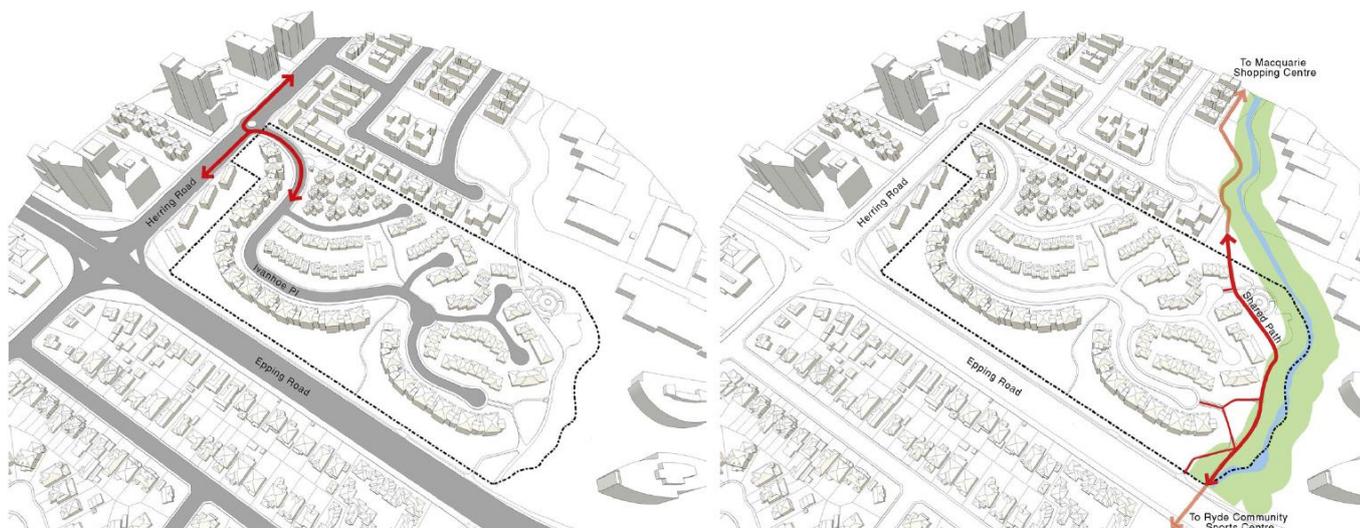


Figure 9 Vehicular and Pedestrian Access to the Site

Source: Bates Smart



Figure 10 Shrimptons Creek Trail

2.2.6 Heritage and Archaeology

There are no known heritage or archaeological items that are listed on the State Heritage Register or under the *Ryde Local Environmental Plan 2014* within the site. An Aboriginal and Historical Heritage Assessment has been prepared by Eco Logical Australia and is provided at **Appendix J**.

2.2.7 Soil and Geotechnical Conditions

The site is generally underlain by the residual Lucas Heights soil landscape, whilst a portion of the site close to Herring Road is partly underlain by the erosional Glenorie soil. The natural soils are likely to comprise sandy clay and clayey sand soils, with the potential for sandstone gravel, ironstone bands and silty clay soils.

The soils are likely to be relatively shallow, but may be deeper in areas of past filling. Observations by a geotechnical engineer indicate that filling is likely to be present in many parts of the site due to past cut and fill activities. Such filling may include gravelly clay and sand soils, as well as other types of filling.

The site is not affected by Acid Sulfate Soils and is at an elevation above those associated with Acid Sulfate Soils. The site is outside of areas mapped for salinity potential and any salinity presented within the Glenorie soil landscape are not likely to be present in significant volumes on the site.

A dyke has been identified approximately 2 kilometres north-west of the site, near Epping Road. This dyke is not mapped on the subject site, but may extend near to the site due to its long and linear formation.

A Geotechnical Assessment has been prepared by Douglas Partners which discusses existing soil and geotechnical conditions in further detail (refer to **Appendix G**).

2.2.8 Contamination

Numerous site investigations have been carried out by JBS&G, including a Detailed Site Investigation in 2016, which undertook soil sampling at 26 locations across the site. A Supplementary Site Investigation has also been completed by DLA Environmental, which undertook targeted soil sampling from nine boreholes.

These investigations found that there is limited evidence of historical contaminating activities on the site. Contaminants of potential concern were reported at levels less than the relevant assessment criteria, with the exception of benzopyrene, which exceeded the adopted ecological criteria at one sample location.

A Supplementary Site Investigation was also undertaken to investigate areas of altered topography where filling and significant alteration of the ground surfaces has occurred. This investigation found that soil samples from one borehole location in the centre of the site contained levels of total recoverable hydrocarbons above the Health Screening Level and the Ecological Screening Level, likely to be the result of localised spillage or leakage of petrol. No source of petroleum hydrocarbon contamination was observed during fieldwork.

The area of the site in the vicinity of the borehole is not currently suitable for the proposed development. In all other areas of the site, contaminants in soils do not present an unacceptable risk to human health or the environment and do not preclude redevelopment of the site for all its intended uses.

2.2.9 Infrastructure and Services

A Utility Services Report has been prepared by ADW Johnson, which details all existing infrastructure and services within the site (refer to **Appendix K**). A summary of existing infrastructure and services to the site is described below.

Potable Water Supply

The site is serviced by trunk and reticulated water mains located beneath Herring and Epping Road, which connect to internal reticulation pipes beneath all roads within the site.

Sewerage

A trunk sewerage main runs through the site and generally follows the alignment of Shrimptons Creek. Internal sewerage reticulation within the site consists of two sewer lines that connect to each existing dwelling.

Electricity

The site is serviced by underground and overhead high and low voltage infrastructure. The Ivanhoe Estate site is serviced by underground high and low voltage power lines, which connect to the existing trunk infrastructure in Herring Road. The internal network runs along both verges of Ivanhoe Place and there are two electrical kiosks on the site. The power lines transition from underground to overhead at two locations on the Epping Road boundary.

Telecommunications

Telecommunications infrastructure is provided within and surrounding the site by a number of telecommunications providers, including NBN, Optus, Telstra and others.

Gas

The site is serviced by a gas main in Herring Road, with low pressure gas mains beneath all roads within the site.

2.3 Surrounding Development

The site is located within the Macquarie University Station Precinct which forms part of the broader Macquarie Park corridor. The Precinct is characterised by a mix of new high density residential uses, older low scale residential flat buildings, the Macquarie Shopping Centre and Macquarie University. Macquarie University Station and Macquarie Shopping Centre are approximately 500 metres north east of the site. The Macquarie Park corridor is a key employment centre, which accommodates a significant number of businesses and research facilities in medium-scale commercial development.

Immediately to the north east of the site is a line of established trees, which separates the site from a series of four storey residential apartment buildings that front Peach Tree Road. Further to the north is Wilga Reserve, which can be accessed via Shrimptons Creek Trail. The north western boundary fronts Herring Road and 137-143 Herring Road, which was the subject of a recent Development Application approved by the Sydney North Planning Panel for the construction of two residential flat buildings (City of Ryde reference: DA2017/0107).

This approval permits the redevelopment of adjoining land at 137-143 Herring Road for a 23 storey and 24 storey building that will accommodate a combined 285 apartments, including 2 storey SOHO apartments at the ground floor of one of the towers. The towers will be constructed over 4 levels of common basement, providing up to 264 vehicle parking spaces that are accessed via Herring Road, with the driveway and loading dock adjoining the eastern and southern boundaries of the site that are shared with the Ivanhoe Estate. The tower nearest to the Ivanhoe site adopts progressive side setbacks that range from 3m to 12m from the eastern and southern boundaries. It is also noted that variations to the ADG building separation requirements were supported subject to mitigation measures including privacy screens adjacent to the interface of the site. Extensive site landscaping is proposed along the site boundaries, with the communal open space for residents being located between the two towers in the centre of the site.

The northern side of Herring Road has also been subject to recent and ongoing residential redevelopment. This comprises the former Stamford Hotel site at 110-114 Herring Road, Macquarie Park which is being redeveloped to provide seven mixed use buildings up to 22 storeys in height, and the 'One Twenty' development at 120-126 Herring Road, Macquarie Park which is being redeveloped into a 23 storey mixed building with 192 apartments.

Epping Road is an 8-lane arterial road that runs along the south western boundary of the site. On the opposite side of Epping Road are detached houses and terrace developments within the suburbs of North Ryde and Marsfield. Further to the south-west is ELS Hall Park, which contains the Ryde Community Sports Centre, playing fields, picnic areas and other recreation facilities. ELS Hall Park can be accessed directly from the site via the Shrimptons Creek Trail.

Shrimptons Creek is area of public open space and runs along the south-eastern boundary of the Ivanhoe Estate and comprises vegetation and a shared pedestrian and cycle path, which connects Epping Road to the Macquarie Shopping Centre. Shrimptons Creek flows from south to north through the Lane Cove National Park and onwards to the Lane Cove River.

Commercial and light industrial uses associated with the Macquarie Park business park are located further to the south east beyond Shrimptons Creek, including a number of multi-storey commercial buildings on Lyonpark Road and the Optus Campus. Surrounding development is shown on a map at **Figure 11** and in the site images at **Figure 12**.



Figure 11 Surrounding development overview

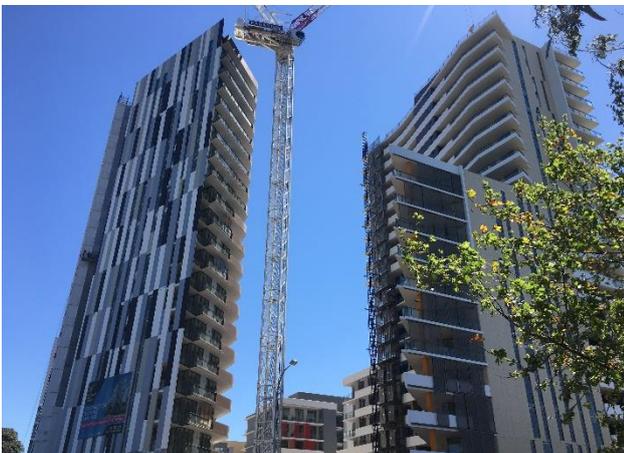
Source: Bates Smart



Former student accommodation, viewed from the western boundary of the site



Epping Road



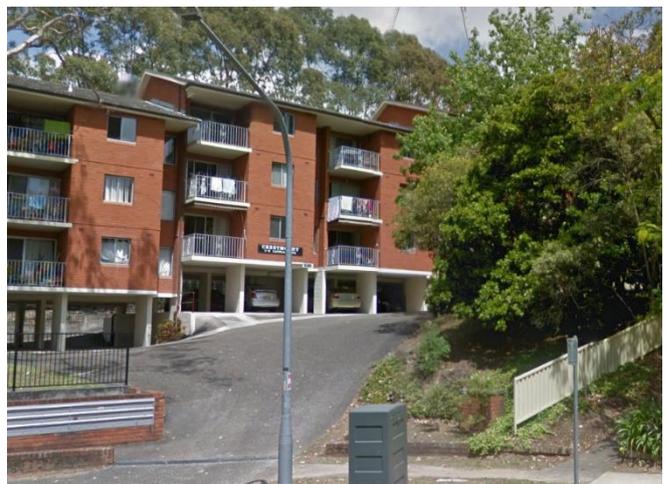
Macquarie Park Village construction



Herring Road with Macquarie Park Village in the background



Existing residential flat building adjoining the site, viewed from Ivanhoe Place



Existing residential flat buildings viewed from Peachtree Road

Figure 12 Surrounding development

3.0 Description of the Development

This chapter of the report provides a detailed description of the proposed development as part of the planned redevelopment of Ivanhoe Estate. In accordance with the Ivanhoe Estate Masterplan, and Section 4.24 of the EP&A Act, this application seeks approval for the following development:

- site preparation works, including tree removal, demolition of roads and services, and earthworks across the Ivanhoe Estate;
- the provision and augmentation of utilities and services infrastructure across the Ivanhoe Estate;
- the construction of all internal roads including public domain within the road reserves, and the bridge crossing and road connection to Lyonpark Road including changes to parking, site access, landscaping and ancillary works at 2-4 Lyonpark Road;
- the consolidation of existing lots and subdivision of the Ivanhoe Estate to reflect the revised road layout, open space, and provide superblocks corresponding to the Masterplan;
- the construction and use of Buildings A1 and C1 comprising residential uses (including social housing), a childcare centre, and retail/community spaces.

The Architectural Plans prepared by Bates Smart and Candalepas Associates and associated Design Reports are included at **Appendix B**. Photomontages of the proposed development have also been included at **Figure 14** to **Figure 16**, and the location of the proposed roads and road network within the Masterplan is considered in **Figure 13** below.

The following sections provide a detailed description of the proposed development.



Source: Bates Smart



Figure 14 Photomontage of Building A1, as viewed from Herring Road

Source: Bates Smart



Figure 15 Photomontage of Building A1, as viewed from Main Street

Source: Bates Smart



Figure 16 Photomontage of Building C1

Source: Candalepas Associates & Doug and Wolf

3.1 Site Preparation

The demolition of buildings on site and associated tree removal is being completed by LAHC as a public authority, subject to a separate planning process. Other site preparation activities such as further demolition including the road network, earthworks, remediation, other tree removal, and site servicing are proposed as part of this DA and are discussed in the following sections.

Demolition

This application proposes to demolish the existing road network to enable the redevelopment of the site in line with the Masterplan. LAHC as a public authority will be completing the demolition of all structures up to the kerb line of the existing road network.

Earthworks

Bulk earthworks are required to grade the site, excavate proposed basement structures, and provide platforms for buildings and public roads. The proposed earthworks will be constructed in stages (see **Section 3.11**) and generally constricted to the footprints of Buildings A1 and C1 (discussed further in **Sections 3.4** and **3.5**) and the proposed road network (discussed further in **Section 3.3**) that are being delivered as part of this application. Earthworks for the remaining building platforms and public domain areas will be completed in later stages and designed to interface with the areas delivered as part of this application.

The proposed earthworks are detailed in the plans at **Appendix L** and discussed in the Civil Engineering Report prepared by ADW Johnson. The proposed earthworks generally require excavating up to 15 metres within the footprint of the proposed buildings to accommodate for building basements, excavating in the road reserve by up to 5 metres, and small areas of fill in the road reserve closer to Shrimptons Creek. If required, exported material will be disposed of to an appropriately licenced facility, with regard to the classification of the material under the EPA's *Waste Classification Guidelines*.

Remediation

A small area in the centre of the Estate will be remediated in coordination with the earthworks and grading proposed across the site. The area of concern is highlighted in **Figure 17** below. It is proposed to excavate this area of contaminated materials, and then dispose of the materials off-site at an appropriately licensed landfill disposal site. The excavated area will then be backfilled, if required, using clean, validated fill materials.

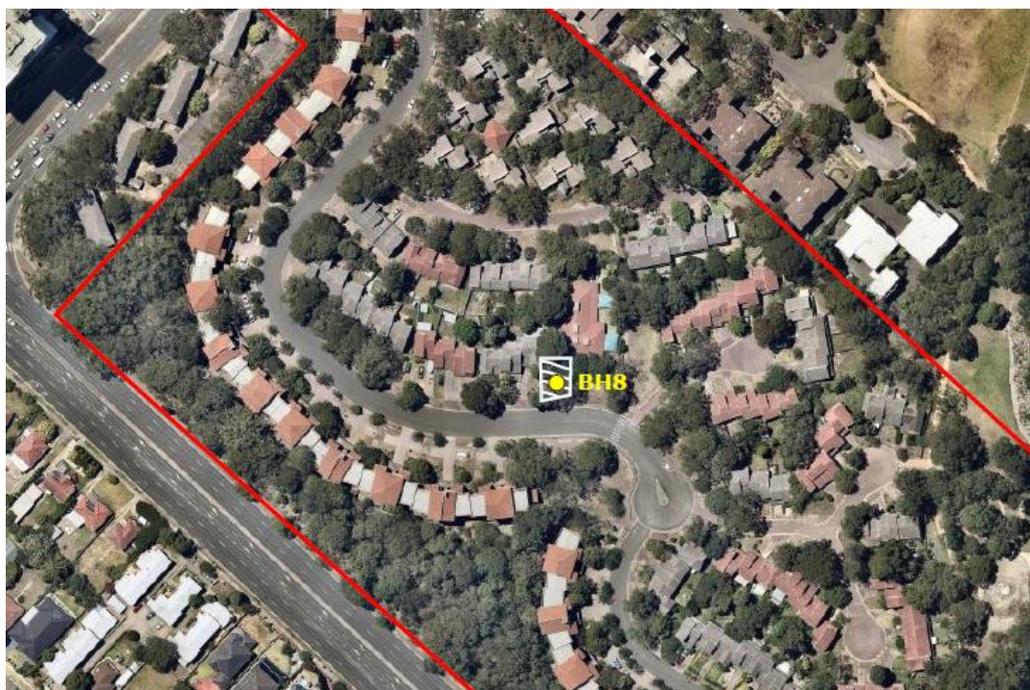


Figure 17 Area identified for remediation (shown hatched around spot BH8)

Source: DLA Environmental Services

Tree Removal

This application seeks to remove 309 trees (noting that 547 have been approved under a separate application for demolition) to facilitate the delivery of the Masterplan. These trees are located within the footprint of works and cannot be reasonably retained on site (refer to **Figure 18**). The Tree Management Plan prepared for the Masterplan Arboricultural Impact Assessment provides guidelines on the protection of 350 trees being retained on the site including requirements for fencing, ground protection measures and construction methods (refer to **Appendix FF**).

A Biodiversity Assessment Report Biodiversity Offset Strategy (**Appendix M**) has also been prepared by Eco Logical Australia for the Masterplan, and will be implemented as part of the proposed development. The removal of trees across the site will require 26 credits to be purchased and retired in accordance with the Office of Environment and Heritage BioBanking Credit Calculator. These credits will be staged in accordance with the staged completion of other site preparation works requiring the removal of trees. Refer to **Section 3.11** below.

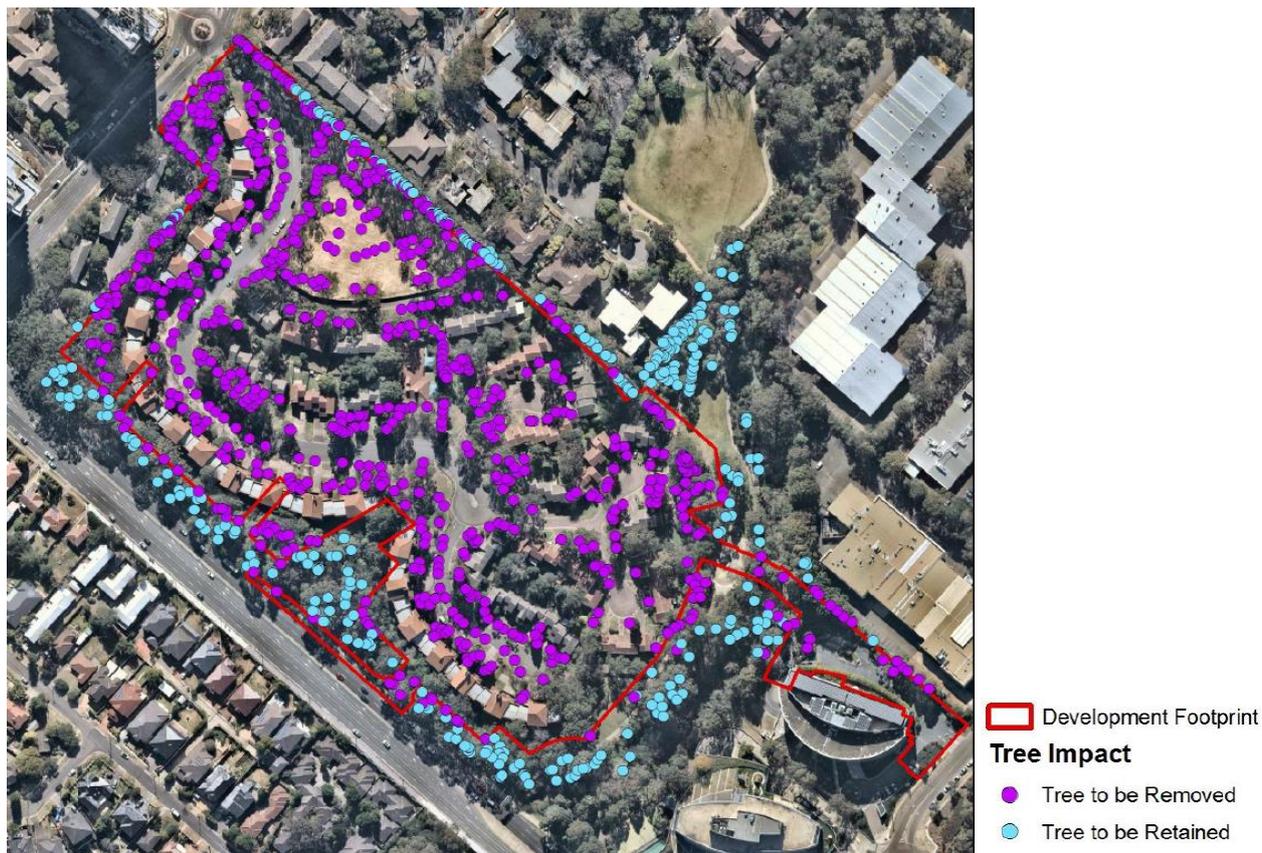


Figure 18 Trees required to be removed across the Estate

Source: Bio Logical Australia

Site Servicing

A Utility Services Report has been prepared by ADW Johnson to assess the capacity for the site to be serviced (refer to **Appendix K**). All relevant utility service providers and authorities have confirmed that the site can be serviced, subject to some infrastructure upgrades. Utilities connections are detailed below.

- **Potable Water** – The site will utilise the existing trunk water main along Herring Road, which has the capacity to service the proposed development. As part of the proposed development, internal infrastructure will be removed and replaced with DN200 mains, fed from the trunk main in Herring Road.
- **Sewage** – Both trunk and reticulated sewer mains are located adjacent to and within the site. As part of the proposed development, the existing internal infrastructure will be removed and replaced with new DM150 and DN300 mains that will connect to the existing North Head System.
- **Electricity** – The site is currently serviced by underground high and low voltage cables that run off the existing infrastructure network within Herring Road. As part of the proposed development, the existing internal infrastructure will be demolished and replaced with a new high voltage network, including mini chamber substations to be installed within buildings and feed into low voltage supplies to dwellings and street lights.
- **Telecommunications** – The existing telecommunications infrastructure on site will be removed in conjunction with the proposed construction works and new infrastructure will be installed within the proposed road verges or within basement carparks or buildings.
- **Gas** – The existing 210kPa main in Herring Road will be extended through the proposed development within the proposed road reserves, and if required within private land with suitable easements.

3.2 Amalgamation and Subdivision

3.2.1 Torrens Title Subdivision

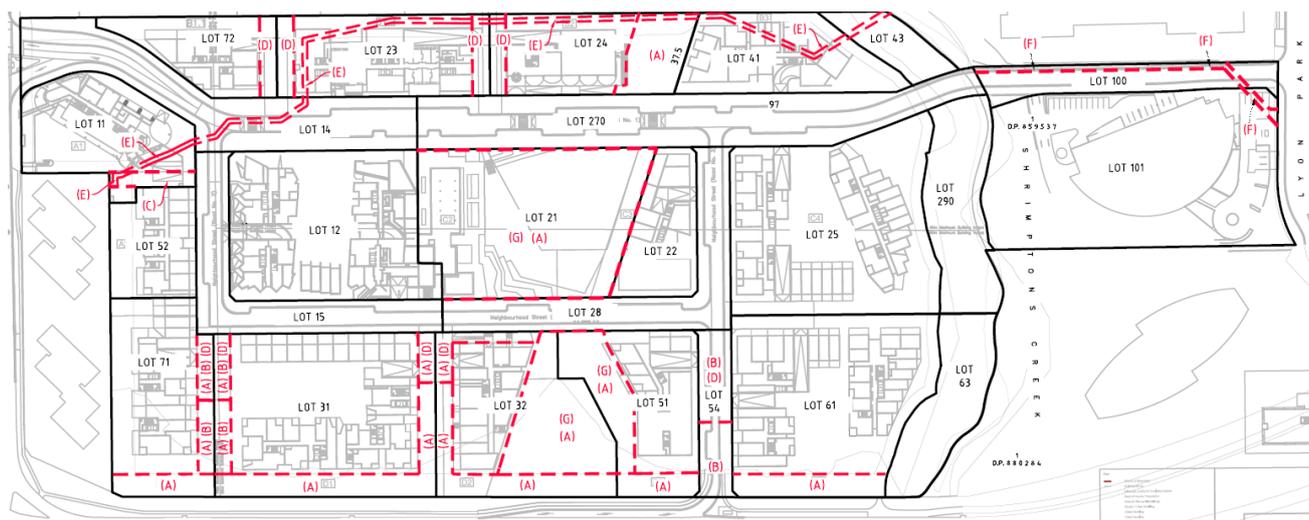
As discussed in **Section 2.2** above, Ivanhoe Estate is presently segregated into seventeen allotments that correspond to the existing pattern of dwellings and the road network. It is proposed to rationalise this lot layout by amalgamating the existing allotments and subdividing the site to align with the new vision established for the Estate under the Masterplan. Subdivision Plans have been prepared by Beveridge Williams (**Appendix N**) detailing the proposed lot layouts that will be delivered over 7 stages.

Table 2 below outlines the extent of the proposed lots, any easements created, and the relevant stage in which the lot is proposed to be delivered as part of the construction and dedication of land under the Masterplan. The outline of the proposed lots has also been replicated at **Figure 19** below.

Table 2 Summary of the proposed lots and staging

Stage	Lot	Size (m ²)	Purpose	Easement
Stage 1	11	3,129	Lot for Building A1	An existing easement over the A1 lot that permits the neighbouring site to the north west to drain water through the Estate, and a new easement corresponding to the overland flow path (discussed further in Section 3.7).
	12	5,579	Lot for Building C1	N/A
	13	-	Residue lot to be subdivided in a subsequent stage	
	14	4,033	Lot for part of Main Street	An easement over the proposed road lot enabling services within the lot, and temporary public access before the lot is dedicated to Council.
	15	2,510	Lot for part of a neighbourhood street	An easement over the proposed road lot enabling services within the lot, and temporary public access before the lot is dedicated to Council.
Stage 2	21	6,023	Lot for Building C2 and the Village Green	An easement for public access and a public park relating to the community centre and Village Green that are to be dedicated to Council.
	22	1,827	Lot for Building C3	N/A
	23	1,827	Lot for Building B1	An easement for right of carriageway and an easement for the drainage of water through the site and along the eastern boundary.
	24	3,078	Lot for Building B2 (the future school)	An easement for a right of carriageway along the northern boundary of the lot, an easement to drain water along the eastern boundary, and an easement for public access over the southern boundary of the lot.
	25	6,355	Lot for Building C4	N/A
	26	-	Residue lot to be subdivided in a subsequent stage	Easement for a public park relating to Forest Playground.
	27		Lot for the remaining part of Main Street	An easement over the proposed road lot enabling services within the lot, and temporary public access before the lot is dedicated to Council.
	28	2,792	Lot for part of a neighbourhood street	An easement over the proposed road lot enabling services within the lot, and temporary public access before the lot is dedicated to Council.
	29	-	Lot for Shrimptons Creek corridor	Lot is to be dedicated to Council at a later stage.
Stage 2A	270	-	Lot for the Lyonpark road bridge and road extension	N/A

Stage	Lot	Size (m ²)	Purpose	Easement
	10	-	Lot for the remaining LGS site	N/A
	290	-	Lot for new public reserve along Shrimptons Creek	
Stage 2B	100	-	Lot for the Lyonpark Road extension	Easement for drainage
	101	-	Lot for the remaining LGS site	N/A
Stage 3	31	6,969	Lot for Building D1	An easement for public access, carriageway, and services relating to the neighbourhood mew that is being delivered as part of a future application, and an easement for public access along the western boundary.
	32	5,019	Lot for Building D2	An easement for public access relating to the neighbourhood mew and Forest Playground that are being delivered as part of future applications, and an easement for public access along the western boundary.
	33	-	Residue lot to be subdivided in a subsequent stage	
Stage 4	41	2,836	Lot for Building b3	An easement to drain water through the site.
	42	-	Residue lot to be subdivided in a subsequent stage	
	43	-	Lot for new public reserve along Shrimptons Creek	
Stage 5	51	3,355	Lot for Building D3	An easement for public access and public park relating to the Forest Playground being delivered as part of a future application.
	52	1,762	Lot for Building A2	-
	53	-	Residue lot to be subdivided in a subsequent stage	
	54	1,077	Lot for part of a neighbourhood street	An easement over the proposed road lot enabling services within the lot, and right of carriageway.
Stage 6	61	6,467	Lot for building D4	An easement for public access along the western boundary.
	62	-	Residue lot to be subdivided in a subsequent stage	
	63	-	Lot for new public reserve along Shrimptons Creek	
Stage 7	71	3,798m ²	Lot for Building A3	An easement for public access, carriageway, and services relating to the neighbourhood mew that is being delivered as part of a future application, and an easement for public access along the western boundary.
	72	1,922m ²	Lot for Building B1	Easement for right of carriageway along the southern boundary.



PROPOSED EASEMENTS:

- (A) EASEMENT FOR PUBLIC ACCESS
- (B) EASEMENT FOR SERVICES
- (C) EASEMENT FOR OVERLAND FLOW & EASEMENT TO DRAIN WATER
- (D) RIGHT OF CARRIAGEWAY
- (G) EASEMENT FOR PUBLIC PARK
- (TA) TEMPORARY EASEMENT FOR PUBLIC ACCESS

EXISTING EASEMENTS:

- E) EASEMENT TO DRAIN WATER 2 WIDE & VARIABLE (D.P.1244080)

LOTS 6-11 & LOTS 13-20 D.P.861433, LOT 5 D.P.740753 & LOT 100 D.P.1223787 HAVE EXISTING EASEMENTS NOT SHOWN ON THIS PLAN

Figure 19 Layout of the proposed lots and easements

Source: Beveridge Williams

3.2.2 Stratum Subdivision

In addition to the subdivision of the Estate described above, it is proposed to subdivide Lots 11 and 12 into Stratum Title lots corresponding to the mixed use buildings considered in this application. The proposed stratum subdivision is detailed in the plans at **Appendix N**, which show the proposed segregation of residential areas and child care and retail/community spaces, and those residences within Building C1 that will be used for market housing and social housing. The stratum subdivision also encompasses building services and dedicated basement parking. A description of the building form and proposed uses for Building A1 and C1 is provided at **Section 3.4** and **3.5** below.

3.3 Road Network

This application proposes to deliver the road network considered under the Masterplan, including public domain areas within the road reserves and the bridge crossing to Lyonpark Road that will enable vehicles to enter and exit the Estate from the south. These works are detailed in the Civil Engineering Plans and report prepared by ADW Johnson, and the Shrimptons Creek Bridge Report prepared by McGregor Coxall at **Appendix L**. The staging of works is discussed in **Section 3.11** below.

An overview of the proposed road network for the Estate is as follows:

- Road No. 1, also known as Main Street, connects Herring Road and Lyonpark Road via a new bridge (discussed further below). The road is 7 metres wide, accommodating one lane of traffic in each direction. There are parking bays provided in sections along the road, and road verges ranging from 3.5m-8.2m that will accommodate a pedestrian footpath, shared zone, and landscaping (see the cross-section at **Figure 21** below).

- Road No. 2 is an 'L-shaped' neighbourhood street that creates an internal loop between Main Street and Road No. 3. The road is 6 metres wide with a 3 metre wide road verge on either side, and is interspersed with parking bays. The road accommodates one lane of traffic in each direction and pedestrian footpaths on both sides. See the cross-section at **Figure 22** below.
- Road No. 3 is also a neighbourhood street and connects the new vehicle entry point off Epping Road (discussed further below) and Main Street. The road is 6 metres wide with a 3 metre wide road verge on either side, and is interspersed with parking bays. A portion of this road has been designed for one-way traffic to benefit cars entering the site via the 'left turn only' intersection with Epping Road. The remainder of this road accommodates one lane of traffic in each direction. See the cross-section at **Figure 22** below.



Figure 20 Proposed road network

Source: ADW Johnson

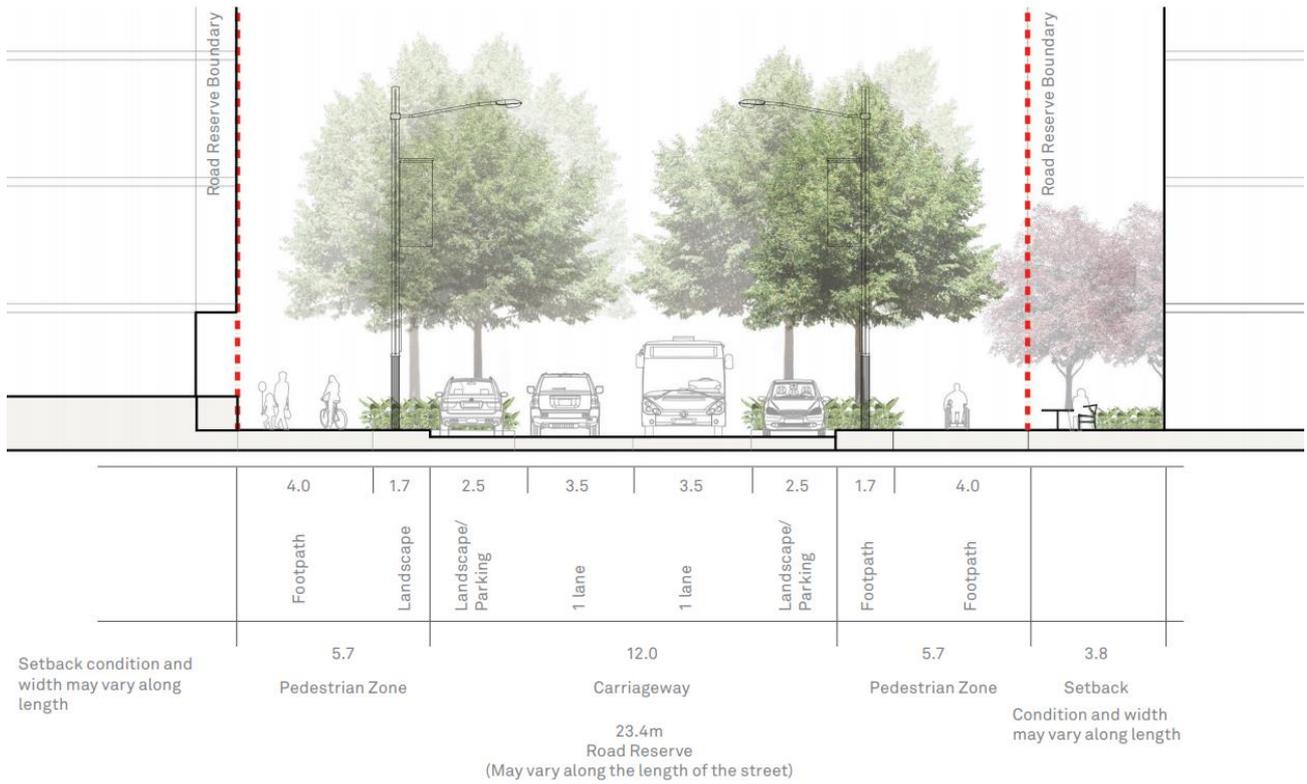


Figure 21 Cross-section of Main Street

Source: Hassell

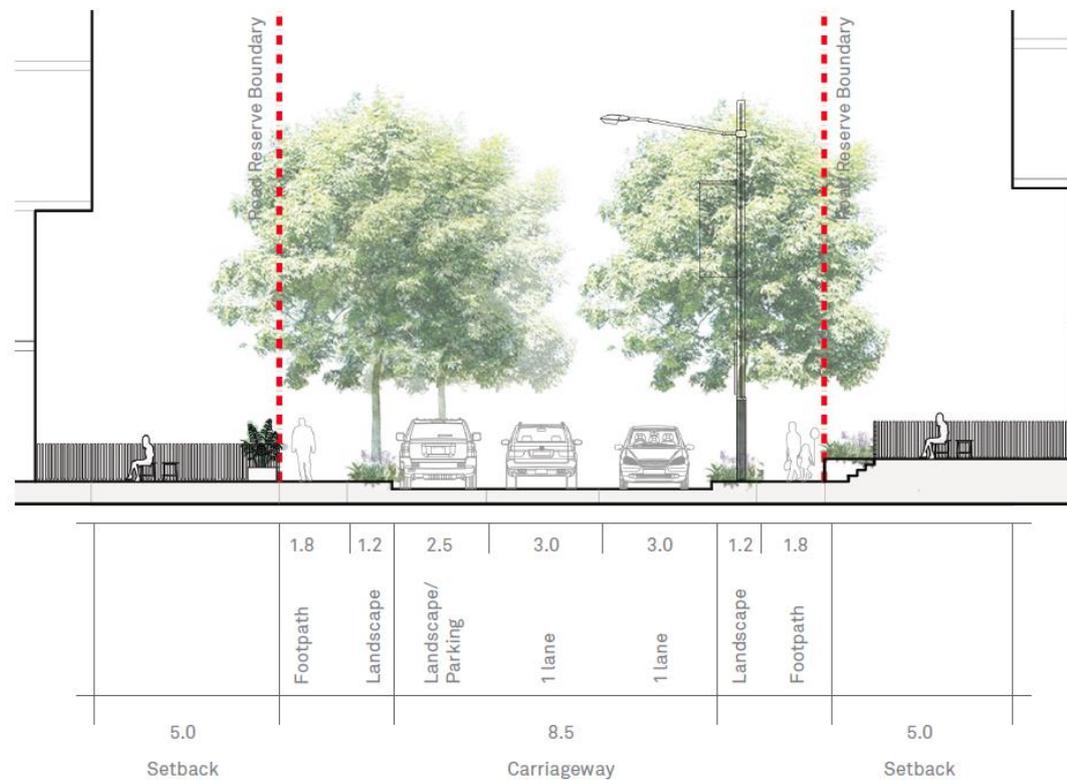


Figure 22 Cross-section of the Neighbourhood Street typology

Source: Hassell

3.3.1 Herring Road and Ivanhoe Place Intersection

The Herring Road and Ivanhoe Place intersection will be signalised, as considered under the Masterplan, to cater for multiple traffic movements in and out of the proposed site. The signalised intersection would replace the existing roundabout at this location. The Civil Engineering Plans at **Appendix L**, detail the lead-in works to this intersection upgrade and make reference to the RMS plans that have been developed for the works to this public road. The envisaged intersection upgrade of the intersection will be completed by RMS.

3.3.2 Epping Road Intersection

It is also proposed to create a new vehicle entry point off Epping Road and into the Estate. This will comprise constructing a new 'left in' turning lane within the Epping Road reserve that will intersect with the easternmost lane of Epping Road. ADW Johnson have also provided an indicative layout of the likely road works (see **Figure 23**), which will be subject to further design and works by RMS within the public road network.

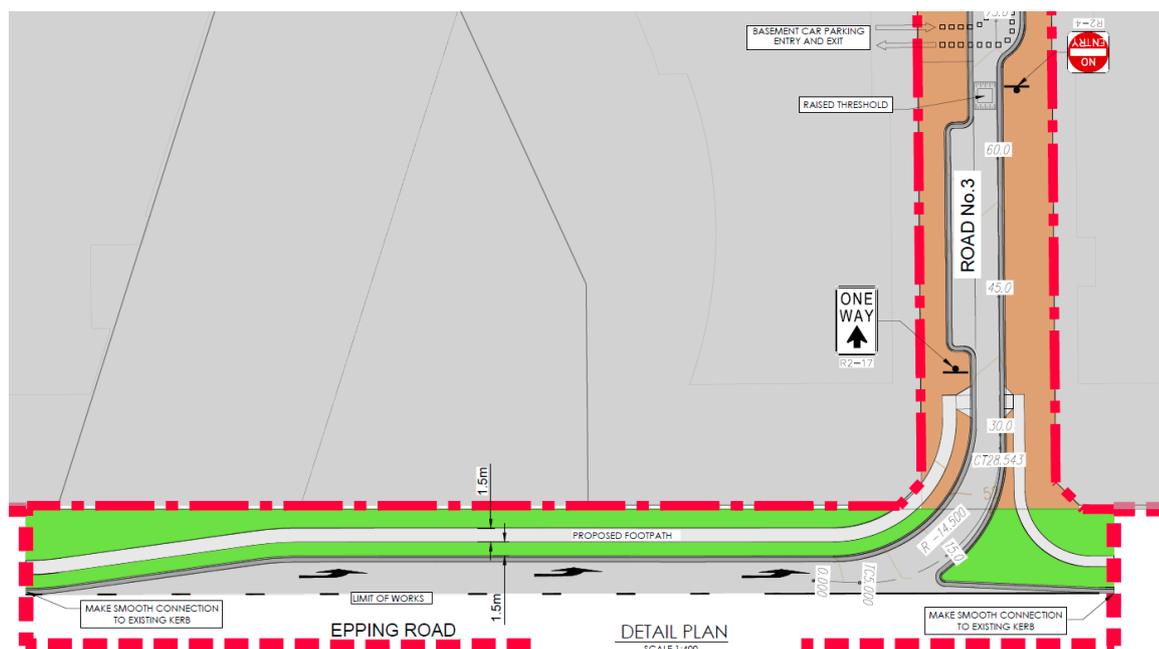


Figure 23 Indicative intersection with Epping Road

Source: ADW Johnson

3.3.3 Shrimptons Creek Bridge

It is proposed to construct a bridge spanning Shrimptons Creek to connect Main Street and Herring Road in the north with Lyonpark Road in the south, facilitating a new entry/exit point to the Ivanhoe Estate. The proposed bridge will be approximately 51 metres long with an overall width of approximately 12 metres, which comprises two standard 3.5m wide traffic lanes, a 1.5m wide side walk and a 3.5m shared path (see **Figure 24** below). A 1.4m high barrier is also provided on both sides of the bridge. It is intended that the bridge will be dedicated to Ryde Council as a local public road.

The bridge has been designed in accordance with the relevant Australian Standards and Roads and Maritime technical directions, and comprises the following:

- A bridge deck constructed from reinforced concrete and steel girders that spans between two abutments.
- The abutments are faced with stonework gabion walls and are supported by angled steel pylons that reference the trunks of the Eucalyptus forest within the Shrimptons Creek Corridor.
- The bridge elevation is proposed to be finished with steel that is treated to naturally weather, requiring minimal maintenance over the life of the structure.
- Public domain lighting is also to be incorporated into the upper deck of the bridge for safety, and uplighting is to be incorporated into the bridge soffits to create a visually striking form.

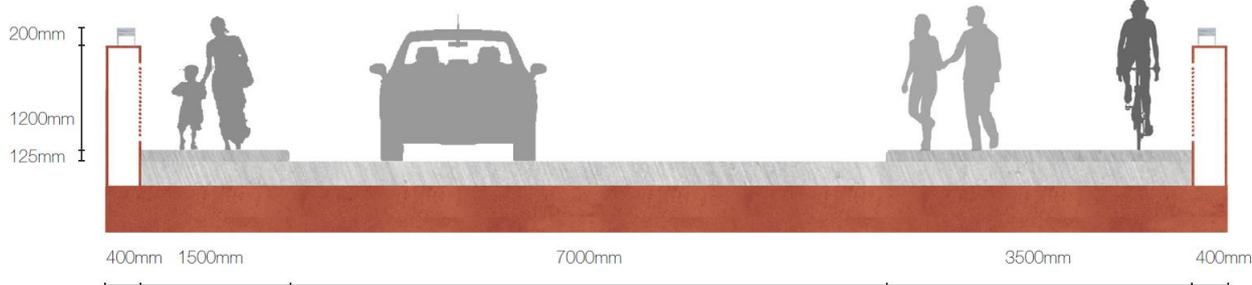


Figure 24 Cross section of the proposed bridge

Source: McGregor Coxall



Figure 25 Elevation of the proposed bridge

Source: McGregor Coxall

3.3.4 Lyonpark Road Connection

It is proposed to connect Lyonpark Road to the bridge, through the Local Government Super (LGS) owned portion of the site at 2-4 Lyonpark Road, in order to facilitate through-traffic. The proposed road up to Lyonpark Road comprises a variable width road reserve that fronts the LGS commercial building and connects Lyonpark Road with the bridge described above. As indicated in **Figure 26** below, the new road will also incorporate two entry/exit points to the existing at-grade LGS carpark surrounding the office building and the relocation of parking on site. There will be no net reduction in the provision of on-site parking within the LGS car park.

The proposed road will be lined with street trees and landscaped verges that separate the road from the pedestrian/cycle pathways. Further groundcover planting and street trees will also be incorporated into the car park, and landscaped retaining walls will attenuate the transition between the Shrimptons Creek Corridor and the site (refer to **Figure 26** below). The relevant cross-section of the road extension to Lyonpark Rd, through the LGS site is shown at **Figure 28** below. The proposed road reserve width for the road extension within the LGS site is variable to a maximum of 13.7m, with the majority width being 12.5m. There is no public parking along this portion of the road extension to Lyonpark Road within the LGS site, unlike the wider road reserve along other portions of Main Street within the Estate.



Function and program

1. Extension of Main Street street trees and groundcover planting
2. LGS trees and groundcover planting mix
3. Proposed 1.8m footpath connecting to Lyon Park Road and proposed Shrimpton's Creek bridge
4. Screen to existing crib wall
5. Proposed retaining crib wall
6. Potential kiosk location zone
7. Existing Shrimpton's Creek planting. Opportunity to revegetate existing planting.

Figure 26 Connection to Lyonpark Road and the proposed treatment to the LGS car park

Source: Hassell



Figure 27 Proposed landscaping treatment – Section AA (within LGS site)

Source: Hassell

3.3.5 Lyonpark Road Intersection

The new intersection with Lyonpark Road will operate as an unsignalised 'T intersection', operating under a 'give way' sign. ADW Johnson have provided an indicative layout of the likely intersection upgrade (see **Figure 28** below), which will be subject to further design.

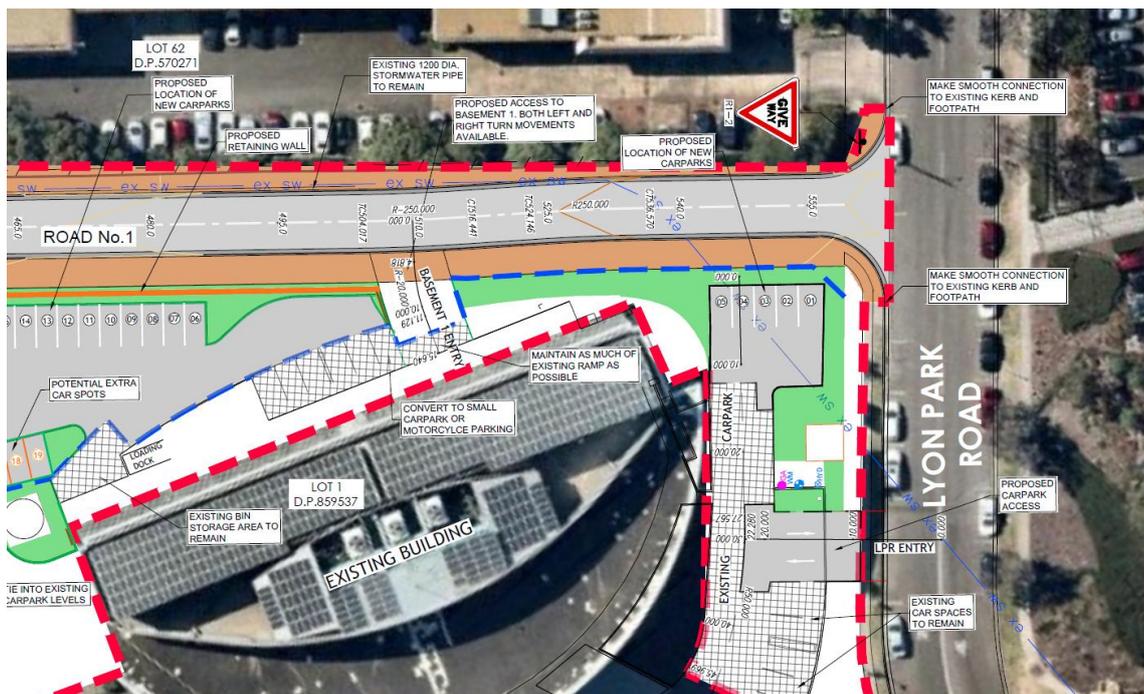


Figure 28 Indicative intersection with Lyonpark Road

Source: ADW Johnson

3.4 Building A1

Building A1 is located in the northernmost corner of the Estate and marks the ‘gateway’ to the Estate, situated at one of the key entry/exit points where the site interfaces with the existing road network. It provides the opportunity to respond to the changing character along Herring Road, as one of the key spines within Macquarie Park, and provide a landmark development for the Estate. The key features of the built form are as follows:

- It has been designed around two interlocking curved facades that respond to the irregular shaped block and enable it to address the three road frontages of the site.
- A 4m wide vertical cut-out is provided along the height of the eastern façade, and for 7 storeys on the western façade, where there is a fold in the geometry of the curved floor plates.
- Two storey voids are provided on the northern and southern ends of the building that will accommodate landscaped ‘sky gardens’ over a number of alternating floors.
- The base of the building establishes a two storey street wall that steps with the topography, following the natural gradient of the site and providing building entrances across multiple levels. The floors above generally protrude outwards over the building base, creating colonnades and sheltered building entrances.
- The roofline of the building is also angled in accordance with the gradient of the site, and will step down in height to address the smaller buildings being provided in the centre of the Estate.
- The façade is treated with a layered frame of strong horizontal and vertical precast concrete lines that have been divided into three zones to create a grid, with the horizontal panels gradually dropping off on high rise floorplates so that the tower becomes ‘visually lighter’ as it rises.

The key numerical information concerning Building A1 is contained in **Table 3** below. Extracts of the elevations of the building developed by Bates Smart are also included at **Figure 30** and **Figure 31** for information.

Table 3 Numerical overview of Building A1

Component	Proposal
Block Area	3,085m ²
Maximum Height	RL 138.3 to top of the lift overrun (c. 75m)
Gross Floor Area	21,729m ² (21,027m ² for residential, 702m ² for child care)
Boundary Setbacks	<ul style="list-style-type: none"> • 3.8m to the eastern boundary (to Main Street) • 5m to the northern boundary (to Herring Road) • 12m to the western boundary (to neighbouring development) • 5m to the southern boundary (to internal road) Refer to Figure 29 below.
Apartments	269 market apartments
Apartment Mix	<ul style="list-style-type: none"> • 7 x studios • 111 x 1 bedroom units • 141 x 2 bedroom units • 10 x 3 bedroom units
Non-Residential Tenancies	1 x child care centre for approximately 75 children
Parking	<ul style="list-style-type: none"> • 236 car parking spaces, comprising: <ul style="list-style-type: none"> – 208 resident spaces (including 12 accessible) – 13 visitor spaces (including 1 accessible) – 15 child care centre spaces (including 1 accessible, and noting that 12 of the spaces are in basement and 3 are on the street) • 269 bicycle parking spaces • 4 motorcycle parking spaces.

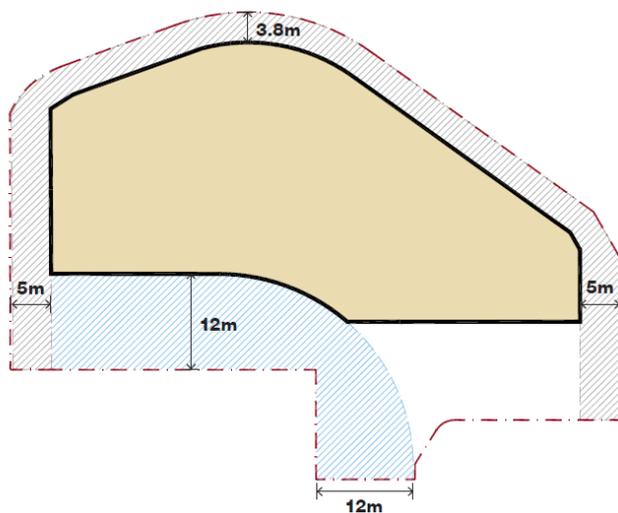


Figure 29 Setback diagram for Building A1

Source: Bates Smart



Figure 30 Extract of the east elevation of Building A1

Source: Bates Smart



Figure 31 Extract of the north elevation of Building A1

Source: Bates Smart

3.4.1 Child Care Centre

A child care centre is to be provided on the upper ground floor of the building. The centre has capacity for approximately 75 children and has been partitioned into 5 indoor areas that can be configured for different age groups. The primary outdoor play area is provided on the western side of the building where the site benefits from good solar access. The interface between the outdoor play area and Herring Road will be treated with planting that terraces approximately 4.5m down to the play area, creating visual privacy for the centre (see **Figure 32**). There will also be a secondary play area overlooking Main Street on the eastern side of the building, which is raised above ground level and will be framed with planting to prevent overlooking.

The centre will be accessed via a lift and stair connecting to both Main Street and the carpark via a double-height childcare entrance lobby on the lower ground floor (see **Figure 33**).

It is emphasised that the fit-out and operation of the child care centre will be the subject of a separate and future application. A preliminary assessment of this centre is provided in **Section 5.21**.



Figure 32 Terraced outdoor play area for the child care centre off Herring Road

Source: Bates Smart



Figure 33 Secondary outdoor play area for the child care centre off Main Street

Source: Bates Smart

3.4.2 Landscaping

Landscaped areas have been provided at the ground plane and on the upper levels of Building A1. The key landscaped areas and vision for each are established in the Landscape Plans (**Appendix C**) and Architectural Plans (**Appendix A**), and are described as follows:

- The boundary to Herring Road will be treated with multiple layers of landscaping, including street trees, a mix of dense understorey planting, and landscaped terraces to frame the pedestrian pathway and appropriately screen the child care centre's outdoor play area.
- The proposed treatment to Main Street reflects the role of this road as the main thoroughfare through the site. It incorporates wide, paved areas extending under the colonnade for pedestrian circulation, planter boxes around the edge of the secondary child care play area, on-grade planted squares, and street trees (see **Figure 34** below).
- The western boundary of the site, adjoining neighbouring development, incorporates dense tree and understorey planting to naturally screen the development and frame the boundary.
- The development also incorporates 'sky gardens' within the vertical 'slots' in the façade, at alternating ends of the corridors and on alternating floors of the building (see **Figure 35** below). These planter beds that will create a pleasant outlook from corridor areas while the two-storey scale maximises daylight penetration into the common corridors.
- A plaza is provided on the southern boundary of the site at the intersection of Main Street with a neighbourhood street, which is to be used as a meeting point for residents, children and parents outside one of the main building entrances. The plaza will be treated with tree planting that wraps around the edge of the A1 site boundary, paving, and a seating area that is sheltered by Level 1 of the building projecting over the plaza (see **Figure 36**).

- A portion of the rooftop will also be treated with tall, wind tolerant native grasses. This area will contribute to landscaping on the site and will be inaccessible to the occupiers of the building.

It is noted that no detailed landscaping scheme has been developed for the child care centre play areas, which will be the subject of a separate and future application considering the detailed design and operation of the centre. The landscaping scheme is highly dependent on the needs and vision of the operator, that are yet to be engaged.



Figure 34 Photomontage of the ground plane at the corner of Herring Road and Main Street (looking down Main Street towards Building C1)

Source: Bates Smart

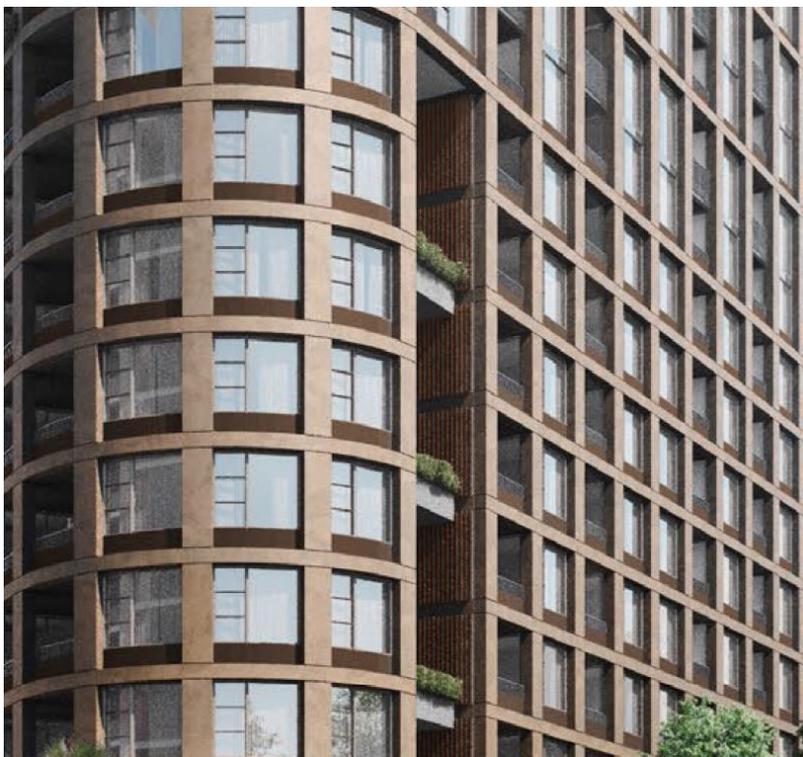


Figure 35 Proposed 'sky gardens' within the façade of Building A1

Source: Bates Smart



Figure 36 Photomontage of the A1 lower ground floor plaza (looking up Main Street towards Herring Road)

Source: Bates Smart

3.4.3 Access and Parking

Pedestrian Access

Building A1 has used the varying site topography to provide segregated building entries across floors, which assist in activating each of the road frontages. A residential lobby is provided on the Lower Ground Floor, fronting the southern boundary and internal road, and on Level 01 fronting Herring Road. The child care centre lobby is accessed from Main Street and is located on the Upper Ground Floor of the building.

Each of the residential lobbies are inset into the building envelope, providing weather protection and increasing space for pedestrian circulation. A colonnade and large pedestrian forecourt is provided on the eastern and southern side of the building, fronting Main Street, which will effectively widen the pedestrian footpath to approximately 12m along this primary north/south pedestrian thoroughfare.

Vehicle Access

All vehicles including service and delivery vehicles will enter and exit the site from the southern boundary, via a new internal road and 6.5m wide driveway. It is assumed that loading and servicing for the proposed development will be conducted by a range of commercial vehicles, up to a 12.5m long truck. These vehicles can be accommodated on site via a loading bay and turn table on the lower ground floor of the development, which will enable trucks to enter and exit the site in a forward direction.

Parking

On-site vehicle parking will be provided over 4 basement floors that accommodate 236 car parking spaces (including 13 accessible spaces) and 1 loading space. 10 tandem parking spaces have been provided across Basement Level 02 and Basement Level 03 and are assigned to larger apartments requiring multiple spaces per unit. Visitor and dedicated child care centre parking is provided on the first basement level of the building, for ease of access and to segregate publicly accessible parking from residential parking areas. A further 3 parking spaces have been provided on the street and are dedicated to the child care centre.

A pedestrian/cycle basement entry ramp is provided on the Lower Ground Floor of the building, providing dedicated access to the loading dock, carpark and 269 storage cages within the basement that can be used to securely store bicycles. The ramp enables free movement between the road frontage and basement storage cages for cyclists.

3.5 Building C1

This building represents the first stage and opportunity to provide a seamlessly integrated community of private and social housing dwellings, consistent with the vision for the site as a new mixed income neighbourhood. It is located to the south of Building A1 and is internal to the Estate. The site is bound by two neighbourhood streets and a future community centre and the Village Green.

The development of this block comprises two, high density, mixed use buildings and a series of terraces between these buildings that have been designed to read as a single complementary development. The key design features of each are discussed in the following sections, and the key numerical information concerning Building C1 is contained in **Table 4** below. Extracts of the elevations of the building and the finishes and materials pallet developed by Candalepas Associates, is also included at **Figure 37** to **Figure 39** below for information.

Table 4 Numerical overview of Building C1

Component	Proposal
Block Area	6,102m ²
Maximum Height	RL 124.95 to top of plant
Gross Floor Area	33,596m ² (33,352m ² for residential, 244m ² for community/retail)
Boundary Setbacks	<ul style="list-style-type: none"> • 0m-3.85m to the eastern boundary (to Main Street) • 2.4m - 7.2m to the northern boundary (to neighbourhood street) • 1.5m - 6.2m to the western boundary (to neighbourhood street) • 7.4m-14.8m to the southern boundary (to the Village Green)
Apartments	471 dwellings including: <ul style="list-style-type: none"> • 212 market apartments • 259 social housing apartments (including 25 dual key apartments, and 45 seniors independent living units) • 4 terraces (market housing)
Apartment Mix	<ul style="list-style-type: none"> • 56 x studios • 179 x 1 bedroom units • 218 x 2 bedroom units • 14 x 3 bedroom units • 4 x 4 bedroom terraces
Non-Residential Tenancies	244m ² retail/community floor space
Parking	<ul style="list-style-type: none"> • 346 car parking spaces, comprising: <ul style="list-style-type: none"> - 328 residential spaces (including 28 accessible) - 15 visitor spaces (visitors are able to use the accessible resident spaces) - 3 staff parking spaces • 471 bicycle parking spaces • 10 motorcycle parking spaces

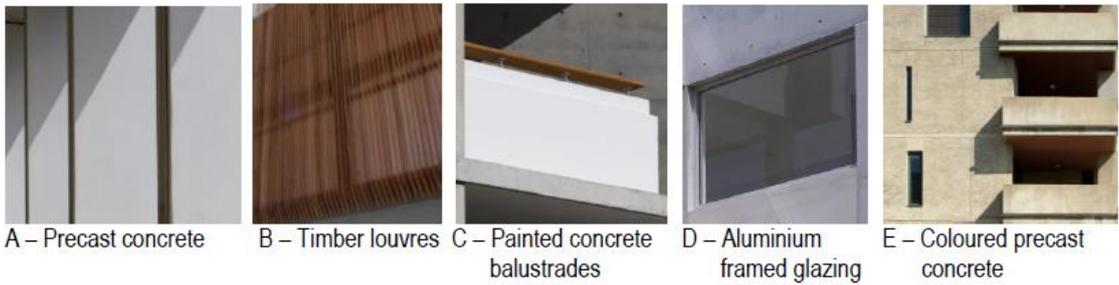
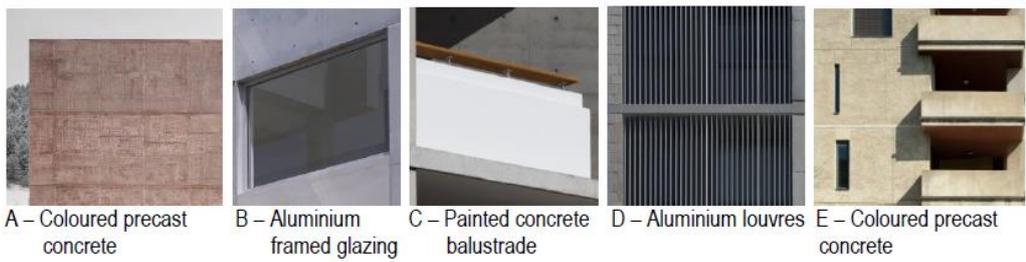


Figure 37 North east elevation of C1 showing the two mixed use towers and terraces in-between
Source: Candalepas Associates



Figure 38 South east elevation of C1 showing the step in height on the site

Source: Candalepas Associates



A – Coloured precast concrete

B – Aluminium framed glazing

C – Painted concrete balustrade

D – Aluminium louvres

E – Coloured precast concrete

Figure 39 South west elevation of C1

Source: Candalepas Associates

Mixed Use Towers

Two high density mixed use buildings are proposed at either end of Block C1. The key features of these buildings are as follows:

- The two towers have been designed in parallel, to bookend the terraces in-between, and read as a single coherent development.
- The towers step in height from 65m in the west, to 45m in the east, to better relate to lower scale development in the east and the four storey topographical change across the site.
- The stepped height enables a landscaped terrace to be provided on the roof of the 45m tall component of each building, that will benefit from solar access, views, and amenable wind conditions and create an attractive outlook for the residences above.
- The buildings establish a consistent two storey base in the form of recessed lobbies and retail/community space, and maisonette and terrace style apartments, to introduce a more intimate scale.
- Residences provided on the ground floor enables private courtyards and gardens to interface with the street frontage, which will act as additional landscaped buffers to the public domain and contribute to street activation.
- Communal open space provided between the towers forms an extension to the public domain and creates a landscaped setting for the towers and terraces.
- A combination of blade walls, screens, façade recesses, and material changes have been used to divide the façade. The proportion of glazing increases over the height of the building, responding to outlook and addressing privacy at lower levels.

Terraces

In the centre of the two buildings is a row of 4 residential terraces that are each 3 storeys in height. These terraces are oriented to address the new road to the west and will assist in creating a human scale and activity along this frontage. They will visually connect the two mixed use towers, to read as a single complementary development, and will be provided with balconies and ground floor terrace gardens.

Retail/Community Space

A large retail/community space is proposed to be provided at the base of the southernmost tower, where it interfaces with the future community centre and Village Green. This will contribute to creating an activated edge to Main Street and the Village Green. The fit-out and operation of this area will be the subject of a separate and future application.

Social Housing

Social housing apartments have been located within the 45m tall components of the building, and have been designed to achieve 'tenure blindness' whereby the different tenure is not perceptible from the public domain and the buildings read as one, despite having separate cores, access and ownership. Social housing residents will either be former residents of the site and applicants on the Department of Families and Community Services Housing Pathways register. Mission Australia Housing will be responsible for maintenance and repairs, facilitating some community activities and administering some social services.

A portion of the social housing units will be Independent Living Units that will also be operated by Mission Australia. Independent Living Units (ILUs) are a form of self-contained seniors living apartments whereby private facilities for cooking, sleeping and washing are included as part of the dwelling and the building, enabling seniors to care for themselves independently.

3.5.1 Landscaping

Landscaped areas are also proposed at the ground plane and on the upper levels of Building C1. The vision for communal open space areas and the landscaped setting for each of the buildings within this block are established in the Landscape Plans (**Appendix C**) and Architectural Plans (**Appendix A**), and are described as follows:

- A neighbourhood garden is proposed to be included on the Main Street frontage of Building C1, within the public domain area. This neighbourhood garden will act as an extension to the ground floor communal open space areas for C1 and will include outdoor seating, paved plazas, feature trees, and groundcover planting. Pedestrian access from the neighbourhood garden to the ground floor communal open space area will be controlled via an entry gate (see **Figure 40** below).
- The treatment to the northern edge of the site, fronting the neighbourhood street, incorporates feature ornamental flowering groundcovers at the intersection with Main Street and individual landscaped terraces associated with the residential units fronting this boundary. Boundary planting and fencing will outline the perimeter of private gardens and act as natural privacy screening.
- Private ground floor terraces will also front the neighbourhood street to the west, including gardens associated with the terraces, which will contribute to the activation of the street and an intimate neighbourhood scale (see **Figure 42** below).
- Ground floor communal open space is provided between the mixed use towers on site. This space will comprise seating, water features, garden beds, pathways through the site and a plaza adjoining the rear of the four terraces (see **Figure 41**).
- Two green roofs are to be provided on top of the 45m tall components of the C1 towers, which will be treated with tall, wind tolerant native grasses and trees. These areas will be inaccessible to the occupiers of the building, but will create a green outlook for upper level residences and contribute to the urban canopy.



Figure 40 Indicative view of the neighbourhood garden outside Building C1

Source: Hassell



Figure 41 Ground floor communal open space for Building C1

Source: Hassell



Figure 42 Individual entrances and landscaped private open space for the terraces and maisonette apartments

Source: Candalepas Associates

3.5.2 Access and Parking

Pedestrian Access

The mix of housing typologies and land uses accommodated within Building C1 requires multiple building entries addressing each frontage of the site.

Separate building lobbies are proposed for the social housing and market housing components of the development, with the social housing lobbies to be accessed via Main Street and the market housing lobbies to be accessed via the new neighbourhood street to the west. The lobbies have been designed with large entry forecourts that open up the field of vision and create prominent building entries when viewing the development from the street.

The ground floor of Building C1 also accommodates residences with individual building entrances and private terraces that front the northern, eastern, and western boundaries of the site, and a ground floor retail/community space with an individual building entrance that fronts the eastern/southern boundary of the site. These individual entrances will assist in creating a human scale and activating the public domain.

Vehicle Access

The Building C1 basement is serviced by two driveways off surrounding neighbourhood streets, which provide access to different controlled areas of the basement. All market housing and retail vehicles will access the building basement via the south western boundary, whilst all social housing vehicles will access the building basement via a new driveway off the north western boundary. Waste collecting and servicing will occur via a dedicated loading area in the building basement. A future connection to the C2 building basement as shown in **Figure 43** below provides the future community centre access to the proposed loading dock.

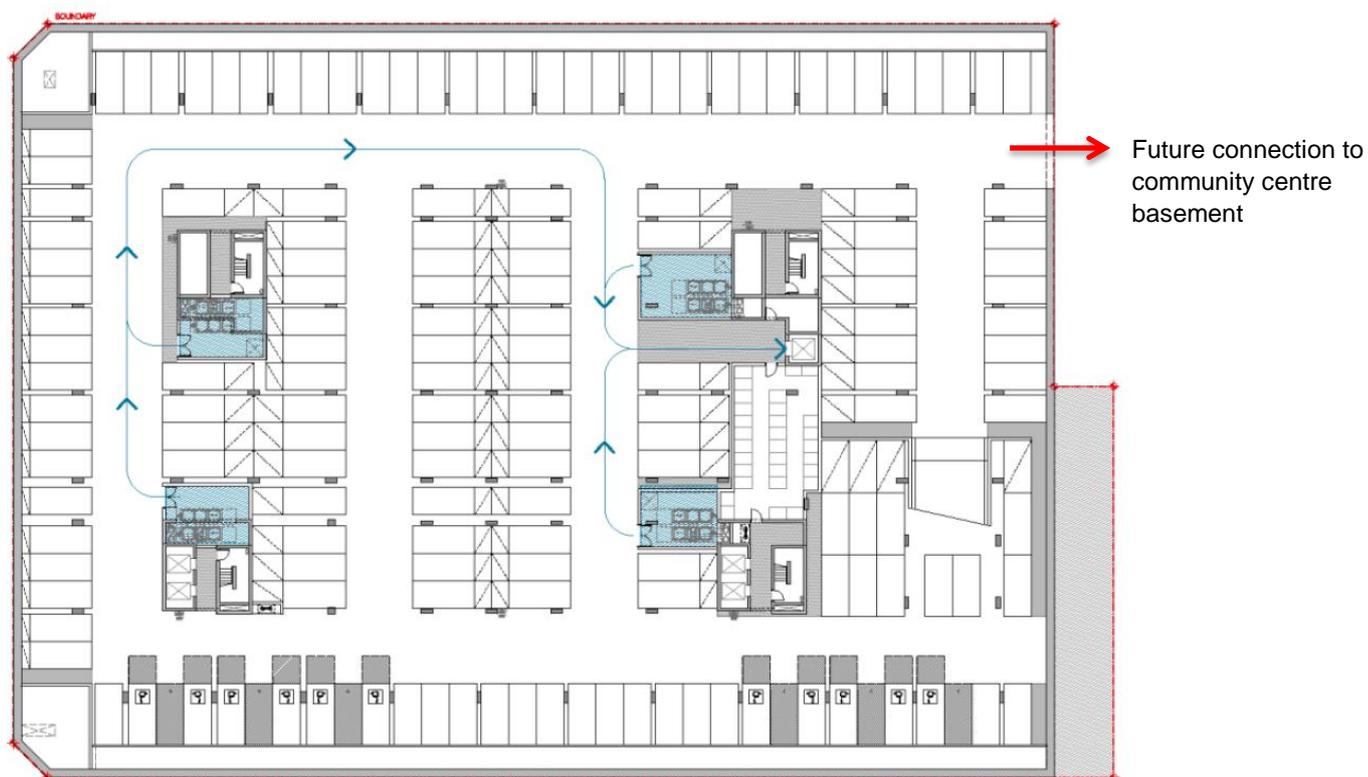


Figure 43 Extract of the C1 Basement Level 3 plan showing loading and the future connection to the community centre

Source: Candalepas Associates + Ethos Urban

Parking

On-site vehicle parking will be provided over 3 basement floors that accommodate 346 car parking spaces. Parking allocated to the social housing residents and visitors (134 spaces) is provided on basement levels 1 and part of 2, whilst parking allocated to the retail/community space (3 spaces) and marketing housing residents and visitors (209 spaces) is provided on the remainder of basement level 2 and 3. These parking areas have been segregated and are accessed via separate entrances/exits.

A combination of 471 designated bicycle storage areas and storage cages are also to be provided within the basement that can be used to securely store bicycles.

3.6 Public Domain

Hassell has prepared Landscape Plans (**Appendix C**) and report detailing the proposed public domain areas being provided in conjunction with the road network, and the interface areas relating to Buildings A1 and C1 (see **Figure 44** below). These areas adopt different characters and functions, as the land moves from an urban environment fronting Herring Road to Shrimptons Creek in the south.

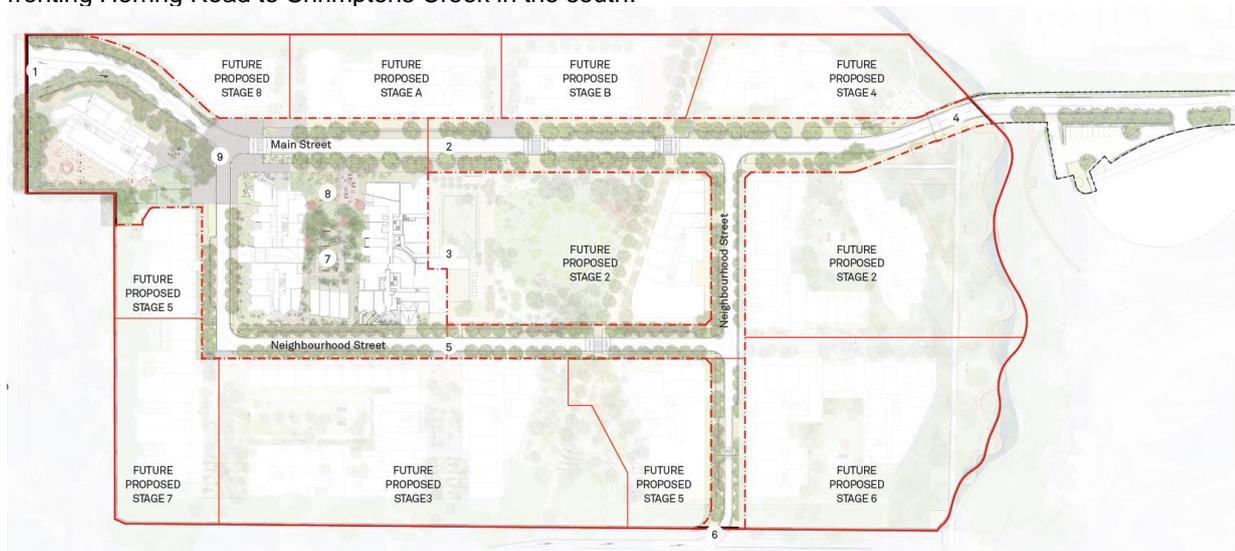


Figure 44 Overview of the proposed public domains works under Stage 1 of the Ivanhoe Estate Masterplan

Source: Hassell

- **Main Street** - the public domain bordering Main Street will adopt an urban character, consistent with the function of this road as the principal circulation spine for the development. It will accommodate a shared path that benefits high capacity pedestrian and cycle movements, a series of neighbourhood gardens for amenity and variety, and regular street tree planting.
- **Intersection of Main Street and Herring Road** – The intersection of Main Street and Herring Road marks the entry to the Estate. The design of this intersection includes the continuation of large paved areas, and uses mixture of trees, looser in their arrangement to differentiate the site from the public landscape of Macquarie Park.
- **Neighbourhood Streets** – the neighbourhood streets, which branch off Main Street, will be finished with extensive understorey planting and a variety of street trees, becoming less regular to create a neighbourhood feel rather than an ordered civic promenade. Street furniture will be interspersed to encourage social interaction.
- **Clearings** – a series of clearings have been incorporated into the road network in sunny locations and at principal pedestrian crossing points, as indicated in the 'street tree masterplan' at **Figure 45**.



Figure 45 Street tree masterplan for road verge planting on the site

Source: Hassell

3.7 Water Cycle Management

A Stormwater and Drainage Assessment has been prepared by ADW Johnson (refer to **Appendix F**), confirming the details of the proposed stormwater management measures and Water Sensitive Urban Design (WSUD) measures to be implemented as part of Stage 1 of the Masterplan. The report is supported by the Civil Engineering Plans at **Appendix L**, which propose the following:

- A series of rainwater tanks and dedicated OSD tanks located within the lots and under private roads will attenuate discharges generated by each lot. Runoff generated from roof areas will be directed via the building hydraulics to rainwater tanks within the building basements, and runoff generated from the remaining lot areas will be captured in a series of subsurface drainage pits and conveyed to the detention tanks. It is noted that whilst the road network will be delivered in addition to Building A1 and C1, all OSD and WSUD requirements only need apply to those areas of the Estate that will remain in private ownership.
- All stormwater flows will be conveyed to discharge at Shrimptons Creek. As the proposed construction works will commence at the upstream end of the site, corresponding to the location of Building A1 and C1, temporary stormwater detention works will be required to convey these flows to the receiving waters in Shrimptons Creek. These works comprise temporary detention basins, swales and batters that will be developed over three stages.
- An end of line raingarden system will cater for runoff generated by the public road reserves. The rain gardens will not be developed as part of Stage 1, rather drainage pipework will be delivered at this stage to allow for these gardens to be developed in the future, in-line with Green Star requirements.
- A series of measures are also proposed within the development to achieve the required water quality targets, including rainwater tanks with a first flush system as pre-treatment prior to runoff entering the tanks, Stormwater 360 'Enviropods' or equivalent litter traps to capture gross pollutants and coarse sediments, and Stormwater 360 'Stormfilters' or equivalent proprietary media filtration devices.

In addition to the proposed works, consent will also be sought to relocate drainage infrastructure and an associated easement that currently enables neighbouring development to drain through the site to the public drainage network. The existing development to the northwest of the site within Lot 1 in DP 60971, drains via a 375mm diameter drainage pipe and associated easement through the Building A1 site. The proposed works in this area of the Estate will require the drainage pipe and easement to be relocated from its current position through the basement of A1, to connect into the new public drainage network located within the proposed road network. The final configuration of the proposed pipe connection and overland flow path is subject to negotiation with the adjoining landowner, with final details to be provided at the Construction Certificate stage.

3.8 Ecologically Sustainable Development

Stage 1 will achieve the sustainability targets that were nominated for development under the Masterplan, as detailed in the Sustainability Report prepared by Frasers Property Australia (**Appendix O**). Buildings A1 and C1 will achieve a 5 star Greenstar rating and incorporate the following sustainability measures:

- solar panels will be installed on the roof of Buildings A1 and C1 to reduce electrical peak demand and greenhouse emissions;
- high efficiency centralised hot water will be installed for both buildings;
- 'smart metering technology' will be used on site to allow efficient demand management;
- the provision and use of gas on site will be minimised;
- social housing will be provided with low cost heating; and
- carbon offsets will be acquired, where necessary, to ensure that 100% energy supplied through Real Utilities is NCOS carbon neutral certified.

3.9 Operational Waste Management

The storage, management, and disposal of waste generated by the operation of the site is considered in the Waste Management Plan prepared by Elephants Foot (**Appendix P**) and in the following sections.

Building A1 and C1 Residences

In order to accommodate the proposed units on site, Building A1 and C1 have provided dedicated waste holding areas within their respective basements for the storage and management of green waste, general waste and recyclables, a separate bin holding area within Building A1 for the on-site collection of waste, an area for flattening cardboard before being disposed of within the dedicated recycling bins, and a storage room for bulky goods being discarded.

Waste will be transported from apartments to the holding areas via two garbage chutes, installed into each building core, which will discharge into large storage bins within the respective building basements. When the bins are full, they will be transferred to the bin holding areas for collection by the building manager / waste contractor. Residents will be responsible for the transportation of large recyclables or bulky goods to the relevant waste storage areas. The building manager / waste contractor will be responsible for exchanging and emptying the recycle bins and storing them in the main bin storage room.

As discussed above, all waste for A1 and C1 will be collected on-site within the proposed basement. It is expected that waste will be collected twice per week.

Retail/Community Space

The retail/community space proposed in Building C1 will be responsible for the storage and management of their own waste via the dedicated Back of House areas. Upon completion of each trading day or as required, nominated staff or cleaners will transport waste and recycling to the allocated retail waste area and into the appropriate collection bins for collection alongside the residential waste.

Child Care Centre

The child care centre proposed in Building A1 will be managed by contract cleaners appointed by the future operators of the centre. These cleaners will transport waste/bins to the bin collection area and return empty bins to the child care centre. Staff food preparation areas will be supplied with a dedicated commingled collection receptacle for the collection of all recyclable glass and plastic items. Staff will be responsible for sorting this material and allocating recyclables into the correct collection facility.

It is expected that waste will be collected once per week.

3.10 Construction Management

The detailed construction and environmental management plan will be prepared by the appointed contractor prior to the commencement of works. The CEMP will be prepared in accordance with relevant applicable Australian Standards and Occupational Health and Safety requirements, and will consider:

- the construction planning and staging methodology for the stages of works;
- details of the site hoarding locations and overall site establishment;
- the deliveries and materials handling strategies;
- the Environmental Health and Safety management approach to be adopted;
- waste management strategies to be adopted;
- stormwater and erosion control measures to be implemented;
- noise and vibration management;
- air and water quality management;
- traffic, parking, and pedestrian management;
- a complaints management process to be adopted during construction.

A Preliminary Construction Traffic Management Plan (CTMP) has been prepared by Ason Group (**Appendix Q**) to detail the likely access, operation and impacts of construction traffic on site. The following are likely construction processes to be implemented on the site:

- Construction works on site will typically occur between 7am to 7pm Monday to Friday, and 8am to 4pm on Saturdays.
- It is proposed that construction vehicles will enter and exit the site via Herring Road, utilising state roads where possible. The construction routes and programming will be communicated by traffic control to ensure construction vehicles are following the correct route and to avoid unnecessary congestion.
- On-site parking will be provided for construction workers along the existing road network, and informally within the construction site.

3.11 Development Staging

The detailed civil and site preparation works and associated biodiversity offsets considered under this application will be delivered in stages, to correspond to the staged construction of buildings considered under the Masterplan and to align with the staged dedication of land to Council as part of ongoing Voluntary Planning Agreement negotiations.

The proposed bulk earthworks, road construction and servicing will be delivered over three stages as shown in **Figure 46** and discussed below:

- Stage 1A – this stage involves bulk earthworks within the Building A1 and C1 sites and the partial construction of Roads No. 1 and No. 2, from Herring Road into the development site. Before the remainder of the road network is constructed, temporary turning heads will be provided at the termination of Roads No. 1 and No. 2 at the Stage 1A and 1B boundary. This stage of the development also involves connecting the existing potable water trunk main in Herring Road to the internal road network, lead in works, the construction of substations, and connecting the existing gas trunk main to the retail centre.
- Stage 1B – this stage involves bulk earthworks and the completion of Roads No. 1 and 2, the Shrimptons Creek Bridge, road extension to Lyonpark Road, and the construction of the two-way traffic component of Road No. 3. As the road network is largely completed in Stage 1B, only a small turning head (in the form of a T head) is required at the termination of Road No. 3. This stage of the development will also deliver the internal services network, including the construction of substations.
- Stage 1C – this stage involves bulk earthworks and the completion of Road No. 3 and its connection to Epping Road. It also involves delivering the remainder of the internal services network, connecting the internal network to the existing potable water trunk main in Epping Road and the construction of substations.



Figure 46 The staging of roads, earthworks, and servicing

Source: ADW Johnson

It is also proposed to stage tree removal and the associated biodiversity offsets in coordination with the delivery of Building A1 and C1 and future buildings that will be delivered under separate and future applications. The indicative staging for tree removal and site preparation biodiversity offsets is detailed at **Figure 47** and **Table 5** below.

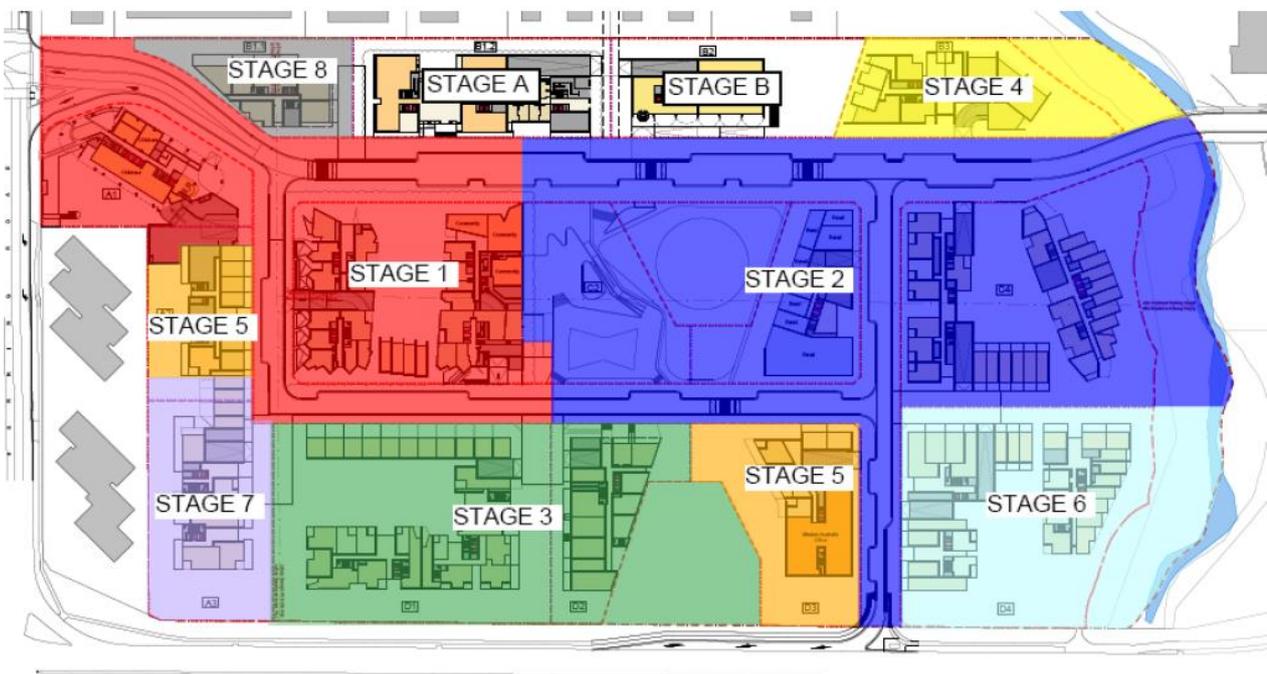


Figure 47 The staging of biodiversity offsets

Source: Eco Logical Australia

Table 5 Offsetting requirement per stage of the development

PCT	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage A	Stage B	Total
ME041			4				6				10
ME58		10		4		2					16
Total	0	10	4	4	0	2	6	0	0	0	26

Source: Eco Logical – Biodiversity Assessment Report and Offset Strategy for the Masterplan

4.0 Consultation

In accordance with the SEARs issued for this project, consultation has been undertaken with Council and other relevant authorities, and the general public with regard to the Stage 1 application. Several consultants have also completed additional consultation with relevant parties during the preparation of their reports. A summary of the consultation undertaken to-date is provided in the sections following.

It is also noted that further community and agency consultation has been conducted as part of the development of the Masterplan, to which this application is pursuant. In addition to meeting with agencies, a series of drop-in sessions and workshops were undertaken with the community, and 'meet-and-greet' sessions were held with the former and current residents of the Estate. A series of newsletters, fact sheets and invitations to attend the consultation exercises were issued to approximately 3,500 surrounding residences/tenancies and a website was created to keep the community informed.

4.1 SEARs Consultation

Consultation with Council, nominated agencies and community groups occurred between October and December 2017, prior to lodgement of the SSD DA. It should be noted that the project team contacted all agencies to request meetings, however given the nature of the project, and the fact that they had been consulted with during the SEARs request and for the Masterplan to which this application is pursuant, multiple stakeholders confirmed they did not require additional meetings. **Table 6** outlines the consultation carried out prior to the lodgement of this SSD DA, and **Appendix R** provides the relevant correspondence for the consultation undertaken with these agencies.

Table 6 Consultation carried out prior to lodgement

Public Authority / Agency / Stakeholder	Invitation sent	Action
City of Ryde Council	22/01/18	Meeting held 31/01/18
Roads and Maritime Services	02/02/18	Meeting held 14/02/18
CBD Coordination Office within Transport for NSW	02/02/18	Meeting held 08/02/18
NSW Office of Environment and Heritage	19/01/18	Did not need to meet.
NSW Department of Education	Ongoing discussions.	
NSW Environment Protection Authority	22/01/18	Did not need to meet.
NSW Department of Primary Industries – Office of Water	19/01/18	No response.
NSW Police	13/02/18	No response.
Sydney Water	23/02/18	Meeting held 05/03/18.
Ausgrid	22/12/18	Did not need to meet.
Macquarie Connect	Ongoing discussions.	
Appropriate social service organisations ²	-	Meeting held 05/12/17
Neighbouring residents and the local community	07/02/18	19/02/18

4.2 Post Lodgement Consultation

The proposed development will be placed on public exhibition for 30 days in accordance with clause 83 of the *Environmental Planning and Assessment Regulation 2000*. During the public exhibition period Council, State agencies and the public will have an opportunity to make submissions on the project.

² workshop with Aboriginal Child, Family and Community Care State Secretariat (AbSec); The Northern Centre; City of Ryde; Shelter NSW; MGSM; Salvation Army; Centre for Volunteering; NSW Federation of Housing Australia; Domestic Violence NSW; Riverside Business Chamber; Ivanhoe Research Team; North Ryde Community Aid; Macquarie University.

4.3 General Public

Elton Consulting have prepared a Consultations Outcome Report (**Appendix R**), outlining the consultation undertaken with the general public prior to the lodgement of the EIS. Members of the general public were invited to join a consultation drop-in session on 19 February 2018 via a newsletter that was delivered to 3,500 surrounding residences, a letter to the former and current Estate residences, and an email invitation to previous participants of engagement events. The session was attended by 32 persons, who offered comments on the design. Elton Consulting notes that “no attendees expressed an opposition to the development application”.

Further opportunities for consultation will be available during the public exhibition period for this application.

5.0 Environmental Assessment

This section of the report assesses and responds to the environmental impacts of the proposed DA. It addresses the matters for consideration set out in the SEARs (see **Appendix C**). The Mitigation Measures at **Section 6.0** complement the findings of this section.

5.1 Relevant EPIs, Policies and Guidelines

The relevant strategies, environmental planning instruments, policies and guidelines as set out in the SEARs are addressed in **Table 7**. A complete breakdown of the SEARs and relevant sections of the report can be found at **Appendix A**.

Table 7 Summary of consistency with relevant Strategies, EPIs, Policies and Guidelines

Instrument / Strategies	Comments
Strategic Plans	
NSW Premier's Priorities	<p>The NSW <i>Premier's Priorities</i> represent 12 of the key policy priorities for the NSW State Government. The proposed Stage 1 SSD DA is consistent with the following priorities:</p> <ul style="list-style-type: none"> • Making housing more affordable: The proposal will deliver 259 social housing dwellings, to replace the social housing stock on the site, in addition to providing 481 private dwellings that contribute to the overall supply of housing in the growing Macquarie Park area and Greater Sydney. • Keeping our environment clean: Buildings A1 and C1 incorporate a range of environmental and sustainability measures to achieve the ESD targets nominated in the Concept Plan.
A Plan for Growing Sydney	<p>When the SEARs were issued, <i>A Plan for Growing Sydney</i> established the strategic vision for Sydney's metropolitan area, including housing and jobs targets and population projections. This Plan has now been superseded by the Greater Sydney Region Plan discussed below.</p> <p>The Plan identifies Macquarie Park as being a Strategic Centre, within an Urban Renewal Corridor, and within the Global Economic Corridor that extends from Sydney Airport to Parramatta and Sydney Olympic Park. The site is therefore clearly located in an area that is earmarked to undergo change, as a priority location for employment, retail, housing and services.</p> <p>The proposed development also remains consistent with a number of key goals, directions, action and priorities established by the Plan, as follows:</p> <ul style="list-style-type: none"> • Goal 1: A competitive economy with world class services and transport Stage 1 proposes to deliver 740 dwellings within the strategic centre of Macquarie Park, which will benefit from excellent access to employment and public transport. • Goal 2: A city of housing choice, with homes that meet our needs and lifestyles The development will deliver 740 of the approximately 3,400 dwellings (subject to future applications) considered in the Masterplan contributing to the supply of housing, including purpose-designed social housing that is critically in demand within NSW. • Goal 3: A great place to live with communities that are strong, healthy and well connected In addition to private and communal open space areas associated with the operation of Buildings A1 and C1 (including the child care centre), the development will deliver the road network including new paths of travel across the site for walking and cycling. • Goal 4: A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources The development incorporates substantial tree planting across the site, associated with the road network and open space areas for Buildings A1 and C1, and will achieve the nominated ESD targets under the Concept Plan for Buildings A1 and C1.

Instrument / Strategies	Comments
	 <p data-bbox="528 651 1342 689"> Strategic Centre Urban Renewal Corridor Global Economic Corridor </p>
<p data-bbox="150 725 518 752">Towards Our Greater Sydney 2056</p>	<p data-bbox="528 725 1433 801"> <i>Towards Our Greater Sydney 2056</i> was a draft amendment to update <i>A Plan for Growing Sydney</i> and was released in November 2016. This amendment has since been superseded by the <i>Greater Sydney Region Plan</i> discussed below. </p> <p data-bbox="528 831 1433 1037"> The primary aim of the amendment was to reconceptualise Greater Sydney as a metropolis of three cities, with Macquarie Park identified as part of the Eastern Harbour City. The draft amendment is focussed on the three key priorities of 'A Productive Sydney', 'A Liveable Sydney' and 'A Sustainable Sydney' and creating a '30-minute city'. The proposal is consistent with this vision as it will provide additional housing in close proximity to jobs and transport and within the strategic centre of Macquarie Park. Sustainability measures nominated in the Masterplan have been incorporated in the development, to contribute to the creation of a sustainable built environment. </p>
<p data-bbox="150 1055 443 1081">Greater Sydney Region Plan</p>	<p data-bbox="528 1055 1377 1131"> On 22 October 2017, the <i>Draft Greater Sydney Region Plan</i> was placed on public exhibition. This Plan is a revision of the former <i>A Plan for Growing Sydney</i>, and was adopted in March 2018. </p> <p data-bbox="528 1160 1433 1319"> Under this Plan, Macquarie Park maintains its role as a strategic centre and health and education precinct, as well as a Priority Growth Area. The proposal remains consistent with this strategic direction for Macquarie Park, providing further and more diverse residential dwellings and supporting community facilities in close proximity to employment opportunities and public transport. It also remains consistent with the 10 directions established for delivering and monitoring the plan. </p>  <p data-bbox="528 1816 1190 1895"> Health and Education Precinct Committed Train Link Economic Corridor On Street Rapid Transit </p>
<p data-bbox="150 1924 467 1977">Draft North District Plan / North District Plan</p>	<p data-bbox="528 1924 1417 1977"> In October 2017, the Greater Sydney Commission updated the <i>Draft North District Plan</i>. This plan was subsequently finalised and adopted in March 2018. </p>

Instrument / Strategies	Comments
	<p>The Plan establishes the 20-year vision for the North District and sets key priority actions, one of which is to create a sense of place, grow jobs and diversify activity in Macquarie Park.</p> <p>The North District Plan sets a number of 'Planning Priorities' that are linked to the Greater Sydney Region Plan. The Stage 1 development remains consistent with a number of these priorities, as follows:</p> <ul style="list-style-type: none"> • Infrastructure and collaboration: The development provides additional residential density in an area that is adequately serviced and benefits from close proximity to public transport and road infrastructure. • Liveability: The development proposes the first stage of social and market housing in a new community that is well-connected to transport and employment opportunities, and that proposes significant landscape planting to contribute to the urban canopy. The delivery of the road network will also provide new opportunities for walking and cycling through the precinct. • Productivity: The additional residential dwellings will support the ongoing growth of the Macquarie Park health and education precinct, allowing workers to live close to where they work. • Sustainability: Existing native vegetation on the site will be maintained and protected where possible, and landscaping throughout the site will enhance the site's existing character. The proposed buildings considered under this application will also achieve the relevant ESD targets established under the Concept Plan. <p>The proposal also remains consistent with the Masterplan, which was developed in consultation with Land and Housing Corporation, state agencies, and private industry experts, in line with the Estate being identified as a Collaboration Area.</p>
State Legislation	
EP&A Act	<p>The proposed development is consistent with the objects of the EP&A Act, in particular:</p> <ul style="list-style-type: none"> • It delivers social housing to support the welfare of the community; • It has been designed to ensure it responds to the terms of the Masterplan and the character of the site and surrounding area; • It represents the first stage in the delivery of the Masterplan, and as such supports the economic and orderly development of land; • It will construct the road network, of which portions will be dedicated to Council to create land for public purposes; • It will incorporate biodiversity offset measures, tree protection, and replacement planting to conserve the natural environment; • It will provide buildings that achieve a range of sustainability targets and measures established under the Masterplan; and • Significantly, it will provide revitalised social housing to support those in need within Sydney. <p>The proposed development is consistent with Part 4 Division 4.1 of the EP&A Act, particularly for the following reasons:</p> <ul style="list-style-type: none"> • the development has been declared to have state significance; • the development is not prohibited by an environmental planning instrument; and • the development has been evaluated and assessed against the relevant heads of consideration under section 4.15. <p>Further, this application has been made pursuant to Section 4.24 of the EP&A Act, which states that whilst a Concept Plan remains in-force, any further detailed application in respect to the site cannot be inconsistent with the consent for the Concept Proposal. This detailed DA has been made with reference to the concurrent Ivanhoe Estate Masterplan and is consistent with, and pursuant to, the Masterplan. This is discussed further in Section 5.3 below.</p>
EP&A Regulations	<p>The EIS has addressed the specification criteria within clause 6 and clause 7 of Schedule 2. Similarly, the EIS has addressed the principles of ecologically sustainable development through the precautionary principle (and other considerations), which assesses the threats of any serious or irreversible environmental damage (see Section 8).</p> <p>As required by Clause 7(1)(d)(v) of Schedule 2, the following additional approvals will be required in order to permit the proposed development to occur are detailed below.</p>

Instrument / Strategies	Comments																																		
	<table border="1"> <thead> <tr> <th data-bbox="536 244 1225 306">Act</th> <th data-bbox="1230 244 1441 306">Approval Required</th> </tr> </thead> <tbody> <tr> <td colspan="2" data-bbox="536 313 1441 344">Legislation that does not apply to State Significant Development</td> </tr> <tr> <td data-bbox="536 351 1225 383">Coastal Protection Act 1979</td> <td data-bbox="1230 351 1441 383">N/A</td> </tr> <tr> <td data-bbox="536 389 1225 421">Fisheries Management Act 1994</td> <td data-bbox="1230 389 1441 421">N/A</td> </tr> <tr> <td data-bbox="536 427 1225 459">Heritage Act 1977</td> <td data-bbox="1230 427 1441 459">N/A</td> </tr> <tr> <td data-bbox="536 465 1225 497">National Parks and Wildlife Act 1974</td> <td data-bbox="1230 465 1441 497">N/A</td> </tr> <tr> <td data-bbox="536 504 1225 535">Native Vegetation Act 2003</td> <td data-bbox="1230 504 1441 535">N/A</td> </tr> <tr> <td data-bbox="536 542 1225 573">Rural Fires Act 1997</td> <td data-bbox="1230 542 1441 573">N/A</td> </tr> <tr> <td data-bbox="536 580 1225 611">Water Management Act 2000</td> <td data-bbox="1230 580 1441 611">N/A</td> </tr> <tr> <td colspan="2" data-bbox="536 618 1441 649">Legislation that must be applied consistently</td> </tr> <tr> <td data-bbox="536 656 1225 687">Fisheries Management Act 1994</td> <td data-bbox="1230 656 1441 687">No</td> </tr> <tr> <td data-bbox="536 694 1225 725">Mine Subsidence Compensation Act 1961</td> <td data-bbox="1230 694 1441 725">No</td> </tr> <tr> <td data-bbox="536 732 1225 763">Mining Act 1992</td> <td data-bbox="1230 732 1441 763">No</td> </tr> <tr> <td data-bbox="536 770 1225 801">Petroleum (Onshore) Act 1991</td> <td data-bbox="1230 770 1441 801">No</td> </tr> <tr> <td data-bbox="536 808 1225 840">Protection of the Environment Operations Act 1997</td> <td data-bbox="1230 808 1441 840">No</td> </tr> <tr> <td data-bbox="536 846 1225 878">Roads Act 1993</td> <td data-bbox="1230 846 1441 878">Yes</td> </tr> <tr> <td data-bbox="536 884 1225 916">Pipelines Act 1967</td> <td data-bbox="1230 884 1441 916">No</td> </tr> </tbody> </table>	Act	Approval Required	Legislation that does not apply to State Significant Development		Coastal Protection Act 1979	N/A	Fisheries Management Act 1994	N/A	Heritage Act 1977	N/A	National Parks and Wildlife Act 1974	N/A	Native Vegetation Act 2003	N/A	Rural Fires Act 1997	N/A	Water Management Act 2000	N/A	Legislation that must be applied consistently		Fisheries Management Act 1994	No	Mine Subsidence Compensation Act 1961	No	Mining Act 1992	No	Petroleum (Onshore) Act 1991	No	Protection of the Environment Operations Act 1997	No	Roads Act 1993	Yes	Pipelines Act 1967	No
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Biodiversity Conservation Act 2016	<p>In accordance with the Masterplan, the proposed development will be assessed under the savings and transitional period set out in the provisions set out in the <i>Biodiversity Conservation (Savings and Transitional) Regulation 2017</i>. This is as the biodiversity assessment for the Ivanhoe Estate has substantially commenced through the inclusion of the reference to the FBA within the SEARs, in accordance with Part 7 of the Regulation which allows for pending and interim planning applications to be assessed under the former planning provisions rather than the new <i>Biodiversity Conservation Act 2016</i>. As a result, the concurrent Stage 1 and Masterplan applications are to be assessed against the <i>Threatened Species Conservation Act 1995</i>.</p>																																		
Threatened Species Conservation Act 1995	<p>The <i>Threatened Species Conservation Act 1995</i> protects and encourages the recovery of threatened species, population and communities listed under the Act. The Act is integrated with the EP&A Act and requires consideration of whether a development is likely to significantly affect threatened species, populations and ecological communities or their habitat.</p> <p>As part of the Masterplan, it was proposed to prepare a Biodiversity Management Plan and Construction Environment Management Plan prior to construction and obtain Biodiversity offsets in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the <i>Environmental Protection and Biodiversity Conservation Act Environmental Offsets Policy 2012</i>. These mitigation strategies and offset measures are discussed further at Section 5.14.</p>																																		
Roads Act 1993	<p>The Stage 1 application seeks consent for the construction of the road network and intersection upgrades considered under the Masterplan. These works would require an Integrated Development Referral to the Roads and Maritime Services (RMS) given consent is required under Section 138 of the <i>Roads Act 1993</i>. The proposed roadworks are detailed in the Civil Plans at Appendix L, and assessed in the Traffic Impact Assessment at Appendix Q.</p>																																		
SEPP 55 – Remediation of Land	<p>DLA Environmental have completed a contamination assessment for the site, and prepared a Remediation Action Plan outlining the steps to be taken to remediate a small portion in the centre of the Estate. This is discussed further in Section 5.19, demonstrating that the site can be made suitable for the proposed development.</p>																																		

Instrument / Strategies	Comments
SEPP (Infrastructure) 2007	<p>Clause 101 of the SEPP applies to the proposed SSD DA as it is development with a frontage to a classified road, being Epping Road. The proposed development is consistent with this clause as it will not compromise the effective and ongoing operation of Epping Road and measures will be incorporated to reduce the potential impact of traffic noise and vehicle emissions on the proposed development. Further, the proposal is consistent with this clause as no temporary or permanent connection to Epping Road is envisaged as part of the application.</p> <p>Clause 102 of the SEPP applies to the proposed SSD DA as Building A1 and C1 include residential uses and a centre-based child care facility adjacent to Epping Road, which has an annual average daily traffic volume of more than 40,000 vehicles. An assessment against the 'Development Near Rail Corridors and Busy Roads – Interim Guideline' is provided in Section 5.22.</p> <p>The proposed SSD DA is also traffic generating development in accordance with Clause 104 and Schedule 3 of the SEPP. Accordingly, the DA will be referred to RMS.</p>
SEPP (State and Regional Development) 2011	The Ivanhoe Estate is identified as a State Significant Site in Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011. Development of Ivanhoe Estate with a capital investment value of more than \$20 million is State Significant Development (SSD) for the purposes of the EP&A Act. As the proposed development will have a capital investment value of \$303,169,200 it is State Significant Development.
SEPP (State Significant Precincts) 2005	The site is not identified as a State Significant Precinct and therefore SEPP (State Significant Precincts) 2005 does not apply to the proposed development.
SEPP (Affordable Rental Housing) 2009	Stage 1 of the Ivanhoe Estate Masterplan will deliver 259 social housing units on the site, which have been designed to be consistent with the design criteria set out in Division 1 and Division 5 of the SEPP. Under the SEPP the term 'affordable housing' includes social housing. A detailed assessment of these dwellings against the Affordable Rental Housing SEPP is detailed at Section 5.1.1 below.
SEPP (Housing for Seniors or People with a Disability) 2004	Stage 1 will deliver 43 Independent Living Units, that will also be managed by Mission Australia. It is emphasised that these units are not provided pursuant to the Seniors Housing SEPP, and as such no further assessment is required. An assessment of the proposed units and their location was completed under the Masterplan, to which this application in pursuant.
SEPP 65 (Design Quality of Residential Flat Development)	A detailed SEPP 65 assessment has been completed by Bates Smart and Candalepas Associates for the residential components of Buildings A1 and C1, demonstrating that the development on the site will be capable of compliance with the design criteria recommended by the Apartment Design Guide. Compliance with SEPP 65 is discussed in further detail at Section 5.8 .
SEPP (Vegetation in Non-Rural Areas) 2017	The Masterplan SSD DA will be assessed against the savings and transitional provisions outlined in the <i>Biodiversity Conservation Act 2016</i> . As a result, the SEPP does not apply to the proposed SSD DA.
SEPP (Educational Establishments and Child Care Facilities) 2017	The proposed development seeks consent for a centre based child care centre on the ground floor of building A1. An assessment of the space requirements and other design criteria under this SEPP have been discussed in Section 5.21 . It is noted that the child care centre will be subject to a separate future DA for its fit-out and operation.
SEPP BASIX 2004	BASIX certificates are provided at Appendix S for the residential dwellings proposed under Stage 1.
DRAFT SEPP – Environment	The Draft SEPP Environment was released for public exhibition in October 2017 and aims to repeal and replace a number of SEPPs and SREPs that currently apply in NSW. Under the Draft SEPP, the site is identified as being within an area of 'Urban Bushland' and as such would be subject to controls relating to the protection of land that is reserved for public open space. No portion of the Estate is zoned for this purpose at this time, and as such the provisions of the Draft SEPP do not apply.
Commonwealth Legislation	
Environment Protection and Biodiversity Conservation Act 1999	The <i>Environment Protection and Biodiversity Conservation Act 1999</i> identifies Matters of National Environmental Significance to be protected. The Sydney Turpentine – Ironbark Forest present on the site is identified as a critically endangered species under the Act and is therefore a Matter of National Environmental Significance. Mitigation strategies to minimise impacts on vegetation and appropriate offsetting will be implemented, as discussed at Section 5.14 .

Instrument / Strategies	Comments																		
Local Planning Instruments & Policies																			
Ryde Local Environment Plan 2014	<p>The Stage 1 DA remains consistent with the Concept Plan, which establishes the relevant development standards and land uses for the staged development of the site. Notwithstanding this, an assessment against the relevant provisions in the LEP have been considered below.</p> <table border="1" data-bbox="523 394 1447 1503"> <tr> <td data-bbox="523 394 751 510">Cl. 2.2 – Zone</td> <td data-bbox="751 394 1447 510">Residential, retail/community and centre based child care centres are permissible with consent in the B4 Mixed Use zone. The 2-4 Lyonpark Road site is zoned B7 Business Park, where roads are permissible with consent.</td> </tr> <tr> <td data-bbox="523 510 751 577">Cl. 4.1 – Minimum Lot Size</td> <td data-bbox="751 510 1447 577">No minimum lot size control applies to the site.</td> </tr> <tr> <td data-bbox="523 577 751 857">Cl. 4.3 – Height of Buildings</td> <td data-bbox="751 577 1447 857"> <p>The buildings have been designed to fit within the building envelopes established under the Concept Plan.</p> <ul style="list-style-type: none"> • Building A1 achieves a maximum building height to the top of the lift overrun at RL 138.3, in compliance with the 75m height control applying to the northern portion of the Estate. • Building C1 achieves a maximum building height in the western portion of the site of RL 129.45 to the top of plant in compliance with the 65m height control, and an RL of 102.80 to the top of plant in compliance with the 45m height control applying to the eastern portion of the site. </td> </tr> <tr> <td data-bbox="523 857 751 947">Cl. 4.4 – Floor Space Ratio</td> <td data-bbox="751 857 1447 947">Stage 1 development will deliver 55,325m² of GFA, and as such remains well below the maximum permitted under the Ryde LEP (2.9:1) and the Masterplan (3.53:1).</td> </tr> <tr> <td data-bbox="523 947 751 1014">Cl. 5.10 – Heritage Conservation</td> <td data-bbox="751 947 1447 1014">There are no listed heritage items present on the subject site. An Aboriginal and Heritage Assessment is attached at Appendix J.</td> </tr> <tr> <td data-bbox="523 1014 751 1081">Cl. 6.1 – Acid Sulfate Soils</td> <td data-bbox="751 1014 1447 1081">The site is not affected by acid sulfate soils.</td> </tr> <tr> <td data-bbox="523 1081 751 1205">Cl. 6.2 – Earthworks</td> <td data-bbox="751 1081 1447 1205">The Geotechnical Assessment (Appendix G) confirms that earthworks can be undertaken on the site, subject to appropriate engineering techniques. Section 5.25 discusses geotechnical considerations in the context of the Stage 1 works.</td> </tr> <tr> <td data-bbox="523 1205 751 1384">Cl. 6.4 – Stormwater Management</td> <td data-bbox="751 1205 1447 1384">A stormwater management plan has been prepared for the site (see Appendix F and Section 5.15) and details how the Building A1 and C1 are consistent with the measures proposed in the Concept Plan, including Water Sensitive Urban Design (WSUD) measures, on-site stormwater detention, and water cycle quality and quantity measures.</td> </tr> <tr> <td data-bbox="523 1384 751 1503">Cl. 6.6 – Environmental Sustainability</td> <td data-bbox="751 1384 1447 1503">The Concept Plan targets a 6 Star Green Star Communities rating and 5 Star Green Star v1.1 rating. Buildings A1 and C1 have been designed to achieve and contribute to achieving the relevant targets established for the Estate under the Concept Plan.</td> </tr> </table>	Cl. 2.2 – Zone	Residential, retail/community and centre based child care centres are permissible with consent in the B4 Mixed Use zone. The 2-4 Lyonpark Road site is zoned B7 Business Park, where roads are permissible with consent.	Cl. 4.1 – Minimum Lot Size	No minimum lot size control applies to the site.	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Cl. 6.6 – Environmental Sustainability	The Concept Plan targets a 6 Star Green Star Communities rating and 5 Star Green Star v1.1 rating. Buildings A1 and C1 have been designed to achieve and contribute to achieving the relevant targets established for the Estate under the Concept Plan.																		
Ryde Development Control Plan	<p>As a State Significant Development, the <i>Ryde Development Control Plan 2014</i> (Ryde DCP) does not apply to Stage 1 of the Ivanhoe Estate Masterplan. The Ivanhoe Estate Masterplan and associated Urban Design Guidelines set the new vision for the site and have the same effect and purpose of a site-specific DCP. Together, they establish the parameters for future development in the form of building envelopes, and apply detailed objectives and design principles to shape the design development of buildings.</p> <p>This approach is in accordance with Section 4.22 of the EP&A Act that confirms that a Staged DA may be made setting out concept proposals (ie: the Masterplan) for the development of a site to which separate and future detailed proposals (i.e. the Stage 1 DA) are pursuant. A concept proposal may also be undertaken in lieu of the preparation of a site-specific DCP in accordance with Section 4.23 of the EP&A Act.</p> <p>Further, it is noted that SSD applications are treated differently to regular 'local' and 'regional' developments, with a range of other legislation not applying (Section 4.41 and 4.46 of the EP&A Act) and other legislation needing to be applied consistently with the terms of any SSD consent (Section 4.42 of the EP&A Act). Accordingly, in this instance Development Control Plans are specifically excluded from being applicable to SSD applications per Clause 11 of the <i>State Environmental Planning Policy (State and Regional Development) 2011</i>.</p>																		

Instrument / Strategies	Comments
	An assessment of the proposal against the terms of the Masterplan and the provisions of the Ivanhoe Urban Design Guidelines is discussed in Sections 5.5-5.6 and Appendix B of the EIS. The consultants reports that accompany this assessment have considered Ryde DCP provisions where appropriate.
City of Ryde Section 94 Development Contributions Plan 2007 (Interim Update 2014)	Aspire Consortium intends on entering into a VPA with Ryde Council. The development contributions payable will be calculated in accordance with the City of Ryde Section 94 Plan, as discussed in the Masterplan DA.
Ryde 2025 Community Strategic Plan	<p>The City of Ryde Community Strategic Plan 'Lifestyle and opportunity @ your doorstep' sets seven outcomes to achieving the vision for Ryde. The Stage 1 DA will continue to be consistent with the Plan, including:</p> <ul style="list-style-type: none"> • City of liveable neighbourhoods: The Stage 1 DA will deliver a high quality public domain and the first stage of the developing residential neighbourhood that seeks to strengthen social ties and provide opportunities for active and passive recreation. • City of wellbeing: The development will deliver the envisaged road network, providing opportunities for walking and cycling through the Estate. • City of environmental sensitivity: The proposal has sought to maintain and protect native vegetation on the site where possible and has been designed to achieved a range of sustainability measures that were targeted in the Concept Proposal. • City of connections: The Stage 1 DA will deliver walking and cycling connections throughout the site, that will connect to the wider Macquarie Park area. Future residents of the site will benefit from the close proximity of Macquarie University station, local bus services and the future Metro station. • City of harmony and culture: The Stage 1 DA will deliver the first integrated residential building including social and market housing, in support of creating a diverse community.
Other Relevant Policies	
Development Near Rail Corridors and Busy Roads – Interim Guideline	<p>The Interim Guideline outlines measures to mitigate any potential safety impacts associated with development near rail corridors and busy roads. As noted above, the proposed SSD DA is consistent with the provisions for development fronting a classified road. An Acoustic Assessment and Air Quality Assessment have been prepared to demonstrate that the impacts associated with the surrounding roads can be effectively mitigated and managed on the site.</p> <p>The majority of safety and design considerations in the Interim Guideline do not apply to the proposed development, however, where relevant matters relating to access, stormwater, lighting and graffiti have been considered to avoid impacts on the adjoining road. Aspire Consortium has consulted with RMS during the preparation of the Masterplan and this Stage 1 application, and will continue to do so throughout the detailed design development and future applications.</p> <p>A detailed Construction Management Plan will be prepared prior to construction on the site to ensure that matters related to excavation, earthworks and other construction related issues are considered.</p>
Guide to Traffic Generating Developments	The Traffic and Transport Assessment prepared by Ason (Appendix Q) has considered the Guide to Traffic Generating Development in the preparation of the traffic impact study and determining appropriate car parking rates, consistent with the Concept Plan.
Sydney's Bus Future 2013	<p>Sydney's Bus Future 2013 is the NSW Government's long term plan to redesign the city's bus network to meet customer needs now and into the future. Whilst the specific projects identified in the Plan do not directly relate to the proposal, the proposal is consistent with Plan's objective to encourage use of the Sydney bus network by commuters. The proposal:</p> <ul style="list-style-type: none"> • Allows for bus access through the site. • Is in close proximity to bus services on Herring Road. • Encourages alternative forms of travel to minimise reliance of private vehicles.
Sydney's Walking Future 2013	Sydney's Walking Future 2013 is the NSW Government's strategy to promote walking for transport and connecting people and places through safe pedestrian networks. The proposed modification is consistent with this strategy as it delivers a high quality, permeable pedestrian network that facilitates walking throughout the site and connections to the wider local area.

Instrument / Strategies	Comments
Sydney's Cycling Future 2013	Sydney's Cycling Future 2013 seeks to increase the mode share of cycling in the Sydney metropolitan region for short trips between 20 to 30 minutes. The Stage 1 DA will deliver the road network, creating new cycling links through the site. This will be supported by bicycle parking areas for residents and visitors in the relevant building basements and throughout the public domain. Together, these measures will enable future residents to make trips by bike to locations in the Macquarie Park area, as well as to connect to other transport services.
NSW Planning Guidelines for Walking and Cycling	<p>The NSW Planning Guidelines for Walking and Cycling aim to improve consideration of walking and cycling in Development Applications. The Guidelines make recommendations about how to account for walking and cycling in local plan making, as well as outline design principles that assist with encouraging walking and cycling. The proposal will deliver the envisaged road network, consistent with the Masterplan and design principles. It will assist in creating:</p> <ul style="list-style-type: none"> • a compact residential community, where activities and services can be accessed by foot or by bicycle without need for a car; • a new community in close proximity to a range of public transport options, including Macquarie University station and bus services on Herring Road; and • new homes and services in close proximity to the Macquarie Park centre, with the Macquarie Shopping Centre, Macquarie University and other employment centres located within walking and cycling distance
NSW Long Term Transport Master Plan	<p>The proposal is consistent with the NSW Long Term Transport Master Plan in the following ways:</p> <ul style="list-style-type: none"> • It will encourage walking and cycling through the provision of an integrated pedestrian and cycling network and facilities for bicycles. • It will provide residential, education, seniors living and retail/community uses in a location that benefits from connections to public transport. • It will not impact on the ability of Transport for NSW to deliver infrastructure and other network upgrades.
EIS Guidelines – Road and Related Facilities	<p>The EIS Guidelines – Road and Related facilities is a NSW State Government document which makes recommendations about preparing an environmental impact statement for roads and related facilities. A Traffic and Transport Assessment has been prepared by Ason Group and discussed further in Section 5.10, confirming that the delivery of the envisaged road network remains consistent with the Guidelines.</p> <p>It is also noted that the proponent has consulted with key stakeholders about the location of the road network under the Masterplan, including the landowner, RMS, City of Ryde and the Department of Planning and Environment.</p>
Guide to Traffic Management – Part 12: Traffic Impacts of Development (AUSTROADS)	The design of the proposed road network and upgrades has been developed in accordance with the Guide to Traffic Management. Future detailed applications will demonstrate compliance with this guideline.
Future Directions for Social Housing in NSW	<p>As detailed in Section 1.3 above, the DA remains consistent with the Future Directions for Social Housing in NSW and is an identified project in the Communities Plus program. Specifically:</p> <ul style="list-style-type: none"> • The redevelopment of the Estate will utilise the Land and Housing Corporation site to deliver approximately 1,000 social housing dwellings and 128 affordable housing dwellings, to be managed by Mission Australia Housing. This Stage 1 DA will deliver the first 259 social housing units, to replace those existing on the site. • The integration of tenure types will create a community where social and affordable housing residents are given support and opportunities for education and employment. • The proposal will provide high quality residential dwellings and a public domain that encourages community interaction and active lifestyles, creating a safe and stable community.
School Assets Strategic Plan	The school considered in the Masterplan does not form part of this Stage 1 DA. No further assessment is required.

5.1.1 State Environmental Planning Policy (Affordable and Rental Housing) 2009

State Environmental Planning Policy (Affordable Rental Housing) 2009 (the ARH SEPP) sets out the standard for the development and maintenance of affordable rental housing in NSW.

Division 1 of the ARH SEPP applies to development that is permitted with consent under an environmental planning instrument, is located on a site that does not contain a heritage item and where all or part of the development is within an accessible area. The proposed development is permissible with consent under the Ryde LEP 2014 in the B4 Mixed Use zone, is not affected by a heritage item and is located within 500 metres of Macquarie University Station. Clause 13 of the SEPP permits an FSR bonus if at least 20% of the GFA of the development is to be used for affordable housing. Under the SEPP the term 'affordable housing' includes social housing.

The key provisions of the ARH SEPP have been considered in the preparation of the SSD DA and are addressed in **Table 10** below.

Table 8 Assessment against the ARH SEPP

Provision	Assessment
Division 1 – In-fill affordable housing	
Clause 13 – Floor space ratio	The Masterplan application nominates a GFA cap for development on the site, which includes a specific breakdown of affordable and social housing and the respective FSR bonus that would apply. Stage 1 of the development is consistent with the terms of the Masterplan in this respect, as illustrated in Section 5.4 below.
Clause 14 – Standards that cannot be used to refuse consent	The following standards set minimums that the consent authority cannot be used to refuse consent. It is noted that not achieving the standard is not a non-compliance.
1(b) if the sites area is at least 450m ² .	The Estate is 8.2 hectares, and the block area for C1 is approximately 5,896m ² .
1(c) at least 30% of the site is landscaped.	When the public communal open space is considered as per the Masterplan Design Guidelines (including the Neighbourhood Garden facing Main Street and Town Square), a total of 1716sqm of communal open space is provided. This equates to 28% of the site area.
1(d) 15% of the site is provided as a deep soil zone with a minimum dimension of 3 metres and (if practicable) at least two thirds of the deep soil zone is located at the rear of the site.	Deep soil zones are provided in alternative locations around the Masterplan site to meet site-wide requirements. 15% of the Estate will be provided as a deep soil zone, with a minimum dimension of 3 metres or more.
1(e) 70% of living rooms and private open space receive at least 3 hours of direct sunlight between 9am and 3pm in mid-winter.	The analysis accompanying the Concept proposal demonstrates that Building C1 is capable of achieving at least 70% of dwellings with 2 hours of solar access in mid-winter, consistent with Design Criteria in the SEPP 65 Apartment Design Guide.
2(a) car parking (minimum rates) 1 bedroom – 0.4 space 2 bedrooms – 0.5 space 3 bedrooms – 1 space	As the application is made on behalf of Land and Housing Corporation and the proposed social housing (as a type of affordable housing) will be managed by Mission Australia Housing, the car parking rates set out in 2(a) are relevant. The car parking provided in the shared basement for C1 is greater than the minimum parking required under this provision for the proposed mix of social housing.
2(b) dwelling size	The Architectural Plans and Design Report at Appendix A and B demonstrate that the proposed social housing dwellings (as a type of affordable housing) achieve the required dwelling sizes, which are generally consistent with the provisions of the Apartment Design Guide.
Clause 16 – Continued application of SEPP 65	SEPP 65 applies to the proposed development as it is development for the purpose of a residential apartment building. Compliance with SEPP 65 is set out in Section 5.8 and Appendix B .
Clause 16A	The existing Ivanhoe Estate site has been used as social and affordable housing for approximately 30 years. The proposed redevelopment of the site is permissible with consent under the Ryde LEP and is consistent with the strategic vision for the Macquarie Park Priority Precinct, where homes are located in close proximity to employment and public transport.
Clause 17 – Must be used for affordable housing for 10 years	The affordable housing component of the development will be used as such for at least 10 years.

5.2 Analysis of Alternatives

A number of options are available to LAHC in responding to the identified need for the redevelopment of the Ivanhoe Estate. The proposed development is consistent with the Masterplan, which assessed the available options for the redevelopment of the site including the 'do nothing scenario' and variables to achieving the best possible outcome such as social and community contributions, built form alternatives, and the timely and economic redevelopment of land. The following informed the discussion associated with the Masterplan alternatives, to which this application is pursuant.

5.2.1 Development Options

Do Nothing

As the site has an FSR of 2.9:1 and a height limit up to 70m, a "Do Nothing" option would represent a significant underutilisation of NSW Government land and undermine the intention of the Macquarie University Station (Herring Road) Urban Activation Precinct rezoning. The UAP rezoning was intended to provide a significant increase in the amount of housing in the Macquarie Park area and relinquishing an opportunity to develop subsequent to this rezoning would represent a significant under-utilisation of the site. Not carrying out the development would also result in a missed opportunity to provide an increase in the availability of social and affordable housing. Further to this, as a Part 5 Review of Environmental Factors has been approved by LAHC for demolition on the site, not carrying out the development would result in the site remaining vacant.

The 'Do Nothing' option would therefore be inconsistent with the NSW Government's strategic planning policies and *Future Directions for Social Housing in NSW Policy*, in particular as it would not increase the provision of social housing on the site in mixed tenure community and therefore was not the preferred option.

FSR Compliant Option

The Masterplan Preferred Option is supported by a clause 4.6 variation to exceed the maximum FSR standard in LEP 2015. The variation has three components which relate to the provision of 'community benefit GFA' and the application of the 'vertical village bonus' in the Seniors Living SEPP and GFA from the RE1 zoned land. The merits of these variations were detailed in the Clause 4.6 Variation that accompanied the Masterplan. An alternative option would be to seek approval for an FSR compliant development. The implication of this option would mean:

- the diverse range of community benefit uses, such as the school, community hub, childcare centres, which will enrich the site and assist with a wide range of social outcomes would not be provided, or alternatively, if they were provided in lieu of residential uses, there would be an associated reduction in the provision of social and affordable housing on the site;
- the provision of both market and social seniors housing would be reduced, contrary to the objectives of the State policy; and
- the overall planning outcome would be compromised, as the Masterplan would not be able to strategically redistribute bulk and scale across the Estate.

As the FSR compliant option would reduce the positive social outcomes on the site and result in less social and affordable housing including seniors housing from being provided, it was not the preferred option.

The Preferred Option

The preferred option is generally consistent with the relevant strategic and statutory planning instruments and policies for the site. It maximises the provision of social housing on the site as part of a mixed tenure community consistent with the NSW's Government's *Future Directions for Social Housing in NSW Policy* and is considered to represent the best development outcome, as explored and demonstrated in the following sections of the EIS.

5.2.2 Design Process and Staging Options

The Masterplan is the outcome of a 2-year collaborative design process involving Australia's leading development, urban design and architectural practices. The process combined the experience and expertise of the consortium

partners Frasers Property Australia and Mission Australia Housing and the design team, led by Bates Smart and supported by Ethos Urban, Hassell, Cox and Candalepas Associates.

The design process commenced in 2015 as part of the bid phase with LAHC, which resulted in the production of LAHC's preferred Masterplan for the site. The Design Reports at **Appendix B** explain the contextual analysis and design principles that underpin the Masterplan, and how Stage 1 responds to these principles.

As part of the Masterplan, an indicative staging framework was developed for the design and construction of the Masterplan. A key principle of this staging is for housing tenures to be evenly distributed within the staging framework, to ensure the social housing is provided at the same rate as the private housing and the development is truly tenure blind. Stage 1 delivers on this intended staging by providing social housing in conjunction with private housing.

5.3 Consistency with the Concept DA

Under Section 4.24 of the EP&A Act, whilst a Concept DA remains in-force, any further detailed application in respect to the site cannot be inconsistent with the consent for the Concept Proposal. This detailed DA has been made with reference to the concurrent Ivanhoe Estate Masterplan and is consistent with, and pursuant to, the Masterplan (as amended). An assessment against the key features of the Masterplan has been provided in **Table 9** below. Detailed discussions concerning the mitigation measures and strategies proposed under the Masterplan are addressed in the following components of **Section 5**.

Table 9 Consistency with the Concept Plan (Ivanhoe Estate Masterplan)

Component	Discussion
Land Uses	The proposed residential, retail/community and child care centre uses are consistent with what was considered under the Masterplan. The suitability of these uses was addressed in the Masterplan, and has been further demonstrated in the following sections of the EIS. The detailed fit-out and operation of the non-residential tenancies will be subject to separate and future applications.
Gross Floor Area and Floor Space Ratio	The first stage of development is compliant with the GFA and FSR established for the Estate. Refer to the breakdown in Section 5.4 below.
Built Form	Buildings A1 and C1 fit within the building envelopes established under the Masterplan, and have been designed to be consistent with the Ivanhoe Estate Design Guidelines, as demonstrated at Appendix A and B and discussed further in Section 5.5 .
Building Heights	Building A1 will achieve a maximum height of 75m and Building C1 will achieve heights of 45m to 65m, which remain under the maximum building heights nominated in the Masterplan.
Access Arrangements	The proposed development will deliver the road network detailed in the Masterplan, including the external connection to Lyonpark Road. This is discussed further in Section 5.10 below. External road upgrades, such as signalling the intersection between Main Street and Herring Road, will be the subject of a separate and future application.
Public Domain	The proposed development will deliver public domain areas associated with the internal road network. These areas will achieve the relevant design guidelines established under the Masterplan as demonstrated at Appendix B and discussed further in Section 5.6 below.
ESD	Buildings A1 and C1 have been designed to achieve the sustainability targets nominated under the Masterplan, as demonstrated in the ESD Report at Appendix O and discussed in Section 5.12 .
Development Staging	The delivery of Buildings A1 and C1 is consistent with the indicative staging plan contained in the Masterplan, ensuring that social housing is provided concurrently with market housing.
Design Guidelines	An assessment against the Design Guidelines has been undertaken for Buildings A1 and C1 (see Appendix B). The assessment demonstrates each building is consistent with the Design Guidelines. An assessment of the broader proposal against the Design Guidelines is provided at Section 5.5 and Section 5.6 below.

5.4 Land Use, Gross Floor Area and Floor Space Ratio

Stage 1 of the Ivanhoe Estate Masterplan will provide two residential flat buildings, A1 and C1, along with a child care centre and a retail/community space. The proposed use of the site is consistent with the Masterplan and relevant legislation governing the desired character of the area, in providing integrated residential and compatible non-residential uses in an accessible location that supports the vitality of the Macquarie Park Corridor.

This first stage of the development will provide 55,325m² of GFA, comprising 54,379m² residential floor space, 244m² retail/community floor space, and 702m² of child care centre floor space. The composition of this floor space

in the context of the Masterplan is detailed in **Table 10** below, and in the context of the development blocks is detailed in **Table 11** below.

Table 10 Proposed GFA in the context of the Masterplan

Tenure Type	Masterplan (m ²)	Stage 1 SSD DA (m ²)
Social	68,974	17,001
Affordable	7,523	-
Subtotal – Affordable	76,497	17,001 (22% of Masterplan)
Market	172,440	37,378
Market ILUs	8,464	-
RACF	6,500	-
Subtotal – All Residential	263,901	37,378 (14% of Masterplan)
Retail	960	244 *
School	9,704	-
Childcare	702	702
MAH Office	596	-
Community Hub	2,137	244 *
Subtotal – Non-Residential	14,099	946 (8% of Masterplan)
Total GFA	278,000	55,325 (20% of Masterplan)
Overall FSR	3.53:1	-

* the final use of the retail/community space provided as part of Building C1 is unknown, and as such it may contribute to either of these non-residential breakdowns. It has only been counted once in the total GFA.

Table 11 Land use and GFA by development block

Development Block	Maximum GFA (m ²)	Uses	Stage 1 SSD DA (m ²)
A1	19,000 – 24,500	Residential, Child Care Centre	21,729 - Residential, child care centre
A2	6,000 – 11,500	Residential	-
A3	13,000 – 15,529	Residential	-
Precinct A Total	38,000 – 51,529		21,729
B1	4,000 – 9,000	Residential	-
B1.2/3/4	12,000 – 17,500	Residential aged care	-
B2	7,000 – 12,500	School, Child care	-
B3	16,000 – 21,500	Residential	-
Precinct B Total	39,000 – 60,500		-
C1	31,000 – 36,500	Residential, Retail/community	33,596 – Residential, retail/community
C2	700 – 2,500	Community	-
C3	9,000 – 14,500	Residential, Retail, Community Facilities	-
C4	33,000 – 38,500	Residential	-
Precinct C Total	73,700 – 92,000		33,596
D1	24,500 – 30,000	Residential	-
D2	17,500 – 23,000	Residential	-
D3	14,000 – 19,500	Residential, Mission Australia Housing Office	-

Development Block	Maximum GFA (m ²)	Uses	Stage 1 SSD DA (m ²)
D4	32,500 – 37,500	Residential	-
Precinct D Total	88,500 – 110,000		-
Total	278,000		55,325

5.5 Built Form and Urban Design

5.5.1 Height

The height of Buildings A1 and C1 have been designed to be consistent with the maximum building heights prescribed under the Ryde LEP, which ranges between 45-75m within Block A1 and C1. Specifically, Block A1 is subject to a maximum building height of 75 metres and Block C1 is subject to maximum building heights of 45 and 65 metres respectively. The height limits were established as part of the Macquarie University Station (Herring Road) Priority Precinct process and the proposal is therefore consistent with the desired and emerging built form character of the centre. **Table 12** details the proposed building heights of Building A1 and C1.

Table 12 Building A1 and C1 Heights

Building	Maximum Building Height	Proposed Building Height
A1	75 metres	74.8 metres (RL 138.3 to top of the lift overrun)
C1	45 metres and 65 metres	44.3 metres (RL 100.65 to top of the lift overrun for C1.3) 64.6 metres (RL 122.45 to top of the lift overrun for C1.4)

5.5.2 Setbacks

Ground Level Setbacks

Stage 1 of the Ivanhoe Estate Masterplan will provide two residential flat buildings, A1 and C1, in addition to the construction of the internal street network. The proposed ground level setbacks for Building A1 and C1 are consistent with the Masterplan and have been informed by the Ivanhoe Estate Masterplan Guidelines in addition to responding to the geometry and orientation of each development block.

The ground level setbacks for Building A1 and C1 are detailed in **Table 13**.

Table 13 Ground Level Setbacks

Ground Level Setbacks	Masterplan / Design Guidelines	Proposed
Building A1		
Herring Road	5 metres	6.3 metres
Main Street	2 metres on average	2 metres on average
Neighbourhood Street	Lot Boundary	10.5 metres
Building C1		
Main Street	2 metres on average	2 metres on average
Neighbourhood Streets	Lot Boundary	2 metres

Upper Level Setbacks

The upper level setbacks for Building A1 and C1 have been designed in accordance with the Ivanhoe Estate Masterplan Guidelines. The guidelines require buildings to be designed to ensure that the scale of buildings be reduced when perceived from the public domain. The guidelines also require upper level setbacks to minimise adverse wind impact of down draft from tall buildings.

The upper level setbacks for Building A1 and C1 are detailed in **Table 14**.

Table 14 Building A1 Upper Level Setbacks

Upper Level Setbacks	Masterplan / Design Guidelines	Proposed
Building A1		
Herring Road	5 metres	6.3 metres
Main Street	Lot Boundary	1.67 metres
Neighbourhood Street	4.75 metres	10.5 metres
Building C1		
Main Street	Lot Boundary	1.3 metres
Neighbourhood Streets	4.75 metres	5 metres on average

5.5.3 Street Wall Height

Building A1

The base of Building A1 is lifted 9 metres to present a two-storey scale to Main Street and the future Residential Street in accordance with the Masterplan Design Guidelines. A childcare centre and residential lobby are located within the base. The northern portion of the building is also lifted to present a two-storey scale and lobby to Herring Road.

The resultant massing achieves a legible two-storey scale at the base. In addressing the corner entry from Herring Road, it creates a 'gateway' into the new precinct and reinforces its urban role within the new development. **Figure 48** depicts the proposed two-storey scale at the base of Building A1.

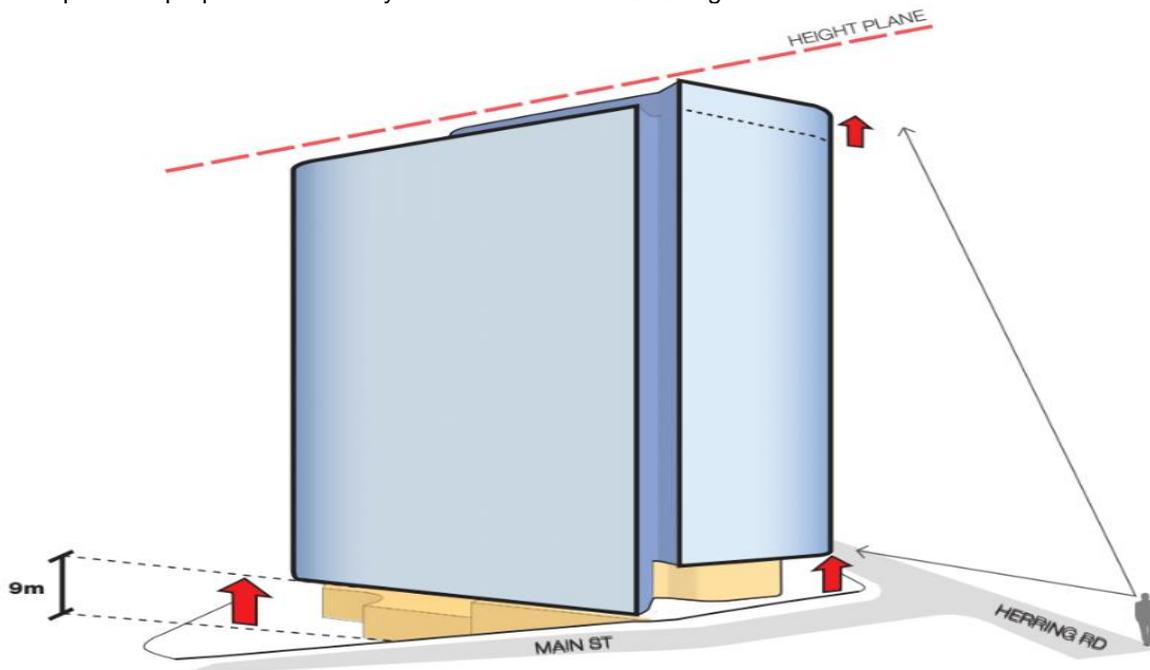


Figure 48 Two Storey Street Wall Height of A1

Source: Bates Smart

Building C1

The base of Building C1 incorporates a two-storey podium expression around the base and fronting the public domain. The elevation to Main Street has been designed in accordance with the Masterplan Guidelines with the street wall recessed and the building façade protruding above level 1. The result is a more civic expression fronting Main Street with generous ground floor entrances providing human scale at the street and opportunities for landscaping in order to soften the building edges.

The treatment of the street wall height for Building C1 has been replicated on the west and south elevations fronting neighbourhood streets in the form of maisonette and terrace style apartments comprising of a two to three storey form. Direct street access is afforded to ground level apartments and terraces with landscaping buffers provided for privacy and amenity.

5.5.4 Building Façade Design

The Masterplan Design Guidelines provide clear guidance on the proposed material and colour palette envisaged for proposed developments within the masterplan. Building functions are to be clearly defined through use of material, lower levels of residential buildings are to use masonry as the prominent façade material, and the colour palette should consist of warm, naturally occurring hues.

Building A1

The façade design of Building A1 adopts a layered frame expressing three different zones that define the low, mid and high sections of the building façade. A two-storey scale primary frame has been applied to the façade which reinforces the residential use of the building and provides depth and shadow to the façade. The frame expression is decreased to a single storey frame at the base to achieve a human scale at ground level. The secondary layer frame applies to the low and mid-rise sections of the building to provide visual solidity at the base and to provide visual privacy to residents.

The resulting façade expression is of a cohesive singular form which expresses lighter elements at the higher sections of the building commensurate with the Masterplan Design Guidelines. **Figure 49** depicts the façade frame overlays for Building A1.

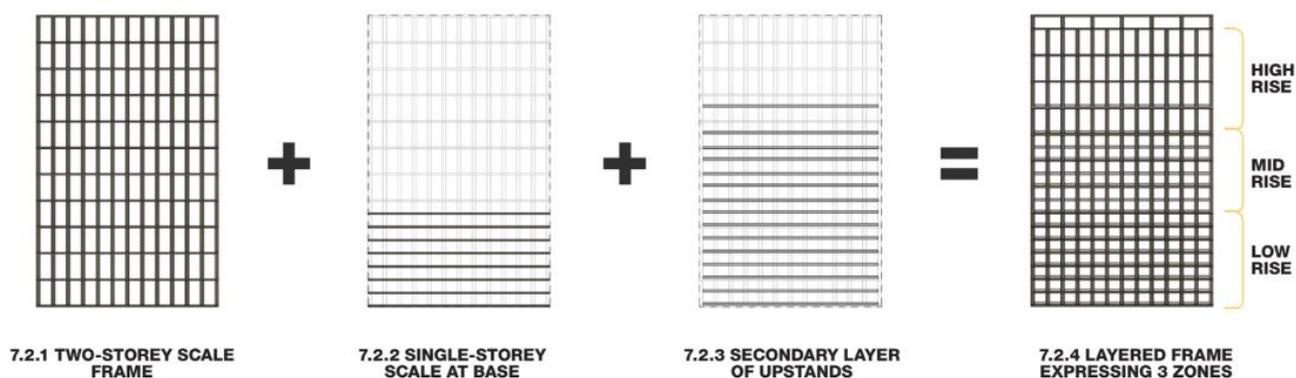


Figure 49 Façade Concept for Building A1

Source: Bates Smart

Building C1

The façade articulation of Building C1 has been carefully considered as a means of breaking down the scale of the building, as well as providing a balanced composition which responds to internal apartment planning.

A detailed layering of precast panels, screens, façade recesses and colour have been used to ensure a high quality architectural expression and offer amenity to apartments. Materials including a combination of coloured precast and off-form concrete, aluminium and timber louvres, painted steel and glazing offer a variety of textures and colours which contribute to the overall façade articulation.

The result is a considered overall building design which responds to the principles of scale, proportion and composition. The façade detail and proposed finishes will offer a positive contribution to the desired future character of the area.

5.5.5 Bulk and Scale

Stage 1 has been designed to be consistent with the mapped FSR of 2.9:1 in Ryde LEP, as well as applying a range of other GFA bonuses relating to affordable housing, seniors housing and community benefit uses.

The Design Reports in conjunction with the Architectural Drawings for A1 and C1, demonstrate that the proposed bulk and scale of Stage 1 is appropriate given:

- there are no exceedances of the maximum height limit;
- the buildings achieve high level compliance with the Apartment Design Guide, notably compliant solar access, cross ventilation and building separation (see Section 5.6);
- the shadow analysis (see Section 5.6.2) demonstrates that the indicative scheme does not have any unacceptable adverse shadow impacts on the surrounding residential areas;
- the setbacks established for the site (see Section 5.4.5) ensure the scale of buildings as perceived from the public domain is reduced; and
- the Visual Impact Assessment concludes that the visual impacts are acceptable.

5.6 Public Domain and Public Access

This first stage of physical works on the site will deliver sections of the public domain areas and access routes considered under the Masterplan. Maximising the proportion of public domain areas being delivered in this initial stage will benefit the establishment of mature vegetation in the streetscape and around building edges, and provide the new community with places to congregate and socialise. These spaces and their treatment have been developed in accordance with the Ivanhoe Estate Design Guidelines and the landscaping framework established by Hassell under the Masterplan, to ensure the delivery of high-quality spaces that contribute to the urban canopy and provide future residents with the opportunity for recreation and social engagement.

The proposed public domain areas being delivered under this application comprise:

- The neighbourhood gardens between Building C1 and Main Street, and Building A1 and the southern collector road, contribute to the landscaped setting of the road network and buildings and act as places of respite and gathering along the main thoroughfares through the site.
- The landscaped 'gateway' to the site at the corner of Herring Road and Main Street will seek to reinstate and improve the landscaped setting of Ivanhoe Estate, and 'stitch into' the existing streetscape character to integrate the development with its surrounds
- The remaining landscaped road verges and associated 'incidental streetscape moments' contribute to a green streetscape and encourage activity in the street by incorporating areas for sitting, playing, and outdoor games such as chess and hopscotch. Planting within the road verges has designed to shape the types of activities in these areas such as regular street trees along main street consistent with a civic character, and irregular and diverse planting along the collector roads consistent with a neighbourhood character.

These proposed spaces are considered to be consistent with the objectives established under the Masterplan, in providing opportunities within the site for landscaping and socialising, and maximising the amenity of new streets and open space areas.

The above public domain areas, in conjunction with other publicly accessible areas, will also provide key access routes underpinning the Masterplan. Namely, the proposed road network incorporates dedicated footpaths, a shared path connecting Herring Road and Lyonpark Road on Main Street, and pedestrian through-block connections via the Village Green and open space areas within the Building C1 block. These access routes contribute to the development of a highly connected network within the Estate and facilitate safe movement through the site.

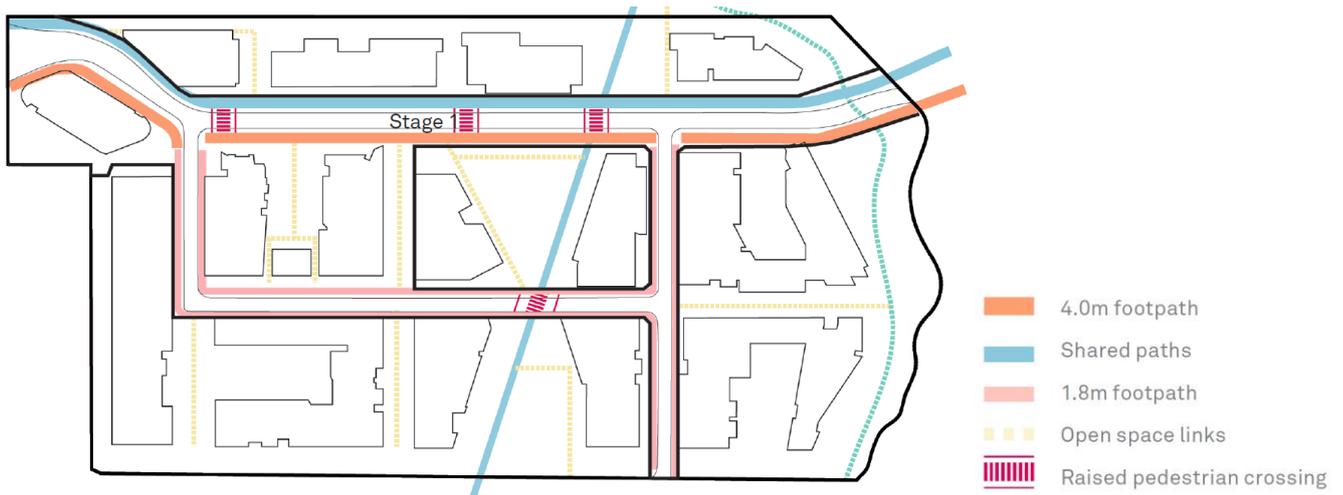


Figure 50 Access and connectivity under the Masterplan

Source: Bates Smart

5.7 Visual and View Impacts

Visualisations have been prepared by Virtual Ideas (**Appendix T**), providing updated visual assessments of the buildings within the building envelopes for A1 and C1 that were considered and assessed under the Visual Impact Assessment prepared by Ethos Urban that accompanied the Masterplan application. The methodology used to complete the VIA is based on established NSW practices and national and international policy, and closely resembles the process established by leading NSW practitioner Richard Lamb and Associates. It comprises an assessment of the nature and scale of the existing visual catchment, an assessment of the impact of the visual impact as a result of the application, and an assessment of the visual impact against other, broader considerations relevant to the proposal.

The VIA considers eight key view points surrounding the site, as indicated in **Figure 51** below. The catchment and character of views to and from this surrounding area can be summarised as follows:

- The landform is gently undulating, featuring small hills, ridgelines, valley and gullies, creating locally contained visual catchments. Sweeping vistas to the site are unlikely to occur. The site has high visibility from Epping Road, which is mitigated by the presence of dense low to medium storey vegetation and regularly spaced, semi-mature eucalypts along the sites boundary with the road.
- The district level visual catchment is defined by the ridgelines running along Lane Cove Road, Herring Road, and Blaxland Road. The site has medium visibility from points within this district catchment.
- While views of the site from elevated locations such as high-rise buildings in the Sydney CBD or Chatswood are likely to be obtained, they have not been used to delineate the visual catchment due to the low number of people who would have access to these views compared to the physical area that would need to be included.
- The urban form and skyline within Macquarie Park is expected to change from having a solely low to medium rise, widely spaced visual profile to being punctuated by clusters of higher rise, more dense development. This change will, in particular, be highly visible for people travelling on Epping Road, as people will readily experience these clusters due to their proximity to the road.

An analysis of the Masterplan building envelopes on the catchment and character of views, from the eight key viewpoints, confirms that the overall visual impact of the Ivanhoe Estate Masterplan is moderate. This degree of impact is considered to be acceptable in the VIA, as the building envelopes are generally consistent with the planning controls for the site and are consistent with the key strategic planning documents that seek to transform the character of Macquarie Park.

An assessment of how the proposed detailed Building A1 and C1 fit within this analysis of the worst-case scenario, loose-fit building envelopes, is provided below.



Figure 51 View locations

Public Views

As demonstrated in **Figure 52** to **Figure 54** below, the proposed buildings sit comfortably within the Masterplan building envelopes and have adopted a number of design measures to mitigate perceptions of bulk. Available views of the proposed building on the site are primarily of Building A1. This building is significantly reduced when considering the maximum permitted building envelope of the masterplan, and the use of the two interlocking curved facades enables the building to successfully fade and recede into the skyline when viewed from the surrounding road network. Additionally, Building A1 will be partly obscured by the adjoining development of 137-143 Herring Road if or when constructed. The rooftop of Building C1 is only just visible from the surrounding area, and as such it will not dominate or otherwise significantly alter existing views.

The proposal will not result in the loss of any valuable views or landscape features, and is consistent with the desired future character of the area as identified in NSW Government strategic planning policies. The built form and massing of both A1 and C1 is significantly less than the building envelope massing considered with the masterplan and will therefore not result in any unacceptable visual impacts.

Private Views

Consistent with the Masterplan, the proposed buildings will also not adversely impact on private views from residents in surrounding residential apartment buildings, specifically apartments in the upper levels of the Macquarie Park Village development. Whilst some view loss will occur as a result of the proposed development, the view loss is acceptable for the following reasons:

- The proposed buildings are within the permissible height limit prescribed by the Ryde LEP 2014 and remain consistent with the objectives of the rezoning set out in the Herring Road Finalisation Report.
- The buildings have been designed to fit comfortably within the building envelopes that were designed and positioned under the Masterplan to promote view sharing and maintain view corridors through the site.
- The site is within a Priority Precinct, where increased density in close proximity to employment and public transport is appropriate.

- An alternative design to reduce view loss to private dwellings would compromise the development of the site and result in a development that provides less social and affordable housing on the site.

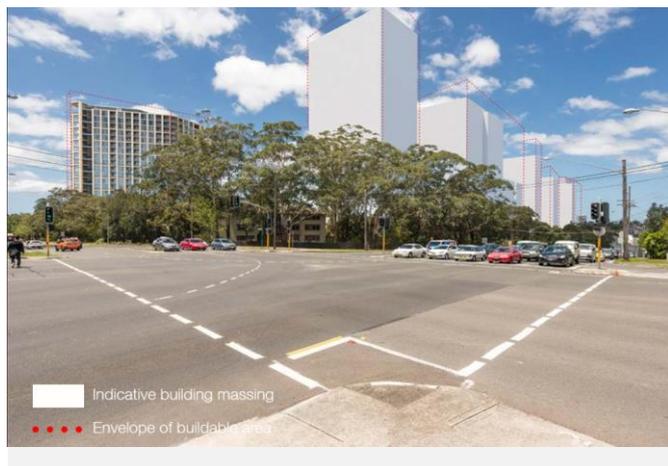


Figure 52 Intersection of Epping Road and Herring Road

Virtual Ideas



Figure 53 Herring Road at Morling College

Virtual Ideas



Figure 54 Macquarie University Station, Herring Road and Waterloo Road

Virtual Ideas

5.8 Amenity

5.8.1 Residential Amenity

Buildings A1 and C1 have been designed to achieve a high level of amenity in accordance with the principles established in the Masterplan in response to the nine principles of SEPP 65 and the design criteria recommended by the Apartment Design Guide. A detailed assessment of the proposed development in accordance with the Apartment Design Guide is provided at **Appendix B**, including an assessment against the provisions of SEPP 65 have been addressed in the Design Reports prepared by Bates Smart and Candalepas Associates. A discussion of the objectives and design criteria for residential amenity under the Masterplan is considered below.

Building Separation and Visual Privacy

ADG Design Criteria 3F Visual Privacy recommends building separation distances to maintain visual privacy. Building separation is measured between the site boundary and a habitable room or window. For buildings within the same site, minimum separation distance should be shared equitably between buildings. The Architectural Plans prepared by Bates Smart and Candalepas Associates demonstrate that the recommended building separation distances have been achieved for the proposed buildings to surrounding development, and internally within C1.

Solar Access

ADG Design Criteria 4A-1 Solar Access requires that living rooms and private open spaces of at least 70% of apartments receive a minimum of 2 hours direct sunlight between 9am and 3pm on 21 June. Building A1 and C1 both achieve a minimum 70% of apartments that receive 2 hours of sunlight between 9am and 3pm during the mid winter, however the proportion of apartments that receive no sunlight during this time is greater than the recommended 15% for Building C1, at 21% of apartments. As discussed in the Design Report at **Appendix B**, the building orientation was prioritised in the design of C1 to maximise the number of apartments that achieve the recommended 2 hours of direct sunlight during midwinter, which resulted in an increased number of apartments in the south western corner of each level of the building receiving no sunlight. It is noted that the proportion of apartments that receive no sunlight during the midwinter within Building A1 is substantially lower than the recommended 15%, ensuring that on-balance the residences delivered as part of Stage 1 remain generally compliant.

Natural Cross Ventilation

ADG Design Criteria 4B-3 Natural Ventilation requires that at least 60% of apartments are naturally cross ventilated in the first nine storeys of the building and apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed. Both Building A1 and C1 achieve 60% crossflow in the first nine-storeys in compliance with the ADG requirements.

Communal Open Space

ADG Design Criteria 3D-1 Communal and Public Open Space recommends that 25% of the site is provided as communal open space and that 50% of the principal usable part of the communal open space receives a minimum of 2 hours direct sunlight between 9am and 3pm on 21 June. For Building C1, 864m² of communal open space has been provided at ground level, which will receive 2 hours of direct sunlight during midwinter to 50% of the area as demonstrated in the overshadowing plans prepared by Bates Smart (**Appendix A**). When considered in conjunction with the public open space being delivered adjoining C1, such as the neighbourhood garden, approximately 28% of the site will be provided as open space that is readily accessible to residents.

No ground floor communal open space has been provided for Building A1 in compliance with the framework established under the Ivanhoe Estate Design Guidelines. These Guidelines recognise that Lot A1 contains a large landscaped external terrace to be used by the childcare centre, which occupies the Ground Floor and provides other benefits such as an activated street frontage and access to services for future residents, workers and visitors to the Estate. This trade-off is supported in the Masterplan that proposes a balanced approach to communal and public open space, recognising that greater than 25% of the Estate will be delivered as open space despite minor deficiencies within individual stages. Accordingly, large areas of open space will be delivered in subsequent stages (see **Figure 55**) and, within Building A1 and C1, each apartment is provided with private balconies/terraces and a heavily landscaped and pedestrianised ground-plane design.



Figure 55 Public open space being delivered under the Masterplan

Source: Bates Smart

Private Open Space

ADG Design Criteria 4E-1 Private Open Space and Balconies requires that all apartments have access to balconies of a certain size and a certain depth, and that ground floor apartments be provided with private terraces that achieve a minimum area of 15m² and depth of 3m. Balconies have been provided for each apartment within Building A1 and C1, and private terraces have been provided for the ground floor apartments within Building C1. It is noted that certain balconies within Building C1 do not achieve the recommended minimum areas, which in-part relates to the irregular shape of these balconies that have been designed to contribute to façade articulation and privacy (see **Figure 56** below).

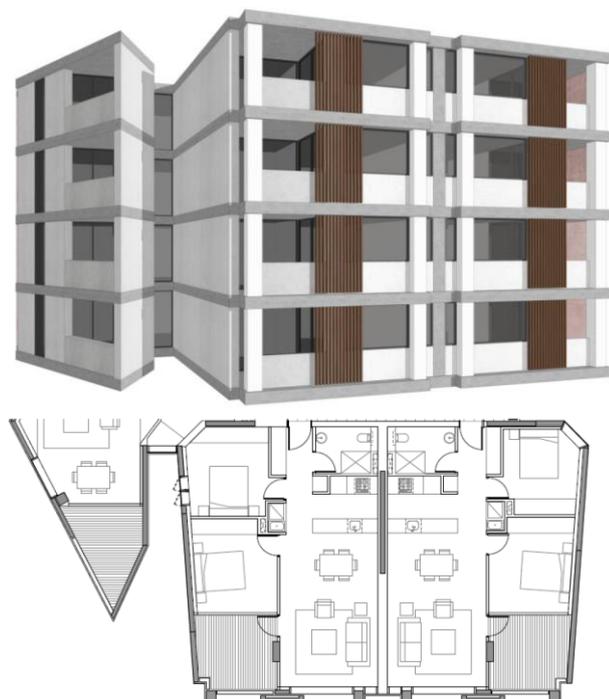


Figure 56 North eastern façade detail of Building C1 detailing irregular balconies

Source: Candalepas Associates

Vertical Circulation

ADG Criteria 4F-1 Common Circulation and Spaces requires that the maximum number of apartments off a single circulation core on a single level is twelve, and for buildings over 10 storeys in height the maximum number of apartments sharing a single lift is 40. Building C1 provides up to 12 apartments off a single circulation core, whilst Building A1 provides 12 apartments per floor off a single circulation corridor. Both A1 and C1 seek to service more than 40 apartments with a single lift.

In view of this, the building corridors have been designed to be open at one or both ends so that natural daylight penetrates into the corridors and these spaces can be naturally ventilated. The corridors for Building A1 will also benefit from views over the 'skygardens', contributing to the overall amenity of these spaces. An assessment of the ability of future lifts to service the proposed number of apartments has also been completed by WSP (**Appendix FF**), which confirms that these buildings will meet international benchmarks and are acceptable in the circumstances. They further state that *"the quantity of lifts prescribed by the ADG would be an over provision in this instance and therefore the ADG non-compliance is justified."*

5.8.2 Overshadowing

Shadow diagrams have been prepared by Bates Smart considering the cumulative impact of Buildings A1 and C1 during the winter solstice, as the worst case scenario when solar access is most limited. The shadows cast by the proposed buildings are consistent with those assessed under the Masterplan DA and can be summarised as follows:

- Shadows will be cast on the secondary open space area (front lawn) of four dwellings on the opposite side of Epping Road. This shadow is restricted to be between 9am and 10am, and as such does not adversely impact these dwellings access to sunlight or prevent these dwellings from achieving a minimum 3 hours of direct sunlight.
- Shadows will be cast on neighbouring development at 137-143 Herring Road, located directly west of Building A1. The shadows will be cast during the morning period and will partially overshadow the eastern façade of one of the neighbouring towers between 9am and 10am. The eastern corner of the site will be overshadowed at 11am, and all shadows will generally not impact the adjoining site by midday (12pm) of the winter solstice. It is noted that the eastern corner of the site adjoining Building A1 is primarily occupied by a vehicle access driveway and loading dock, and that the communal open space for the neighbouring development is located in the centre of the two approved buildings and remains generally unaffected by the proposed development.
- All remaining shadows are restricted to within the Estate, meaning no shadows will be cast on the adjoining residential flat buildings fronting Peach Tree Road or Lyonpark Road. The amenity of future buildings within the Estate surrounding A1 and C1 have been considered in the Masterplan modelling and will be addressed at each subsequent detailed design stage.

5.9 Wind

A Wind Impact Assessment has been prepared by Cermak Peterka Petersen Pty Ltd (CPP) to assess the wind environment created by the proposed development (refer to **Appendix U**) in the context of the Masterplan. The assessment confirms that the environmental wind conditions at ground level are expected to meet the comfort criteria for pedestrian standing and walking, pass the safety criterion, and be consistent with the DCP criteria for intended purpose.

The following are noted in relation to Building A1 and C1:

- The ground plane wind conditions for Building A1 remain suitable for pedestrian accessways, but not stationary activities. The building entries for A1 are located away from the corners of the building where there is the potential for building downwash.
- The outdoor play area for the child care centre within Building A1 will benefit from the level change between the play area and Herring Road, and as such from a wind perspective would be classified as being suitable for use as a recreation area.

- The private open space areas for Building A1 are expected to experience mostly calm conditions, with the exceptions of rooftop private open space that could benefit from additional screening such as glass screening along the perimeter of the rooftop. It would be expected that these balconies still fulfil the DCP criterion for private balconies.
- The ground plane wind conditions for Building C1 are expected to be suitable for standing activities with local hotspots with windier conditions particularly near the building corners, which would be expected to meet the criteria for pedestrian accessways.
- The private open space areas for Building C1 are expected to be usable by occupants as they feature solid or porous side walls, which reduce the impact of strong winds around the corners on buildings.

CPP recommend that mitigation measures be considered in most areas if outdoor seating is required, and that horizontal awnings be provided in some locations to help mitigate downwash and benefit pedestrian refuge and amenity.

5.10 Transport, Traffic, Parking and Access

5.10.1 Site Access

The road network considered under the Masterplan will be delivered in this application, to maximise the amount of public domain being delivered in the first stage of the development. ADW Johnson have completed an assessment of the detailed design of the road network (**Appendix L**) and confirm that:

- The proposed roads are consistent with the Austroads design guidelines and generally consistent with the DCP requirements, with some sections being wider than recommended under the DCP to accommodate improved landscaping and pedestrian / shared pathways. The proposed extension to Lyonpark Road remains consistent with the Austroads standards, but is narrower than DCP cross sections, being constrained by the existing commercial building on the LGS site. Notwithstanding this, the road is capable of accommodating two-way traffic, a segregated pedestrian pathway, and landscaping in the road reserve, and will deliver on a key objective of the DCP by connecting Herring Road and Lyonpark Road. ADW Johnson confirm that this road connection is “still considered to be safe and suitable for the proposed development”.
- The majority of the proposed roads have a longitudinal grade of less than 5%. The maximum grade is 12.5%, consistent with the maximum permitted in the DCP, which corresponds to the topographical high-point on Herring Road and extending into the site. The minimum road grade is 0.75%, corresponding to the approach to the proposed bridge over Shrimpton’s Creek, in order to locate the low point within Road 1 as close as possible to the creek without adversely affecting the bridge design.
- All internal road intersections can accommodate the turning circle of a 12.5m truck, in accordance with the Austroads design guidelines.
- The bridge connecting the Estate with Lyonpark Road has been designed in accordance with the relevant Austroads standards, and with AS5100 Bridge Design Code with reference to relevant Roads and Maritime technical directions where applicable.

Temporary Access Solutions

Ason Group have also considered the temporary arrangement proposed for the Stage 1 buildings, confirming that the temporary turning heads to be constructed at the end of the Stage 1A and Stage 1B roads are capable of accommodating a U-turn manoeuvre, enabling vehicles to enter and exit the site in a forward direction.

5.10.2 Parking

Vehicle Parking Demand

The parking demand for Building A1 and C1 has been developed with consideration of the maximum parking rates applying to the site under Council’s DCP and the minimum parking requirements applying to the proposed social and seniors housing under the SEPPs. As outlined in **Table 15** below, the maximum and minimum parking rates are achieved for both buildings and is supportable on this basis.

Table 15 Breakdown of required and proposed parking

Component	Rate	Applicable No. Spaces	Spaces Provided	Compliance
Social housing (including ILUs)	<u>Min.</u> 0.5 space x unit	129.5	134 *	✓
Retail tenancies	<u>Max.</u> 1 space x 100m ²	3	3	✓
Child care centre	<ul style="list-style-type: none"> 1 space x 8 children 1 space x 2 employees 	13	15 (12 in the basement and 3 on the street)	✓
Residences (inclusive of market and social housing)	<u>Max.:</u> <ul style="list-style-type: none"> 0.6 x studio 0.6 x 1 bedroom 0.9 x 2 bedroom 1.4 x 3 bedroom 1 x 20 units for visitors 	220 for A1 342 for C1	220 for A1 * 343 for C1 **	✓ ✓
Accessible	5% of market dwellings	13.45 for A1 12.95 for C1	14 for A1 28 for C1	✓ ✓

* including visitor spaces

** excluding retail/community use spaces

Bicycle Parking Demand

The proposed development will deliver a high proportion of bicycle parking, aligning with the sustainability initiatives and aspirations for the site. Accordingly, each of the proposed dwellings are provided with either a dedicated bicycle parking space or a basement storage space that is sufficient to accommodate a bicycle. The proposed development is therefore capable of meeting the demand for bicycle parking and will encourage residents to use more sustainable forms of transport.

Access

Ason Group certify that the proposed basement parking area for Building A1 and C1 has been designed to achieve the relevant Australian Standards and User Classes. The parking areas for different residential tenancies and non-residential uses are also appropriately segregated by control points.

A swept path analysis has been completed and accompanies the Traffic Impact Assessment at **Appendix Q**, confirming that vehicles are capable of circulating the proposed basement parking areas and access ramps.

5.10.3 Servicing

Servicing for Building A1 and C1 is proposed within the basement car parks, which has been designed to accommodate vehicles up to and including a 12.5m long truck, which exceeds the dimensions of Council's existing garbage collection fleet.

5.10.4 Traffic Generation

Ason Group have provided an assessment of the traffic generation associated with the operation of Building A1 and C1 considered under this application. Building A1 is expected to generate a total of 52 vehicles per hour in the AM peak and a total of 46 vehicles per hour in the PM peak, whilst Building C1 is predicted to generate a total of 43 vehicles per hour both in the AM peak and PM peak. Being the first stage of the Masterplan, the resultant traffic fits comfortably within the assumed peak traffic thresholds that will be generated through the redevelopment of the Estate and can therefore be accommodated within the proposed network.

It is noted that whilst upgrades to the intersection of Epping Road, Herring Road and Lyonpark Road are considered under this application in terms of the required lead-in works and a series of indicative designs that have been prepared by ADW Johnson, these intersection upgrades will be subject to further design and works in consultation with RMS or the relevant road authority. In view of this, Ason Group have considered the traffic generation of Buildings A1 and C1 being delivered under Stage 1 and confirm that the future upgrade of the existing Herring Road / Ivanhoe Place intersection is not required at this stage to accommodate these Stage 1 buildings. SIDRA modelling confirms that the Stage 1 buildings will have a minimal impact on the operation of the local area network

with the key intersection of Herring Road and Ivanhoe Place continuing to operate with a similar level of service that is currently experienced.

5.10.5 Construction Traffic

Ason Group have developed a Preliminary Construction Traffic Management Plan, that accompanies the Traffic Impact Assessment at **Appendix Q**. This Plan provides an overview of construction traffic and outlines the principles that would be implemented during the construction period, to be confirmed by a detailed Management Plan at the Construction Certificate stage.

It is expected that the Stage 1 works will generate a maximum of 108 heavy vehicle movements per day, reducing to 72 heavy vehicles per day. This equates to a peak of approximately 14 vehicle movements per hour on average; 7 entering and 7 exiting. These vehicle movements are expected to occur outside of peak periods.

It is anticipated that a maximum of 400 contractors will be on-site at any one time during the main construction stage, and a maximum of 240 contractors would arrive and depart on-site via private vehicles during the morning and afternoon periods. Assuming carpooling is implemented, it is assumed that 64 vehicles will arrive/depart from the site during the network peak periods.

Ason confirms that the peak traffic flows associated with construction vehicles and workers is sufficiently below the estimated peak traffic generated by the proposed development, once operational, and that *“the proposed Stage 1 construction activities will not result in an adverse impact on the operational capacity of the surrounding network”*. Heavy vehicle movements and any traffic generated by the proposed development will be appropriately managed through the detailed Construction Traffic Management Plan to be provided at the construction phase of the development.

5.10.6 Sustainable Travel

Ason Group have developed a Sustainable Travel Strategy for the Estate to encourage the use of public transport, walking and cycling, which includes a number of measures that will be implemented as part of Stage 1. These measures will ensure the delivery of the Masterplan achieves the relevant targeted mode shares for people journeying to and from the site.

The measures to be implemented as part of Stage 1 comprise:

- household information packs distributed to each new resident to set out the sustainable travel options in the area;
- a preloaded opal card will be provided to new residents to encourage the uptake of public transport;
- the proponent will explore establishing a bus service between the Estate and Macquarie University Station;
- end of trip facilities will be provided in the basement of Building A1 and C1 and to maximise bicycle usage;
- bicycle initiatives such as ‘cycle to work day’ will be promoted; and
- workplace travel plans will be encouraged to be provided for new businesses.

5.11 Social Housing

This application represents the first stage and opportunity to provide a seamlessly integrated community of private and social housing dwellings, consistent with the vision for the site as a new mixed income neighbourhood. An assessment of the potential social impacts of these dwellings formed part of the Masterplan application and included a detailed Social Impact Assessment.

The following has been noted in relation to the proposed development with respect to the above.

Intended operation of community housing provider(s)

The social dwellings within stage 1 at Ivanhoe will be managed by a Community Housing Provider (CHP). The Ivanhoe Estate Redevelopment will involve Mission Australia Housing (MAH) as an experienced community housing provider and broker for a wide range of community support services.

From practical completion of Stage 1 MAH will have a permanent presence through an office located within the Ivanhoe estate. This presence will allow the consistent delivery of the range of services but also provide the Social Housing tenants a place for face to face contact with MAH.

The Ivanhoe Social Housing Outcomes Plan (SHOP) is being developed to provide an improved social housing experience for all tenants. The SHOP will form the long term practical strategy and will include a package of initiatives that incorporates tenant management, tailored tenant support services and a community development and partnership (Strengthening Communities) approach to place making. The SHOP aims to create:

- More opportunities, support and incentives to create housing independence
- A better housing experience for social housing tenants where they feel safe and empowered to participate in their community
- Links to early learning, education, training and employment.

The SHOP will include a range of services to support social housing tenants. These services are in a number of forms:

- Tenancy management, property management and tenant engagement
- Programs and services to increase economic and social participation
- Tailored Support Coordination – involves collaborative work with social housing tenants and the development of individualised Personal Support Plans to identify goals, provide information and refer to the appropriate services and supports. Individualised Support Plans could include a TAFE course, financial management skills, job search assistance, and/or participation in social activities
- The Strengthening Communities Program will have a:
 - Community development focus including convening of community groups, leveraging resources for local activities, skill and leadership development
 - Partnership focus including mapping of community assets, identifying and engagement with delivery partners, engaging with local business, clubs, and associations

Further work will be done to establish referral pathways, identify volunteering opportunities, and address barriers to service delivery and access.

Future Directions and Communities Plus recognise the importance of providing appropriate, sustainable and meaningful education, training and employment opportunities and skills development to social housing tenants. Ivanhoe is a strategic site located close to major new economy and tertiary education opportunities throughout Macquarie Park. Training and employment links with local employers and educational institutions will be a key focus of the future Ivanhoe and imperative to the success of the Ivanhoe redevelopment.

Consultation and leading practice research have emphasised the importance of continuity with existing, established service providers and the establishment of new strategic partnerships. In light of this, MAH will work with local services to involve them in the package of services and programs that will be available to Ivanhoe residents. The SHOP will be key to guiding the provision of services and support to residents of the redeveloped Ivanhoe. Strengthening Communities facilitators will build partnerships within and beyond the Ivanhoe community including the establishment of referral pathways for social housing tenants.

Mix of housing

A key aim of the Ivanhoe Estate Renewal is to create a new mixed community on the site. The concept development application includes a range of housing tenures including home ownership, private market rental, affordable rental housing and social housing.

The concept development application for Ivanhoe enables the provision of an increase in social housing dwellings on the site from a pre-development state of 259 dwellings to approximately 1,000 social housing dwellings as part of the new development. In addition to this around 128 affordable and over 2,000 market dwellings will be provided. The Ivanhoe Estate Redevelopment is in line with best practice mixed tenure estate renewal. It addresses key issues in relation to:

- Increase in housing supply to around 3,400 dwellings
- Mixed tenure redevelopment (with approximately 30% social housing provided as part of the proposal)
- An integrated approach to the inclusion of social housing dwellings
- Provision of new, fit for purpose, accessible dwellings
- A comprehensive (and funded) approach to community support services delivered by an experienced Community Housing Provider partner
- The provision of a range of community facilities
- High quality and accessible open space
- A comprehensive community development program focused on community building that is available to all residents.
- Improved traffic linkages
- The provision of a new independent School
- The provision of an Aged Care Facility.

Stage 1 of the Ivanhoe development integrates 259 Social dwellings and 481 market dwellings

5.12 Ecologically Sustainable Development

The Ivanhoe Sustainability Report included at **Appendix O**, has been prepared by Frasers to explore a range of sustainability strategies, and outline examples of best practice sustainable building principles that will be delivered as part of Stage 1 to achieve the commitments under the Masterplan. A key outcome of the redevelopment of the site will be to deliver a more sustainable community than is presently provided, in line with Fraser's standing as the foremost provider of Green Star communities in Australia.

As part of the Report, WSP as an independent certifier have also assessed Buildings A1 and C1 and have provided indicative Green Star Communities Scorecards. These scorecards certify that the initiatives identified in this application are able to meet the benchmark requirements nominated in the Masterplan. Whilst the scorecard is likely to change, based on design, predicted performance and whole-of-life cost, the certified ratings demonstrate that the proposal is capable of achieving the nominated targets.

5.13 Safety

A key objective of the project is to create a 'welcoming and safe place' that hosts a mixed community of social and market housing, and community and education infrastructure. This is considered in the Crime Prevention Through Environmental Design (CPTED) report prepared by Ethos Urban (**Appendix V**) in consultation with NSW Police, that provides commentary on the detailed design of Buildings A1 and C1 and the road network and public domain areas being delivered in Stage 1, to make recommendations about appropriate strategies to reduce the opportunity for crime to occur.

The assessment confirms that the design of the Stage 1 buildings and public domain areas is generally consistent with the principles of CPTED and worthy of support provided recommendations are implemented. Key recommendations from the CPTED assessment include:

- certifying general building maintenance and cleanliness is maintained throughout the estate to ensure there is no visual indication that a unit or building is social, affordable or market housing;
- ensuring adequate and discrete CCTV coverage monitors entry/exits are installed for semi-private and private spaces, such as the child care centre and residential lobbies;
- installing access control measures, such as electronic pass systems or physical barriers and intercom systems, whilst ensuring that such measures do not appear to fortify the environment;
- providing lighting through the site, with specifications regarding strength and positioning contained in the CPTED report;
- ensuring wayfinding signage is installed;

- securing all apartment mailboxes, excluding ground floor dwellings with individual street access;
- preventing large shop-front window displays within the retail tenancies of Building C1, which have the potential to limit views and the surveillance of surrounding areas;
- securing access to back-of-house areas to minimise concealment opportunities;
- storing unfixed outdoor seating or other equipment when not in use, to minimise the potential for theft, misuse, or concealment; and
- installing convex mirrors where the visibility of a direct path is unclear in areas with reduced natural surveillance, such as residential storage cage areas.

It is also important to note that in large developments that have a social housing component, “social interventions” (i.e.: community policing, preventative initiatives, social engagement programs etc) are as important or sometimes more important than physical design interventions in minimising crime. A combination of both is considered to be the best strategy. Such social strategies have been considered in the Social Impact Assessment report developed for the Masterplan and discussed broadly in **Section 5.11**, which has been prepared in consultation with Frasers Property, NSW Land & Housing Corporation, Mission Australia and other partners and agencies.

5.14 Flora and Fauna Assessment

A Biodiversity Assessment Report and Offset Strategy was developed by Eco Logical Australia and accompanied the Masterplan application, and a supporting letter summarising the findings of this assessment is provided at **Appendix M**. This assessment addressed the impact of the proposed development on threatened ecological communities located within the site, the impact of tree removal, and developed a Biodiversity Offset Strategy in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the *Environment Protection and Biodiversity Conservation Act* Environmental Offsets Policy. The outcomes of the report are that the proposed Stage 1 site preparation works will not require the retirement of any credits.

In accordance with the Masterplan, the proposal has been designed to avoid impacts to the remaining threatened ecological community, retain significant vegetation where possible, and mitigate any loss in biodiversity through offsets and on-site landscaping.

5.15 Potable Water, Drainage, and Stormwater

As discussed in **Section 3.7** above, the proposal incorporates a range of stormwater detention and water quality treatment measures to meet the requirements of the Ryde DCP and the Masterplan framework.

Water Quantity

The proposed stormwater management system has been designed with due consideration to Council’s requirements for stormwater conveyance, detention and Water Sensitive Urban Design (WSUD), and has been subject to the relevant testing. The required sizes of the detention tanks for Building A1 and C1 were determined via a XP-RAFTS model, and the resultant flow rates were assessed via a DRAINS model. This assessment confirms the proposed use of rainwater tanks and dedicated detention tanks will ensure the post developed 1 in 100 year ARI peak discharges can be adequately attenuated back to the post developed 1 in 5 year ARI peak discharges via a low flow outlet and high flow weir.

Water Quality

It is proposed to use a combination of at source and conveyance controls to treat the runoff prior to it entering the public drainage system. The nominated systems have been considered via MUSIC modelling to demonstrate compliance with Council’s DCP treatment targets, as replicated in **Table 16** below. This demonstrates that the proposed water quality measures will meet and exceed Council’s targets for Building A1 and C1.

Table 16 Compliance with water quality requirements

Building	Pollutant	Target	Result	Compliance?
A1	Gross Pollutant	90%	100%	✓
	Total Suspended Solids	85%	86.8%	✓

Building	Pollutant	Target	Result	Compliance?
C1	Total Phosphorus	60%	67.1%	✓
	Total Nitrogen	45%	59.6%	✓
	Gross Pollutant	90%	100%	✓
	Total Suspended Solids	85%	86.6%	✓
	Total Phosphorus	60%	65.2%	✓
	Total Nitrogen	45%	56.7%	✓

Source: ADW Johnson + Ryde DCP 2014

Water Conservation

Stormwater will be captured on-site as part of the Stage 1 buildings and reused in for maintenance activities such as car washing and site irrigation, as one method of reducing the developments demand on potable water. Modelling has been completed by ADW Johnson to determine the average volume of water expected, and thereby the likely reduction in the demand for potable water. It is expected that the 20-30kL rainwater tanks will reduce the demand for potable water by 16.6-21.6%.

Potable water for use within the site will be provided via the Sydney Water's existing carrier water mains, with this being supplemented by captured stormwater for reuse within buildings. No other permanent water sources are proposed to be utilised by the development and accordingly an ongoing water license for the site is not required.

5.16 Flooding

As discussed in **Section 2.2.4**, the Estate is bound by Shrimptons Creek to the south and is located in the catchment area of this creek. Accordingly, as part of the overarching Masterplan, BMT WBM prepared a flood impact assessment (**Appendix I**) that considered the development of buildings, public open space, roads, and community uses on the existing catchment conditions to determine whether there would be a change in flood regime. The modelling completed as part of that assessment confirmed that the flood conditions were representative of shallow inundation and low velocities.

BMT WBM confirmed that;

“impacts on; emergency planning and evacuation, social and economic cost to the community and erosion, siltation, riparian vegetation and bank stability have not been altered due to the proposed Ivanhoe Estate Master Plan development.”

They further confirm that “the Stage 1 development does not pose any flood impacts (overland or otherwise) as it is wholly contained in ‘local drainage’ areas, with the exception of the Shrimptons Creek Bridge”.

BMT WBM have completed further modelling of the detailed Shrimptons Creek Bridge design considered under this application, and have updated the scenario model for the Masterplan to include the Shrimptons Creek Bridge. They conclude that the velocity increases as a result of the bridge are relatively minor and therefore the overall risk of erosion and damage to Shrimptons Creek during flood events is similar in both the existing and modelled conditions. It confirms that properties both upstream and downstream of the proposed bridge will not be impacted by the expected change in peak flood levels or velocity.

5.17 Subdivision

The proposed amalgamation and subdivision of the site will align the Estate with the vision established under the Masterplan and will be delivered in stages, to enable the logical delivery of works on site and the staged dedication of road lots to Council. The easements included in the subdivision plans demonstrate how the proposed lots can be adequately serviced and accessed and how the lots will not preclude future development on the neighbouring site to the north west of Building A1.

The proposed Stratum Subdivision also aligns with the design and intended operation of Buildings A1 and C1 and will enable the staging, funding and delivery of these buildings to proceed efficiently. It will permit the future occupation and use of the envisaged mixed-use and mixed-tenancy development.

5.18 Heritage and Archaeology

An Aboriginal and Historical Heritage Assessment was prepared by Eco Logical Australia and accompanied the Masterplan, and a supporting letter summarising the findings of this assessment is provided at **Appendix J**. It confirms that the site is not a heritage item and is not in the vicinity of any heritage items, and as such no heritage interpretation plan is warranted. Further, an assessment was conducted of the Aboriginal Heritage Information Management System that confirmed that no sites are registered on the site or in the vicinity of the site, and as such no identified aboriginal heritage will be impacted by the proposed works. A site visit was also conducted in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW*, which did not identify any archaeological artefacts, potential deposits or sites.

Accordingly, no further assessment is warranted and no separate approval is required under the *Heritage Act 1977* or *National Parks and Wildlife Act 1974*.

5.19 Contamination

The site has been subject to numerous investigations completed by JBS&G and DLA Environmental Services including a Detailed Site Investigation in 2016, which undertook soil sampling at 26 locations across the Ivanhoe Estate site and six locations at 2-4 Lyonpark Road. A Supplementary Site Investigation has also been completed, which undertook targeted soil sampling from nine boreholes.

These investigations found that there is limited evidence of historical contaminating activities on the site, and that contaminants of potential concern were reported at levels less than the relevant assessment criteria, with the exception of benzo(a)pyrene. Soil samples from one borehole in the centre of the Estate (see **Figure 17**) contained levels of total recoverable hydrocarbons above the Health Screening Level and the Ecological Screening Level, likely to be the result of localised spillage or the leakage of petrol. No source of petroleum hydrocarbon contamination was observed during fieldwork, and in all other areas of the site it was confirmed that the soil did not present an unacceptable risk to human health or the environment, and did not preclude the redevelopment of the site.

In view of the outcome of these site investigations, it is proposed to remediate the soil within the vicinity of borehole 8 where an exceedance of benzo(a)pyrene has been recorded. DLA Environmental Services has prepared a Remediation Action Plan (RAP) at **Appendix W** that proposes four options for the remediation of the site including the on-site treatment of soil, the off-site treatment of soil, the disposal of material off site, and the consolidation and isolation of soil on-site. The most suitable and preferred option is the removal of contaminated material to an appropriate facility off-site and the reinstatement of clean material, if needed. This method can be coordinated with bulk earthworks being completed across the site to facilitate site services, the construction of roads, and proposed/future buildings. Further validation sampling of the remediation area will be required following the excavation and removal of impacted soils.

DLA Environmental have also detailed a number of recommendations concerning the management of remediation works on the site, the importing of fill material to the site, mitigating groundwater contamination, and the event of an unexpected find on the site, which will be implemented when completing the proposed works on site. This has informed the mitigation measures at **Section 7.0** of this report.



Figure 57 Area identified for remediation (shown hatched around spot BH8)

Source: DLA Environmental Services

5.20 Design Excellence

This EIS is accompanied by a Design Excellence Strategy (**Appendix X**) that outlines the principles and procedures that have been and will continue to be followed during Stage 1 of the Masterplan delivery program. The Strategy demonstrates how the architecture and urban design of Stage 1 has achieved a high level of design quality and has been the subject of an independent design review process. Advice and feedback issued as part of the design review process has been addressed in the design development of the proposed buildings and public domain, as discussed in **Section 5.20.2** below.

5.20.1 Design Excellence Process

The Strategy outlines four key elements to ensure the detailed design of Buildings A1 and C1 exhibits design excellence and will retain architectural integrity through to the construction stage, as follows:

1. the engagement of an expert and varied design team;
2. the selection of an independent, expert Design Review Panel (DRP);
3. the adoption of Design Guidelines that will guide the design development and assist the DRP in its deliberations; and
4. the implementation of reporting and review processes to safeguard design excellence and design integrity.

Design Team

The detailed design of Stage 1 of the Masterplan has been undertaken by three different design teams, to encourage design diversity and create visual interest. Bates Smart have been engaged as the designers of Building A1, Candalepas Associates have been engaged as the designers of Building C1, and Hassell have been engaged to develop the public domain and urban design components including the interface between the buildings and the ground plane. The engagement of various firms encourages design diversity and innovation, as well as bringing together a wealth of skills and experience in both local and international contexts.

Design Review Panel

A project-specific independent Design Review Panel (DRP) has been compiled specifically to oversee the Stage 1 application, and was tasked with providing independent, impartial advice on the design of buildings, infrastructure, landscapes and public spaces associated with Stage 1. The Panel has been developed in accordance with the specific Terms of Reference (appended to the Strategy at **Appendix X**).

This Panel has been developed with reference to the NSW Government Architect's (OGA) integrated design policy *Better Placed*, that recognises that large-scale urban renewal projects are complex and often involve multiple projects being undertaken across stages. It recommends that developments of this size are evaluated by panels comprising leading cross-disciplinary experts that offer independent and impartial advice on design to achieve the best built outcome for stakeholders.

Design Guidelines

The *Ivanhoe Estate Design Guidelines* accompanied the Masterplan application and establishes the overarching framework for development on the site including site specific design principles and objectives. These Guidelines ensure a high-quality design and amenity outcome is achieved, and have been considered during the design development of Building A1, C1 and the public domain as addressed throughout **Section 5** of this report.

5.20.2 Design Excellence Response

In accordance with the Strategy, the Consortium's expert design team have presented to the DRP prior to the lodgement of this application on 27 February 2018. An informal information session was also held on 27 March 2018 at the request of the DRP, and a review of the revised Masterplan and a revision on Stage 1 occurred between 1-9 August 2018. Detailed minutes, including recommendations and action lists were subsequently issued, and accompany this application alongside the Strategy at **Appendix X**.

The relevant design teams involved have prepared design statements confirming how the design of the buildings and public domain addresses the Design Guidelines and has incorporated and/or addressed the feedback of the DRP. Refer to the architectural Design Statements prepared by Bates Smart and Candalepas Associates at **Appendix B** and the Landscape Report prepared by Hassell at **Appendix C**.

5.21 Child Care Centre

As discussed in **Section 3.4.1**, the proposed development will deliver a new child care centre at the ground floor of Building A1, in-line with the commitment to providing essential non-residential uses under the Masterplan. Whilst this centre will be the subject of a future application seeking consent for the detailed design and operation of the centre, the shell of the centre has been designed in consideration of the Education and Child Care SEPP.

This SEPP was gazetted on the 1st September 2017 and aims to ensure a child care centre can meet the physical requirements for the subsequent service approval application. The SEPP absorbs key requirements from the National Quality Framework for Early Childhood Education and Care Facilities into the NSW planning system and supersedes local planning controls that are inconsistent with the National regulations.

Part 2 contains seven Design Quality Principles that establish the broad design context guide of all new proposals. Part 3 covers Matters for Consideration that support the Design Quality Principles and must be considered by the consent authority when assessing a DA. Essentially if a proposal is consistent with the Matters for Consideration, the proposal will satisfy the Design Quality Principles. Part 4 contains the guidance on how to apply the National regulations to development proposals.

Accordingly, **Appendix Y** provides a preliminary assessment against Part 2, Part 3 and Part 4 of the Child Care Guideline and includes the National Quality Framework Assessment Checklist to demonstrate that the development remains capable of complying with the requirements of Part 4.3 'Physical Environment of the Education and Care Services National Regulations'. A detailed application will be prepared demonstrating compliance with these provisions, once an operator is engaged.

5.22 Noise and Vibration

An Acoustic Assessment Report has been prepared by Acoustic Logic and is included at **Appendix Z**. This report assesses the likely noise and vibration impacts associated with the construction and operation of the proposed development, as well as the potential impacts of noise intrusion from the surrounding road network. The report has been prepared having regard to the Masterplan, and the Ryde DCP 2014, SEPP Infrastructure, the 'Development Near Rail Corridors and Busy Roads Interim Guideline' and the relevant Australian Standards.

5.22.1 Noise Intrusion

The major noise sources surrounding the Stage 1 site comprise traffic noise from Herring Road and Epping Road. These noise sources have the potential to impact the internal amenity of residences, and the indoor and outdoor areas of the child care centre proposed within Building A1. Acoustic Logic have taken into account noise monitoring and the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and room sound absorption characteristics, and have provided recommendations on acoustic treatments including the detailed treatment of windows, external rooves and ceilings, external walls and entry doors.

5.22.2 Noise Emission

Operational Noise

The Estate is bordered by residences to the east fronting Peach Tree Road, new residences being constructed on the northern side of Herring Road, a student accommodation development to the west of Building A1, and existing residences on the western side of Epping Road. Accordingly, consideration has been afforded to the potential noise sources emanating from the operation of the proposed buildings. These potential sources include mechanical plant, the operation of the loading dock, and the child care centre located at the ground floor of Building A1.

Regarding these emission sources, Acoustic Logic have confirmed the following:

- Acoustic treatments will be explored at the Construction Certificate stage to mitigate noise emissions from mechanical plant, which would involve consideration of plant selection, standard acoustic treatments such as duct lining, acoustic silencers, and enclosures. Acoustic Logical have further nominated a plant noise emission criteria, which will be addressed at the relevant stage of the development.
- The proposed location of loading docks and vehicle parking underground, in an enclosed basement, will not adversely impact on sensitive receivers surrounding the Estate. It is further recommended that the use of the loading docks be restricted to the hours of 7am to 10pm on Monday to Saturday, and 8am to 10pm on Sundays and public holidays.
- Outdoor play areas for the proposed child care centre will meet the noise emission requirements, assuming they are restricted to a maximum of 40 children outside at any one time over 2-hour time periods, openings from the child care centre are minimised, and a canvas shade cover in installed in the outdoor play area or an equivalent acoustic treatment.

Construction Noise and Vibration

The detailed demolition, excavation and construction methodology is not available at this stage and will be confirmed upon the engagement of a contractor, with further acoustic analysis to be carried out at the Construction Certificate stage. Notwithstanding this, Acoustic Logic have identified the likely sources of construction noise and vibration and nominated strategies to be adopted during the construction phase of the development and the criterion in **Table 17**.

Accordingly, it is recommended that:

- A system for monitoring be developed at the Construction Certificate stage once the detailed piling/excavation is determined, and that this monitoring be used to safeguard adjacent buildings and ensure the project does not result in any adverse vibration impacts.
- Further acoustic analysis be completed at the Construction Certificate stage based on the adopted criterion and the strategies outlined in the Acoustic Assessment, once the detailed construction methodology is confirmed.

Table 17 Nominated noise and vibration management levels

Receiver	Period	Time of Day	Noise / Vibration Criteria		
			Background Noise Level	Construction Management Level	Highly Noise Affected Level
Residential	Monday to Friday	7am-6pm	42 dB(A) L_{90}	52 dB(A) $L_{eq(15min)}$	75 dB(A) $L_{eq(15min)}$
			Recommended Vibration Limits		
Residential	-	Any	$\leq 5\text{mm/s PPV}$		

Source: Acoustic Logic

5.23 Air Quality and Odour

WSP have completed an Air Quality Assessment (**Appendix AA**) to determine the relative impact of construction activities on surrounding sensitive receptors and to determine if sensitive receptors within the proposed development will be affected by air quality impacts from the surrounding environment or from operational activities associated with the development. The nearest existing sensitive receptors, being those surrounding buildings that have the potential to be impacted by the construction and operation of the proposed development, have been identified by WSP and include Building A1 and C1 that have the potential to be impacted during the staged delivery of site preparation and civil works. Those surrounding the site comprise buildings fronting Herring Road and Peach Tree Road up to c.35m from the site.

5.23.1 Construction Phase

The main air pollutants that can arise from construction works comprise the following:

- dust;
- particulate matter (total suspended particulates (TSP), PM₁₀ and PM_{2.5}) from dust-generating construction activities and vehicle exhausts; and
- Nitrogen dioxide (NO₂), sulfur dioxide, (SO₂), and carbon monoxide (CO) due to exhaust emissions from diesel powered vehicles and equipment used on-site (non-road mobile machinery) and vehicles accessing the site.

During the proposed works on site, there is the potential for dust and particulate matter to have an impact on sensitive receptors to the east and north of the site (SR1, SR2, and SR3). The risk of potential impacts is mitigated by the well-established nature of the site and given the proposed works will be staged and will move across the site to mitigate the extent of impacts on neighbours. WSP confirm that the likelihood of air quality impacts during the proposed construction works is low and that the potential for development to exacerbate existing air pollutant concentrations to levels above the EPA's Air Quality Index Assessment criteria is also low given the existing ambient air quality at the site is of good quality.

The following is recommended in relation to the proposed development:

- vehicles and plant/equipment should be fitted with appropriate emission control equipment and be serviced and maintained in accordance with the manufacturers' specifications;
- loads comprising loose material entering or leaving a site should be covered;
- dusty activities should be dampened, particularly during dry weather;
- drop heights for materials should be minimised to control the fall of materials;
- cutting of materials such as concrete slabs or bricks should be undertaken with extraction or suppression where possible. Pouring water over material as it is being cut can greatly reduce the amount of dust generated;
- skips should be securely covered; and
- materials should be removed from site as soon as practicable.

Construction air quality mitigation measures will be developed with the managing contractor leading up to and during the construction phase.

5.23.2 Operational Phase

The main air pollutants arising from the operation of the proposed development comprise the following:

- NO₂, SO₂, CO, PM₁₀ and PM_{2.5} due to exhaust emissions from vehicles on internal and adjacent roads, and within the basement car parks being discharged; and
- odour emissions from commercial kitchens.

Child Care Centre

The proposed child care centre within Building A1 is the most sensitive receptor from the operation of the development and must achieve the relevant childcare guidelines addressed at **Appendix Y** of this EIS. WSP note that the risk of air quality impacts on the proposed child care centre is considered to be low. The vegetation surrounding the outdoor play area will assist in filtering air pollution from Herring Road and Epping Road, and the centre will be sufficiently separated and screened from Epping Road by buildings, which means that particulate concentrations will be reduced by over 90% from kerbside levels due to dissipation into the atmosphere. The exhaust for the basement car park associated with Building A1 is located at an appropriate distance and height above the child care centres outdoor play area, and impacts are expected to be minimal given the relatively small size of the basement car park.

Residences

WSP have also completed an assessment of the potential impacts on the proposed residences being delivered as part of Stage 1. In terms of vehicle exhausts, Buildings A1 and C1 are sufficiently separated from Epping Road by a distance of up to 100m and are screened by both vegetation and buildings ensuring that there is a low risk of potential air quality impacts. The internal road network is expected to receive low volumes of traffic and therefore also isn't expected to impact the amenity of the proposed residences. The exhaust discharge points for Building C1 will be located as far as practicable from outdoor areas.

Restaurants and Cafes

It is possible that the proposed retail tenancies within Building C1 will be occupied by restaurants and cafes. Accordingly, WSP recommend that any commercial kitchen be fitted with appropriate commercial exhaust ventilation systems that filter and treat discharges in accordance with the relevant Australian Standards.

5.24 Waste Management

Elephants Foot have prepared a Waste Management Plan (**Appendix P**) detailing the impacts and management of waste generated by the proposed works and the operation of Buildings A1 and C1.

The Waste Management Plan confirms that waste associated with the proposed construction activities will be controlled by the engaged construction contractor, and will be confirmed at the Construction Certificate stage. It is recommended that waste management form part of the detailed Construction and Environmental Management Plan to be prepared for the site prior to the commencement of works, including provisions for the disposal of waste at an appropriately licenced facility, if required, with regard to the classification of the material under the EPA's Waste Classification Guidelines.

Waste generated by the operation of the mixed use buildings will be stored and collected on site, and will be the responsibility of residents and tenants to transport waste to the holding facilities, and the building managers and contractors to manage waste for pick-up and disposal. It is expected that leasing arrangements with retail/commercial operations contain direction on waste management services and expectations, and that residents will be educated on the correct separation of garbage and recycling items and the operation of garbage chutes and holding areas.

The temporary collection measures for Building C1 are considered to be appropriate, given it is temporary in nature and will be rectified when Building C2 is delivered in Stage 2.

5.25 Geotechnical

The existing ground water and soil conditions for the Ivanhoe Estate and 2-4 Lyonpark Road were assessed as part of the Masterplan Application, which confirmed the following of relevance to the Stage 1 application:

- The site is not affected by Acid Sulfate Soils and is at an elevation above those associated with Acid Sulfate Soils. The site is outside of areas mapped for salinity potential and any salinity presented within the Glenorie soil landscape are not likely to be present in significant volumes on the site; and
- The depth of groundwater below the site is likely to be at a depth of approximately 5 – 10 metres. The Geotechnical Assessment that accompanied the Masterplan Application details that any potential groundwater seepage can be readily managed using 'sump and pump methods'.

The recommended strategies for development under the Geotechnical Assessment prepared by Douglas Partners (**Appendix G**), will be implemented when completing the construction drawings and works on the site.

5.26 Utilities

A Utilities Services Report has been prepared by ADW Johnson (**Appendix K**) to determine whether the proposed development can be suitably accommodated on site and to confirm the lead-in infrastructure and upgrades that are required. As discussed in **Section 3.1** utilities and services will be replaced across the site to provide for future development and to correspond to the revised road layout. ADW Johnson contacted the relevant service providers when developing the preliminary scheme and have confirmed that the provision of utilities and services does not represent a constraint to the delivery of Stage 1.

5.27 Accessibility

Morris Goding Accessibility Consulting has completed a review of the proposed Buildings A1 and C1 against the relevant statutory guidelines governing ingress and egress, paths of travel, circulation areas, common areas, car-parking, and accommodation (**Appendix BB**). The proposed development remains generally capable of complying, with regard to a number of recommendations that will be developed in the ongoing design of development and confirmed prior to the issuance of a construction certificate.

5.28 Building Code of Australia

McKenzie Group have prepared an assessment of the proposed Buildings A1 and C1 against the provisions of the Building Code of Australia (**Appendix CC**). These assessments confirm that there are a number of elements that would need to be assessed against the relevant performance requirements of the BCA, which will be confirmed at the Construction Certificate stage as the project develops.

5.29 Fire Safety

Affinity Fire Engineering have prepared a preliminary Fire Safety Strategy for Building A1 and C1 (**Appendix DD**), outlining the fire engineering principals that will be utilised to ensure that the proposal can comply with the Deemed-to-Satisfy provisions of the BCA.

5.30 Staging

The proposed site preparation and civil works are required to be staged, as set out in **Section 3.0** of this report, to enable:

- the logical delivery of works in line with the various stages of the Masterplan;
- the dedication of land in accordance with a VPA that is to be entered into with Council (see **Section 5.31** below); and
- the acquisition and retirement of appropriate biodiversity offsets.

In view of the above, any consent issued for the proposed works will require staged Construction Certifications and Occupation Certificates where necessary, so that Stage 1 can be delivered in a logical manner and the proposed dwellings can be handed over to buyers and social housing providers as soon as practicable.

5.31 Contributions

In accordance with the Masterplan, Aspire Consortium intends on entering into a VPA with Council to establish a framework for development contributions and the delivery of both on and off site public benefits in the form of works in kind. Aspire Consortium and Council are currently working together to develop a heads of agreement for the future VPA. Based on the discussions to date, the baseline contributions will be calculated in accordance with the City of Ryde Section 94 Development Contributions Plan 2007 Interim Update (2014).

A range of works in kind will be undertaken on and off site to deliver public benefits in lieu of the baseline monetary contribution. The specific scope of works is yet to be determined with Council, however initial discussions indicate that the on-site works may include:

- rehabilitation, embellishment and dedication of the Shrimptons Creek open space corridor;

- construction and dedication of public roads;
- construction and rights of public access to the Village Green and Forest Playground;
- construction and rights of use of sports facilities in the school;
- construction and use of the enlarged community hub.

The off-site works may include:

- embellishing the Shrimptons Creek Epping Road underpass;
- provision of a bike connection between the Epping Road underpass and the Epping Road regional bike path
- road and intersection upgrades, including the acquisition of adjoining land and the creation of a new bridge for dedication.

It is noted that no Special Infrastructure Contribution in accordance with Section 7.24 of the EP&A Act is applicable to the site.

6.0 Environmental Risk Assessment

The Environmental Risk Assessment (ERA) establishes a residual risk by reviewing the significance of environmental impacts and the ability to manage those impacts. The ERA for the first stage of works under the Ivanhoe Estate Masterplan has been adapted from Australian Standard AS4369.1999 Risk Management and Environmental Risk Tools.

In accordance with the SEARs, the ERA addresses the following significant risk issues:

- the adequacy of baseline data;
- the potential cumulative impacts arising from other developments in the vicinity of the Site; and
- measures to avoid, minimise, offset the predicted impacts where necessary involving the preparation of detailed contingency plans for managing any significant risk to the environment.

Figure 58 indicates the significance of environmental impacts and assigns a value between 1 and 10 based on:

- the receiving environment;
- the level of understanding of the type and extent of impacts; and
- the likely community response to the environmental consequence of the project;

The manageability of environmental impact is assigned a value between 1 and 5 based on:

- the complexity of mitigation measures;
- the known level of performance of the safeguards proposed; and
- the opportunity for adaptive management.

The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented.

Significance of impact	Manageability of impact				
	5 Complex	4 Substantial	3 Elementary	2 Standard	1 Simple
1 – Low	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)	2 (Low)
2 – Minor	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)	3 (Low)
3 – Moderate	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)	4 (Low/Medium)
4 – High	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)	5 (Low/Medium)
5 – Extreme	10 (High)	9 (High)	8 (High/Medium)	7 (High/Medium)	6 (Medium)

Figure 58 Risk Assessment Matrix

Risk Item				Risk Assessment		
Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures and / or Comment	Significance of Impact	Manageability of Impact	Residual Impact
Built Form and Visual Impact	O	<ul style="list-style-type: none"> Visual impact of the development when viewed from the public domain 	<ul style="list-style-type: none"> The proposed buildings are consistent with the bulk and scale and detailed Design Guidelines established under the Masterplan, and are therefore consistent with the conclusions of the Masterplan. The delivery of public domain areas across the site as part of the Stage 1 works will also contribute to softening the built form and creating an attractive and amenable ground plane. Being the first stage of the development, the Stage 1 works will be visually prominent until future stages are constructed and vegetation matures. 	3	1	4
Amenity	O	<ul style="list-style-type: none"> Potential privacy impacts on adjoining properties. Potential overshadowing of adjoining properties. 	<ul style="list-style-type: none"> The location of building envelopes has been sited to minimise impacts on the amenity of neighbouring properties. Future detailed design of the buildings will be designed to minimise overshadowing and incorporate privacy treatments. 	2	1	3
Transport, Traffic, Parking and Access	C/O	<ul style="list-style-type: none"> Increased traffic on local road network during construction and operation. 	<ul style="list-style-type: none"> Initiatives to promote alternative forms of transport, including public transport, walking and cycling as well as a car share scheme will be implemented for the Stage 1 buildings. The Stage 1 works will deliver the internal road network and has made provisions for future intersection upgrades to address the increased capacity of the site under the Masterplan. Parking on the site is consistent with the rates nominated under the Masterplan. 	3	1	4
Social	O	<ul style="list-style-type: none"> Potential for social integration to be implemented poorly. Potential pressure on existing infrastructure and community facilities in the area. 	<ul style="list-style-type: none"> Community programs and activities will be implemented as recommended in the Social Impact Assessment prepared for the Masterplan by Elton Consulting, essential to the successful integration of the mixed tenure community in Building C1. Stage 1 will deliver resident and publicly accessible open space areas, and a child care centre that will contribute to supporting an increased residential population on the site. 	3	2	5
Safety	O	<ul style="list-style-type: none"> Potential for crime and unsafe behaviour. 	<ul style="list-style-type: none"> The recommendations of the CPTED assessment are implemented in the detailed design and construction of Building A1 and C1 and the nominated public domain areas, to safeguard against anti-social behaviour. 	3	2	5

Risk Item				Risk Assessment		
Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures and / or Comment	Significance of Impact	Manageability of Impact	Residual Impact
Child Care	O	<ul style="list-style-type: none"> Impact on the safety, health and overall care of young children. 	<ul style="list-style-type: none"> Ensure the future detailed design and operation of the child care centre within Building A1 is consistent with Part 2, Part 3 and Part 4 of the Child Care Guideline and the National Quality Framework Assessment Checklist. 	3	1	4
Flora and Fauna	C/O	<ul style="list-style-type: none"> Impact on protected vegetation. Potential impact on fauna habitat. 	<ul style="list-style-type: none"> Offset planting in accordance with the relevant State and Commonwealth offsets policy and the nominated staging of offsets. Retain and protect native vegetation not nominated for removal and wherever possible. 	3	1	4
Water, Drainage, Stormwater and Groundwater	C/O	<ul style="list-style-type: none"> Potential impacts of stormwater runoff and pollutants on the catchment. Potential impacts of water wastage from building operations. 	<ul style="list-style-type: none"> Implement erosion and sediment control measures, including a temporary detention basin, during construction. Ensure that the nominated stormwater treatment mechanisms, rainwater tanks, dedicated detention tanks and other infrastructure upgrades are implemented. Reduce potable water use with captured stormwater. 	1	2	3
Flooding	O	<ul style="list-style-type: none"> Potential flood impacts during 20 year ARI and 100 year ARI event 	<ul style="list-style-type: none"> Ensure that all floor levels and entrances to basement car parking are located above the PMF event flood levels. 	2	2	4
Heritage	C	<ul style="list-style-type: none"> Potential for Aboriginal archaeological objects to be found during construction. Potential for European heritage archaeological objects to be found during construction. 	<ul style="list-style-type: none"> If potential Aboriginal objects are located during future works, works must cease in the affected area and an archaeologist must assess the finds. If Aboriginal objects are located, OEH must be notified and an appropriate course of action in accordance with the National Parks and Wildlife Act 1974. If European archaeological objects are discovered, works should cease and an archaeologist must assess the finds. 	2	2	4
Contamination	C	<ul style="list-style-type: none"> Potential contamination of small area of the site likely due to a petrol spill. 	<ul style="list-style-type: none"> Remediate and validate the identified area of the site. 	1	2	3
Utilities	O	<ul style="list-style-type: none"> Additional demand on existing utilities 	<ul style="list-style-type: none"> Utilities are augmented to provide appropriate capacity for the development. 	3	1	4

Risk Item				Risk Assessment		
Item	Phase	Potential Environmental Impact	Proposed Mitigation Measures and / or Comment	Significance of Impact	Manageability of Impact	Residual Impact
Geotechnical	C / O	<ul style="list-style-type: none"> Noise and vibration as a result of excavation works. Potential seepage of groundwater. Potential foundation stability issues during construction. 	<ul style="list-style-type: none"> Implement appropriate engineering excavation and construction methods, as detailed in the Desktop Geotechnical Assessment prepared by Douglas Partners. 	3	2	5
Noise	C / O	<ul style="list-style-type: none"> Noise and vibration impacts on surrounding sensitive receivers during construction. Noise impacts on surrounding sensitive receivers from operation of plant, school and child care centre. Noise impacts on future residents as a result of traffic noise. 	<ul style="list-style-type: none"> Comply with nominated acoustic and vibration criteria during construction, subject to detailed construction methodology. Limit outdoor activity from the child care centre to two hours per day. Appropriately attenuate the child care centre. Incorporate acoustic treatments into residential buildings where required. 	2	2	4

7.0 Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in **Table 18** below. These measures have been derived from the previous assessment in **Section 5.0** and those detailed in appended consultants' reports.

Table 18 Mitigation Measures

Mitigation Measures
<p>Detailed Design</p> <ul style="list-style-type: none"> All proposed buildings and structures will be designed and constructed in accordance with the relevant requirements of the Building Code of Australia, and the recommendations of the BCA Reports for A1 and C1 prepared by McKenzie Group (October 2018), the Access Review prepared by Morris Goding Accessibility Consulting (November 2018), and the Fire Engineering Strategies for A1 and C1 prepared by Affinity Fire Engineering (October 2018).
<p>Construction Management</p> <ul style="list-style-type: none"> A detailed Construction Traffic Management Plan is to be submitted to the Principal Certifying Authority prior to the commencement of works. Construction traffic, including traffic control, entering and exiting the site, driver protocols and parking is to be managed in accordance with the preparation of a final Construction Traffic Management Plan and the recommendations of the Traffic Impact Assessment prepared by Ason Group (February 2019) where relevant. A Biodiversity Management Plan and Construction Environment Management Plan is to be submitted to the Principal Certifying Authority prior to the commencement of works on site, detailing (among other things): <ul style="list-style-type: none"> the delineation of clearing boundaries and minimising harm to fauna; mechanisms to minimise other environmental impacts such as sediment control, dust, noise, lighting and the protection of waterways (with reference to other mitigation measures below); pre-clearing surveys and clearance supervision; re-planting and vegetation management; and weeding and ongoing measures. <p>These plans are to have reference to the recommendations of the Biodiversity Assessment Report and Offset Strategy prepared by Eco Logical Australia (September 2018) where relevant.</p> Noise and vibration is to be managed in accordance with the recommendations of the Acoustic Assessment prepared by Acoustic Logic (November 2017) and the detailed Construction Environment Management Plan. A Construction Air Quality Management Plan should be prepared separately or form part of the Construction Environment Management Plan, with reference to the recommendations of the Air Quality Impact Assessment prepared by WSP (October 2018), and submitted to the Principal Certifying Authority prior to the commencement of works. The proponent is to provide a Waste Policy Design Compliance Certificate for the Construction Certificate application, which is to include details regarding disposal and recycling of different materials expected from construction, and the transport and destinations of these materials. Erosion and sediment control is to be managed in accordance with the Erosion and Sediment Control Plans prepared by ADW Johnson (August 2018), or as amended by a suitably qualified person.
<p>Wind</p> <ul style="list-style-type: none"> Complete further wind-tunnel testing for Building A1 and C1 and relevant public domain areas. Explore and implement amelioration measures for specific locations where local wind speeds are greater than desired, with consideration of the Qualitative Wind Assessment prepared by CPP (November 2018).
<p>Access and Parking</p> <ul style="list-style-type: none"> The detailed design of the road network should be generally consistent with the Civil Engineering Plans and Report prepared by ADW Johnson (October 2018) and the Shrimptons Creek Bridge Report prepared by McGregor Coxall (October 2018). Any intersection upgrade works will be designed and completed in consultation with the relevant road authority. Where practicable, implement the recommendations of the Green Travel Plan prepared by Ason Group (February 2019) and encourage the preparation of workplace travel plans for new businesses. Ensure the detailed design of Building C2 provides adequate loading and a waste collection area(s) that are integrated with and cater for Building C1. Truck movements within the proposed loading docks will be restricted to 7am to 10pm Monday to Saturday and 8am to 10pm Sunday and public holidays.

Mitigation Measures

Child Care Centre

- The detailed design and operation of the centre must demonstrate consistency with Part 2, Part 3 and Part 4 of the Child Care Guideline and the National Quality Framework Assessment Checklist.
- The future design and operation of the child care centre will have consideration to the recommendations of the Acoustic Assessment prepared by Acoustic Logic (November 2017).

Social Impacts

- Where practicable, implement the recommendations and mitigation measures to minimise social impacts and increase social cohesion outlined in the Social Impact Assessment prepared by Elton Consulting (November 2017).

Safety

- Where practicable, implement the recommendations of the Crime Prevention Through Environmental Design Report prepared by Ethos Urban (February 2019).

Waste

- Waste management is to be carried out in accordance with the details and recommendations of the Waste Management Plan prepared by Elephants Foot (October 2018).

Utilities and Services

- Utilities and services shall be extended and augmented in accordance with Authority requirements and specifications and with reference to the Utility Services Report prepared by ADW Johnson (October 2018) and are subject to appropriate negotiations being undertaken with other affected property owners.

Sustainability

- The development will incorporate ecological sustainable development principles and will be designed generally in accordance with the objectives, targets and strategies of the Ivanhoe Sustainability Report prepared by Frasers Property Australia (August 2018).

Flora and Fauna

- Acquire and retire biodiversity offsets in accordance with the Biodiversity Offset Strategy (September 2018) developed with regard to the NSW Biodiversity Offsets Policy for Major Projects and the *Environment Protection and Biodiversity Conservation Act* Environmental Offsets Policy, and the Stage 1 Biodiversity Assessment prepared by Eco Logical Australia (October 2018).
- Provide nest boxes to replace hollow bearing trees.

Water Sensitive Urban Design

- Provide a new piped stormwater system through the basement of Building A1 and connected to the public drainage network to cater for emergency overland flows and 1 in 100 year ARI storm events, enabling Lot 1 in DP 609711 to continue to drain through the site. Final details of the proposed system will be provided prior to the issuance of the relevant Construction Certificate.
- All water quality devices will be provided within the lots to treat runoff prior to it discharging to the public drainage network as recommended in the Stormwater and Drainage Assessment prepared by ADW Johnson (October 2018).
- Ensure the drainage pipework can provide for an end of line rain garden(s) to meet the requirements of the Green Star communities' guidelines, being delivered in a subsequent and future stage of the development.
- Provide rainwater tanks, OSD tanks, and surface drainage pits within the lot to capture and attenuate flows before discharging to the public system, in accordance with the recommendations of the Stormwater and Drainage Assessment prepared by ADW Johnson (October 2018).

Archaeology

- In the event that unexpected historical archaeological objects or deposits are uncovered, works should cease and a qualified Archaeologist contacted to assess the significance of the material and recommend whether further investigation is required.
- If the finds are found to be Aboriginal objects, the Office of Environment and Heritage must be notified under section 89A of the *National Parks and Wildlife Act 1974*.
- Appropriate management and avoidance or approval under a Section 90 Aboriginal Heritage Impact Permit should then be sought if Aboriginal objects are to be moved or harmed.

Remediation

- The Site Management Plan for remediation works should be reviewed and implemented by the Remediator/Construction Contractor in accordance with the Remediation Action Plan (RAP) prepared by DLA Environmental Services (March 2018).
- The contingency measures outlined in the RAP should be implemented in the event of unexpected finds or validation failure.
- A validation report will be prepared documenting the remediation works undertaken with reference to the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011). The validation report will include documentation of waste disposal, waste tracking, results of the validation testing and other information as applicable.

Mitigation Measures

Design Excellence

- In accordance with the Design Excellence Strategy prepared by Ethos Urban (February 2018), the Design Team will be expected to:
 - retain lead roles over the relevant design decisions in the preparation of the design drawings for a construction certificate for the preferred design;
 - retain lead roles over design decisions in the preparation of the design drawings for the contract documentation; and
 - maintain continuity during the construction phases to the completion of the project.

Air Quality

- If required, incorporate measures such as appropriate ventilation systems, vegetative and physical screens in accordance with the recommendations of the Air Quality Assessment prepared by WSP (October 2018).

Noise and Vibration

- Attenuate windows, doors, external roofs, ceilings, and walls in accordance with the recommendations of the Acoustic Assessment prepared by Acoustic Logic (November 2017).
- Plant will be designed in accordance with the recommendations of the Acoustic Assessment prepared by Acoustic Logic (November 2017), and assessed via a detailed mechanical noise assessment to be submitted to the Principal Certifying Authority prior to the issuance of the relevant Construction Certificate.

Flooding

- Ensure all floor levels and entrances to basement car parks are located above the PMF event flood levels.

Geotechnical

- The recommended strategies for development under the Geotechnical Assessment prepared by Douglas Partners (March & August 2018), will be implemented when completing the construction drawings and works on the site.

Retail/Community

- Any commercial kitchen be fitted with appropriate commercial exhaust ventilation systems that filter and treat discharges in accordance with the relevant Australian Standards.
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8.0 Justification of the Proposal

In general, investment in major projects can only be justified if the benefits of doing so exceed the costs. Such an assessment must consider all costs and benefits, and not simply those that can be easily quantified. As a result, the EP&A Act specifies that such a justification must be made having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.

This means that the decision on whether a project can proceed or not needs to be made in the full knowledge of its effects, both positive and negative, whether those impacts can be quantified or not.

The proposed development involves the first stage of detailed design and physical works in the staged delivery of the Ivanhoe Estate Masterplan. The assessment must therefore focus on the identification and appraisal of the effects of the proposed change over the site's existing condition, and in accordance with the vision established under the Concept Plan to which this application is pursuant.

Various components of the biophysical, social and economic environments have been examined in this EIS and are summarised below.

8.1 Social and Economic

The proposal has significant social and economic benefits with both local and State-wide implications.

Housing Supply

The proposal will deliver the first integrated stage of social and market housing, renewing the existing social housing units on site and providing up to 740 new homes (combined) to help meet existing and forecast demands.

A key driver of this application is to replace the 259 existing social housing dwellings located on the site, and to generally contribute to the stock of available housing within Macquarie Park. *Future Directions* confirms that the total number of applicants in NSW currently on the waiting list for social housing is close to 60,000 people, which excludes people waiting for a transfer, demonstrating a need for new, suitable housing to meet the needs of the community. There is also a well-recognised demand for housing that can meet substantial forecast population growth within the Ryde LGA, and Sydney generally.

Integrated Community

Future Directions identifies that "approximately 40% (41,000 dwellings) of social housing in NSW are located in concentrated housing estates", which can experience high levels of crime, unemployment, poor access to essential services, and tenancy management problems that can lead to further social polarisation and disadvantage. It recognises the need to de-concentrate estates and develop accessible and integrated communities, which can also reduce the stigmatisation felt by social housing tenants. The DA represents the first stage in the delivery of a mixed-tenancy, integrated community where social housing blends with private to create an integrated and resilient community.

Community Services and Infrastructure

The Stage 1 DA will deliver suitable non-residential uses alongside the proposed housing, to serve the needs of future residents and benefit the surrounding area. These uses comprise a child care centre, retail tenancies, and public domain areas to activate and attract people to the site, and ensure the future community established on the site has access to basic services and facilities whilst the remaining stages of the Estate are being designed and delivered.

Employment Generation

The first stage of the Estate is expected to accommodate 40 jobs on site from the operation of the retail tenancies and child care centre, which will contribute towards meeting the employment targets set for Macquarie Park of 14,500-20,500 jobs. Further, during the delivery phase a further significant number of fulltime equivalent construction jobs will be created by Stage 1 (peak of 400 jobs). This will be subsidised by further employment and broader economic benefits occurring within the local and wider Australian economy relating to flow-on multipliers during the construction phase. Whilst not specifically quantified, it is also expected that expenditure from the proposed redevelopment will benefit established local businesses in the locality, that would profit from a growing local customers base.

Public Benefits

The redevelopment of the Ivanhoe Estate is an entirely self-funding program that will capitalise on existing LAHC assets. As Stage 1 is developed, the new social housing properties created will be handed over to LAHC as payment for the land. This represents a value for money return to the New South Wales Government. Further, the Consortium is committed to providing additional assets, infrastructure, works-in-kind, and monetary contributions, to provide a range of public benefits that are intrinsically linked to the delivery of the Masterplan.

8.2 Biophysical

The redevelopment of the Ivanhoe Estate has carefully considered the opportunities and constraints of the site, to mitigate and offset biophysical impacts, where appropriate. The Stage 1 DA has been designed to avoid impacts to the remaining threatened ecological community, retain significant vegetation where possible, and clarify the staging of offsets considered in the Biodiversity Offset Strategy. The proposed offset measures will acquire and retire the full quantum of ecosystem credits required at each stage of the proposed site preparation works, appropriately mitigating any loss in biodiversity.

8.3 Ecologically Sustainable Development

Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs, in accordance with the EP&A Regulation.

Precautionary Principle

The precautionary principle is utilised when uncertainty exists about potential environmental impacts. It provides that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. The precautionary principle requires careful evaluation of potential environmental impacts in order to avoid, wherever practicable, serious or irreversible damage to the environment.

This EIS has not identified any direct serious threat of irreversible damage to the environment and therefore the precautionary principle is not relevant to the proposal. Notwithstanding, indirect avoidance of damage to the environment can be achieved through implementing the mitigation measures identified in this EIS, which will inform the construction and operation of this stage of the Ivanhoe Estate.

Intergenerational Equity

Inter-generational equity is concerned with ensuring that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proposal has been designed to benefit both the existing and future generations through the implementation of the Ivanhoe Sustainability Report. Specifically, the first stage of the Ivanhoe Estate Masterplan has been designed to achieve the relevant standards and targets set under the Concept Plan. This includes delivering the first mixed-tenure development that emphasises community integration within the Ivanhoe Estate, and incorporating sustainability initiatives that ensure Building A1 and C1 achieve the 5 star Greenstar rating nominated under the Masterplan.

The proposal has integrated both short and long-term social, financial and environmental considerations so that any foreseeable impacts are not left to be addressed by future generations. Issues with potential long-term implications such as waste disposal can be avoided and/or minimised through construction planning and the application of safeguards and management measures described in this EIS and the appended technical reports. The proposed social and private housing will assist with providing housing infrastructure to future generations.

Conservation of biological diversity and ecological integrity

This principal upholds that the conservation of biological diversity and ecological integrity should be a fundamental consideration in development. As discussed in **Section 5.1** the Stage 1 development seeks to remove some areas of Endangered Ecological Community existing within the site, consistent with what is considered under the Masterplan. However, the development has been designed to minimise impacts on existing Turpentine Ironbark Forest, and offset those areas being affected. To minimise impacts on the vegetation, a Biodiversity Management Plan and Construction Environment Management Plan will be implemented prior to construction.

Improved valuation, pricing and incentive mechanisms

The principles of improved valuation and pricing of environmental resources requires consideration of all resources which may be affected by a proposal, including air, water, land and living things. The cost of infrastructure, biodiversity offsets, design measures, and other sustainability initiatives for the Ivanhoe Estate have been incorporated into the cost of development and will be delivered in the most cost-effective way via a life cycle cost approach that provides best return on investment. Mitigation measures for avoiding, reusing, recycling and managing waste during construction and operation would also be implemented to ensure resources are used responsibly in the first instance.

9.0 Conclusion

Stage 1 of the Ivanhoe Estate proposes to undertake the first stage of physical works on the site, as the initial step in realising the vision that was established under the Masterplan. The application is consistent with and pursuant to the Masterplan, and enables the timely staging and delivery of works across the Estate. Significantly, this application will also deliver renewed social housing with market housing and complementary non-residential uses, as the first mixed-tenure development within the Estate. It will establish the benchmark for the delivery of mixed tenure communities into the future.

This EIS has been prepared to consider the environmental, social and economic impacts of the proposed Ivanhoe Estate Masterplan Concept SSD DA. The EIS has addressed the issues outlined in the Secretary's Environmental Assessment Requirements (**Appendix C**) and accords with Schedule 2 of the EP&A Regulation with regards to consideration of the potential environmental impacts of the proposal in this Environmental Impact Statement. Having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development, the carrying out of the project is justified for the following reasons:

- The proposed development is consistent with the vision and framework established under the Masterplan, to which this application is pursuant.
- The detailed design of Buildings A1 and C1 are consistent with the site-specific Ivanhoe Estate Design Guidelines, and have been reviewed by and amended in accordance with the advice of independent experts within the Design Review Panel that are charged with ensuring design excellence is achieved on the site.
- The proposal will deliver 259 purpose-designed social housing units, including dual key and independent living units, to replace the existing housing stock with new, high-quality homes. Dwellings of all tenures will achieve an acceptable level of residential amenity.
- The provision of complementary non-residential tenancies will cater to the new community being established on site, and encourage site activity.
- The buildings achieve a high level of architectural design, are varied in design and contribute to visual interest on the site, and will benefit the developing skyline of Macquarie Park.
- The proportion of public domain areas being delivered in this initial stage have been maximised to benefit the establishment of mature vegetation in the streetscape and around building edges, and provide the new community with places to congregate and socialise.
- Examples of best practice sustainable building principles will be delivered as part of Stage 1 to achieve the commitments under the Masterplan, and Building A1 and C1 have been certified as being capable of achieving the nominated targets.
- The proposal demonstrates that it fits within the capacity of the existing road network, and other utilities and public infrastructure are readily available and can be augmented to meet the needs of the additional business activities and population arising from the increased density.
- The proposal will deliver a portion of the public benefits considered under the Masterplan that are intricately linked with the development (such as an enhanced public domain, road network etc).
- The project has been informed by extensive pre-lodgement community consultation occurring at this stage and for the concurrent Masterplan, with feedback from this consultation shaping the end outcome.
- There are no adverse environmental impacts that cannot be appropriately managed by the mitigation measures set out in this EIS and the accompanying reports.

Given the planning merits described above, and the significant public benefits associated with the proposed development, it is recommended that this application be approved.