ETHOS URBAN

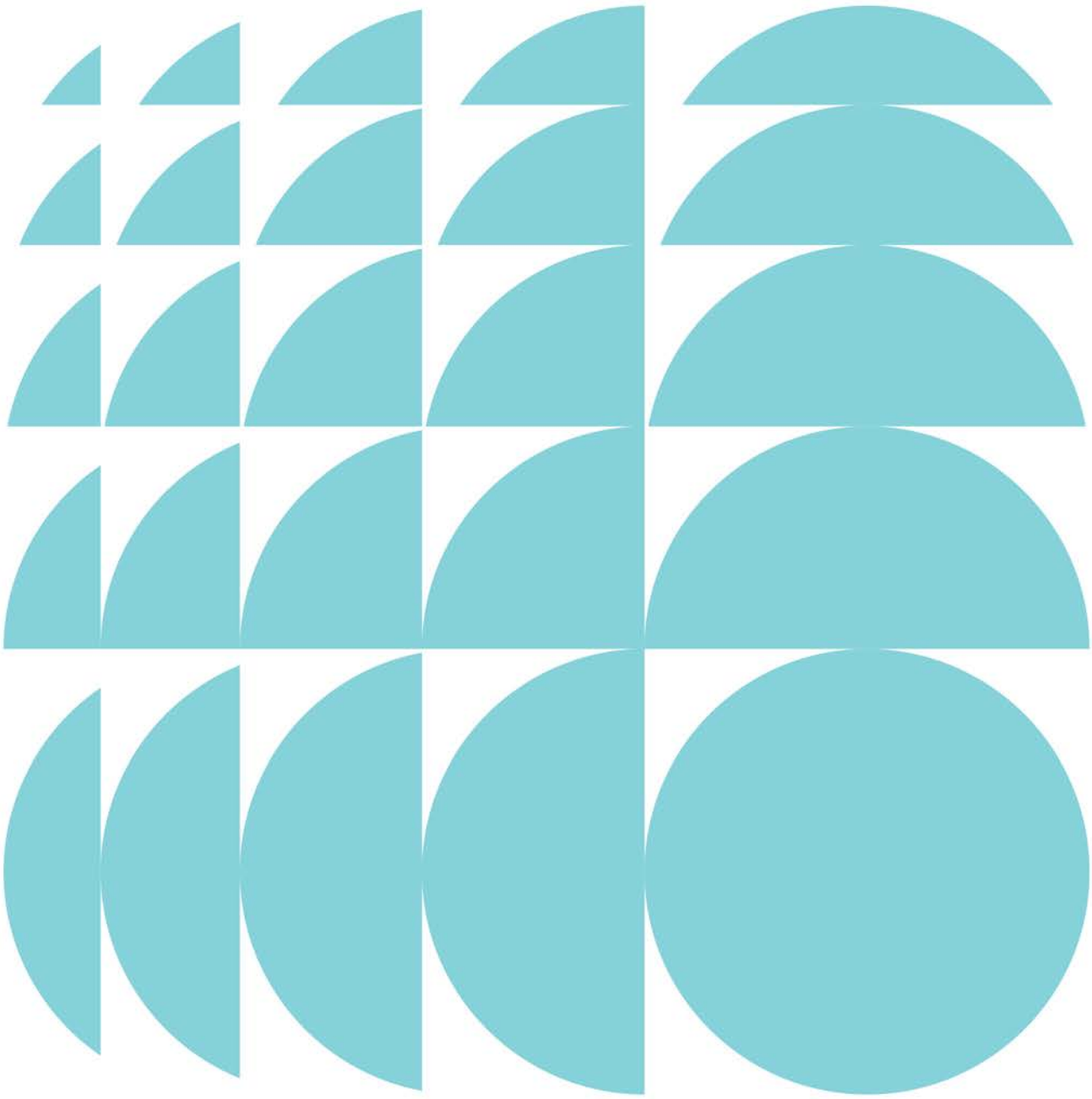
Ivanhoe Estate Masterplan

State Significant Development

Submitted to the Department of Planning and Environment

On behalf of Aspire Consortium

3 April 2018 | 17156



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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	Concept Plan for mixed use State Significant Development as described in Section 3.0 of this Environmental Impact Statement
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	5/03/2018

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 State Significant Development for the redevelopment of the Ivanhoe Estate, 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 $1.7 billion it is SSD.

A request for the issue of Secretary's Environmental Assessment Requirements (SEARs) was sought on 29 August 2017. Accordingly, the SEARs were issued on 25 September 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 Concept Development Application (DA) seeks approval for the Ivanhoe Estate Masterplan, a new integrated community where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space. Specifically, consent is sought for:

- A mixed use development involving a maximum of GFA of 283,500m^2, including:
  - residential flat buildings comprising private, social and affordable housing
  - seniors housing comprising of a residential care facility and self-contained dwellings
  - a new high 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 Site

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares in area and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout.

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 is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment 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 via a round-a-bout on Herring Road.

The Ivanhoe Estate site is comprised of 17 individual lots and are owned and managed by Land and Housing Corporation. The Masterplan site also incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyonpark Road. This land is included to facilitate a bridge crossing and road connection to Lyonpark Road.

Planning Context

Section 5.0 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 the zones. The proposed development complies with the maximum height limits in Ryde LEP. The proposed development seeks to vary the maximum FSR standard in Ryde LEP by applying a number of bonusses related to the provision of affordable seniors housing, open space and community uses.

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**.

Built Form

Significant work has been undertaken in the design of the Masterplan to ensure the GFA proposed, which has material public benefit, does not have any adverse environmental impacts and will result in an appropriate built form outcome. This EIS demonstrates that the GFA and heights proposed in the Masterplan are appropriate for the site. A comprehensive Visual Impact Assessment has been undertaken and finds that the visual impacts of the development are acceptable and consistent with the desired future character of the area.

Further, in order to ensure that bulk and scale is managed during the detailed design of each building, the Masterplan is accompanied by the Ivanhoe Estate Design Guidelines, which establish site specific controls relating to street frontage heights and setbacks, to further regulate the bulk and scale of the future development.

Landscape and Public Domain

A key principle of the Masterplan is to retain the existing landscape character of the area and enhance the public domain to support the future residential community. An extensive public domain masterplan has been prepared that incorporates a variety of open space types to provide opportunities for active and passive recreation as well as significant native planting. These include a village green, town plaza, a number of playgrounds and pocket parks as well as planting along Shrimptons Creek. Open space throughout the site will be connected by a pedestrian and cyclist network that is designed to ensure permeability through the site and connections to the surrounding area.

Residential Amenity and Overshadowing

The Masterplan has been designed to ensure future dwellings achieve a high level of residential amenity in accordance with State Environmental Planning Policy 65 (Design Quality of Residential Flat Buildings) and the design criteria set out in the Apartment Design Guide. Overshadowing impacts on adjoining properties are limited and will not adversely affect the amenity of the area.

Traffic and Parking

The proposed development will generate approximately 537 vehicle trips per hour in the AM peak and 434 vehicle trips per hour in the PM peak, resulting in generally unchanged traffic conditions at the majority of key intersections in the surrounding area. Where traffic conditions at key intersections will be affected by the proposed development, the increased delay is within the range of 10 – 15 seconds and will be improved by road upgrades that are planned for Macquarie Park. Car parking has been provided generally in accordance

with the Ryde Development Control Plan 2014, which uses the RMS recommended car parking rates for high density development and seeks to minimise the provision of car parking spaces where possible.

Vegetation and Biodiversity

The proposed Masterplan seeks to maximise the retention of existing native vegetation on the site, including portions of the protected Sydney Turpentine-Ironbark Forest. Where impacts on vegetation are unavoidable, 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. This application is made as an interim planning application in accordance with the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

Social and Economic Impacts

The proposed Masterplan will deliver a significant increase of social and affordable housing, as well as private dwellings, to contribute to increased supply of housing in the Macquarie Park area. The Masterplan will provide high quality residential dwellings in a community that has been specifically designed to benefit from a range of open spaces and community facilities, with a strong emphasis on community connection and active lifestyles. The Masterplan has been designed in accordance with best practice principles for mixed tenure community integration and will increase equitable opportunities for residents of Sydney 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.

The mix of land uses, including residential aged care facilities, a high school and child care centres will further contribute to the social benefits of the proposal and stimulate positive economic impacts by providing education and employment opportunities. By providing residential density in close proximity to employment and public transport, it is anticipated the development will stimulate indirect economic benefits by reducing costs associated with traffic congestion and promoting economic activity in the Macquarie Park area. 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.

Stormwater and Waste Water Management

A public and a private stormwater management system will be established on the site and will drain to Shrimptons Creek. In accordance with the City of Ryde policy, appropriate Water Sensitive Urban Design measures will be incorporated into the stormwater management system to treat the quality of stormwater prior to discharge. On-site detention basins and rainwater tanks will also be provided to adequately detain stormwater flows for discharge and re-use where possible.

Flooding

The site is partly flood affected near Shrimptons Creek and the proposed Masterplan has taken this into account when considering building design and the location of uses. Detailed design of future buildings on flood prone land will be designed to appropriately mitigate against potential flood impacts.

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. In addition to the augmentation of utilities, the development will also provide a range of infrastructure on the site including roads, open space, community facilities and a new high school. 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.

Geotechnical and Contamination

Engineering solutions will be implemented during construction of future stages of development to ensure that geotechnical conditions on the site minimise any potential impacts on the structural integrity of future development. There is limited evidence of contamination on the site, however a small portion of the site will be remediated prior to completion of Stage 1 due to the presence of contaminants likely due to a petrol leak. Overall, the site can be made suitable for the proposed development.

Noise

Noise criteria for the various land uses across the site to ensure that internal amenity is achieved and to minimise any potential noise impacts on surrounding sensitive receivers. Acoustic treatments can be appropriately incorporated into future building designs to mitigate against any potential noise impacts.

Wind

The Masterplan is capable of achieving a suitable wind environment for pedestrians and meeting the relevant safety criterion. This can be achieved through design interventions and due consideration of the prevailing winds when delivering detailed buildings as part of future applications. The incorporation of mitigation measures such as setbacks, awnings, screening and planting will be suitable to create a comfortable wind environment.

Heritage

The site does not contain any heritage items and is not located in close proximity to any heritage items. Based on the previous use of the site as farm land, it is not expected that any items of Aboriginal or built heritage significance will be found. Should any items of Aboriginal or built heritage be discovered on the site during construction, appropriate procedures will be implemented to record and protect potential heritage items.

Ecologically Sustainable Development

The Masterplan seeks to achieve a 5 Star Green Star v1.1 rating and 6 Star Green Star Communities rating. This will be achieved through the incorporation of a range of environmentally sustainable development measures relating to energy and water use, selection of building materials and sustainable transport.

Safety and Crime Prevention Through Environmental Design

The Masterplan has incorporated Crime Prevention Through Environmental Design principles to ensure that a high level of safety is achieved for future residents. The Masterplan will maximise opportunities for passive surveillance and incorporate principles of territorial reinforcement through lighting, technical surveillance and public domain design to minimise the potential for crime.

Conclusion and Justification

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 EIS addresses the SEARs, and describes the proposal for the Ivanhoe Estate Masterplan. The proposal will deliver approximately 3,500 dwellings (subject to future Development Applications and design development), including approximately 1,000 social and 128 affordable housing dwellings, as well as residential aged care facilities, community facilities, a high school, childcare centres, retail and public open space. The potential impacts of the development are acceptable and are able to be managed in accordance with the mitigation measures included in this EIS. Given the planning merits of the proposal, the proposed development warrants approval by the Minister for Planning.

1.0 Introduction

This Environmental Impact Statement (EIS) is submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in support of a State Significant Development (SSD) Concept Development Application (DA) for the Ivanhoe Estate Masterplan.

The report has been prepared by Ethos Urban for Aspire Consortium on behalf of NSW Land and Housing Corporation, and is based on the Masterplan prepared by Bates Smart (see **Appendix A**), Urban Design Report prepared by Bates Smart and Hassell (**Appendix B**) and other supporting technical information appended to the report (see 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

Pursuant to Section 4.22 of the EP&A Act, a Concept DA may be made to set out the concept proposal for the development of the site and for which the detailed proposal is to be subject to subsequent development applications.

This application seeks Concept approval for the following development:

- A mixed use development involving a maximum of GFA of 283,500m^2, including:
  - residential flat buildings comprising private, social and affordable housing
  - seniors housing comprising a residential care facility and self-contained dwellings
  - a new high 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.

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 comprises 259 social housing 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, comprising Frasers Property Australia, Citta Property Group and Mission Australia Housing was announced as the successful proponent to develop the site. This Concept DA is the

first step as part of the planned redevelopment of the Ivanhoe Estate and will create an integrated neighbourhood of approximately 3,500 dwellings (subject to future Development Applications and design development) including more social housing mixed with affordable and private housing.

1.3 Future Directions for Social Housing in NSW & Communities Plus

Future Directions for Social Housing in NSW ('Future Directions') 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 UrbanGrowth 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 at least 950 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 1** below details the broader team that makes up and supports the Aspire Consortium.

Figure 1 – 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 $1.78 billion.

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 Concept SSDA 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 25 September 2017. A copy of the Secretary's Environmental Assessment Requirements (SEARs) and where each of these requirements has been addressed in this report and the accompanying technical studies is included at **Appendix C**.

1.6.4 Future Approvals Framework

Future stages of development will be subject to separate planning approval as appropriate at the time of the application. Under Section 4.22 of the EP&A Act, development subsequent to a concept development

application must be the subject of a subsequent development application. As a result, future applications will l be made consistent with Concept DA and in accordance with Part 4 of the EP&A Act.

1.7 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.

In accordance with Clause 17 of the ARH SEPP, the affordable housing component of the development will be provided as affordable housing for a minimum of 10 years.

[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 Ivanhoe Estate is located in Macquarie Park near the corner of Herring Road and Epping Road within the Ryde Local Government Area (LGA). The site is located within 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 2**.

Figure 2 – Location Plan

2.2 Strategic Context

Macquarie Park is recognised as a rapidly changing area in the NSW State Government's strategic planning policies, specifically *A Plan for Growing Sydney*, the Revised Draft North District Plan and the *Draft Greater Sydney Regional Plan*. Strategic plans have consistently identified Macquarie Park as an important centre within the economic corridor that extends from Macquarie Park through the Sydney CBD to Sydney Airport, as shown in **Figure 3** and **Figure 4**. Macquarie Park is the largest non-CBD office market in Australia and is projected to become the largest non-CBD office market in Australia and Australia's fourth largest commercial precinct by 2030.[2] At present, it accommodates a total of 878,950 square metres of office floor space.[3] The Macquarie Park area is also significant for the cluster of health, education and high-tech industries, with the Revised Draft North District Plan identifying the area as a health and education precinct. The North District Structure Plan 2036 is shown at **Figure 5**.

The Greater Sydney Commission has identified Macquarie Park as Collaboration Area, where all tiers of government, stakeholders and the community will work together to ultimately produce a Place Strategy and Infrastructure Plan that responds to rapid growth and investment in the area. The Greater Sydney Commission has released the Draft Greater Sydney Regional Plan, which conceptualises metropolitan

[2] Greater Sydney Commission. 2017. *Revised Draft North District Plan*. Sydney: NSW Government. p. 48.

[3] Greater Sydney Commission. 2017. *Revised Draft North District Plan*. Sydney: NSW Government. p. 52.

Sydney as three cities. Macquarie Park is part of the Eastern Harbour City, characterised by established financial, professional, health and education sectors. Urban renewal in the Eastern Harbour City is focussed on creating local identity and amenity.

Strategic planning for the area has also identified Macquarie Park as an urban renewal area, with the Herring Road Precinct, which includes the Ivanhoe site, forming part of the Department of Planning and Environment's Priority Precinct program. The Herring Road Precinct focussed on the walking catchment around Macquarie University Railway Station and along Herring Road, which were predominantly zoned B4 Mixed Use under Ryde Local Environmental Plan 2012. In 2015 the process led to amendments to Ryde LEP to increase the height and density controls, particularly around the station and major road intersection approaches to the Precinct.

The Precinct is intended to deliver a significant number of new dwellings by 2031, transforming the area into a vibrant centre that makes the most of the available transport infrastructure and the precinct's proximity to jobs, retail and education opportunities within the Macquarie Park corridor. The Priority Precinct process also identified additional infrastructure needed to support additional growth in the Precinct, which will be funded through local contributions to Council and works in kind.

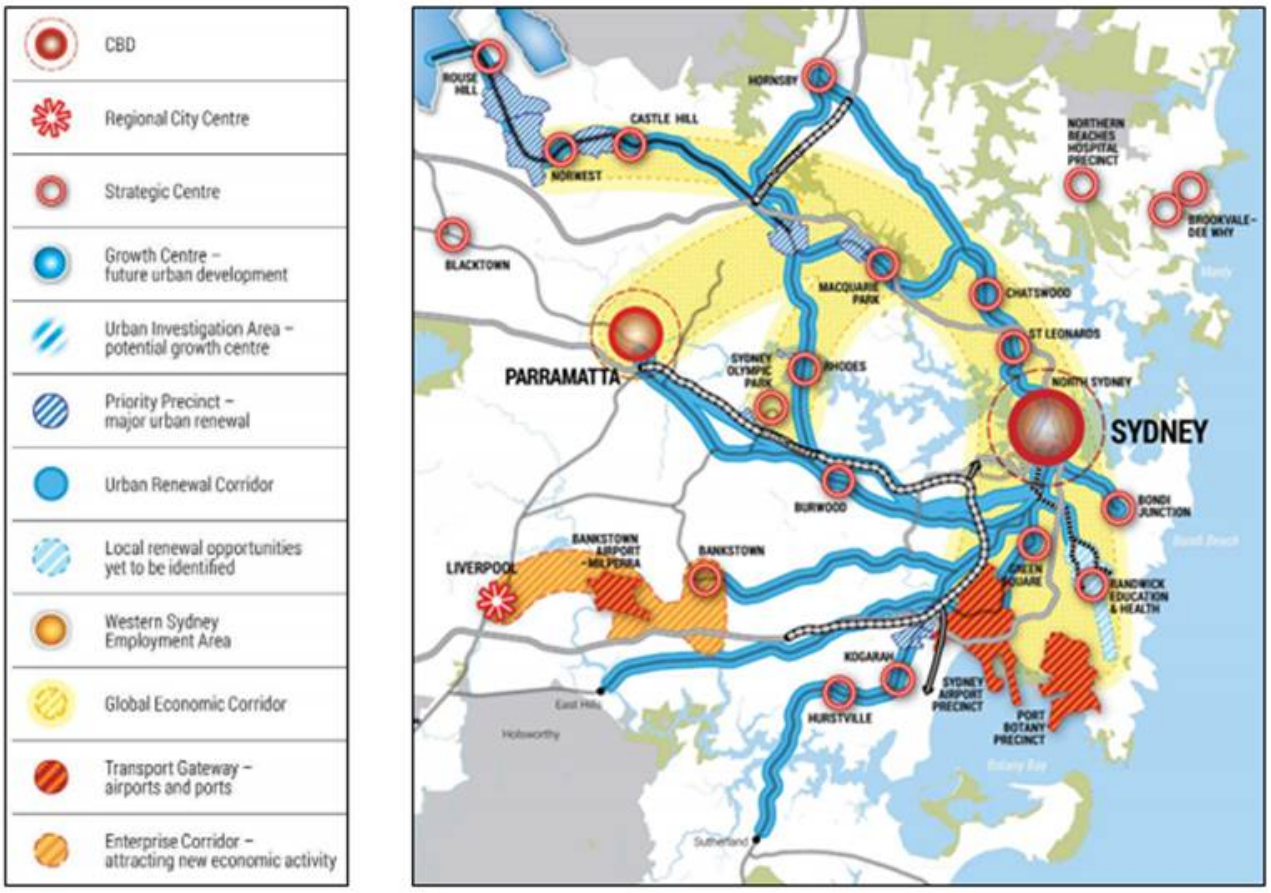


Figure 3 – A Plan for Growing Sydney strategic context

Source: Department of Planning and Environment – A Plan for Growing Sydney

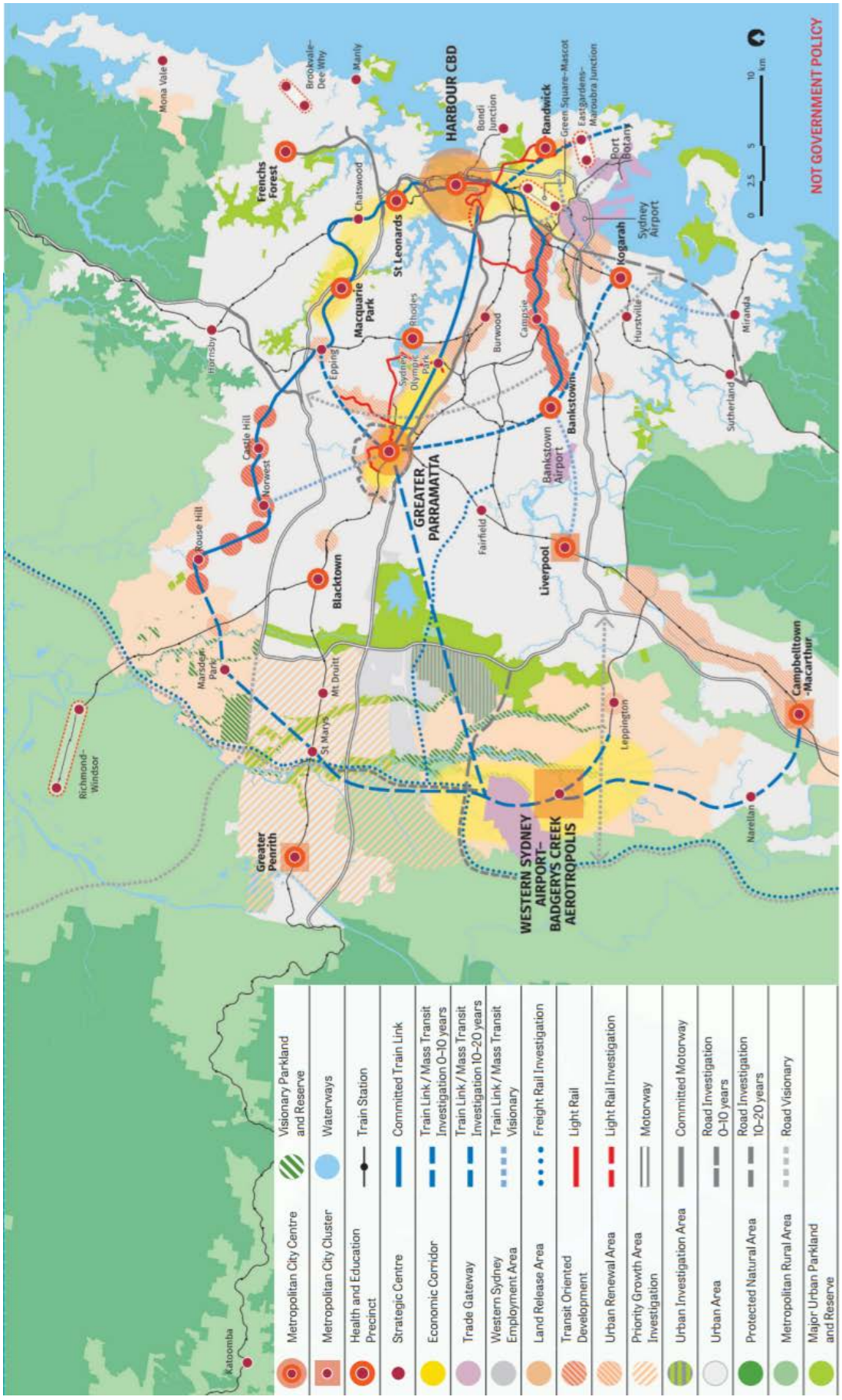


Figure 4 – Draft Greater Sydney Regional Plan

Source: Greater Sydney Commission – Draft Sydney Regional Plan

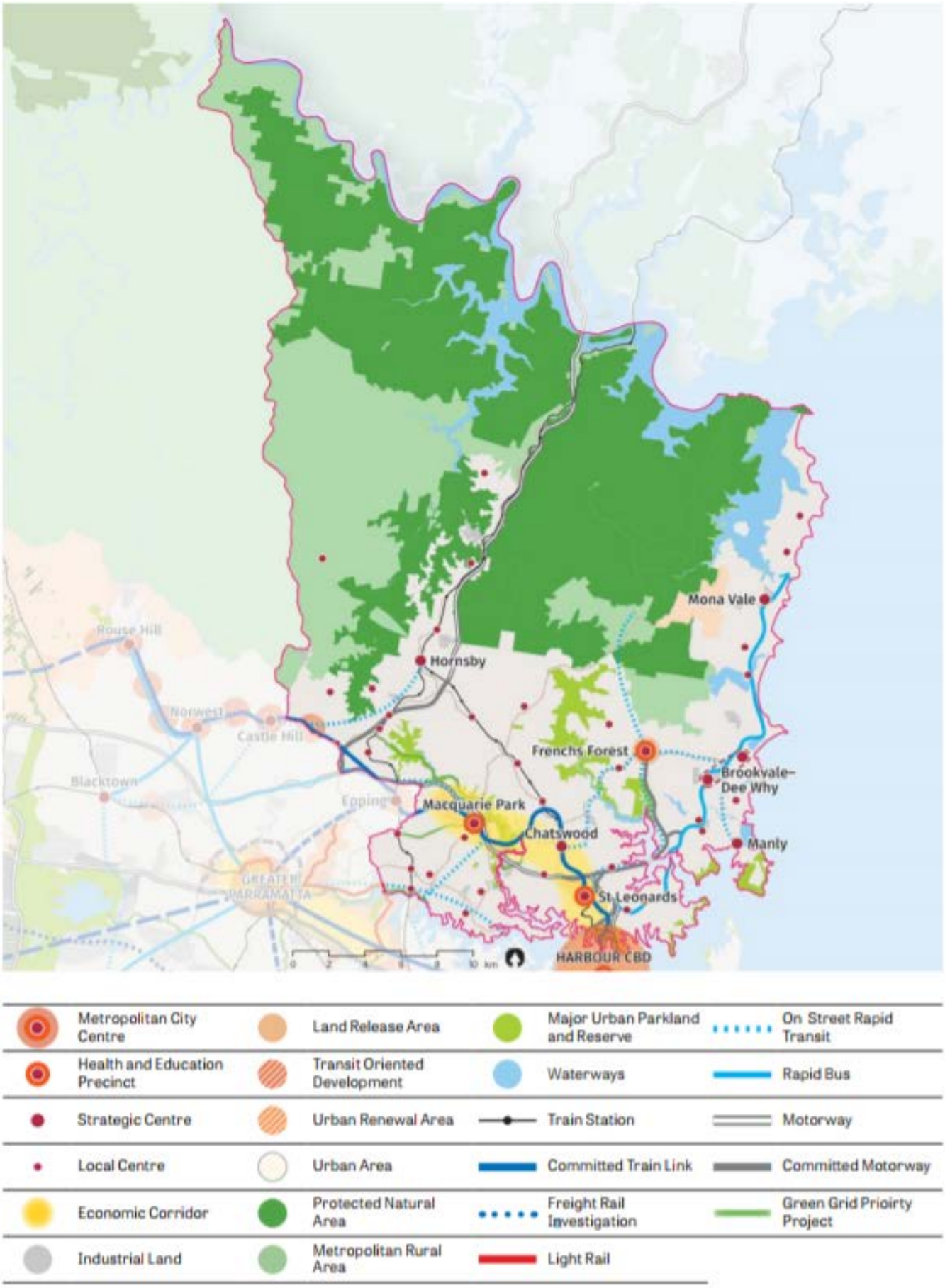


Figure 5 – North District Structure Plan

Source: Greater Sydney Commission – Revised Draft North District Plan

2.3 Site Description

The Ivanhoe Estate site is approximately 8.2 hectares in area. The Masterplan site also incorporates adjoining land, being a portion of Shrimptons Creek and part of Lot 1 DP859537 (2-4 Lyonpark Road) to facilitate a bridge crossing and road connection to Lyonpark Road. This area is approximately 1 hectare. An aerial photo of the site is shown at **Figure 6** and a survey plan is located at **Appendix D.**

Figure 6 – Aerial Plan

2.3.1 Legal Description and Ownership

The Ivanhoe Estate site comprises 17 individual allotments, as shown in **Table 1** and **Figure 7**. 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 ownership 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 filum* legal precedent, whereby the owner of a lot adjacent to a creek also owns a portion of the creek up to the centre point. This is reflected in **Table 1** and **Figure 7** below.

Table 1- Legal description

Lot	DP	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

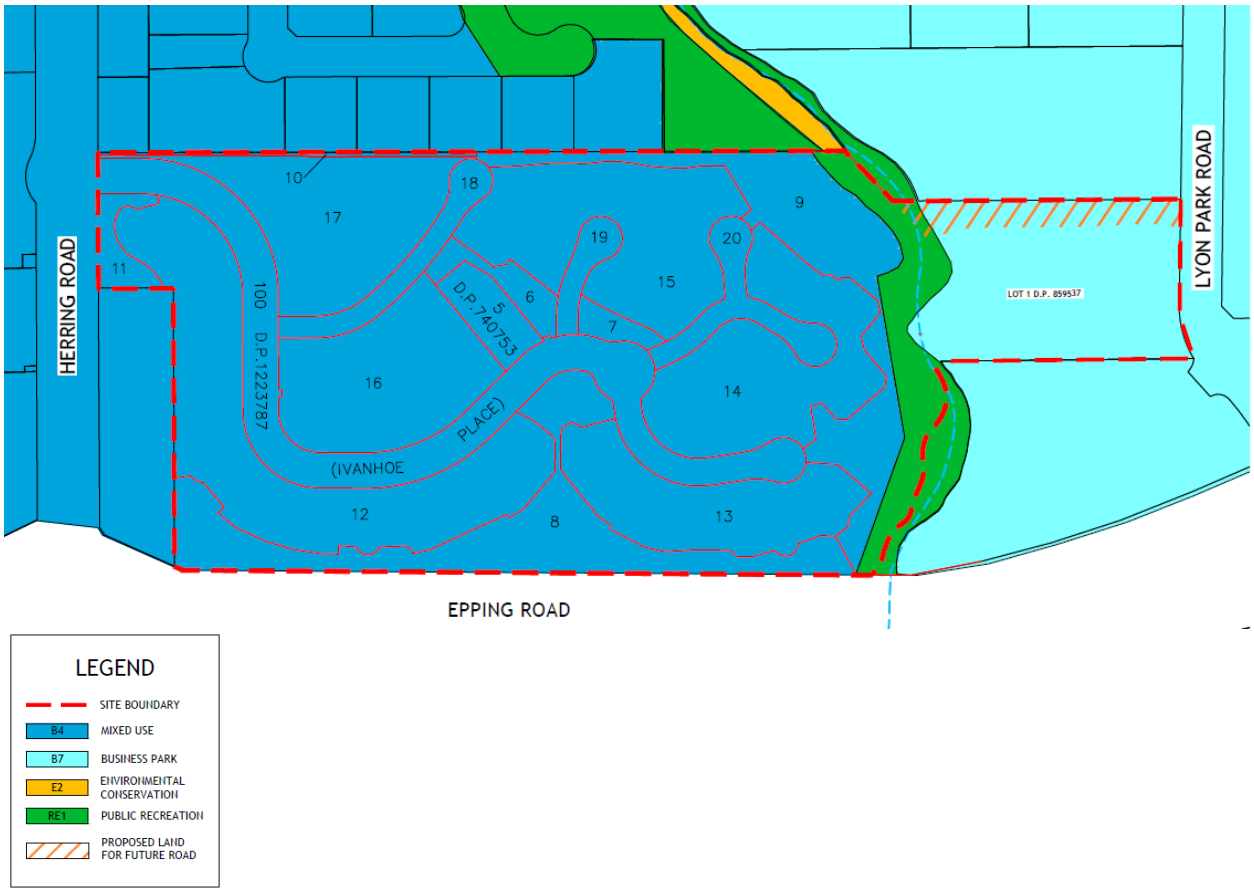


Figure 7- Lot boundaries and zoning
Source: ADW Johnson

2.3.2 Existing Development

Ivanhoe Estate site

The Ivanhoe Estate currently accommodates 259 social housing dwellings comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. The site currently adjoins Shrimptons Creek, which includes a shared path and recreation facilities. Typical development is shown in **Figure 8** and illustrated at **Figure 9**.

Typical existing streetscape and built form

Typical existing streetscape, Ivanhoe Place

Typical residential flat buildings

Existing vegetation, recreation facilities and pedestrian path at Shrimptons Creek

Existing semi-detached dwellings

Existing streetscape and residential flat buildings

Figure 8 – Existing development

Figure 9 – Illustration of the site

2-4 Lyonpark Road

The site also includes 2-4 Lyonpark Road, which will be used in part for the purposes of facilitating road access to Lyonpark Road from the Ivanhoe Estate. 2-4 Lyonpark Road is currently occupied by a 5 storey commercial office building with at-grade car parking and associated landscaping, as shown at **Figure 10**.

Figure 10 – 2 to 4 Lyonpark Road

2.3.3 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.

2.3.4 Vegetation and Fauna

Vegetation on the site comprises a mixture of native and exotic species, as well as weeds. Existing vegetation on the site is highly impacted by indirect impacts due to its proximity to the existing residential development. There is established vegetation along the Epping Road and Shrimpton Creek frontages of the site as well as street trees through the site, as shown in **Figure 11**.

There is 3.4 hectares of native vegetation is dispersed throughout the site, with dense concentrations along the Epping Road boundary and along Shrimptons Creek. Two major plant community types exist on the site, which are the Turpentine-Ironbark open forest and the Smooth-barked Apple-Turpentine-Blackbutt open forest. **Figure 12** shows the existing vegetation zones on the site.

Open space and vegetation adjoining Shrimptons Creek

Existing condition of Shrimptons Creek

Epping Road vegetation

Typical street trees

Figure 11 – Existing vegetation

Figure 12 – Existing vegetation zones on the site
Source: Ecological

Eco Logical Australia has undertaken a detailed assessment of vegetation on the site (refer to **Appendix E**) and found that vegetation along Epping Road is in reasonable condition, whilst the remaining vegetation throughout the site is in moderate condition. The majority of vegetation throughout the development site has had the understorey and mid-storey entirely removed.

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-bearing 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.

2.3.5 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 interallotment drainage infrastructure currently drains runoff generated by the existing development south towards Shrimptons Creek. There are currently three culvert outlet locations discharging into Shrimptons Creek. Stormwater generated by the existing residential to the north-west of the site currently drains through the site 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

There are no registered bores within a 500 metre radius of the site. It is expected that regional groundwater would be present at depth within the underlying bedrock, at depths of greater than 5 – 10 metres. Based on the hydrology of the local area, it is expected that groundwater underlying the site would 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 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 and is largely confined to the banks of Shrimptons Creek as well as small amounts of localised flooding throughout the site. Peak flood depth during the 100 year ARI event is shown at **Figure 13**. Existing flood impacts are further discussed in the Flood Impact Assessment prepared by BMT WBM at **Appendix I**.

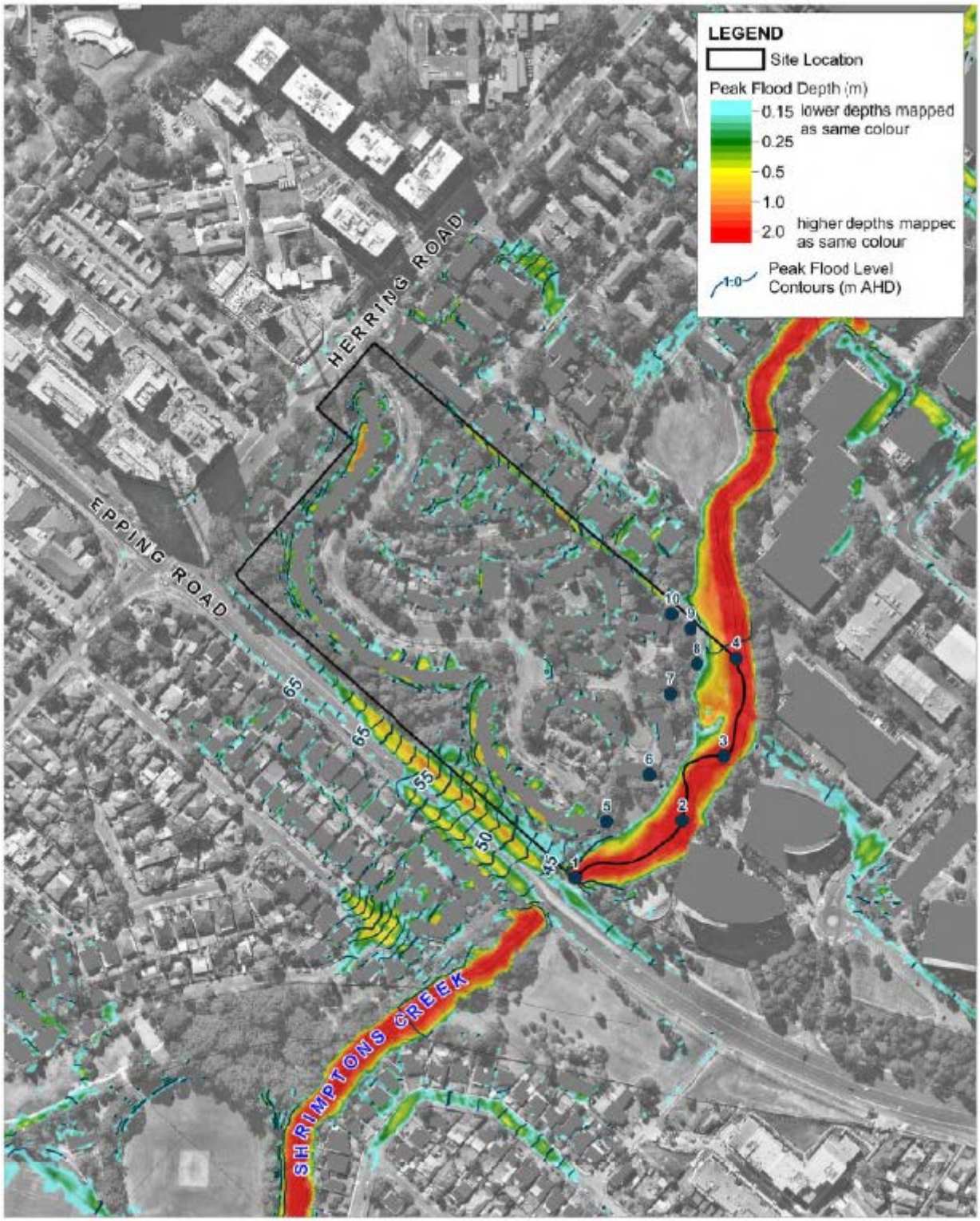


Figure 13 – Peak flood depth during 100 year ARI event

2.3.6 Vehicular and Pedestrian Access

There is a single point of vehicle entry to the existing Ivanhoe Estate site, via a roundabout on Herring Road. 2 – 4 Lyonpark Road is accessed via Lyonpark 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.

The pedestrian and vehicular access to the site is shown at **Figure 14**. The pedestrian link under Epping Road at the boundary of the site is shown in **Figure 15**.

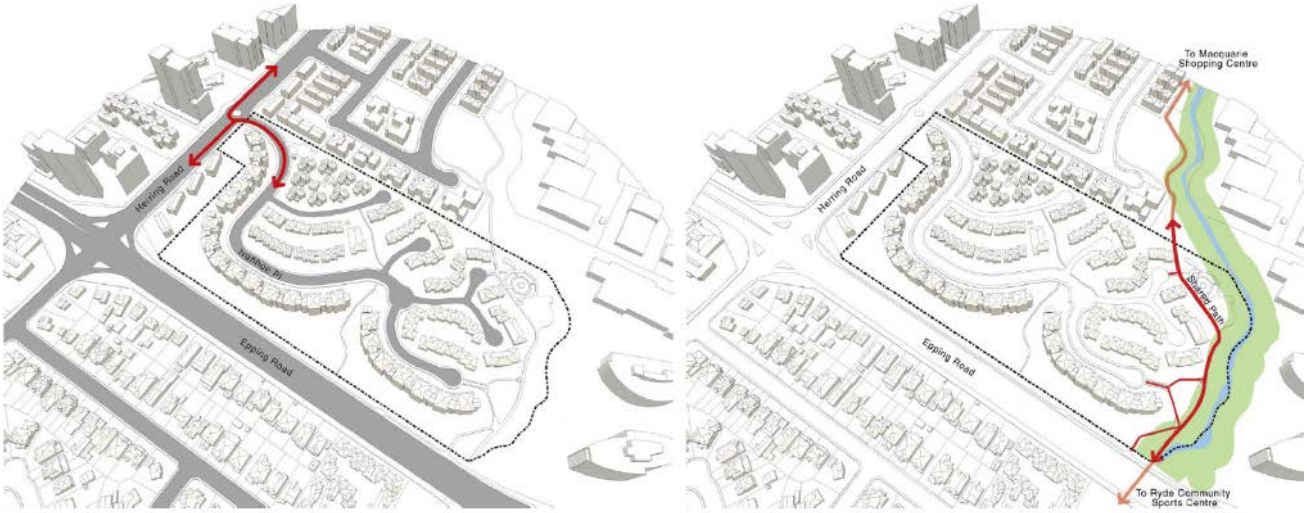


Figure 14 – Vehicular and Pedestrian Access to the Site

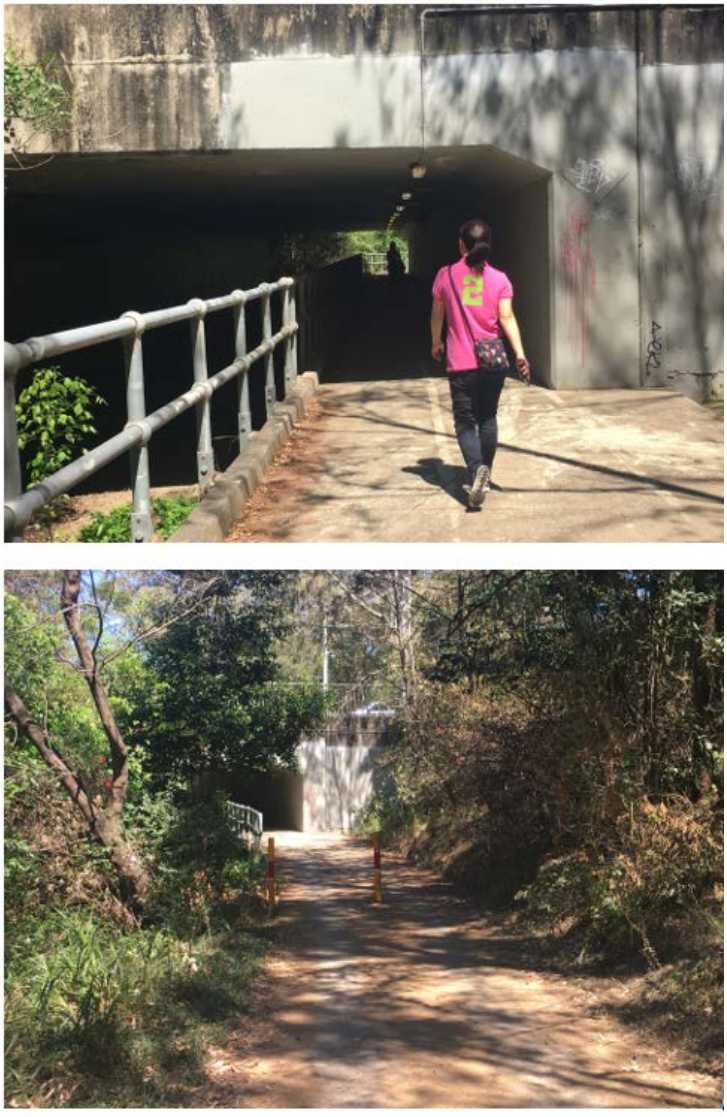


Figure 15 – Entrance to Shrimptons Creek Trail, Epping Road above

2.3.7 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* located on the site.

An Aboriginal and Historical Heritage Assessment has been prepared by Eco Logical Australia and is provided at **Appendix J**.

2.3.8 Soil and Geotechnical Conditions

The existing site is underlain by the residual Lucas Heights soil landscape. A portion of the site close to Herring Road is also 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 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.

The NSW Department of Planning and Environment Sydney Geological Map shows that the site is underlain by Ashfield Shale towards Herring Road and by Hawkesbury Sandstone in the south-eastern portion of the site. Where the Ashfield Shale is present, it would be underlain by Hawkesbury Sandstone and possibly with a transitional Mittagong Formation between the two layers. Based on previous investigations by a geotechnical engineer, Ashfield Shale may not be present on the site.

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

Registered groundwater bores in the vicinity of the site are located near Macquarie University, at the intersection of Lane Cove Road and Waterloo Road and are between 300 metres to 1 kilometre from the site. Permanent groundwater levels are expected to be at depths of greater than 5 metres to 10 metres within the sandstone, with seepage generally through weathered band and defects within the rock mass.

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

2.3.9 Contamination

Numerous site investigations have been carried out by DLA Environmental, 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, 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 filing 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.

The Detailed Site Investigation prepared by DLA Environmental Services is attached at **Appendix H**, and the Supplementary Site Investigation prepared by DLA Environmental Services is also attached at **Appendix H**.

2.3.10 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. 2-4 Lyonpark Road is also serviced by the water main in Epping Road.

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.

The 2-4 Lyonpark Road site is serviced by high voltage underground cables, which are located in the northern verge of Lyonpark Road. Two electrical kiosks are located within the front eastern corner of the property, which also provide the property with a low voltage supply via underground cables.

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.

2.4 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 stand 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 is occupied by 4 unused student accommodation buildings. A DA was recently approved for redevelopment of 137-143 Herring Road for two residential flat buildings accommodating approximately 297 dwellings across 22 storeys (City of Ryde reference: DA2017/0107).

The northern side of Herring Road has been subject to recent and ongoing residential redevelopment. This comprises the former Stanford 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, an 8-lane arterial road, runs along the south western boundary of the site. On the opposite side of Epping Road are detached houses and townhouse 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, an area of public open space, runs along the south-eastern boundary of the Ivanhoe Estate and is bound by 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 16** and at **Figure 17**.

Figure 16 – Surrounding development overview (Refer to Design Report for further detail)

Source: Bates Smart

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

Epping Road

Macquarie Park Village under construction

Herring Road with Macquarie Park Village in the background

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

Existing residential flat buildings viewed from Peachtree Road

Figure 17 – Surrounding development

3.0 Description of the Development

This chapter of the report provides a detailed description of the proposed concept development, known as the Ivanhoe Estate Masterplan.

The Ivanhoe Estate Masterplan provides for a vibrant mixed-use neighbourhood with buildings arranged to maximise residential amenity outcomes and a diverse open space network designed to create an inclusive community oriented public domain.

Pursuant to Section 4.22 of the EP&A Act, this application seeks concept approval for the following development:

- A mixed use development involving a maximum of GFA of 283,500m^2, including:
  - residential flat buildings comprising private, social and affordable housing
  - seniors house comprising a residential care facilities and self-contained dwellings
  - a new high 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 Masterplan Drawings prepared by Bates Smart are included at **Appendix A** and the Urban Design Report prepared by Bates Smart + Hassell is attached at **Appendix B**. An illustration and photomontage of the Masterplan is shown at **Figure 18** and **Figure 19**.

Indicative Architectural Plans for each of the development blocks has been included as part of the Urban Design Report at **Appendix B** for information purposes only. These drawings illustrate a built form outcome consistent with the maximum heights, GFAs and Design Guidelines, for which approval is sought under this DA. The drawings also illustrate the likely location of land uses and configuration of social, affordable and private housing.

Figure 18 – Proposed Masterplan

Source: Bates Smart

Figure 19- Indicative Masterplan
Source: Bates Smart

3.1 Design Concept

The Masterplan concept is focussed on delivering a seamlessly integrated community of private, affordable and social housing dwellings arranged to maximise residential amenity outcomes. The Masterplan also includes a range of other complimentary uses to support the future community, including a residential aged care facility, a years high school, retail, community uses, and child care facilities.

The urban design framework that underpins the Masterplan will enhance the character of the site, linking the established bushland corridor with a series of high quality public open spaces. A new main street will be activated by community and retail uses, alongside a hard-landscaped retail plaza, soft landscaped village green, amphitheatre, forest park and community hub. Shrimptons Creek will also be enhanced to provide a recreational and environmental green spine.

A key component of the Masterplan concept is establishing a street grid that allows connectivity through the site and to the surrounding areas for vehicles, pedestrians and cyclists. This includes a new crossing of Shrimptons Creek to connect to Lyonpark Road and also a potential future connection to Epping Road, creating new access points in the local road network.

The planning and design principles adopted for the proposed Masterplan are to provide:

- World class urban design and sustainability creates a high quality place.
- Private, affordable and social housing dwellings are indistinguishable and evenly distributed.
- Building design innovation assists management of mixed tenures.
- Urban design creates inclusive, high amenity place to optimise community interaction.

- Social housing meets the needs of tenants with built in flexibility.
- Programs supporting social housing tenants to engage in the community and local education, training and employment opportunities.
- Create opportunities and programs to improve social outcomes.
- Industry leading water and energy efficiency.

The detailed principles that underpin the built from and public domain concept are outlined in Sections 3.2 and 3.3 below and described in detail at **Appendix B**.

3.2 Built Form Concept

The Masterplan sets up a framework of 15 development blocks in four precincts, as shown in **Figure 20**. Precinct A accommodates three building lots on the northwest edge of the site. Precinct B accommodates four building lots along the northeast edge of the site. Precincts C and D accommodate four building lots each, with two 'superlots' within each group. Precinct C runs though the centre of the site, while Precinct D fronts Epping Road.

Within the development blocks the Masterplan adopts the following principles:

- Perimeter Setbacks: Buildings are generally proposed a minimum of 10m from side boundaries in accordance with the Ryde DCP. In some cases, lower levels (up to five storeys) extend to 6m from the side boundary. Residential buildings are also set back on upper levels to comply with the Apartment Design Guide requirements. Along Epping Road, buildings are set back a minimum of 10m in accordance with the DCP and Envelope Control Plan
- Public And Community Uses Along Main Street: Buildings along the central portion of Main Street propose a range of public and community uses including: retail, school, residential aged care facility, multipurpose hall, swimming pool and childcare facilities.
- Human Scale To Neighbourhood Streets: On residential streets, buildings propose a 2-4 storey scale using townhouse typologies to provide an active streetscape which responds to the scale of the pedestrian.
- Orient Apartment Buildings For Solar Access: Above the ground plane, apartment buildings are oriented to maximise solar access to building facades and open space.
- Building Heights Consistent with Height Plane: Building heights step in accordance with the LEP height plane, generally increasing in height towards the intersection of Epping and Herring Roads.
- Fragment Form Along Shrimptons Creek: Along the edge of Shrimptons Creek, building forms are broken down to provide a sense of smaller floorplates with a less formal arrangement than the urban grid, responding the alignment of the riparian corridor.

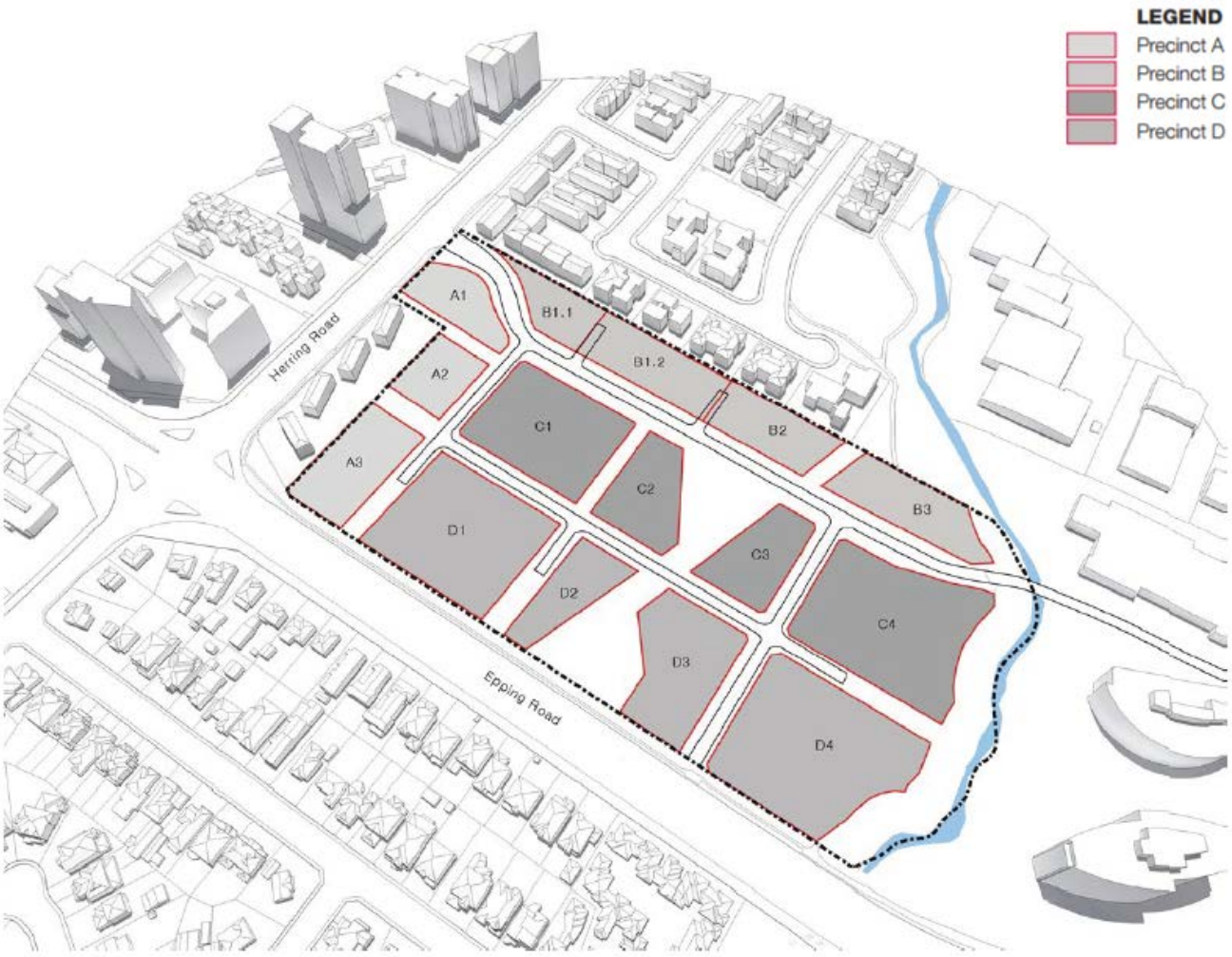


Figure 20 – Development Blocks

Source: Bates Smart

3.2.1 Land Uses and GFA

In order to ensure the Masterplan delivers a seamlessly integrated community of private, affordable and social housing dwellings complemented by uses to support the future community, a range of maximum and minimum GFAs have been established.

The proposed Masterplan will have a maximum GFA of 283,500m^2 comprising;

- a maximum total residential GFA of 270,313m^2, including:
  - a minimum social housing GFA of 70,488m^2
  - a minimum affordable housing GFA of 7,184m^2
  - a minimum residential aged care facility GFA of 6,600m^2
  - a minimum seniors self care units GFA of 9,048m^2
- a maximum retail GFA of 1,246m^2;
- a minimum community benefit GFA of 11,941m^2, including;
  - a maximum child care centre GFA of 1,345m^2;
  - a maximum school GFA of 9,006m^2;

A detailed description of each of the land uses are outlined below.

In order to provide an appropriate level of flexibility in the detailed design of the future buildings a minimum / maximum GFA range has been nominated for each development block, with a maximum GFA for each precinct. A breakdown of the land uses and GFA by each development block is provided in **Table 2**.

Table 2 – Land Use and GFA by Development Block

Development Block	Maximum GFA (m^2)	Uses
A1	22,082 – 24,290	Residential, Child Care Centre
A2	8,378 – 9,216	Residential
A3	19,047 – 20,952	Residential
Precinct A Total	**49,507 - 54,458**	
B1	6,265 – 6,892	Residential
B1.2/3/4	15,010 – 16,511	Residential aged care
B2	9,006 – 9,907	High School
B3	12,935 – 14,229	Residential, Child Care Centre
Precinct B Total	**43,216 - 47,539**	
C1	33,855 – 37,241	Residential, Retail
C2	15,811 – 17,392	Residential, Retail
C3	12,094 – 13,303	Residential, Retail, Community Facilities
C4	32,129 – 35,342	Residential
Precinct C Total	**93,889 - 103,278**	
D1	26,860 – 29,546	Residential
D2	17,030 – 18,733	Residential
D3	19,653 – 21,618	Residential, Mission Australia Housing Office
D4	31,407 – 34,547	Residential
Precinct D Total	**94,950 - 104,444**	
Masterplan Total	283,500	

Residential – Private Housing

Privately owned residential dwellings will be evenly dispersed in residential flat buildings across the site. The indicative designs for each block show that there will be approximately 2,300 private dwellings across 12 of the development blocks.

Residential – Social Housing

Social housing will be managed by Mission Australia Housing and evenly dispersed in residential flat buildings across the site. The Masterplan is underpinned by the principle of tenure blindness, with no external indicators of tenure type in the design and layout of the community. The indicative designs for each block show that there will be approximately 1,000 social housing dwellings across 7 of the development blocks. Social housing throughout the development will be in separate lots to the private strata lots and provided with a dedicated entry point to enable effective building management by Mission Australia Housing. **Figure 21** illustrates the potential distribution of tenure across the site.

Residential – Affordable Housing

Affordable housing will be managed by a community housing provider and will be located in a single building in Block D4. The affordable housing building will be in a separate ownership lot and will be provided with a dedicated entry point to enable effective building management by the community housing provider. Approximately 128 affordable dwellings will be provided on the site.

Residential Aged Care Facility

A residential aged care facility will be provided in Block B1.2 – B1.4 and will accommodate approximately 120 beds. The residential aged care facility will be operated by an independent third party operator. The facility will provide on-site support services and a range of communal facilities for the residents.

Private and Social Independent Living Units

132 private independent living units will be provided within Blocks B1.3 and B1.4 and social independent living units will be provided within Block B1.1. Both private and social independent living units will be provided with on-site support services.

Educational Establishment

An independent vertical high school will be provided within Block B2. The high school will cover years 7-12 and accommodate approximately 1000 students. The school will also comprise a range of facilities which can be used by the wider community outside of school hours.

Child Care Centre

Two child care centres will be provided within the site at ground level in Blocks A1 and B3. The child care centres will be able to accommodate a minimum of 75 children each and will be independently operated.

Retail

A number of minor retail tenancies will be provided along Main Street and fronting the new urban plaza in Blocks C1 and C2. Retail tenancies are intended to accommodate convenience retail for the future Ivanhoe community and may include cafes, shops and a mini-major / supermarket.

Community Hub

A community hub will be provided in Block C2 fronting the Village Green for use by future residents of the Ivanhoe Estate and broader Macquarie Park Community. It is envisioned that the community hub will be utilised to run programs by Mission Australia Housing, the residents' corporation, Council programs and other community initiatives.

Office Premises

An office premises to accommodate Mission Australia Housing will be provided at ground level in Block D3.

2-4 Lyon Park Road

2-4 Lyon Park Road will accommodate the future road connection to Lyon Park Road (see Section 3.6) whilst continuing to be used as an office premises. The GFA is not included as part of the Ivanhoe Estate Masterplan GFA, and its site area has not been included for the purposes of the calculation of GFA within the Ivanhoe Estate. It is noted that the owner may seek the opportunity to apply an increased floor space ratio to the balance of the Land (2-4 Lyon Park), and for the benefit of the balance of the Land, in accordance with section 4.4A of the City of Ryde Local Environmental Plan 2014.

3.2.2 Building Height

The Concept SSD DA seeks approval for maximum heights for each development block consistent with the maximum height limits prescribed in the Ryde LEP (see **Table 3** and **Figure 21**). Some development blocks have two different height where the LEP height limit varies across the block.

Whilst the Concept SSD DA seeks maximum heights across each Development Block to allow for flexibility in the future siting of buildings, the maximum GFA limits and Design Guidelines which also form part of the Concept SSD DA incorporate appropriate measures to ensure that the maximum development block height is not achieved in all buildings but a varying range of heights is achieved similar to that illustrated in the Indicative Design provided at **Appendix B**.

Table 3 – Building Heights

Development Block	Maximum Height (m)
A1	75
A2	75
A3	75
B1.1	Part 75/Part 45
B1.2	45
B2	45
B3	45
C1	Part 65/Part 45
C2	Part 65/Part 45
C3	Part 65/Part 45
C4	Part 65/Part 45
D1	65
D2	65
D3	65
D4	65

Figure 21 – Building Height Plan

Source: Bates Smart

3.2.3 Design Guidelines

To guide the future design and assist with the development assessment process, the Concept SSD DA seeks to introduce a set of site specific Design Guidelines (see **Appendix L,** also provided as appendix to **Appendix B**). The Concept SSD DA in conjunction with the Design Guidelines will ensure a high quality architectural and amenity outcome is achieved for the future residents and adjoining development. The Design Guidelines contain provisions and objectives relating to:

- North-East Development Lots B1 – B3 to allow for future connectivity and solar access.
- Public and communal open space.
- Deep soil zones.
- Public domain interface.
- Active frontages.
- Pedestrian and vehicular entry locations.
- Street wall height.
- Ground level street setbacks.
- Upper level setbacks.
- Rooftops.
- Façade expression and materials.
- Design excellence.
- Universal design.

3.3 Public Domain Concept

A Public Domain Concept has been prepared by Hassell and is included in the Urban Design Report at **Appendix B**. The Public Domain Concept translates the public domain vision embodied in the Masterplan into a concept intended to inform the detailed design of the future public domain within the site, including the size, location and design of roads and open space. A range of publicly accessible open space will be provided across the Ivanhoe Estate, from urban plazas and village greens to shared courtyards and the riparian corridor. The diversity of open spaces to be provided places a strong emphasis on the outdoors, recreation and social engagement. The Public Domain Masterplan is shown at **Figure 22**.

PUBLIC DOMAIN MASTER PLAN

LEGEND

1/ New vehicular and pedestrian link to Herring Road, providing immediate links to Macquarie University, Macquarie Centre and station. The entry is a forest of Melaleuca in paving creating a dynamic entrance to the site.

2/ A new mixed-use Main Street is created through the site as the main movement spine and the focus for public functions.

3/ The Town Plaza and Retail Street is lined with active uses. It will be a busy, active space that caters for a range of activities from casual dining to public meetings and entertainment.

4/ The School Garden provides active and passive public spaces adjacent to the school.

5/ The Green Link is a circulation and landscape spine from creekline through the open spaces of the development to the Epping Road bushland buffer.

6/ The Village Green is a place to celebrate the outdoor lifestyle, a large, flexible and recreation reserve for organised events or casual gatherings such as informal sports, picnics and play.

7/ Vehicle and pedestrian bridge across Shrimptons Creek and connection to Lyonpark Road and Macquarie Business Park.

8/ A neighbourhood loop road provides connections around the site.

9/ Shrimptons Creek is an important landscape and recreational spine, connecting Ivanhoe to the Macquarie Centre and to the creek parklands. Rehabilitation of the riparian corridor and duplication of the path system, coupled with improvements to the Epping Road underpass and inclusion of new amenities will dramatically upgrade the creek environs

10/ New entrance connection from Epping Road.

11/ Neighbourhood Mews provide driveway access to buildings while sensitively interfacing with adjacent bushland and providing open areas for small gatherings.

12/ Communal courtyards provide private sanctuary for residents.

13/ Neighbourhood Gardens provide a series of intimate, informal public spaces.

14/ Forest thresholds form the boundary between the development and its context. Stepped terraces take up the slope and create areas for gathering and individual activities.

15/ Forest playground is a place that celebrates the natural history of the site through play.

16/ Entry clearing celebrates your arrival into the community. Taking advantage of the abundant sunlight in this location, it connects the adjacent plaza, neighbourhood garden, Main Street and Neighbourhood Street.

Figure 22 – Public Domain Masterplan

Source: HASSELL

The public domain concept is inspired by the idea of 'forest to neighbourhood', emphasising the existing bushland character along Epping Road and Shrimptons Creek. The public domain concept also seeks to clearly distinguish between Main Street and the surrounding neighbourhood streets. A landscape design theme has been developed that draws on the existing landscape and adapts it to the proposed Masterplan. The site's informal forested edges will infiltrate the urban grid, particularly through the Green Link that will run diagonally across the site and connect the Epping Road vegetation to the Shrimptons Creek corridor. Beyond the Green Link, the streets will take on a neighbourhood character where a more orderly arrangement of street trees and furniture will provide a high level of urban amenity. This 'forest to neighbourhood' concept is shown in **Figure 23**.

Figure 23 – 'Forest to neighbourhood' public domain concept

Source: HASSELL

Utilising this concept of 'forest to neighbourhood', a hierarchy of primary, secondary and incidental public spaces are provided within the site. Primary public spaces are designed for civic and recreation purposes and will each have a different landscape character. A series of secondary public spaces will also respond to the forest and neighbourhood landscape themes and include on-street gardens and planted areas suited to the quieter neighbourhood streets. At the boundaries of the site, forested urban gardens will delineate the transition to the existing bushland. Incidental open spaces will be created throughout the site with street furnishings and planting to create spaces for sitting and meeting. Open space throughout the site is shown at **Figure 24**.

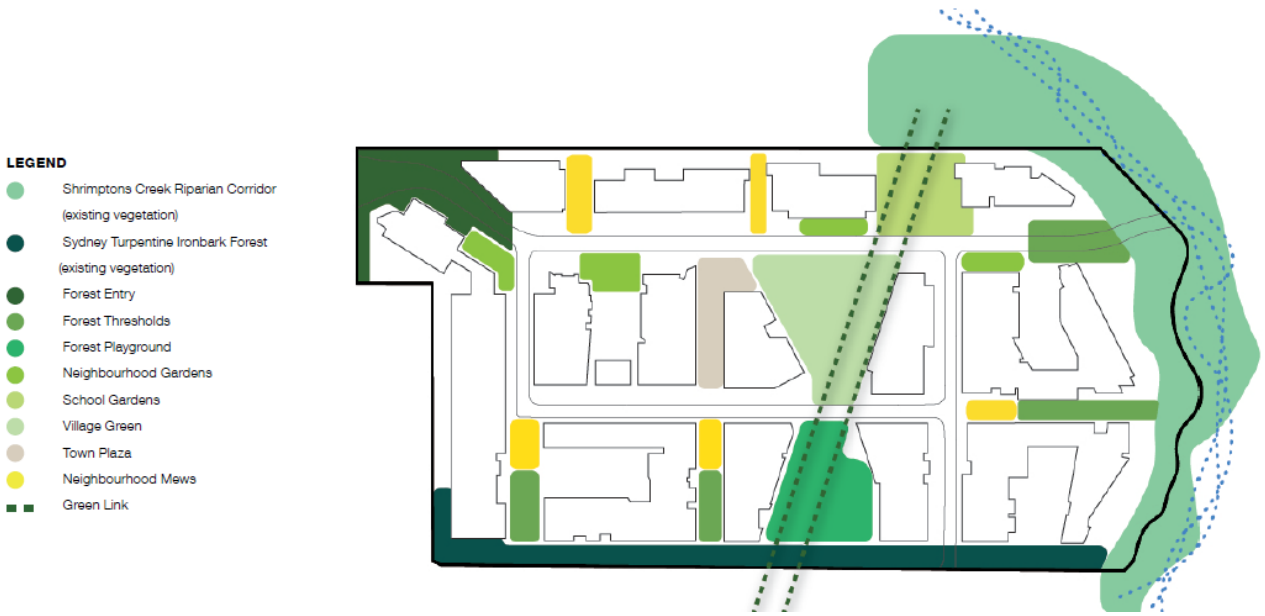


Figure 24 – Open space network

Source: HASSELL

Future Development Applications will need to demonstrate that they are generally in accordance with the Public Domain Plan to ensure a high quality public domain consistent with the vision of the original Frasers bid is delivered on the site. A summary of the key elements of the public domain is outlined below.

3.3.1 Primary Open Space

Primary open space areas are designed to have different functions and a distinct landscape character depending on whether it has a 'forest' or 'neighbourhood' character. These primary open spaces are shown in **Figure 25** and outlined below.

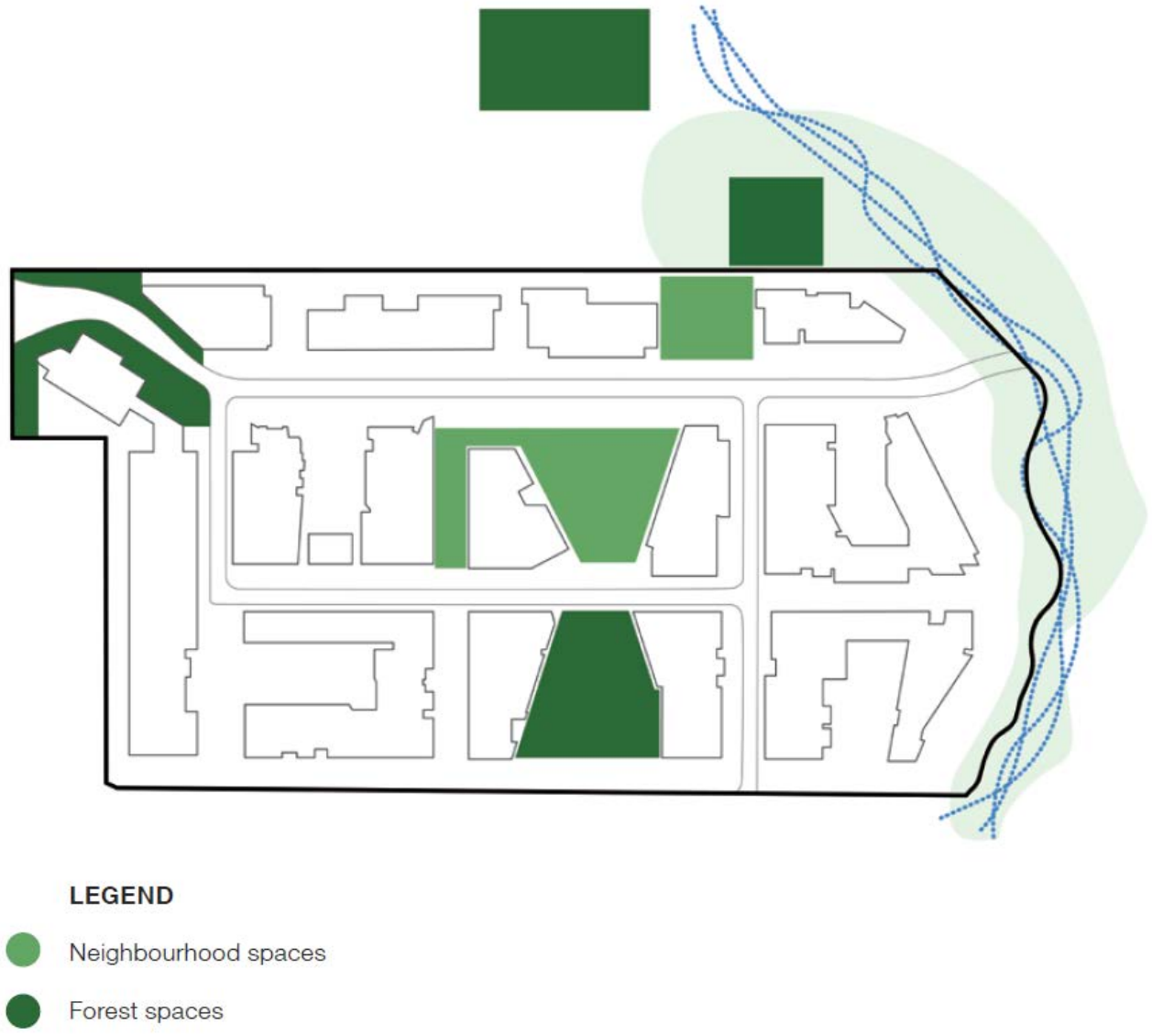


Figure 25 – Primary open spaces

Source: HASSELL

Green Link

The Green Link is a circulation and landscape spine that extends between the Shrimptons Creek corridor to the Epping Road bushland, connecting the Village Green and other primary, secondary and incidental spaces. The Green Link will incorporate the same species of planting to create a unifying landscape element that enhances wayfinding through the site.

Village Green

The Village Green is located between Block C2 and C3 and is a large and flexible outdoor recreation area that is intended for use by all residents and can accommodate organised events, casual gatherings, sports, picnics and play. A purpose-built playground will also be provided on the Village Green. **Figure 26** illustrates the indicative design concept for the Village Green.

Figure 26 – Village Green illustrative design concept

Source: HASSELL

Town Plaza

The Town Plaza is a hard landscaped area that runs between Block C1 and Block C2 and is the interface between ground level retail uses. The Town Plaza will be an active space that will accommodate outdoor dining, gathering and entertainment. **Figure 27** illustrates the indicative design concept for the Town Plaza.

Figure 27 – Town Plaza indicative design concept

Source: HASSELL

Forest Playground

The Forest Playground is located between Block D2 and D3 and is part of the transition between the Green Link and the existing bushland on Epping Road. A large nature-based playground will be provided within the setting of the existing trees. **Figure 28** illustrates the indicative design concept for the Forest Playground.

Figure 28 – Forest Playground indicative design concept

Source: HASSELL

School Garden and Playground

The School Garden and Playground is located adjacent to the school in Lot B2 and will provide opportunities for organised sport, individual play and gathering areas. The School Garden and Playground will be for use by school students as well as the child care centre. **Figure 29** illustrates the indicative design concept for the School Garden and Playground.

Figure 29 – School Garden and Playground indicative design concept

Source: HASSELL

3.3.2 Secondary Open Space

Secondary open spaces will be planted neighbourhood gardens or 'forest thresholds' to provide a transition to the existing bushland on the perimeter of the site. The location of secondary open spaces is shown at **Figure 30** and an indicative design of the 'forest threshold' is shown at **Figure 31**.

Figure 30 – Secondary open spaces

Source: HASSELL

Figure 31 – Forest threshold indicative design

Source: HASSELL

3.3.3 Incidental Spaces

Incidental open spaces are distributed throughout the site to provide small landscaped areas with street furniture. The indicative location of incidental open spaces is shown at **Figure 32** and an indicative design at **Figure 33**.

Figure 32 – Incidental open spaces

Source: HASSELL

Figure 33 – Street garden incidental open space indicative design

Source: HASSELL

3.3.4 Residential Courtyards

Communal courtyards will be provided between development blocks, as shown in the Public Domain Masterplan. These courtyards will be for private use by residents and will incorporate communal facilities and landscaping.

3.3.5 Shrimptons Creek

Shrimptons Creek will provide a mixture of riparian planting and recreation facilities that will be publicly accessible. A 20 metre riparian corridor, measured from the top of the creek bank, will be provided in accordance with the NSW Office of Water *Guidelines for riparian corridors on waterfront land*. In accordance with these guidelines, a shared pedestrian and cycle path will be provided within the Shrimptons Creek riparian corridor, with commensurate offset planting to be provided adjacent to the corridor if required. The primary, linear path parallel to the creek will provide an edge to a series of raingardens that will both treat stormwater runoff as well as provide a physical delineation between public and private space.

The corridor is an important landscape and recreational spine and connects the site to the Macquarie Centre and parklands. Rehabilitation works will be undertaken to improve the existing creek setting, as well as improvements to the Epping Road underpass and provision of new recreation facilities.

3.3.6 Epping Road Vegetation

The Epping Road bushland corridor will be maintained and protected, preserving the landscape character of the site and creating a buffer between Epping Road and the residential development.

3.3.7 Recreation and Play Facilities

A variety of recreation and play facilities will be provided throughout the site, with a focus on fostering social interactions and healthy activity. Opportunities for recreation and play for all ages is proposed, with play spaces designed to focus on nature, health and learning. Play spaces are all designed to benefit from co-location with other uses, such as the school, community centre and existing vegetation. The location of recreation and play spaces throughout the development is shown at **Figure 34**.

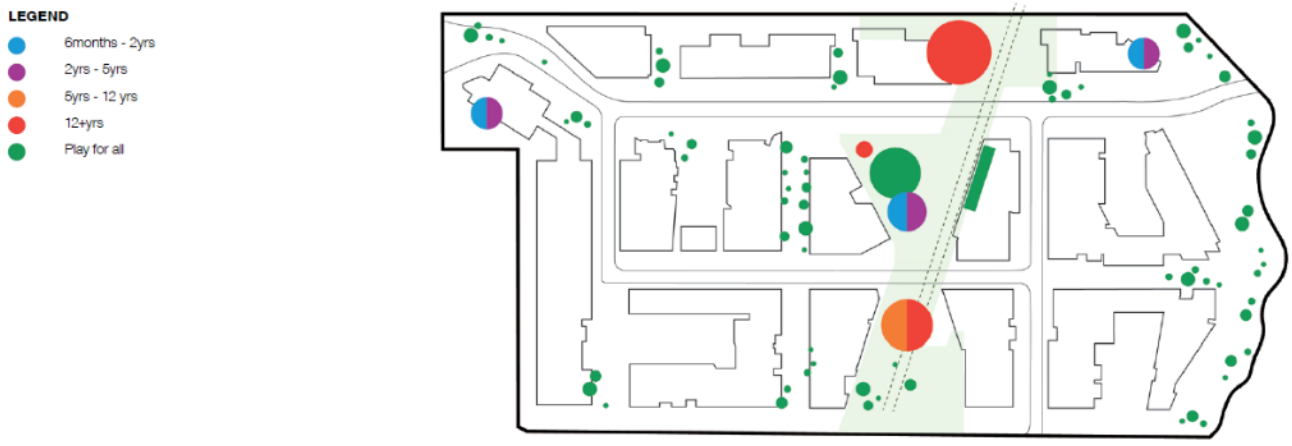


Figure 34 – Recreation and play facilities

Source: HASSELL

3.3.8 Street Design

A clear road hierarchy each with its own unique character has been established across the site to strengthen wayfinding, sense of place and function. Primary pedestrian streets, including the Main Street, Green Link and the Town Plaza provide the main north-south and east-west pedestrian and cycle connections through the site, as shown at **Figure 35**.

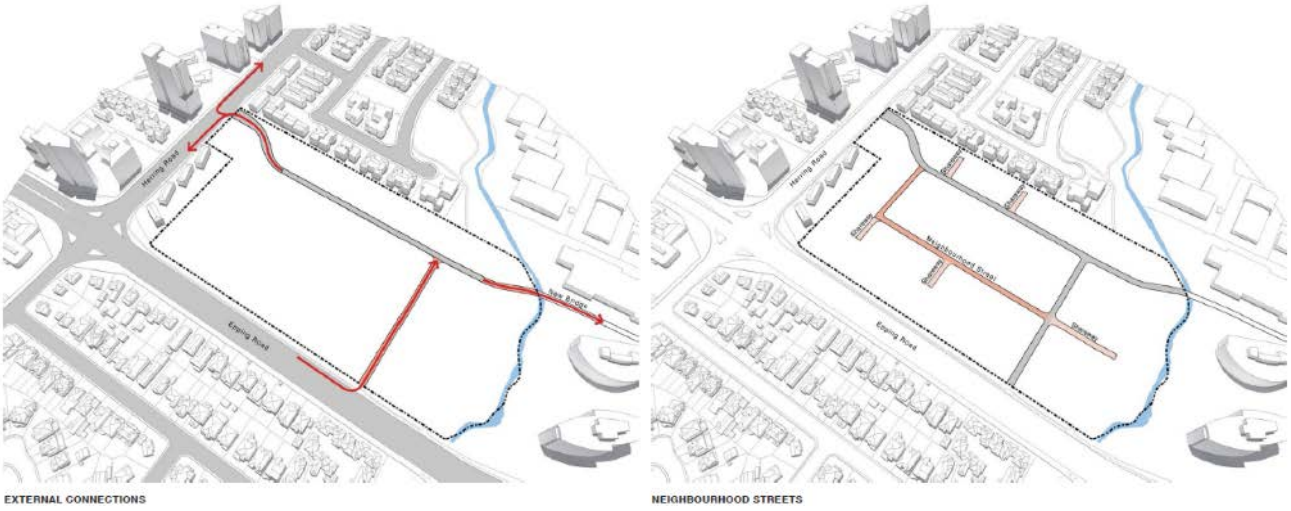


Figure 35 – Vehicular streets

Source: Bates Smart + HASSELL

Main Street

Main Street is the main north-south connecting road through the site, providing a connection to the wider Macquarie Park area. Main Street will also be the 'high street' of Ivanhoe, where retail, community and public open space are concentrated. Main Street will be designed to have a civic character, incorporating broad footpaths, large canopy trees, public seating and pedestrian crossings. Main Street accommodates two lanes for vehicles, on-street car parking on both sides of the street and a shared pedestrian and cycle path will run along the Main Street. A diagram illustrating the character of Main Street is shown at **Figure 36**.

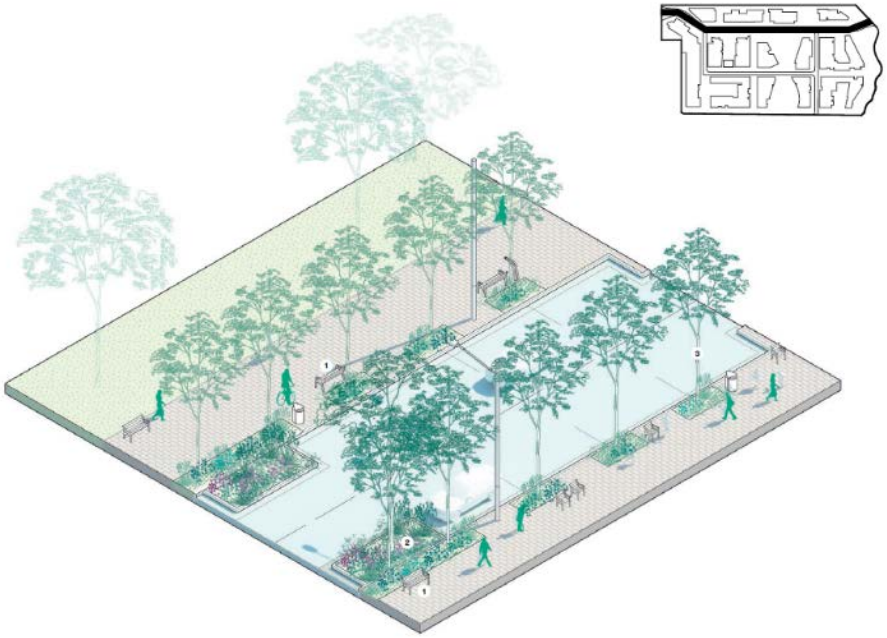


Figure 36 – Illustration of Main Street

Source: HASSELL

Neighbourhood Streets

Neighbourhood streets provide local access throughout the site for vehicles, pedestrians and cyclists. Neighbourhood streets comprise two lanes for vehicles, on-street car parking is limited to one side of the road and broad pathways on both sides for pedestrians. Street trees, planting and furniture will be used to frame the street and create a sense of place. A diagram illustrating the character of the neighbourhood streets is shown at **Figure 37**.

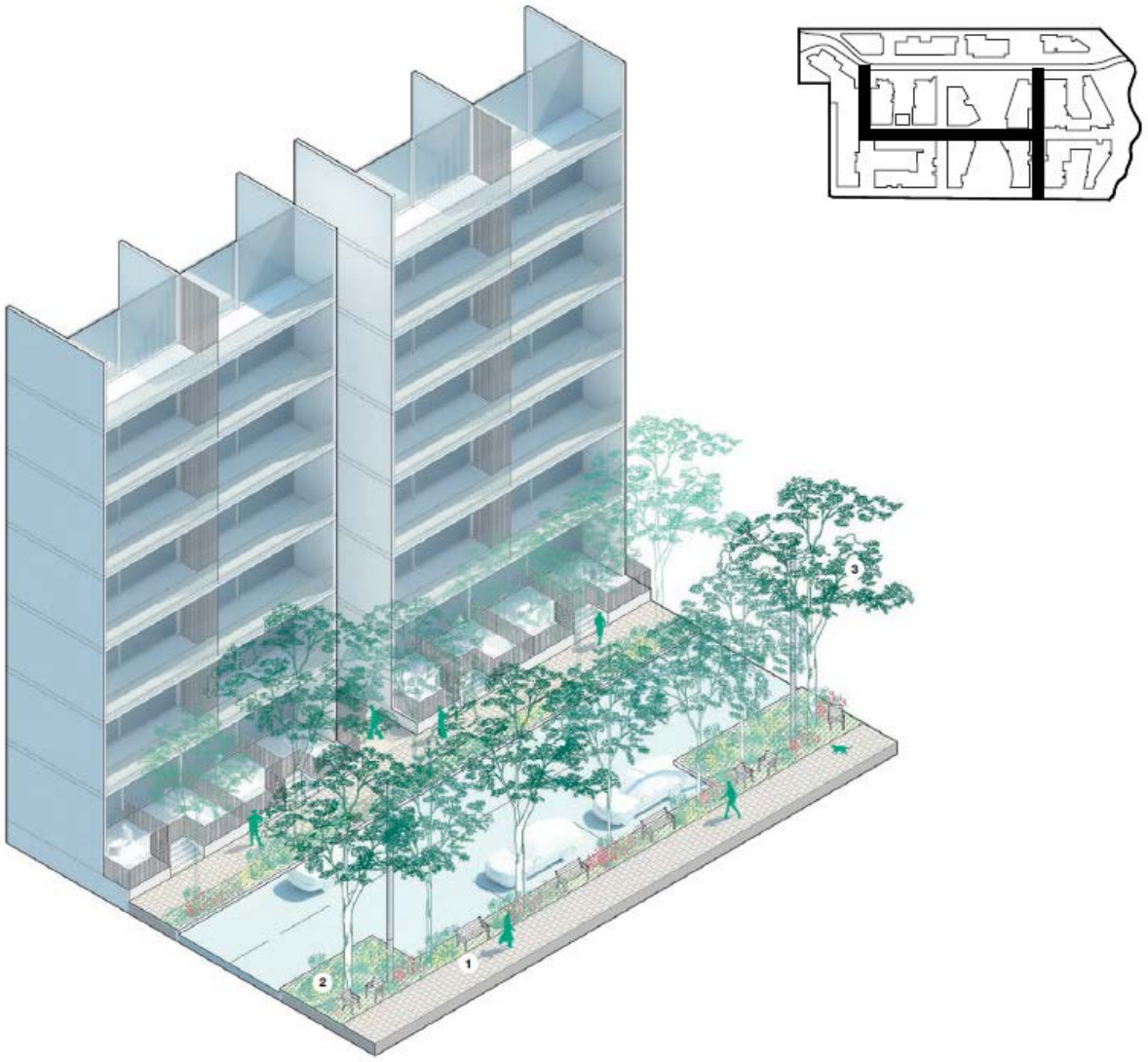


Figure 37 – Illustration of neighbourhood streets

Source: HASSELL

Neighbourhood Mews

Neighbourhood Mews are small scale plazas that provide driveway access to basement car parks and have been designed as shared use spaces to allow for recreation use, such as a kick-about space or neighbourhood gatherings. The Neighbourhood Mews will be a flush paved surface with tree planting and street furniture to minimise conflicts between vehicles and pedestrians. A diagram illustrating the character of the Neighbourhood Mews are shown at **Figure 38**.

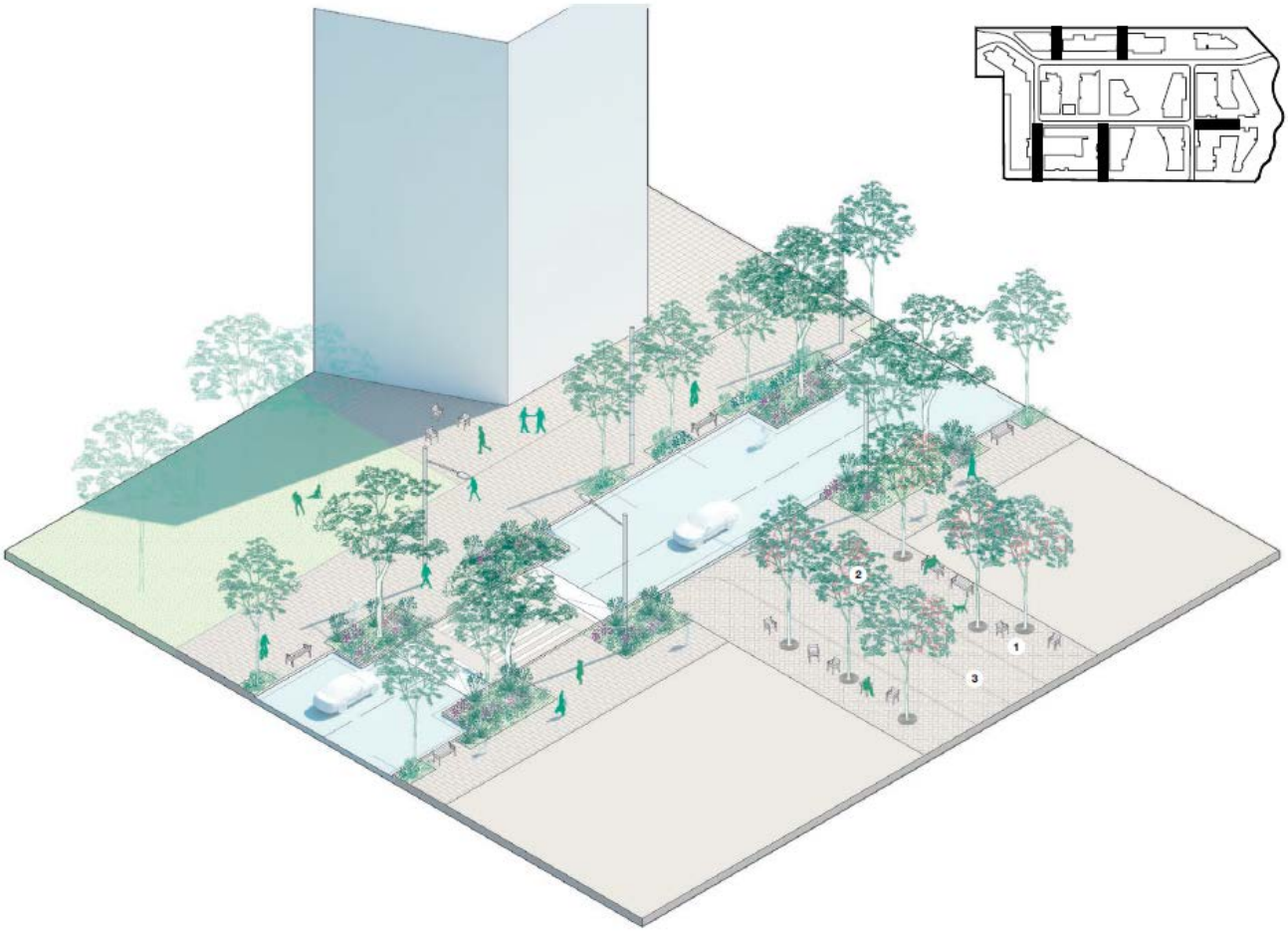


Figure 38 – Illustration of Neighbourhood Mews

Source: HASSELL

3.4 Public Art

A number of locations for public art are identified in the Public Domain Masterplan. Future public art works throughout the site may reference the environmental and cultural background of the site and there is an opportunity for a series of integrated art works or stand-alone pieces. **Figure 39** shows the locations that have been identified as appropriate for public art.

Figure 39 – Public art locations

Source: HASSELL

3.5 Access

Pedestrian and cyclist priority is paramount to the design of the Ivanhoe Estate, whilst local vehicle access has been designed to facilitate connectivity through the site. The design features a legible grid based street network with clear lines of sight connecting key uses and destinations including, the Main Street, Shrimptons Creek, Village Green, community facilities, surrounding precincts and parks.

Vehicle Access

The street network is designed according to the hierarchy of Main Street and Neighbourhood Streets to create a legible and comfortable street network. Main Street connects Ivanhoe to the wider Macquarie Park area, via a signalised intersection at Herring Road and across a new bridge and road extension to Lyonpark Road. Neighbourhood Streets are designed to be predominantly residential in nature and transition into Garden Mews, which are paved and landscaped spaces that will provide vehicle access to basement car parks. The street network is shown at **Figure 40**.

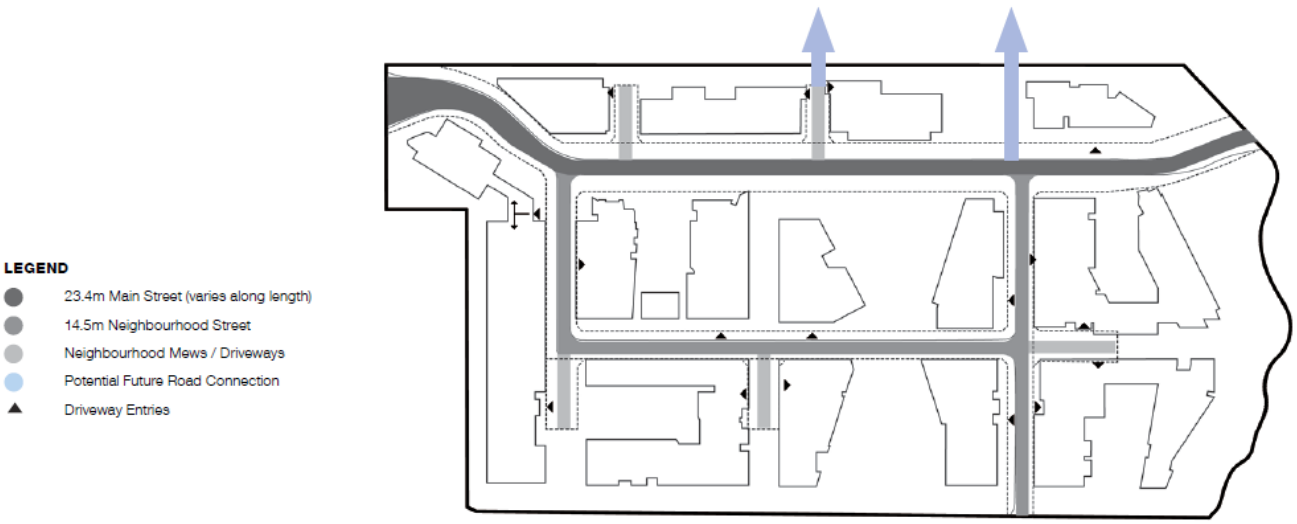


Figure 40 – Vehicle access

Source: Bates Smart + HASSELL

Pedestrian Access

The pedestrian network has been designed to create a walkable and safe street network, with primary pedestrian paths on streets designed to allow for passing wheelchairs and prams as well as streetscape planting and seating areas.

Circulation zones on both sides of Main Street are 4 metres wide, while Neighbourhood Streets are 1.8 or 2.4 metres wide. Neighbourhood Mews are designed to be shared spaces.

A range of pedestrian crossings will allow for safe movement across roads at intersections and adjacent to primary public spaces and buildings.

Pedestrian 'through-site links' are also provided throughout the open space network. A fully accessible path of travel is also available throughout the development, using a mix of on-street and open space connections. This accessible path connects all public spaces and facilities on the site. The pedestrian network is shown at **Figure 41**.

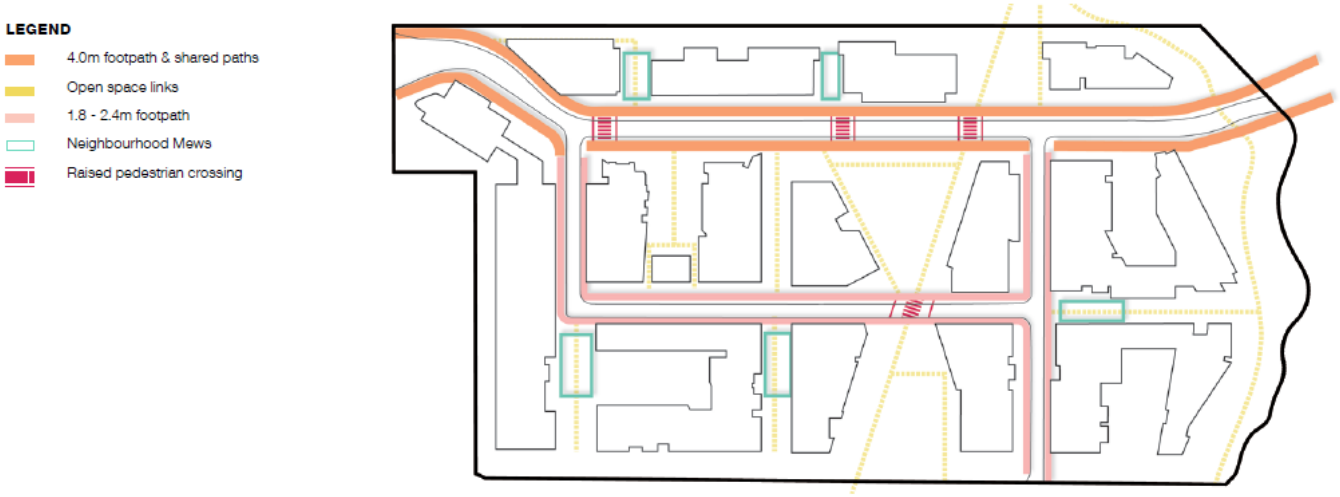


Figure 41 – Pedestrian access

Source: Bates Smart + HASSELL

Cycle Access

Cycle paths are provided throughout the development to connect to existing cycle paths in the Macquarie Park area. A shared path on Main Street is proposed as a local cycle link between Herring Road and both the existing shared path along Shrimptons Creek Trail and the cycle route on Lyonpark Road.

A secondary shared path is also proposed along the Green Link. This cycle path is primarily intended for use by children and other residents to connect the open spaces within the site. The cycle network is shown at **Figure 42**.

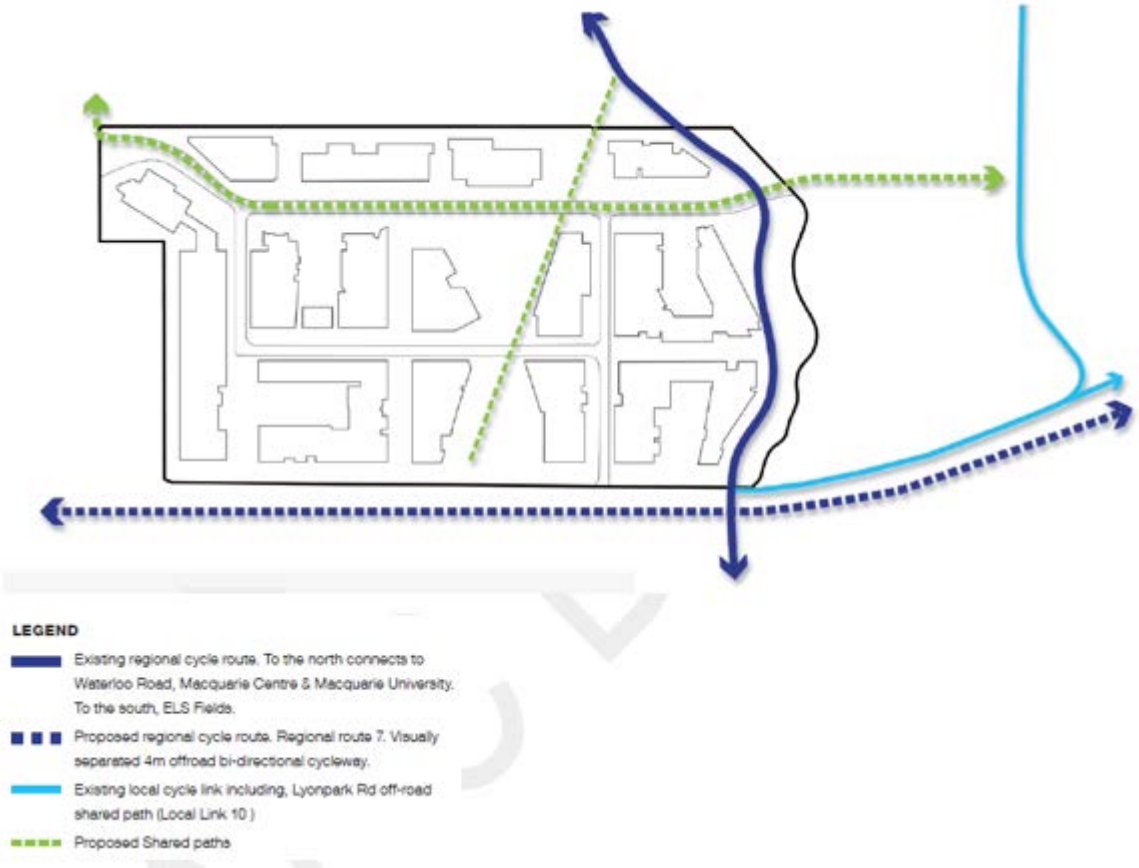


Figure 42 – Cycle access

3.6 Road and Intersection Upgrades

The proposed Masterplan includes a number of road and intersection upgrades to ensure that the site is accessible and to minimise traffic impacts on the surrounding road network. These upgrades are detailed below and in the Traffic and Transport report prepared by Ason Group at **Appendix M** and are shown in the Concept Engineering Plans prepared by ADW Johnson at **Appendix Z**.

Signalisation of intersection of Herring Road and Main Street

The intersection of Main Street (currently Ivanhoe Place) and Herring Road will be upgraded to a signalised intersection. It is noted that this upgrade will be undertaken by Roads and Maritime Services as part of its Macquarie Park Bus Priority and Capacity Improvements.

Road connection to Lyonpark Road

To facilitate vehicle movements through the site, a bridge will be built over Shrimptons Creek to connect Main Street to Lyon Park Road. As part of the construction of the road, the at-grade car parking at 2-4 Lyon Park Road will be reconfigured including access points, delivery and parking areas.

Left-in turn from Epping Road

A vehicle connection will be established on the Epping Road boundary of the site, allowing vehicles to turn left into the site from Epping Road.

3.7 Car and Bicycle Parking

This DA seeks approval for car parking rates for the future development generally in accordance with the Ryde DCP. Each future stage will be required to demonstrate the development complies with the maximum rates set out in **Table 4**.

Table 4 – Car Parking Rates

Use	Rate
1 Bedroom Dwellings	0.6
2 Bedroom Dwellings	0.9
3 Bedroom Dwellings	1.4
Visitors	1 per 20
Car share	1 per 100 and minimum of 50
Residential care facility	1 per 10 beds + 1 space per 2 employees
Independent living units	1 per 5 dwellings
Retail	1 per 100sqm max.
Commercial	1 per 100sqm max.
Child care	1 space per 8 children & 1 space per 2 employees
School	30 max.
Bicycle parking	1 per dwelling

3.8 Site Preparation

Site preparation works will be subject to separate approvals. Demolition of existing buildings and associated tree removal on the site will be undertaken by Land and Housing Corporation, subject to a separate planning process.

Other site preparation activities, such as tree removal, remediation (as required), excavation and construction of roads will be detailed in the future Stage 1 application.

3.9 Adaptable Housing

5% of all private residential dwellings will be adaptable apartments.

All social dwellings will be designed to Land and Housing Corporation's standards, which requires Silver Level Livable Housing Design Guidelines requirements to be met.

3.10 Ecologically Sustainable Development

Ivanhoe Estate seeks to achieve the following three key sustainability targets:

- 5 Star Green Star Design and As Built v1.1.
- 6 Star Green Star Communities v1.
- Deliver a private embedded electrical and hot water network, referred to as 'Real Utilities'.

A Sustainability Report prepared by Frasers Property Australia is attached at **Appendix N** and details a range of initiative to achieve these targets.

3.11 Water Cycle Management

A Stormwater and Drainage Assessment has been prepared by ADW Johnson (refer to **Appendix F**) to detail the proposed stormwater management measures, including the implementation of Water Sensitive Urban Design (WSUD). The proposed water cycle management measures have been developed in accordance with the Ryde Development Control Plan 2014, the Ryde Stormwater Management Technical Manual and Water Sensitive Urban Design Guideline. A Concept Stormwater Drainage Plan has been prepared, noting that future detail relating to pits, pipes and overland flow paths would be provided prior to the commencement of work on the site.

The Concept Stormwater Drainage Plan is separated into an on-lot private system and on-street public system. The private system is designed to capture runoff from the lots and private access roads within the site, whilst the public system has been designed to capture runoff generated by public areas. All stormwater flows will be conveyed to discharge at Shrimptons Creek.

The Concept Stormwater Drainage Plan also includes rainwater tanks for each building to capture stormwater for reuse on landscaping and car washing. This water reuse will result in a reduction of potable water demand.

The private system will capture and attenuate flows generated by the private lots before discharging to the public system. The private stormwater drainage system consists of the following elements:

- Rainwater tanks.
- On-site detention tanks.
- Surface drainage.

The public system will consist of the following elements:

- Pit and pipe drainage system.
- Overland flow paths.

As adjoining sites currently drain into the stormwater infrastructure in Ivanhoe Place, the future detailed design of the stormwater infrastructure will ensure that these sites continue to be appropriately drained.

Stormwater Quantity

Using the XP-RAFTS software, an on-site detention model was created using a combination of rainwater tanks and designated detention tanks to adequately attenuate peak flows.

The drainage system to be provided on the site will cater for runoff generated from all storm events up to and including the 20 year ARI storm event. The road network and dedicated overland flow paths will be provided to safely convey flows which exceed the capacity of the drainage network during the 20 year ARI storm event up to the 100 year ARI storm event.

Onsite detention will ensure that peak discharge in the post-developed 100 year ARI storm event does not exceed the peak discharge in the post-developed 5 year ARI storm event.

Stormwater Quality

A water quality model was created in the MUSIC software to determine the required water quality treatment measures to meet the City of Ryde's water quality targets. The stormwater treatment objectives for the development are:

- **Gross pollutants:** 90% retention of the average annual load for particles and suspended solids.
- **Suspended solids:** 85% retention of the average annual load for particles and suspended solids.
- **Total phosphorus**: 65% retention of average annual pollutant load.
- **Total nitrogen**: 45% retention of average annual pollutant load.

It is proposed to use a combination of at-source and conveyance controls to treat the runoff prior from the private system prior to it entering the public system. The following devices are proposed within the development to achieve the required targets:

- **Rainwater tanks**: to be provided within each building to capture and store runoff generated from the roof for reuse.
- **Gross pollutant traps**: to be provided in all grated surface inlet pits.
- **Media filtration**: comprised of bio-filtration rain gardens within landscaped areas and "Stormfilter" filtration devices within on-site detention tanks.

An Erosion and Sediment Control Plan was also developed to ensure that runoff during construction would be adequately treated prior to entering the downstream receiving waters. Measures to be implemented include:

- Temporary detention basin,
- Sediment and silt fencing.
- Installation of diversion drain.
- Creation of a temporary swale.
- Gravel, sand bags and straw bales use throughout.

Concept Engineering Plans are provided at **Appendix Z.** This plan will be continually updated during future stages of development.

Water Licensing Requirements and Other Approvals

Potable water for use within the site will be provided via the existing Sydney Water mains, with this being supplemented for reuse within buildings. No other permanent water sources are proposed and therefore an ongoing water license is not required.

Any water licensing requirements for dewatering during construction will be sought prior to the commencement of the relevant works.

Works within the Shrimptons Creek riparian corridor may require a Controlled Activity Approval from the NSW Office of Water. Where required, a Controlled Activity Approval would be obtained prior to the commencement of the relevant works.

3.12 Waste Management

A Waste Management Plan (WMP) has been prepared by Elephants Foot Recycling Solutions and is provided at **Appendix O**. The WMP sets out the framework for waste collection within the Ivanhoe site. The WMP seeks to ensure that waste is recovered, reused and recycled where possible to minimise the amount of waste and recyclables to land fill and that all relevant codes and policies are complied with.

In developing the WMP, Elephants Foot Recycling Solutions considered the proposed uses and the number of residential dwellings accommodated at the site and quantified the likely waste generated by each use. The WMP contains a detailed estimation of the amount of waste and recycling to be generated on the site and recommended options for disposal.

As outlined in the WMP, each of the buildings will be fitted with garbage chutes and spaces for separating and storing waste within a main waste area. A room will also be allocated in each of the residential buildings for temporary storage of bulky goods.

Residential waste will be transported to bin holding areas by building managers for collection by Council's waste collection service. Retail and other non-residential waste will be collected by a private waste contractor.

3.13 Utilities

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 Supply

New water mains will be installed on the site and will connect to the existing water main on Herring Road. As part of the new internal potable water network, a series of hydrants and boosters will be provided. Consultation with Sydney Water has concluded that there is capacity within the existing trunk potable water network to service the proposed development.

Sewerage

New sewerage mains will be installed on the site and will connected to the existing main adjacent to Shrimptons Creek. Consultation with Sydney Water has concluded that there is capacity within the existing trunk sewerage network to service the proposed development.

Electricity

Consultation with Ausgrid has concluded that the existing electricity network surrounding the site cannot support the load generated by the proposed development. The electricity network will be upgraded as part of the proposed development by providing a new high voltage network, including mini chamber substations, to be installed throughout the site. These mini chamber substations will feed a low voltage supply to the proposed dwellings and street light network. The new high voltage network will connect to the surrounding electricity network through the provision of three new high voltage feeders.

Telecommunications

Internal telecommunications infrastructure will be located within the public road verges or basements and the site is capable of being connected to existing telecommunications services by a number of providers, including NBNCo and OptiComm.

Gas

The site will be connected to the existing gas main in Herring Road, subject to further consultation with Jemena. A secondary gas main will be provided within the site that will connect to the internal reticulation network.

‘Real Utilities’

As described in **Section 3.10** above, a private embedded electrical and hot water network will be developed to supply all users across the precinct. This service will operate in addition to the services described above and will facilitate the achievement of Green Star ratings and sustainability targets across the site.

3.14 Indicative Development Staging

The future development of the site will occur in a staged manner over a 10-15 year period. An indicative staging plan is provided at **Figure 43**. Housing tenures will 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.

Figure 43 – Indicative Staging Plan

Source: Bates Smart

4.0 Consultation

In accordance with the SEARs issued for this project, consultation was undertaken with relevant public authorities, the community and Council.

A summary of the consultation undertaken to-date with Council, the community and relevant agencies is provided in the Consultation Outcomes Report is included at **Appendix P** and in the tables below. Several consultants have undertaken additional consultation with relevant parties during the preparation of their reports.

4.1 SEARs Consultation

As part of the SEARs received for the project, a number of key public authorities provided comment and requested various inputs be provided as part of the EIS documentation. **Table 5** outlines the key issues raised and outlines the responses provided as part of the EIS documentation.

Table 5 - Summary of Issues Raised and Response

Key Issue	Response
City of Ryde Council	
Built Form and Urban Design achieving excellence	To guide the future design and assist with the development assessment process, the Concept SSD DA seeks to introduce a set of site specific Design Guidelines. The Concept SSD DA in conjunction with the Design Guidelines will ensure a high quality architectural and urban design outcome is achieved to promote design excellence. Refer to Section 3.2 and Appendix L
Public Domain and Public Space to support the future community and its recreation needs	A Public Domain Concept has been prepared by Hassell. The Public Domain Concept translates the public domain vision embodied in the Masterplan into a concept intended to inform the detailed design of the future public domain within the site, including the size, location and design of roads and open space. A range of publicly accessible open space will be provided across the Ivanhoe Estate, from urban plazas and village greens to shared courtyards and the riparian corridor. Refer to Section 3.3 and Appendix B.
Transport, Traffic and Access	A Traffic and Transport Report has been prepared by Ason Group to consider the traffic impacts of the proposed Masterplan. The Traffic and Transport report includes a detailed summary of existing transport patterns in Macquarie Park, including an analysis of public transport, vehicle and active transport infrastructure provision and estimated daily movements. Refer to Section 5.7 and Appendix M.
Social Impact	A Social Impact Assessment has been prepared by Elton Consulting to consider the social impacts of the Concept Masterplan. Refer to Section 5.8 and Appendix W.
Ecologically Sustainable to realise the opportunities presented for water and energy use minimisation	The Ivanhoe Sustainability Report has been prepared by Frasers to explore a range of sustainability strategies, and outline examples of best practice sustainable building principles that can be implemented through the delivery of the Masterplan. A key outcome of the redevelopment of

Key Issue	Response
	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. Refer to Section 5.9 and Appendix N.
Flood management	The site is bound by Shrimptons Creek to the south and is located in the catchment area of this creek. Accordingly, BMT WBM have prepared a Flood Impact Assessment to investigate the flood behaviour within the vicinity of the site and the impacts of the proposed development on this flood behaviour, including stormwater runoff, flows within the underground pipe drainage network, and flows within the Shrimptons Creek corridor. Refer to Section 5.13 and Appendix I.
Heritage interpretation	There are no known heritage or archaeological items that are listed on the State Heritage Register or under the *Ryde Local Environmental Plan 2014* located on the site. An Aboriginal and Historical Heritage Due Diligence Assessment has been undertaken by Eco Logical Australia and found that there are no Aboriginal or historical heritage items located on the site. Refer to Section 5.14 and Appendix J.
Consultation with the Ryde community	Community information and feedback sessions were held on Wednesday 29 November and 5 December 2017 to provide the local community with the opportunity to meet the project team, ask questions and have input into the master plan for Ivanhoe. An outcomes report prepared by Elton Consulting summarises the major themes raised during the information sessions. Refer to Appendix P.
Roads and Maritime Services	
The applicant is proposing to have a left-out entry onto Epping Road and signalising the intersection of Epping Road and Lyon Park Road. These proposals may not be implemented due to the existing constraints and safety concerns. Therefore, the modelling should include at least one future scenario without these proposals.	A left-out exit onto Epping Road and the signalisation of Epping and Lyonpark Road are not proposed. Refer to Section 5.7 and Appendix M.
A detailed analysis of the following intersections needs to be undertaken to identify any required mitigation measures: - Lyon Park Road / Epping Road - Herring Road / Ivanhoe Place - Herring Road / Epping Road - Herring Road / Waterloo Road - Waterloo Road / Byfield Street	A detailed assessment of the existing and future safety and performance of key intersections has been undertaken based on traffic volume data used by Transport for NSW for the Waterloo Road temporary bus shutdown network planning from 2016. The assessment includes results for both the post-development scenario, as well as when surrounding road upgrades to be undertaken by RMS are completed. Refer to Section 5.7 and Appendix M.
Intersection of Herring Road and Ivanhoe Place needs to be signalised	The proposed Masterplan will include works to signalise the intersection of Herring Road and Ivanhoe Place. Refer to Section 5.7 and Appendix M.

Key Issue	Response
Recommendation for a U-turn facility on Ivanhoe Place be incorporated into the development of Ivanhoe Estate to maintain local access on the western side of Herring Road	The proposed road network provides for a U-Turn facility via the street network which will assist local traffic exiting the western side of Herring Road. Vehicles (including service vehicles) are able to circulate through the road network and exit southbound on Herring Road. Refer to Appendix M.
Transport for NSW (CBD Coordination Office)	
Recommendation for a U-turn facility on Ivanhoe Place be incorporated into the development of Ivanhoe Estate to maintain local access on the western side of Herring Road	The proposed road network provides for a U-Turn facility via the street network which will assist local traffic exiting the western side of Herring Road. Vehicles (including service vehicles) are able to circulate through the road network and exit southbound on Herring Road. Refer to Appendix M.
NSW Office of Environment and Heritage	
Biodiversity	The proposed Masterplan seeks to maximise the retention of existing native vegetation on the site, including portions of the protected Sydney Turpentine-Ironbark Forest. Where impacts on vegetation are unavoidable, 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. The required biodiversity offsets will be retired in a staged manner, commensurate to the area of impacts. Refer to Section 5.11 and Appendix E.
Aboriginal Cultural Heritage	An Aboriginal and Historical Heritage Due Diligence Assessment has been undertaken by Eco Logical Australia and found that there are no Aboriginal or historical heritage items located on the site. Refer to Section 5.14 and Appendix J.
NSW Environment Protection Authority	
Soil and groundwater contamination.	Refer to Section 5.15 and Appendix H.
Air quality, especially dust emissions during demolition, site preparation, bulk earthworks and construction.	Future detailed applications will demonstrate that air quality impacts associated with demolition works can be appropriately mitigated during construction.
Noise and vibration from demolition, site preparation, bulk earthworks and construction.	Refer to Section 5.20 and Appendix S.
Water quality impacts, especially on Shrimptons Creek.	Refer to Section 3.11 and Appendix F.
Waste management in the context of the waste management hierarchy.	Refer to Section 3.12 and Appendix O.
Soil erosion and sedimentation particularly from demolition, site preparation, bulk earthworks and construction.	Refer to Section 3.11 and Appendix Z.
Energy and water conservation, including water reuse opportunities and water sensitive urban design.	Refer to Section 3.11 And Appendix F.
NSW Department of Primary Industries – Office of Water	
Prepare a Stormwater, Groundwater and Drainage Assessment including modelling , contour maps and methodologies , to assess the impacts of the proposal on surface and groundwater hydrology and quality .	Refer to Stormwater and Drainage Assessment at Appendix F, Geotechnical Assessment at Appendix G, Section 5.12 and 5.19.

Key Issue	Response
Detail erosion, sediment and stormwater management controls during construction and management and mitigation measures for the prevention of potential water quality impacts during construction .	Refer to Stormwater and Drainage Assessment at Appendix F and Section 5.12.
Identify appropriate water quality management measures focussing on the management of the impacts from the proposed works, including new road crossing, on Shrimptons Creek and water courses, riparian corridors and groundwater dependent systems located in the vicinity of Shrimptons Creek.	Refer to Stormwater and Drainage Assessment at Appendix F, Section 3.11 and Section 5.12.
Identify any water licencing requirements or other approvals required under the Water Act 1912 or Water Management Act 2000.	Refer to Section 3.11.
Prepare an Integrated Water Management Plan /drainage concept. This should include stormwater and wastewater management, including any re use and disposal requirements, demonstration of water sensitive urban design and any water conservation measures.	Refer to Stormwater and Drainage Assessment at Appendix F and Section 3.11.
Provide details of adequate and secure water supply for the life of the project including cumulative impacts on water resources, consideration of alternative water supply arrangements, water sensitive urban design and water conservation measures.	Refer to Stormwater and Drainage Assessment at Appendix F, Section 3.11 and Section 3.13.
NSW Police	
Police request that a detailed CPTED report be included in all stages of the development application.	Detailed CPTED Reports to be included in all stages of the development. Refer to Section 5.10 and Appendix X.
In large residential unit complexes theft from mail boxes within the Sydney Metropolitan Area is a growing concern that can lead to fraud and identity theft. Police request that the design of the mail boxes in unit complexes are to be designed in such a way that the mail can be placed into letter boxes from outside of the building however the mail can only be accessed by the residents from within a secure mail room inside a secure building with access to residents only.	Future detailed applications will demonstrate that mail boxes will be appropriately secured. Section 5.10 and Appendix X.
Police request that all buildings have CCTV installed both internally and externally around the buildings.	Future detailed applications will demonstrate that CCTV will be strategically positioned to provide a safe environment. Section 5.10 and Appendix X.
Fire and Rescue NSW	
Brigade Access on Roads	Future detailed applications will address requirements of Fire and Rescue NSW.
Fire Brigade Booster Locations	Future detailed applications will address requirements of Fire and Rescue NSW.
Location of Fire Control Centres	Future detailed applications will address requirements of Fire and Rescue NSW.

Consultation with nominated agencies and community groups occurred between October 2017 and February 2018, 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, multiple stakeholders confirmed they did not require additional meetings. **Table 6** outlines the consultation carried out prior to the lodgement of the SSD DA.

Table 6 – Consultation carried out prior to lodgement

Public Authority / Agency / Stakeholder	Invitation sent	Meeting accepted
City of Ryde Council	✓	✓
Roads and Maritime Services	✓	✓
CBD Coordination Office within Transport for NSW	✓	✓

Public Authority / Agency / Stakeholder	Invitation sent	Meeting accepted
NSW Office of Environment and Heritage	✓	✓
NSW Department of Education	✓	✓ *Note: Department of Education agreed to meet but deemed that meeting was not necessary until a school provider is secured.
NSW Environment Protection Authority	✓	x
NSW Department of Primary Industries – Office of Water	✓	x
Sydney Trains	✓	x
NSW Police	✓	✓
NSW Ambulance Service	✓	TBC
Fire and Rescue NSW	✓	✓
Macquarie Connect	✓	✓
Appropriate social service organisations	✓	✓
Neighbouring residents and the local community	✓	✓

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.

4.3 Communications Strategy

The strategy for communications and engagement across all stages of the development, include:

- Prior to lodgement of the SSD DA.
- During exhibition of the SSD DA.
- During early works and construction.
- Occupation.

A variety of communications and engagement techniques will be implemented to ensure there is appropriate and diverse engagement with stakeholders. This includes:

- Project webpage.
- Project newsletter.
- Stakeholder workshops.
- Information sessions with former residents.
- Community drop-in sessions.
- Preparation of communications collateral, including fact sheets, advertisements and media releases.
- Social media strategy.
- Project phone line to provide a response to community enquiries.
- Project email address to receive queries, feedback and comment.
- Establish a communications database to record enquiries.
- Report and evaluate on effectiveness of communication and engagement techniques.

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**.

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

Instrument/Strategy	Comments
Strategic Plans	
NSW Premier's Priorities	The NSW *Premier's Priorities* represent 12 of the key policy priorities for the NSW State Government. The proposed Ivanhoe Estate Concept SSD DA is consistent with the following priorities: • **Making housing more affordable**: The proposal will deliver 128 affordable housing dwellings and approximately 1,000 social dwellings, which significantly increases the amount of affordable and social housing currently on the site. The increased supply of private dwellings will also contribute to the overall supply of housing in the growing Macquarie Park area and Greater Sydney. • **Keeping our environment clean**: Ivanhoe Estate will target a 6 Star Green Star Communities rating and 5 Star Green Star v1.1 for all buildings and will incorporate a range of environmental and sustainability measures with the aim of being carbon neutral in operation. These measures include photovoltaic solar power and water recycling plants. The development will also involve the rehabilitation of Shrimptons Creek. The proposed redevelopment of the Ivanhoe Estate will also support a number of the other Premier's Priorities that relate to improved social outcomes, including: • **Improving education results:** The provision of a high school at Ivanhoe Estate will create education opportunities fo residents of the site and the surrounding area, reducing pressure on existing schools in the area. • **Tackling childhood obesity:** The Masterplan has been designed to incorporate a variety of active and passive recreation spaces so that future residents of the site are encouraged to spend time outdoors, as well as benefit from walking and cycling connections to nearby transport and services.
A Plan for Growing Sydney	A Plan for Growing Sydney is the strategic vision for Sydney's metropolitan area over the next 20 years. The Plan anticipates that the population of Sydney will increase by 1.6 million people over the next 20 years and sets out housing and jobs targets. The Plan aims to locate new residential development to give people a choice of housing that is more affordable and to enable them to work closer to where they live. It encourages balanced growth by stimulating housing growth in both infill and greenfield area and aims to make the best use of transport and infrastructure, making Sydney more sustainable and efficient. In planning for balanced growth, the Plan focuses urban renewal in areas surrounding existing centres, transport hubs and corridors, and green spaces. The proposed Masterplan supports a number of key goals, directions, action and priorities established by the Plan, as follows: **Goal 1: A competitive economy with world class services and transport** • The Masterplan locates residential dwellings within the strategic centre of Macquarie Park, allowing residents to benefit from nearby employment opportunities and public transport connections. • The Masterplan provides for a new high school and will provide access to education in an identified urban renewal area, and will also benefit from close proximity to Macquarie University. **Goal 2: A city of housing choice, with homes that meet our needs and lifestyles.**

Instrument/Strategy	Comments
	• The Masterplan will provide approximately 3,500 dwellings (subject to future Development Applications and design development), which will accelerate housing supply in the Macquarie Park area as well as contribute to the supply of affordable and social housing. • The Masterplan will provide dwellings in close proximity to the employment centre of Macquarie Park and public transport connections to other centres. **Goal 3: A great place to live with communities that are strong, healthy and well connected** • The Masterplan incorporates a comprehensive green space network across the site, which connects to the existing Shrimptons Creek corridor. • The Masterplan incorporates a range of passive and active recreation spaces to encourage outdoor activities and to facilitate walking and cycling connections to the surrounding area. **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 Masterplan seeks to maintain and protect the existing native vegetation on the site and will rehabilitate the existing Shrimptons Creek vegetation corridor. • The Masterplan seeks to achieve a 6 Star Green Star Communities rating through the use of sustainability and environmentally-friendly measures, such as solar power and water recycling.
Towards Our Greater Sydney 2056	Towards Our Greater Sydney 2056 is a draft amendment to update A Plan for Growing Sydney and was released in November 2016. The primary aim of the amendment is 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 proposed Masterplan 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. The Masterplan also places a strong emphasis on lifestyle, providing open space and recreation facilities throughout the site as well as connections to existing open space in the surrounding area. Sustainability measures incorporated throughout the development, including solar power and recycled water facilities, will contribute to the creation of a sustainable built environment.
Draft Greater Sydney Region Plan	The Draft Greater Sydney Region Plan was released by the Greater Sydney Commission in October 2017 and outline the strategic vision for Sydney to 2056, conceptualising the metropolitan region as the Eastern Harbour City, Central River City and the Western Parkland City. Ivanhoe Estate is located in the Eastern Harbour City, which is focussed on leveraging its strong financial, professional, health and education sectors. Macquarie Park maintains its role as a strategic centre and health and education precinct, as well as a Priority Growth Area. The proposal is consistent with this strategic direction for Macquarie Park, providing residential dwellings and supporting recreation and community facilities in close proximity to the employment opportunities and public transport of Macquarie Park. The Draft Greater Sydney Region Plan sets 10 directions for delivering and monitoring the plan, supported by 40 objectives. The proposed development is consistent with a number of these directions, as outlined below:  **A city supported by infrastructure** • The Masterplan benefits from existing and planned public transport infrastructure, particularly the existing train service from Macquarie University Station and the future Sydney Metro. • Community infrastructure will be delivered on site as part of the proposed Masterplan, as well as contributions made to improving community infrastructure in the surrounding area. • The site is able to be serviced by key utilities. .  **A collaborative city** • The proposed Masterplan has been developed on behalf of the NSW Land and Housing Corporation, to support the objectives of the NSW Department of Families and Communities 'Future Directions for Social Housing in NSW'. • The proposed Masterplan is consistent with the strategic vision for the area as set out by the Department of Planning and Environment in *A Plan for Growing Sydney* and the Greater Sydney Commission in the *Greater Sydney Region Plan*. • The proposed Masterplan has been developed with input from the City of Ryde to ensure an appropriate local outcome is achieved.

Instrument/Strategy	Comments
	 **A city for people** • The proposed Masterplan incorporates a range of services and infrastructure to ensure that all future members of the community have access to appropriate support, services and amenities. • The proposed Masterplan is designed to facilitate social interactions, active transport and exercise in a range of open spaces and community facilities. • The future community will be comprised of a diverse range of people of different ages, socio-economic status and backgrounds.  **Housing the city** • The proposed Masterplan will provide approximately 3,500 dwellings (subject to future Development Applications and design development). • Approximately 1,000 social dwellings and 128 affordable housing dwellings will be provided.  **A city of great places** • The site is within the Macquarie Park centre, where significant employment opportunities, retail, education and entertainment are concentrated. • Residents benefit from a range of open spaces in walking distance, including open space to be provided on the site as well as Wilga Reserve and ELS Hall Park.  **A well connected city** • The proposed Masterplan delivers a significant amount of new dwellings within 500 metres of the Macquarie University Station and bus services. • The site is located within one of Sydney's largest strategic centres with immediate access to employment, as well as access to other strategic centres within 30 minutes by public transport.  **Jobs and skills for the city** • The Masterplan includes a high school, which may benefit from co-location with Macquarie University to provide education and increase skills training. • Programs aimed at skills training and increasing employment may be implemented by Mission Australia Housing and future community housing providers on the site.  **A city in its landscape** • The Masterplan seeks to retain existing vegetation where possible, including the Sydney Turpentine-Ironbark Forest and vegetation along Shrimptons Creek. • New landscaping and deep soil planting will be provided throughout the site to contribute to the landscape character of the area and increased the urban tree canopy. • A range of public open spaces will be provided throughout the site to facilitate active and passive recreation as well as walking and cycling links.  **An efficient city** • The Masterplan targets a 5 Star Green Star v1 rating for all buildings, and a 6 Star Green Star Communities rating for the precinct. • Photovoltaic panels will be used to generate energy on the site. • The Masterplan will aim to be carbon neutral in operation.  **A resilient city** • The proposed Masterplan has sought to minimise exposure to natural hazards by ensuring that future development is not affected by flooding. • The environmental initiatives implemented throughout the development will contribute to enhanced environmental outcomes and seek to mitigate impacts related to climate change.

Instrument/Strategy	Comments
Draft North District Plan	In November 2016, the Greater Sydney Commission released the Draft North District Plan. The Draft 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. An update to this District Plan was released in October 2017, and is known as the revised Draft North District Plan. The revised Draft North District Plan sets a number of 'Planning Priorities' that are linked to the Greater Sydney Region Plan. The proposed Concept Masterplan is consistent with a number of these priorities, as follows: • **Infrastructure and collaboration:** The Ivanhoe Estate Masterplan locates additional residential density in an area that is adequately serviced and benefits from close proximity to public transport and road infrastructure. • **Liveability:** The Masterplan provides social, affordable and private housing in a new community that is well-connected to transport and employment opportunities, and that maintains the existing bushland character of the area and provides additional open spaces to promote active lifestyles. • **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. This work will include rehabilitation of Shrimptons Creek and connections to Wilga Reserve and ELS Hall Park. The proposal targets a 6 Star Green Star Communities rating, which will be achieved through the use of solar power, water recycling and other sustainability measures. The draft Plan identifies Macquarie Park as a health and education precinct and Priority Precinct, and it will be a Collaboration Area. Collaboration Areas are identified as areas where a significant productivity, liveability or sustainability outcome is achieved through the collaboration of different levels of government and, in some cases, the private sector or landowners. The Macquarie Park Collaboration Area will give consideration to: • Enabling additional capacity for commercial floor space to maintain a commercial core. • Improving urban amenity as the centre transitions from business park to a vibrant commercial centre, including reducing the impact of vehicle movements on pedestrian and cyclist accessibility. • Delivering a finer grain road network to enhance pedestrian connections and provide new access points. • Promote design excellence in urban design by upgrading public areas. • Delivering an innovation ecosystem in Macquarie Park, capitalising on the relationship with Macquarie University and nearby high-tech and medical corporations. • Improve public transport connections to Parramatta and the District's other strategic centres, including the Northern Beaches Hospital. In addition to this, the Macquarie Park Strategic Centre is identified as the third largest centre for employment in Greater Sydney behind the Sydney CBD and Greater Parramatta. By 2036, Macquarie Park is projected to deliver between 73,000 and 79,000 jobs. The Ivanhoe Estate is specifically identified in the Plan as being a Collaboration Area led by Land and Housing Corporation will bring together State agencies to lead housing initiatives and provide an integrated community including social housing. Where applicable, the Concept Masterplan is consistent with these considerations as it seeks to improve the urban amenity of the site through a high quality public domain that incorporates open space for active and passive recreation, as well as walking and cycling connections to the surrounding area. The proposed redevelopment of the site will support other identified objectives of the Collaboration Area by supplying housing, including social housing, in a location that has good access to jobs and transport.
State Legislation	
EP&A Act	The proposed development is consistent with the objects of the EP&A Act for the following reasons: • The Masterplan will support the delivery of increased affordable, social and private dwellings for the social and economic welfare of the community. • The Masterplan has been designed to ensure that it responds to the character of the site and the surrounding area. • The site is can be serviced by communication and utility services. • The Masterplan will accommodate a range of community services and facilities for the benefit of future residents. • The Masterplan seeks to protect and maintain native vegetation where possible.

<table>
<tr><th>Instrument/Strategy</th><th>Comments</th></tr>
<tr><td></td><td>

The Masterplan incorporates a range of sustainability targets and measures.
128 affordable housing dwellings and approximately 1,000 social housing dwellings are provided.

The proposed development is consistent with Part 4 Division 4.7 of the EP&A Act, particularly for the following reasons:

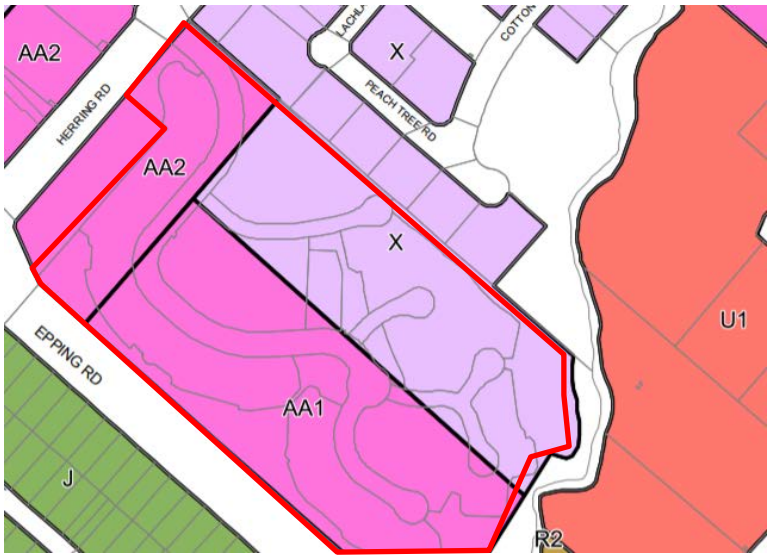
the development has been declared to have state significance;
the development is not prohibited by an environmental planning instrument; and
the development has been evaluated and assessed against the relevant heads of consideration under section 4.15.

In accordance with section 4.22 of the EP&A Act, this application is a concept development application that sets out the concept proposal for the site and separate parts of the site will be the subject of subsequent development applications. In accordance with section 4.22(5), this application considers the lilkely impact of the concept proposal. The likely impact of carrying out the development will be subject to a subsequent development applications.
</td></tr>
<tr><td>EP&A Regulations</td><td>
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).

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.
<table>
<tr><th>Act</th><th>Approval Required</th></tr>
<tr><td colspan="2">Legislation that does not apply to State Significant Development</td></tr>
<tr><td>Coastal Protection Act 1979</td><td>N/A</td></tr>
<tr><td>Fisheries Management Act 1994</td><td>N/A</td></tr>
<tr><td>Heritage Act 1977</td><td>N/A</td></tr>
<tr><td>National Parks and Wildlife Act 1974</td><td>N/A</td></tr>
<tr><td>Native Vegetation Act 2003</td><td>N/A</td></tr>
<tr><td>Rural Fires Act 1997</td><td>N/A</td></tr>
<tr><td>Water Management Act 2000</td><td>N/A</td></tr>
<tr><td colspan="2">Legislation that must be applied consistently</td></tr>
<tr><td>Fisheries Management Act 1994</td><td>No</td></tr>
<tr><td>Mine Subsidence Compensation Act 1961</td><td>No</td></tr>
<tr><td>Mining Act 1992</td><td>No</td></tr>
<tr><td>Petroleum (Onshore) Act 1991</td><td>No</td></tr>
<tr><td>Protection of the Environment Operations Act 1997</td><td>No</td></tr>
<tr><td>Roads Act 1993</td><td>Yes</td></tr>
<tr><td>Pipelines Act 1967</td><td>No</td></tr>
</table>
</td></tr>
<tr><td>Biodiversity Conservation Act 2016</td><td>The Concept SSD DA will be assessed under the savings and transitional provisions set out in the Biodiversity Conservation (Savings and Transitional) Regulation 2017. As a result, the application is assessed against the Threatened Species Conservation Act 1995.</td></tr>
<tr><td>Threatened Species Conservation Act 1995</td><td>The Threatened Species Conservation Act 1995 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.

The Sydney Turpentine – Ironbark Forest is identified as a threatened ecological community under the Act, as well as ‘critically endangered’ under the Environmental Protection and Biodiversity Conservation Act 1999.</td></tr>
</table>

Instrument/Strategy	Comments
	There is one threatened ecological community located on the site, being the Sydney Turpentine – Ironbark Forest. There is no critical habitat identified or threatened fauna species identified on the site. The Concept Masterplan has been sited to minimise impacts on the Sydney Turpentine – Ironbark Forest, retaining as much of the threatened ecological community where possible. Approximately 0.3 hectares of the Sydney Turpentine – Ironbark Forest will be removed and it is considered that these portions of vegetation are unviable due to their location within existing residential development and adjacent to a major arterial road. To minimise impacts, a Biodiversity Management Plan and Construction Environment Management Plan will be prepared prior to construction. Biodiversity offsets will be provided in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the *Environmental Protection and Biodiversity Conservation Act Environmental Offsets Policy 2012.* These mitigation strategies and offset measures are discussed further at **Section 5.11**.
SEPP 55 – Remediation of Land	The Contamination Assessment prepared for the site (see **Appendix H**) demonstrates the site can be made suitable for the proposed development. This is discussed in further detail at **Section 5.15**.
SEPP (Infrastructure) 2007	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 the primary vehicle access to the site is provided via either Herring Road or the future Lyonpark Road bridge connection. The Transport and Traffic Assessment at **Section 5.7** and **Appendix M** further details how the safety and ongoing operation of Epping Road is unlikely to be adversely affected. Appropriate measures will be taken to ensure that the relevant noise criteria will not be exceeded in residential buildings, and will be subject to assessment as part of future detailed applications. Clause 102 of the SEPP also applies to the proposed SSD DA as the proposal includes residential uses, an educational establishment 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 below. The Concept SSD DA is traffic generating development in accordance with Clause 104 and Schedule 3 of the SEPP. Accordingly, the Concept SSD DA will be referred to RMS. Traffic and transport impacts are assessed at **Section 5.7** below.
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 $1.7 billion it is SSD.
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	The Concept SSD DA seeks to utilise the FSR bonus set out in clause 13 of the Affordable Rental Housing SEPP. The Concept SSD DA is consistent with the design criteria set out in Division 1 and Division 5 of the SEPP and will be used as affordable housing for a minimum 10 years under the management of a community housing provider. A detailed assessment of the Concept SSD DA against the Affordable Rental Housing SEPP is detailed at **Section 5.1.1** below.
SEPP (Housing for Seniors or People with a Disability) 2004	The Concept SSD DA proposes housing for seniors in a residential aged care facility and independent living units. Whilst the Concept proposal for the residential aged care facility and independent living units is not made pursuant to the SEPP, a demonstration of compliance with the key provisions of the SEPP is set out at **Appendix R**.
SEPP 65 (Design Quality of Residential Flat Development)	A Preliminary SEPP 65 Assessment has been undertaken by Bates Smart, which confirms that the proposed Masterplan is consistent with the design quality principles set out in SEPP 65 and that future 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 5.6**.
SEPP (Vegetation in Non-Rural Areas) 2017	The Concept SSD DA will be assessed against the savings and transitional provisions outlined in the *Biodiversity Conservation Act 2016*. As a result, the SEPP does not apply to the proposed SSD DA.
SEPP (Educational Establishments and Child Care Facilities) 2017	Future development applications for the high school and child care centres outlined in the Concept SSD DA will be required to be consistent with this SEPP. The proposed envelopes will be capable of accommodating the space requirements and other design criteria required under this SEPP.

Instrument/Strategy	Comments	
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999	The *Environment Protection and Biodiversity Conservation Act 1999* identifies Matters of National Environmental Significance to be protected. As noted above, the Sydney Turpentine – Ironbark Forest 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 5.11**.	
Local Planning Instruments and Controls		
Ryde Local Environmental Plan 2014	Clause 2.2 – Zone	The proposed uses within the Ivanhoe Estate site are permissible with development consent in the B4 Mixed Use zone. The open space and road proposed in Shrimpton's Creek open space corridor are permissible in the RE1 zoned land with development consent. The 2-4 Lyonpark Road site is zoned B7 Business Park, where roads are permissible with consent.
	Clause 4.3 – Height of Buildings	There are three building heights that apply to the Ivanhoe Estate site, as follows: • X: 45 metres. • AA1: 65 metres. • AA2: 75 metres.  The 2-4 Lyonpark Road site has a maximum height of buildings of 30 metres. The proposed envelopes are compliant with the maximum height of buildings standard.
	Clause 4.4 – Floor Space Ratio	The FSR of the site is 2.9:1. The Concept SSD DA seeks to utilise the available Affordable Housing SEPP bonus as well as vary the FSR standard to provide for additional community uses and seniors housing. A full explanation of the proposed FSR and Clause 4.6 Variation are located at **Appendix Q**.
	Clause 5.10 – Heritage Conservation	There are no listed heritage items present on the subject site. An Aboriginal and Heritage Assessment is attached at **Appendix J**.
	Clause 6.1 – Acid sulfate soils	The site is not affected by acid sulfate soils.
	Clause 6.2 – Earthworks	The Geotechnical Assessment (**Appendix G**) confirms that earthworks can be undertaken on the site, subject to appropriate engineering techniques. **Section 5.19** discusses geotechnical considerations in further detail and a future application will undertake a detailed assessment of future earthworks.
	Clause 6.3 – Flood planning	Areas of the site are located on flood prone land, as outlined in the Flood Assessment at **Appendix I** and **Section 5.13**. Impacts of a potential flood event will be mitigated as habitable areas are locate clear of the flood planning level and the proposed stormwater network will be capable of adequately conveying stormwater flows away from the site.

Instrument/Strategy	Comments	
	Clause 6.4 – Stormwater management	A stormwater management plan has been prepared for the site (see **Appendix F** and **Section 3.11**) and details that: • Water sensitive urban design measures will be implemented throughout the site. • On-site stormwater detention will be provided. • Impacts of stormwater runoff are minimised and mitigated.
	Clause 6.6 – Environmental sustainability	The Concept SSD DA targets a 6 Star Green Star Communities rating and 5 Star Green Star v1.1 rating. These targets will be achieved through: • Water demand reduction measures. • Energy demand reduction measures. • Indoor environmental quality targets. • Use of sustainable materials. • Sustainable transport initiatives.
Ryde Development Control Plan 2014	An assessment against the relevant provisions of the Ryde DCP is provided at **Appendix R**.	
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 (see **Section 5.18**).	
Ryde 2025 Community Strategic Plan	The City of Ryde Community Strategic Plan 'Lifestyle and opportunity @ your doorstep' sets seven outcomes to achieving the vision for Ryde. The Concept SSD DA's consistency with the relevant outcomes is as follows: • **City of liveable neighbourhoods:** The Ivanhoe Estate Masterplan will provide a high quality public domain and residential neighbourhood that seeks to strengthen social ties and provide opportunities for active and passive recreation. • **City of wellbeing:** The Ivanhoe Estate Masterplan will provide recreation and community facilities to encourage residents to be active and participate in their community. These include parks, walking and cycling links and a dedicated community space. • **City of environmental sensitivity:** The Ivanhoe Estate Masterplan seeks to maintain and protect native vegetation on the site, will rehabilitate the portion of Shrimptons Creek that passes through the site and will also include a range of sustainability measures in the built form. • **City of connections:** The Ivanhoe Estate Masterplan provides options walking and cycling connections throughout the site, which 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 Ivanhoe Estate Masterplan seeks to create a diverse community, where residents are able to interact in the range of public and community spaces provided.	
Other Relevant Policies		
Development Near Rail Corridors and Busy Roads – Interim Guideline	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. Further to this, the proposed Masterplan is consistent with the Interim Guideline as: • Future detailed applications will demonstrate that noise and air quality impacts associated with Epping Road can be appropriately mitigated for residential uses. • Educational establishments and child care centres are strategically located away from the Epping Road boundary, generally on the opposite side of the site adjoining residential uses. • Seniors housing is located away from Epping Road, on the opposite side of the site. The Acoustic Assessment prepared by Acoustic Logic (refer to **Appendix S**) demonstrates that the proposed development is capable of satisfying the relevant noise criteria contained in the Interim Guideline, subject to recommended building treatments (refer to **Section 5.20**) below. The majority of safety and design considerations 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 will continue to do so throughout the detailed design development and future applications.	

Instrument/Strategy	Comments
	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.
Guide to Traffic Generating Developments	The Traffic and Transport Assessment prepared by Ason (**Appendix M**) has considered the Guide to Traffic Generating Development in the preparation of the traffic impact study and determining appropriate car parking rates.
Sydney's Bus Future 2013	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 are not directly related to the proposal, the proposal is consistent with Plan's objective to encourage use of the Sydney bus network by commuters. The proposal: • 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 Masterplan 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. The trail along Shrimptons Creek will allow residents to access the Macquarie Shopping Centre and Station, as well as other spaces along the trail, such as Wilga Reserve and ELS Hall Park.
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 that can be a 20 to 30 minute. The Concept Masterplan provides cycling links to existing regional cycle paths. This will facilitate future residents to make trips by bike to locations in the Macquarie Park area, as well as to connect to other transport services. The Concept Masterplan also provides bicycle storage for residents and will incorporate bicycle parking throughout the public domain. These measures will contribute to the realisation of the objectives of Sydney's Cycling Future.
NSW Planning Guidelines for Walking and Cycling	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 outlines design principles that assist with encouraging walking and cycling. The proposed Masterplan is consistent with these design principles as it: • Creates a compact residential community, where activities and services can be accessed by foot or by bicycle without the need to use a car. • Is located in close proximity to a range of public transport options, including Macquarie University station and bus services on Herring Road. • Benefits from close proximity to the Macquarie Park centre, with the Macquarie Shopping Centre, Macquarie University and other employment centres located within walking and cycling distance. The Concept Masterplan incorporates a highly permeable pedestrian and cycle network that will encourage residents to use alternative forms of transport and is consistent with the design principles set out in the Guidelines. The pedestrian and cycle network connect to existing regional paths, facilitating walking and cycling connections between the site and the surrounding Macquarie Park area.
NSW Long Term Transport Master Plan	The proposal is consistent with the NSW Long Term Transport Master Plan in the following ways: • 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 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	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. The proposed bridge and road connection to Shrimptons Creek is consistent with the Guidelines as: • The proposed road location has been selected based on existing capacity in the local road network and a study of existing traffic conditions in Macquarie Park. • The proponent has consulted with key stakeholders about the location of the road, including the landowner, RMS, City of Ryde and the Department of Planning and Environment.

Instrument/Strategy	Comments
	• The proposed route will have limited environmental impacts and is compatible with the surrounding commercial and residential development.
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	As detailed in **Section 1.3** above, the Concept SSD DA is consistent with the Future Directions for Social Housing in NSW and is an identified project in the Communities Plus program. Specifically: • The redevelopment of the site 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 and other community housing providers. • 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 Masterplan 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 Assets Strategic Plan sets the direction and framework for the future of school infrastructure in NSW. The Plan sets out six key sections for action and the proposed Masterplan is consistent with the relevant key actions as follows: • **The growing school population:** The proposed high school will cater for the growing number of students in NSW. • **Sustainability:** The proposed high school will be located on a small site over multi-storeys, consistent with the action of making use of existing infrastructure and building on small sites to ensure schools are financially sustainable. • **Stronger partnerships:** The high school will be delivered in partnership with a non-government provider, Aspire Consortium and the NSW Government. • **Joint and shared use:** The proposed high school will provide and benefit from join and shared use school and community facilities, including by utilising open space in the City of Ryde and also by providing shared sporting facilities within the school. A future detailed application will demonstrate consistency with the School Assets Strategic Plan.
Draft Better Schools Design Guide	The Draft Better Schools Design Guide has been prepared by the Government Architect to support the SEPP (Education and Child Care Facilities) 2017 and to establish design principles for schools across NSW. The Guide describes the seven principles outlined in the SEPP and methods for achieving outcomes consistent with these principles. Whilst the detailed school design will be subject to a future application, the school concept is generally consistent with these principles as follows: • **Context, built form and landscape:** The future school site has been identified as part of a detailed architectural and urban design process, which has sought to appropriately locate uses on the site and holistically plan for amenity for all users of the site. The school site will be located on Main Street and will benefit from close proximity to open space within the site and nearby at Wilga Reserve. • **Sustainable, efficient and durable:** The future school building will be required to be consistent with the sustainability targets for the site. Each building will target a 5 Star Green Star rating and the community overall seeks to achieve a 6 Star Green Star rating. • **Accessible and inclusive:** The detailed school design will seek to be accessible and inclusive, reflecting the integrated community it will be part of and sharing facilities with the wider community. • **Health and safety:** Health and safety are key drivers of the Masterplan, incorporating multiple open spaces for active and passive recreation and opportunities for passive surveillance. The school site will benefit from these principles, and the future application will detail how health and safety outcomes are delivered. • **Amenity:** Consistent with the overall Masterplan, the future school will provide a high level of amenity for staff and students through high quality design and access to open space. The future application for the school will detail how amenity is achieved for staff, students and neighbours. • **Whole of life, flexible and adaptive:** The future school design will maximise environmental performance, ease of adaption and multi-use facilities, consistent with the environmental targets for the project. • **Aesthetics:** The school site is one component of a Masterplan, which has been designed with the input of multiple architects and environmental experts. As a result, the proposed school will achieve a high level of aesthetic design and will integrate with the surrounding neighbourhood.

5.1.1 State Environmental Planning Policy (Affordable 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 8** below.

Table 8 – Assessment against the ARH SEPP

Provision	Assessment
Division 1 – In-fill affordable housing	
Clause 13 – Floor space ratio	The total GFA to be used for affordable housing is 77,672m^2. This is equivalent to 36% of the residential component. As a result, the formula set out in Clause 2(b)(ii) applies as follows: *Z = AH/2.5* As a result, a bonus FSR of 0.421 applies to the proposed development. **Refer to Section 5.3.1**
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 site area is 8.2 hectares.
1(c) at least 30% of the site is landscaped.	At least 30% of the site will be landscaped.
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.	15% of the site will be provided as a deep soil zone, with a minimum dimension of 3 metres of more. Deep soil planting is distributed evenly throughout the site, including at the rear, side and centre.
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 the Masterplan is capable of achieving 70% of dwellings receiving the required solar access for 2 hours 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 social and affordable housing will be managed by Mission Australia Housing and other community housing providers, the car parking rates set out in 2(a) are relevant. The car parking provided is in excess of the amount required by this clause, as follows: 1 bedroom – 0.6 spaces 2 bedroom – 0.9 spaces 3 bedroom – 1.4 spaces
2(b) dwelling size	The Indicative Drawings at **Appendix B** demonstrate that future dwellings will be capable of compliance with the required dwelling sizes, which are generally consistent with the requirements 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. Preliminary compliance with SEPP 65 is set out in **Section 5.6** and **Appendix B**.

Provision	Assessment
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 and social housing component of the development will be used as such for at least 10 years.

5.2 Analysis of Alternatives and Staging

5.2.1 Development Options

A number of options are available to LAHC in responding to the identified need for the redevelopment of the Ivanhoe Estate.

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 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 are detailed in the Clause 4.6 Variation at **Appendix Q**. 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; and
- the provision of both market and social seniors housing would be reduced, contrary to the objectives of the State policy.

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.

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 and affordable 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 for the site.

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, Citta Property Group, and Mission Australia Housing and the design team, led by Bates Smart and supported by Ethos Urban, Hassell, Turner, 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 Report at **Appendix B** explains the contextual analysis and design principles that underpin the Masterplan.

The Staging outlined in Section 3.14 is indicative only. However, it is noted that a key principle of the 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.

5.3 Land use, Gross Floor Area and Floor Space Ratio

5.3.1 Summary of Proposed Gross Floor Area and FSR

The Concept SSDA proposes a mixed-use development that will encompass a unique and diverse range of land uses which includes a mix of residential, commercial, civic, community and retail uses. These uses will provide for a seamlessly integrated community of private, social, affordable and seniors housing supported by a range of complimentary uses such as a high school, childcare, retail, and community facilities.

Overall, the Concept SSDA will comprise a total GFA of 283,500m^2 which includes 11,941m^2 of community benefit land uses. **Table 9** details the composition of the proposed GFA.

Table 9 – Proposed GFA

Tenure Type	Overall GFA (m^2)
Social	70,488
Affordable	7,184
SUB TOTAL – AFFORDABLE	**77,672**
Market	176,993
Market ILUs	9,048
RACF	6,600
SUB TOTAL – ALL RESIDENTIAL	**270,313**
Retail	1,246
School	9,006
Childcare	1,214
MAH Office	558
Community Hub	700
Community Swimming Pool	463
SUB TOTAL – NON RESIDENTIAL	**13,187**
TOTAL GFA	**283,500**
OVERAL FSR	**3.60:1**

5.3.2 FSR Framework

Ryde Local Environmental Plan 2014

The site is subject to a maximum FSR of 2.9:1 pursuant to the Ryde LEP. Based on a site area of 78,680m^2 which includes only the B4 zoned portion of land, the site can accommodate a GFA of 228,172m^2.

State Environmental Planning Policy (Affordable Rental Housing) 2009

As outlined in **Section 5.2.1**, the Concept SSDA will seek to utilise the GFA bonus pursuant to Clause 13 (2) (b) of the State Environmental Planning Policy (Affordable Rental Housing) 2009 (SEPP ARH) which is reproduced below:

(1) This clause applies to development to which this Division applies if the percentage of the gross floor area of the development that is to be used for the purposes of affordable housing is at least 20 per cent.

(2) The maximum floor space ratio for the development to which this clause applies is the existing maximum floor space ratio for any form of residential accommodation permitted on the land on which the development is to occur, plus:

(b) if the existing maximum floor space ratio is greater than 2.5:1:

(ii) Z per cent of the existing maximum floor space ratio—if the percentage of the gross floor area of the development that is used for affordable housing is less than 50 per cent, where:

AH is the percentage of the gross floor area of the development that is used for affordable housing.

$$Z = AH \div 2.5$$

The GFA of the development that is being used for affordable housing is 77,672m^2. This equates to 36% of the total residential GFA under the maximum allowable GFA of 228,172m^2. On this basis, the bonus GFA available under the SEPP ARH can be calculated as follows:

Affordable Housing (AH GFA) = 77,672m^2

AH as a % of residential development = 77,672 / 214,985 (residential GFA only, excluding proposed non-residential GFA) = 36%

Z = 36 / 2.5

= 14.4%

FSR bonus = 0.144 x 2.9

= 0.42:1

New FSR (including SEPP ARH bonus) = 0.42 + 2.9

= 3.32:1

Additional GFA = 33,045m^2

The GFA available under the ARH SEPP results in a maximum allowable GFA of 261,217m^2 for the site which represents an FSR of 3.32:1 as depicted in **Table 1**.

Table 10 – Maximum Allowable GFA / FSR

	FSR	Site Area (m^2)	GFA (m^2)
B4 Zoned Land	2.9:1	78,680	228,172
Affordable Housing Bonus	0.42:1	78,680	33,045
Total	**3.32:1**	**-**	**261,217**

In this regard, the Concept SSDA will comprise a total GFA of 283,500m^2 which represents an FSR of 3.60:1. The proposed FSR therefore exceeds the maximum FSR development standard by 0.28:1 which equates to a variation of 8.4%.

5.3.3 Clause 4.6 Variation

The Concept SSDA has been accompanied by a clause 4.6 written request to vary the maximum FSR development standard and is provided at **Appendix Q**. The nature and extent of the variation to FSR comprises of three separate components which include:

- Community Benefit GFA (11,941m^2)
- Seniors Housing Bonus GFA (4,892m^2) including On-Site Support Services (1,200m^2)
- RE1 Land (4,150m^2) and B7 Land (99m^2) adjacent to Shrimptons Creek

These components are discussed in further detail below.

Community Benefit GFA

The Concept SSDA encapsulates a diverse range of 'community benefit' land uses which include the following:

- School
- Childcare
- MAH Offices
- Community Hub
- Swimming Pool
- Communal Areas

The quantum of community benefit land uses will comprise a total of 11,941m^2. These uses do not reflect the highest value land uses, and in most cases, will generate no revenue at all. However, they are considered to enrich the site and assist with a wide range of social outcomes for the community of Ivanhoe and the broader Macquarie Park community. The delivery of the community benefit GFA is therefore critical to delivering the desired social outcomes for the Ivanhoe Estate and have therefore been included as a variation above the FSR standard.

It is noted that if the community uses were provided in lieu of residential uses, there would be an associated reduction in the provision of social and affordable housing on the site.

State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

The Concept SSDA will comprise of senior housing in the form of independent living units and a residential aged care facility consistent with the provisions of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004. Clause 45 of the Seniors SEPP allows a consent authority to consent to a development application for the purpose of seniors housing involving buildings having a density and scale (when expressed as a floor space ratio) that exceeds the floor space ratio by a bonus of 0.5 to the GFA component of the FSR. The 0.5 bonus is predicated on providing at least 10% of the dwellings as an affordable place in addition to on-site support services.

By virtue of clause 18(2) the DA cannot be made pursuant to the Seniors SEPP as the Masterplan relates to a mixed use development, and not an exclusively seniors housing development. Nevertheless, if the seniors housing component were to be delivered as a stand-alone development, the bonus GFA available under the Seniors SEPP would be applicable to the Site.

In this respect, it is prudent to consider the quantum of GFA available under Clause 45 of the Seniors SEPP given that the Concept SSDA will satisfy the principal objectives of the bonus GFA by providing affordable seniors places and on-site support services consistent with the State policy.

The site area of the seniors housing component is 9,785m^2 equating to an additional 4,892m^2 of potential bonus GFA. The bonus has been applied to the entire site area of Lot B1.1 and B1.2. However, in order to accurately reflect the anticipated occupancy of the social housing dwellings, the bonus available under the Seniors SEPP has been calculated at 16.6% of the site area of Lot C1 on the basis that 43 of the 259 dwellings within Lot C1 will be occupied by seniors or people with a disability. **Figure 44** depicts the proposed site area of the seniors housing component.

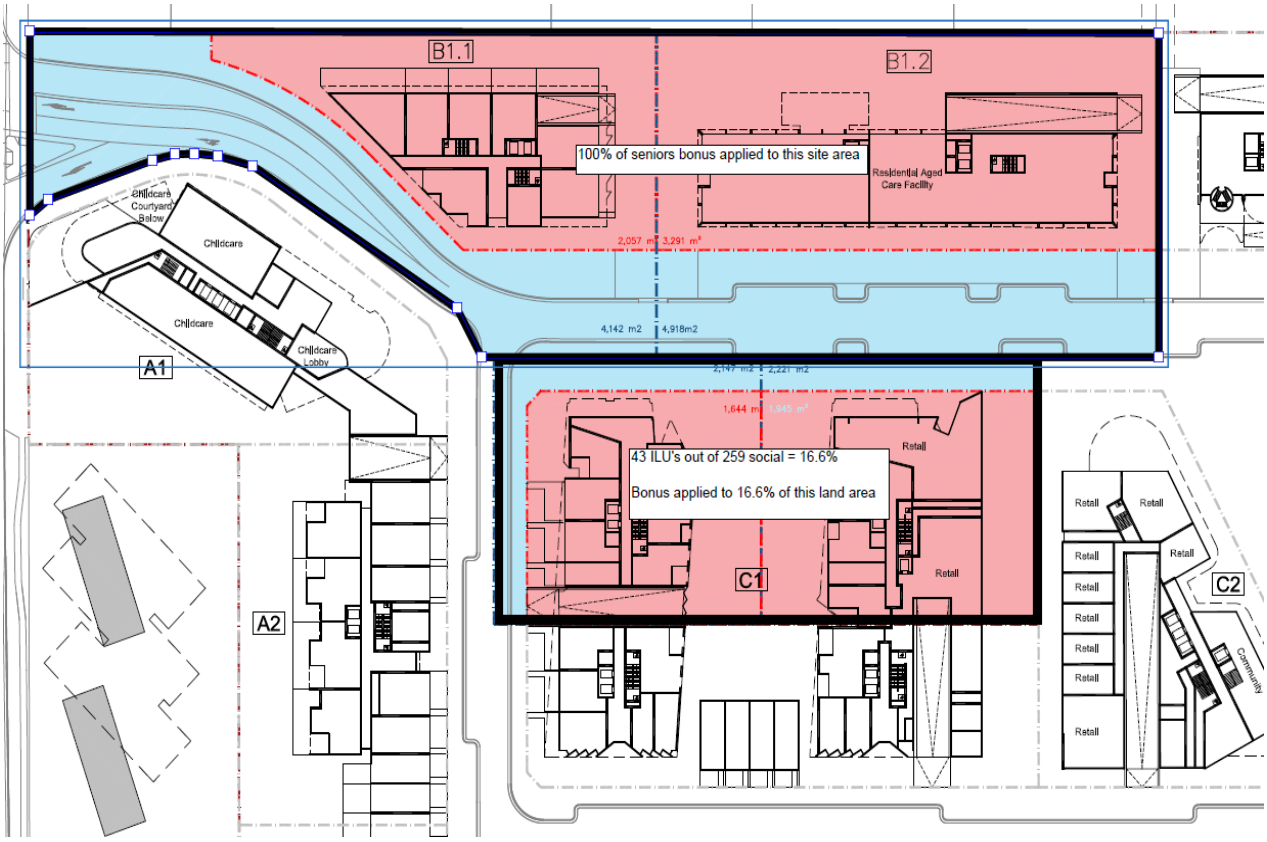


Figure 44 – Site Area of Seniors Housing

Source: Bates Smart

Furthermore, the Residential Aged Care Facility within Lot B1.2 will include the provision of 1,200m^2 to be used for the purposes of on-site support services. Pursuant to Clause 45(4) of the Seniors SEPP, the area dedicated to the provision of on-site support services can be excluded from the calculation of gross floor area as stipulated below.

> *(4) In calculating the gross floor area for the purposes of subclause (2), the floor space used to deliver on-site support services (other than any floor space used to deliver communal or residents' living areas) is to be excluded.*

In this regard, the GFA attributed to on-site support services is proposed to be excluded from the overall proposed GFA in order to incentivise the provision of affordable seniors housing within Lots B1.1, B1.2 and C1 and in accordance with the aims of the Seniors SEPP.

Rehabilitation of Shrimptons Creek Riparian Corridor

The Ivanhoe Estate comprises a large portion of RE1 Public Recreation zoned land and B7 zoned land within the current site boundary adjacent to Shrimptons Creek. The total area of the RE1 zoned portion of land within the site is approximately 4,150m^2 and the area of the B7 zoned portion of land is approximately 99m^2. It is noted that the B7 zoned portion of land is subject to an FSR of 1:1 under the LEP. Whilst there is no FSR allocated to the RE1 zoned portion of the land, it is prudent to consider the costs associated with the provision of public infrastructure and the overall benefit of the development to the enhancement and active use of Shrimptons Creek.

This area of the site will be rehabilitated and embellished to restore the Shrimptons Creek corridor immediately adjacent to the site. Shrimptons Creek will provide a mixture of riparian planting and recreation facilities that will be publicly accessible. A 20-metre riparian corridor will be provided in accordance with the NSW Office of Water Guidelines for riparian corridors on waterfront land. In accordance with these guidelines, a shared pedestrian and cycle path will be provided in the outer riparian zone, with commensurate offset planting to be provided adjacent to the corridor. The corridor is an important landscape and recreational spine and connects the site to the Macquarie Centre and parklands. Rehabilitation works will be undertaken to improve the existing creek setting, as well as improvements to the Epping Road underpass and provision of new recreation facilities.

For this reason, given the enhancement and curtilage of Shrimptons Creek within the site boundary, it is reasonable to consider the site area associated with both the RE1 and B7 land and the potential GFA that could be harnessed. This is contemplated by clause 4.4A (3) of the Ryde LEP *'Exceptions to floor space ratio'* which stipulates the following:

> *(3) Despite clause 4.4 (2), for land shown as "Macquarie Park Corridor" or "North Ryde Station Precinct" on the Centres Map, the consent authority may consent to development that results in a floor space ratio in excess of the floor space ratio shown for that land on the Floor Space Ratio Map, if:*
>
> *(a) the land contains land that has been dedicated to the Council for a public purpose, including roads, drainage or open space, and*
> *(b) the excess floor space does not exceed the equivalent of the site area provided for the portion of the land dedicated to the Council in relation to the land.*

The clause relates to land that has been dedicated, rather than is yet to be dedicated as is the case in this instance. The timing of the dedication is anticipated to occur once the rehabilitation and embellishment of Shrimptons Creek is completed, and therefore cannot occur prior to this Concept SSDA. Nevertheless, it is considered that the proposal satisfies the underlying objective/intent of the clause given that the land will ultimately be dedicated for a public purpose. Therefore, under this scenario, a GFA equal to the site area of the RE1 zoned land which represents 4,150m^2 and the B7 zone which represents 99m^2 is available to the Site. As such it is considered reasonable to factor into account the potential GFA of the RE1 and B7 zone within the site boundary in order to justify a variation above the maximum permitted FSR.

Overview and Offset of GFA

Table 11 provides an overview of the proposed GFA and FSR to demonstrate that the variation above the maximum permitted FSR can be reasonably offset through the seniors bonus, the GFA available under the RE1 land and the provision of community benefit GFA.

Table 11 - Overview and Offset of GFA

	FSR	GFA (m^2)
B4 Zoned Land	2.9:1	228,172
Affordable Housing Bonus	0.42:1	33,045
Total Allowable FSR/GFA	**3.32:1**	**261,217**
Total Proposed FSR/GFA	**3.60:1**	**283,500**
Actual Variation FSR/GFA	**0.28:1**	**22,283**
Seniors Living Bonus GFA	0.5:1	4,892
On-Site Support Services	-	1,200
RE1 Zoned Land	1:1	4,150
B7 Zoned Land	1:1	99
Community Benefit GFA	-	11,942
Total Potential GFA Variation	**-**	**22,283**

In this respect, the clause 4.6 variation request demonstrates that compliance with the maximum floor space ratio (FSR) development standard is unreasonable and unnecessary in the circumstances of the case and that there are sufficient environmental planning grounds to justify contravention of the standard. The clause 4.6 variation is provided at **Appendix Q.**

5.4 Built Form and Urban Design

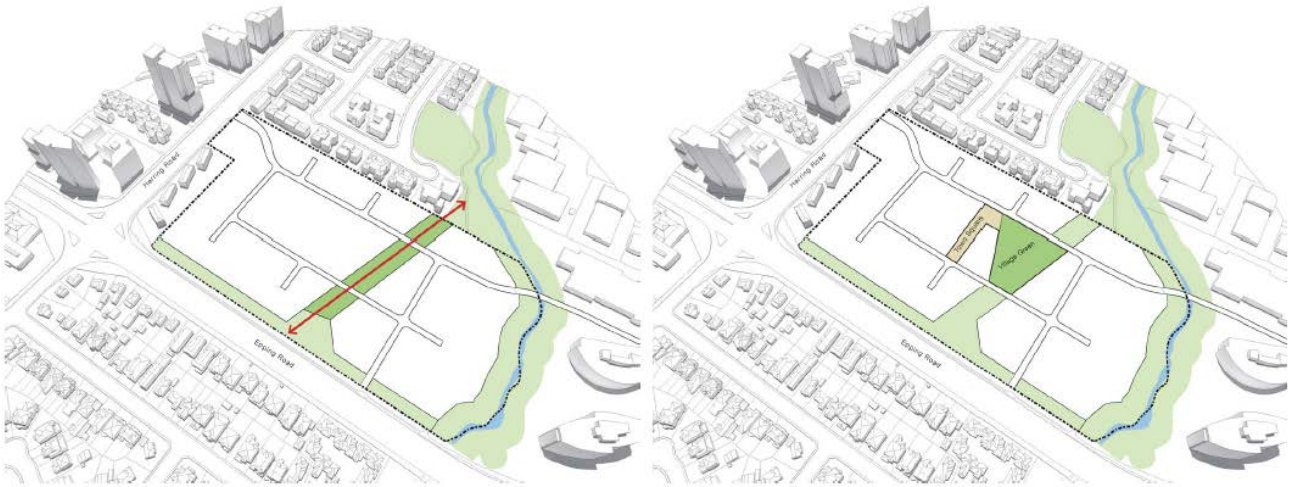
5.4.1 Site Suitability

In regards to the characteristics of the site and its location, the site is considered to be highly suitable for the proposed development in that it:

- Forms part of the Macquarie University Station (Herring Road) Priority Precinct, which is intended to deliver a significant number of new dwellings by 2031, transforming the area into a vibrant centre that makes the most of the available transport infrastructure and the precinct's proximity to jobs, retail and education opportunities within the Macquarie Park corridor.
- Represents a singular opportunity to provide a truly tenure blind masterplanned community of the type and scale of development envisaged.
- Makes efficient use of underutilised land containing existing social housing that no longer caters to NSW's changing demographics or the target objective 70:30 ratio of private to social housing to enable more integrated communities.
- Forms its own 'precinct', being to the south of adjoining residential development and separated by roads or open space / waterways on three sides, which will ensure that any potential impacts from the redevelopment on neighbouring landowners can be generally isolated and minimised.
- Has excellent access to a wide range of services and facilities, open space, and employment that will support, and benefit from, the future occupants of the development.
- Is capable of accommodating the proposed development, which is of a scale and nature that is compatible with the site and area without adversely impacting environmental operations, the use of surrounding land, or the evolving character of the area.

5.4.2 Urban Structure

As detailed in the Design Report at **Appendix B** and in Sections 3.1-3.3, the urban structure draws on the site's existing landscape features with a diagonal sequence of high quality public open spaces connecting the turpentine forest along Epping Road with the public open space on Shrimptons Creek (see **Figure 45**).



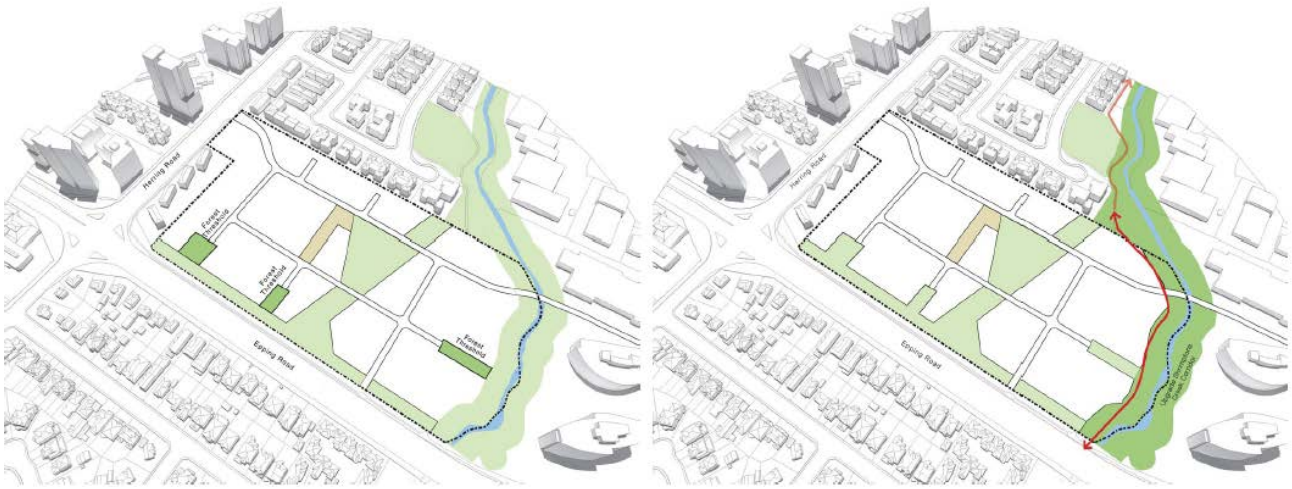


Figure 45 – Open Space Defines the Urban Structure

Source: Bates Smart + HASSELL

The public domain approach sets up a framework or development blocks across four precincts (see **Figure 46**). A regular grid of residential buildings step down the steep hillside. Buildings are generally rectangular, with angled building forms fronting the key public open spaces. At the top of Main Street, Building A1 provides a gateway form to reinforce the primary entrance to the site. At the bottom of the hill, buildings along the winding edge of Shrimptons Creek are proposed in fragmented forms, breaking down the formality of the street grid at the interface with the open space corridor.

Figure 46 – Development Blocks that Respond to the Public Domain

Source: Bates Smart + HASSELL

The result of the public domain lead urban structure is a high-density mixed-use neighbourhood with buildings arranged to maximise residential amenity outcomes, and a diverse open space network that creates an inclusive community oriented public domain.

The urban structure is embedded within the Concept Plan Drawings for which approval is sought. The Ivanhoe Estate Design Guidelines then provide a framework to ensure that the future buildings maximise the principles embedded within the Masterplan.

5.4.3 Height

The proposed Masterplan has been designed to be consistent with the maximum height limits in Ryde LEP, which range from 45-75m across the site (see **Figure 47**). The height limits were established as part of the Macquarie University Station (Herring Road) Priority Precinct process and the Masterplan is therefore consistent with the desired and emerging built form character of the centre.

The rationale for the heights, which was explained in the Herring Road Finalisation Report, was to provide:

- a ‘gateway’ on the land fronting Herring Road between Epping Road and Ivanhoe Place;
- buildings up to 20 storeys along Epping Road positioned behind the existing trees and vegetation which provides some screening and where the building shadows fall mainly onto Epping Road; and
- building heights up to 14 storeys on the northern half of the estate to manage overshadowing of other buildings and open space.

Whilst the Masterplan envelopes seek to utilise the maximum height limits provided in the LEP, as reflected in the Indicative Reference Scheme drawings at **Appendix B**, the actual building heights will range across the site and where appropriate be lower than the height limit to optimise solar access to the public domain and other buildings.

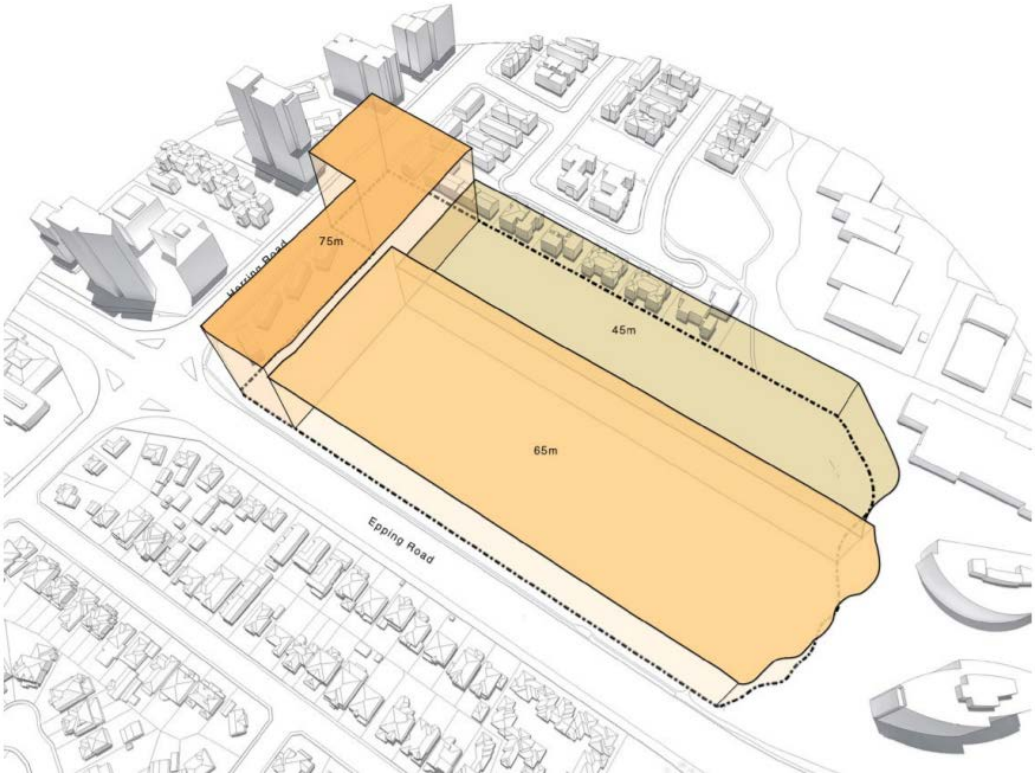


Figure 47 – The LEP building height limits applying to the site

Source: Bates Smart

5.4.4 Bulk and Scale

The proposed Masterplan 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.

Significant work has been undertaken in the design of the Masterplan to ensure the GFA proposed, which has material public benefit (see Section 5.3 and **Appendix Q**), does not have any adverse environmental impacts and will result in an appropriate built form outcome.

The Design Report at **Appendix B** in conjunction with the Indicative Architectural Drawings at **Appendix B**, demonstrate that the GFA proposed in the Masterplan is appropriate for the site, specifically:

- there are no exceedances of the maximum height limit;
- a high quality public domain with a variety of appropriately sized public and private open spaces can be achieved across the site, including providing at least 15% as deep soil area;
- the future buildings are capable of complying 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 (see Section 5.4.6 and **Appendix T**) concludes that the visual impacts are acceptable.

Further, in order to ensure that bulk and scale is managed during the detailed design of each building, the Masterplan is accompanied by the Ivanhoe Estate Design Guidelines, which establish site specific controls relating to street frontage heights and setbacks, to further regulate the bulk and scale of the future development.

5.4.5 Setbacks

External Setbacks

Minimum perimeter building setbacks are incorporated into the Building Envelope Plan. The Design Guidelines then provide further ground and upper level setback controls for each development Block.

A minimum setback of 10m from the site's perimeter boundaries has generally been adopted. In some cases, lower levels (up to five storeys) extend to 6m from the side boundary consistent with the minimum side setback control in the DCP.

All residential buildings set back on upper levels to comply with the minimum ADG building separation requirements.

The proposed perimeter setbacks, consistent with the DCP and ADG will ensure that:

- appropriate separation is achieved between the new development and the adjoining properties, minimising potential privacy and solar impacts;
- the retention of trees along the site's boundaries is maximised to further mitigate the impacts of the new development;
- the scale of buildings as perceived from the public domain is reduced;
- adverse wind impacts from the down drafts from tall buildings is minimised; and
- ADG compliant deep soil planting can be achieved across the site.

Figure 48 – Setback Requirements – ground level (left) and upper level (right)

Source: Ivanhoe Masterplan Development Design Guidelines

Internal Setbacks

Within the site, the proposed development establishes setbacks to the internal streets that vary from Council's 5m requirements along Main Street. The proposed setbacks are intended to reinforce the more civic quality of Main Street and will provide buildings that positively contribute to the physical definition of the public domain as well as providing for a landscape design that contributes to the streetscape and residential amenity. It is noted that whilst the setbacks are less than 5m, when combined with the street width still achieve or exceed the separation requirements in the ADG.

5.4.6 Visual Impact Assessment

A Visual Impact Assessment has been prepared by Ethos Urban and Virtual Ideas (see **Appendix T**). The Visual Impact Assessment finds that the proposal will generally have a medium visual effect, with a high visual effect from limited view points.

This finding is based on the principles of physical absorption capacity and compatibility with the surrounding landscape. Physical absorption capacity is the extent to which the existing visual environment can mitigate the visibility of a proposal and the extent to which the character, scale, colours, materials and finishes of a proposal enable it to reduce contrast with similar nearby development to the extent that it cannot be easily distinguished as a new feature. Compatibility is determined by whether the proposal will unacceptably change the character of the surrounding area and is assessed against whether the proposal responds positively to or borrows from the surrounding landscape.

While the overall visual impact of the proposal is medium, this impact is acceptable on the basis that the proposal is consistent with key strategic planning documents that seek to transform the character of Macquarie Park and that the proposal is generally consistent with the planning controls for the site. The Visual Impact Assessment notes that there are a number of elements in the Masterplan which assist in mitigating potential visual impacts, including the provision of vegetation buffers, appropriate building separation and building alignment which maintains view corridors through the site.The Visual Impact Assessment considers views of the proposed development from eight key view locations, as shown at **Figure 49** below.

Figure 49 – View impact assessment locations

The visual effect of the proposal from these key view points is presented in **Table 12**.

Table 12 - Assessment of visual effect

View Location	Visual Effect
Intersection of Epping Road and Herring Road	High
Epping Road near Sobraon Road	Low
Shrimptons Creek, north east of Cobar Way	High
Cottonwood Crescent near Peach Tree Road	Low
Herring Road at Morling College	Medium
Macquarie University Station, Herring Road and Waterloo Road	Low
Epping Road, east of Shrimptons Creek	High
Epping Road, north of Lane Cove Road	Low

It is noted that the proposal will appropriately address the interface between the site and the surrounding public domain through the design of a complementary public domain and built form. Key elements of the Masterplan which will mitigate visual effects are:

- Rehabilitation of Shrimptons Creek and increased riparian planting.
- Fragmentation of built form along Shrimptons Creek.
- Maintaining the vegetation along Epping Road.
- Provision of vegetation and public domain throughout the site.
- Transitioning building height and bulk to lower-scale surrounding areas.
- Incorporating substantial separation distances between buildings.
- Orienting buildings to present the narrow elevation to Epping Road.

Importantly, the Masterplan is consistent with the strategic vision for Macquarie Park and is compliant with the maximum height of buildings for the site as set out in the Ryde LEP 2014. All relevant key planning documents identify Macquarie Park as a key growth area within metropolitan Sydney. Macquarie Park is a strategic centre, focussing on the provision of high value, innovation jobs with complementary uses that support this role, including high density residential, retail, community and open space uses. The proposal reinforces this preferred future role and character and is comparable to other development occurring in North Ryde and along Herring Road. The proposal will make a significant contribution to the transformation of Macquarie Park consistent with the desired future character of the area set out in the NSW Government's strategic planning documents. This is a key factor in determining that the proposal has an acceptable visual impact.

5.4.7 Ivanhoe Masterplan Development Design Guidelines

This SSD DA is supported by the Ivanhoe Masterplan Development Design Guidelines ('the Design Guidelines' - see **Appendix L**). The Design Guidelines are intended to work with the proposed building envelopes to ensure that the future development consistent with the Concept DA will achieve an optimal design and amenity outcome. The Design Guidelines contain specific controls and provisions in relation to the following:

- North East Development Lots (B1-B3).
- Public and Communal Open Space.
- Deep Soil Zones.
- Public Domain Interfaces.
- Active Frontages.
- Pedestrian and Vehicular Entry Locations.
- Street Wall Height.
- Ground Level Street Setbacks.
- Upper Level Setbacks.
- Rooftops.
- Façade Expression and Materials.
- Design Excellence.
- Universal Design.

5.5 Public Domain and Public Access

Public Domain Concept and Access

The Public Domain Concept for the site creates a hierarchy of open spaces and is designed to link the different land uses across the site, as well as provide connections to the surrounding area. The streetscape, open space and public domain features are described in detail at **Section 3.3** above. **Section 3.3** also identifies key vehicular, bicycle and pedestrian linkages with and between other public domain spaces, proposed buildings and uses, and surrounding areas.

The streetscape has been designed with wide circulation zones to encourage pedestrian connectivity throughout the site and to allow for incidental meeting spaces. The provision of street furniture and landscaping throughout the site creates a legible public domain that will encourage way-finding around the site as well as opportunities for social interaction. Primary connections through the site are along Main Street and the Green Link. Main Street allows for vehicle, pedestrian and cycle movement through the site and connects to the wider Macquarie Park area, whilst the Green Link is a dedicated open space corridor which connects open spaces within the site and to the existing Shrimptons Creek Trail.

The connection to Shrimptons Creek Trail provides future residents with the opportunity to access multiple open spaces along the trail, including Wilga Reserve and ELS Hall Park, as well as an alternative route to access the Macquarie Shopping Centre and train station. The Green Link also provides a dedicated connection between the proposed school and Wilga Reserve, promoting clear access between the joint school-community use facilities. Overall the public domain concept will facilitate a high degree of accessibility, promoting an active lifestyle for future residents and creating a permeable public domain that transitions to the surrounding area.

Shrimptons Creek

The interface between the site and the Shrimptons Creek corridor will be landscaped to distinguish between public and private open space, whilst recognising the importance of the existing Shrimptons Creek landscape. Upgrades to Shrimptons Creek corridor are likely to form a part of the VPA offer made to Council and will likely include dedication of the land for public open space, landscaping and public domain embellishment, rehabilitation of the riparian corridor and stormwater management works.

Open Space Demand

A Community Infrastructure and Recreation Demand Study has been prepared by Elton Consulting (refer to **Appendix U**) to assess the adequacy of existing open space provided in the local area and how the proposed Masterplan will contribute to this demand.

There are a number of parks and recreation spaces within the City of Ryde, however Macquarie Park is considered to have a low provision of open space. There are ten open spaces in Macquarie Park, however the majority of these spaces are concentrated near the Lane Cove National Park. The adjoining suburb of Marsfield has fourteen open spaces, however the majority of these spaces are dedicated to organised sport. In addition to this, Epping Road presents a major barrier to residents of Ivanhoe Estate accessing open space in Marsfield. Similarly, the M2 Motorway is a barrier to accessing open space within the Lane Cove National Park. **Figure 50** shows the existing open space in close proximity to the site.

The study has also identified gaps in the provision of open space within the LGA and Macquarie Park, specifically there is a lack of:

- Indoor facilities.
- Sports fields.
- Walking and cycling links.
- Facilities for young people.
- Parks and open space.

It is noted that the City of Ryde has recently received $5 million of funding from the NSW Department of Planning and Environment to upgrade open space along the Shrimptons Creek corridor.

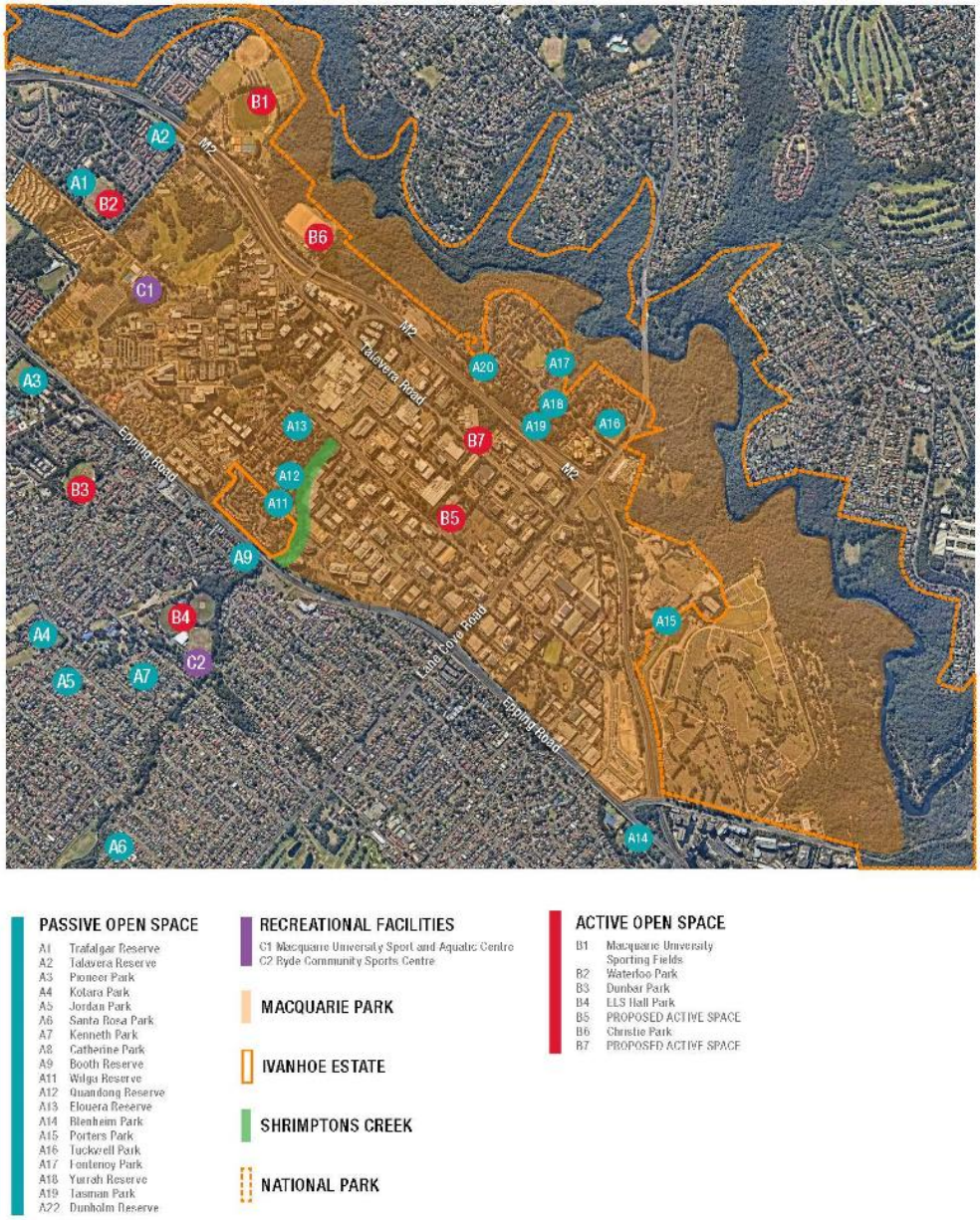


Figure 50 – Open space in the local area

Source: Elton Consulting

To assess whether existing open space provision will be adequate to meet demand for open space, the study considers the projected population for the Macquarie Park area and the predicted demographic composition. It is forecast that the population for Macquarie Park in 2036 will be 27,253 and that there will be approximately 7,100 living at Ivanhoe Estate at this time. A comparison of the predicted demographics of Ivanhoe Estate and Macquarie Park shows that there will be more children living at Ivanhoe Estate, less people of working age and more people over the age of 50. It is also noted that the provision of high quality open space in urban renewal areas is key to creating liveable higher density environments, as high density means that residents rely on public open space for recreation. This predicted community composition informs the assessment of open space demand at Ivanhoe Estate.

A review of sports participation data published by the Australian Bureau of Statistics shows that the most participated in outdoor activities are informal and unstructured activities, indicating a potential demand for open space that is flexible and multi-purpose.

Benchmarking of recent, comparable urban renewal sites indicates that 0.7 hectares of open space is required for the proposed Masterplan. The Masterplan incorporates over 1.5 hectares of open space, with a variety of passive and active spaces proposed. In particular:

- The Green Link, including the Village Green, forest playground, learn to cycle track and gardens.
- Town Plaza, including spaces for the community to meet and gather.
- Shrimptons Creek open space corridor, including planting, running and cycle paths and exercise stations.
- Forest thresholds, that provide unstructured spaces for gatherings and exercise.

The proposed design and location of these open space areas are compliant with the standard contained in the City of Ryde's 'Integrated Open Space Plan'.

In addition to the open spaces that will be provided throughout the site, it is noted that there will also be demand for sports fields and other courts. As part of the proposed development, Aspire Consortium will make contributions to improve local sports fields such as Wilga Reserve and ELS Hall Park, and is likely to deliver these upgrades through the VPA (see **Section 5.18**). The Study also identifies that the proposed recreation facility within the school will allow for joint community-school use, and will cater for potential demand for activities such as indoor sports, yoga or martial arts. Demand for swimming classes, hydrotherapy and other aquatic activities is likely to be met through the proposed 25 metre swimming pool.

Overall, the proposed amount of open space in the Masterplan is double the amount provided in comparable urban renewal projects in Sydney. The proposed types of open space are likely to cater for the various open space demands of the projected future population and will encourage community interaction. Improvements to surrounding open space and joint school-community facilities will further contribute to satisfying future demand for open space and recreation areas.

5.6 Amenity

5.6.1 Residential Amenity

The Concept Masterplan has been designed to achieve a high level of residential amenity in accordance with the nine principles of SEPP 65 and the design criteria recommended by the Apartment Design Guide. The Indicative Reference Scheme (see **Appendix B**) has been prepared to demonstrate that the proposed building envelopes are capable of accommodating buildings that can achieve key design criteria of solar access and natural cross ventilation. Consideration of the key ADG Design Criteria relevant to the Masterplan is provided below. An assessment of the Masterplan against all the objectives and design criteria and guidance in the ADG has been prepared by Bates Smart and included at **Appendix B**.

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 Indicative Drawings demonstrate that the recommended building separation distances can be achieved between all indicative residential buildings, with the exception of the building separation between Lot A1 and Lot A2 and between Lot A1 and B1.1. The indicative building separation is shown in **Figure 51** below.

Figure 51 – Building separation of Indicative Reference Scheme

Source: Bates Smart

This diagram illustrates that the minimum building separation of 24 metres is achieved between all buildings across the site, with the exception of Lot A1 and Lot A2 where a 14 metre building separation is achieved.

This separation distance achieves the recommended criteria up to four storeys and visual privacy impacts at higher levels will be mitigated through appropriate design measures, such as:

- Orienting each building so that direct lines of sight between habitable rooms are avoided or obscured.
- Incorporation of privacy screens, offset windows and vertical fins or louvres.
- Utilising the slope of the site in this location to minimise any potential visual privacy impacts.

As illustrated in the Indicative Scheme (see **Figure 52**), the apartment on the northern corner of A2 can be orientated to the west, with its secondary wall facing the apartment on the southern corner of A1 at the interface. The southern corner A1 Apartment is then orientated to have an outlook down the neighbourhood street.

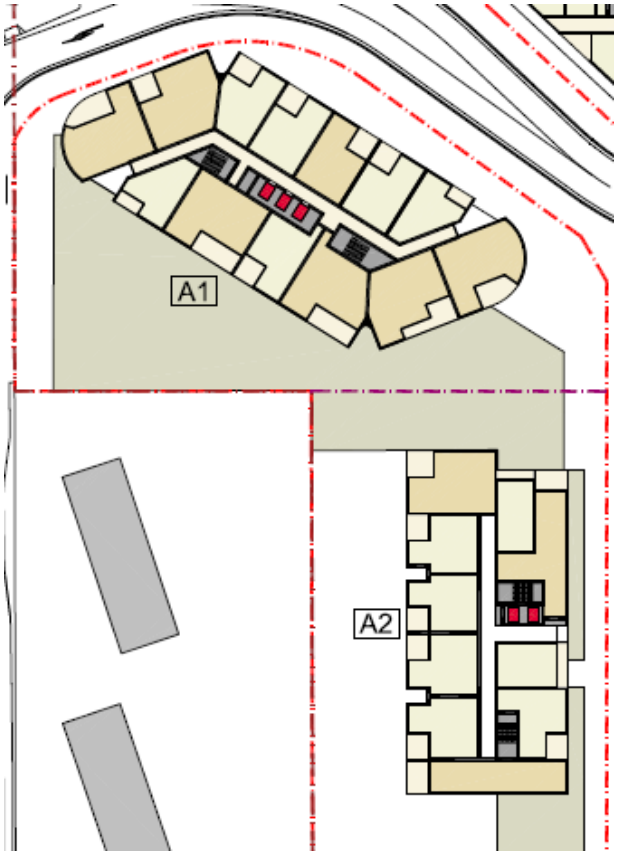


Figure 52 – Extract of the Indicative Scheme showing the interface between A1 and A2

Source: Bates Smart

Building separation between A1 and B1.1 is also a minimum of 22 metres. This variation to the recommended design criteria is acceptable on the basis that the building separation increases to approximately 27 metres towards Herring Road and habitable rooms are able to be oriented to avoid direct sight lines between neighbouring buildings. Future detailed design of each building will incorporate appropriate privacy measures, such as screening.

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. The solar access studies undertaken by Bates Smart (see **Appendix B**) demonstrate that at least 70% of apartments receive the recommended solar access.

The ADG recommends that no more than 15% of apartments should receive no direct sunlight between 9am and 3pm at midwinter. The Indicative Reference Scheme demonstrates that this Design Criteria is also satisfied.

Communal and Public 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. Communal open space provision will exceed 25% of the site and the Solar Access and Shadow Study shows that at least 50% of the principal usable part of the communal open space receives direct sunlight between 9am and 3pm on 21 June.

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.

The Indicative Drawings show that natural cross ventilation is achieved to 60% of apartments. Balcony design will be subject to future detailed development applications, however it is not expected that enclosed balconies will be proposed.

5.6.2 Overshadowing

Shadow diagrams have been prepared by Bates Smart using the Indicative Reference Scheme (see **Appendix B**). During the Winter Solstice the main impact of the proposed development will be on the low density residential on the opposite side of Epping Road. These shadow impacts are considered appropriate because:

- The proposed development complies with the maximum height limit in Ryde LEP, and the shadows cast are consistent with the impacts associated with a development of the scale that was envisaged for the site as part of the Priority Precinct rezoning process that occurred.
- The urban structure ensures there are gaps between buildings and their associated shadows, which results in intermittent shadows/sunlight passing over the properties during the affected period.
- The shadows predominantly fall on the front yards and roofs of the dwellings and not their primary private open space.
- Where overshadowing of the primary private open space (the rear yards) occurs on the properties fronting Epping Road, the shadows move off those areas by midday, ensuring there is no loss of sun during the lunch period, and is completely off the properties by 2pm.
- Only three dwellings (178-182 Epping Road), which have their primary private open space in the front setback addressing Epping Road, will have overshadowing impacts during the lunch period. However, the shadow moves across the open space during this time, ensuring that the open space area still receives full sun for the majority of the lunch period and that the dwellings still achieve over 3 hours of solar access between 9am and 3pm.

No shadows are cast on the adjoining residential flat buildings fronting Lyonpark Road. The adjoining site at the corner of Herring Road and Epping Road is affected by shadow for a limited duration between 9am and 11am.

During the spring equinox, shadow impacts are limited, with minor overshadowing of the front yards of the dwellings fronting Epping Road until 11am and then no overshadowing after that time. The site at the corner of Herring Road and Epping Road has some addition shadow cast on it between 9am and 11am.

The impacts created by the proposal are considered to be minor and acceptable, particularly as the proposed building height is consistent with the maximum height of buildings in the Ryde LEP 2014. Future detailed building design will further consider shadow impacts and incorporate measures, where possible, to minimise shadows on the adjoining properties.

5.6.3 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 V**). It is noted that the change to the structure and scale of buildings on the site as a result of the development would be expected to alter the existing ground plane conditions. The specific massing of the proposed buildings and their interaction with approaching wind flows will dictate the actual wind environment on the site and the resulting wind acceptability levels. However, the assessment finds that the proposed Masterplan remains capable of achieving a suitable wind environment for pedestrians and of meeting the relevant safety criterion.

This can be achieved through appropriate design interventions and with due consideration of the prevailing winds when delivering the detailed buildings considered under the Masterplan. CPP nominate a number of mitigation measures that can be employed, including the use of setbacks or awnings to reduce downwash, local screening around seating areas particularly in the retail areas, and dense evergreen landscaping to mitigate wind channelling.

This assessment will be supplemented by further wind tunnel testing as part of the design development and delivery of detailed buildings within the Masterplan. The results of those studies will be submitted with each of the DAs to be lodged. Opportunities to improve existing wind conditions, as opposed to simply retaining existing conditions, will be investigated in this regard. This is consistent with the Principles established in the Urban Design Study in terms of improving the ground plane and amenity of the Ivanhoe Estate.

5.6.4 External Privacy

The proposed building envelopes have been orientated and sited to minimise impacts on adjoining landowners. Of particular relevance are the existing residential flat buildings on Peach Tree Road to the east and those fronting Herring Road in the north west of the site. All remaining surrounding land has been largely separated from the site by Epping and Herring Roads and Shrimptons Creek, and will also benefit from significant changes in topography, mature vegetation, or are non-residential uses.

The Concept Proposal building envelopes have been sited to ensure each building is appropriately set back from the site boundaries. All residential flat buildings will be set back from the boundaries consistent with the Design Criteria in the Apartment Design Guide. Other buildings will be set back from boundaries consistent with Council's DCP. Whilst the detailed design of the buildings within the envelopes will ultimately inform the relationship between the site and adjoining landowners, each of the proposed envelopes will safeguard external privacy through:

- design interventions such as privacy screens, offset windows, vertical louvres or fins, and the orientation of apartments;
- stepping development away from the site boundary with height, where greater setbacks are needed;
- positioning only non-habitable spaces within boundary setback zones if required;
- retaining significant mature trees along site boundaries and supplementing landscaped areas with screening planting; and
- providing boundary fencing.

The building envelopes also generally orientate development away from the site boundaries and towards the main streets and centres of activity. The exception to this is the buildings fronting Shrimpton's Creek, which have been orientated to capture the amenity of the corridor and provide passive surveillance.

5.6.5 View Impacts

Public Views

A Visual Impact Assessment has been prepared by Ethos Urban (**Appendix T**) to assess the visual impact of the Concept Masterplan from key vantage points in the surrounding area, as described in detail in **Section 5.4.6**. The Visual Impact Assessment finds that the Masterplan will have an acceptable visual impact as it incorporates a number of measures to mitigate perceptions of bulk and is consistent with the desired future character of the area as identified in NSW Government strategic planning policy. In addition to this, the Masterplan is generally consistent with the planning controls for the site set out in the Ryde LEP 2014 and will be designed to ensure that future buildings achieve compliance with the Apartment Design Guide, thus ensuring view corridors are maintained through the site. Where there are high view impacts on the surrounding area, these are generally to main roads and will not result in the loss of any valuable views or landscape features.

Private Views

The envelopes proposed by the Concept Masterplan will likely impact on private views for residents of 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 Masterplan, this view loss is acceptable for the following reasons:

- The proposed building envelopes are within the permissible height limit prescribed by the Ryde LEP 2014 and consistent with the objectives of the rezoning set out in the Herring Road Finalisation Report.

- The arrangement of building envelopes within the Masterplan maintains view corridors through the site, which promotes the principle of view sharing.
- 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 potential of the site and result in a development that provides less social and affordable housing on the site.

5.7 Transport, Traffic, Parking and Access

A Traffic and Transport Report has been prepared by Ason Group to consider the traffic impacts of the proposed Masterplan (refer to **Appendix M**). The Traffic and Transport report includes a detailed summary of existing transport patterns in Macquarie Park, including an analysis of public transport, vehicle and active transport infrastructure provision and estimated daily movements.

Existing Traffic and Transport Facilities

The site main roads surrounding the site are Epping Road, Herring Road and Lyonpark Road. The traffic and transport facilities provided on these roads is as follows:

- Epping Road is an arterial road and provides the following facilities:
  - Signalised intersection at Waterloo Road.
  - Pedestrian paths on each side of the road.
  - Bus stop adjacent to the site near Shrimptons Creek.
- Herring Road is a collector road and provides the following facilities:
  - On-street parking on each side.
  - Signalised intersections at Epping Road and Waterloo Road.
  - Pedestrian paths on each side.
  - Bus stops on each side.
  - Macquarie University train station is located at the intersection of Herring Road and Waterloo Road.
  - Macquarie Bus Interchange located at intersection of Waterloo Road.
- Lyonpark Road is a local road and provides the following facilities:
  - On-street parking on each side.
  - Pedestrian paths on each side.

Design and Operation of Proposed Road Network

The Traffic and Transport Report details road upgrades that have been identified or are proposed for Macquarie Park by RMS and the City of Ryde. These upgrades will assist in improving permeability throughout the precinct in addition to capacity improvements at key intersections, including upgrades to the intersection of Epping Road and Herring Road. In addition to these government-led road upgrades, the proposed Masterplan includes the following road upgrades:

- New vehicular and pedestrian access to Lyonpark Road.
- Signalisation of Ivanhoe Place with Herring Road.
- New pedestrian connection to Peach Tree Road.
- Left-in access from Epping Road.

The design and operation of the proposed road network has been assessed by Ason Group and is presented at **Appendix M**.

Traffic Generation

Traffic modelling has been undertaken for the proposed development to estimate the total daily and peak hour trips likely to be generated by the proposed development. The methodology for trip generation is detailed at **Appendix M**. The results of this modelling are presented in **Table 12**.

Table 13 – Estimated traffic generation

Land Use	AM peak (vehicles per hour)	PM peak (vehicles per hour)
Market dwellings	325	282
Social dwellings	26	44
Market Independent Livings Units	13	13
Social Independent Living Units	4	7
Affordable Units	15	13
Residential Aged Care Facility	12	12
Residential sub-total	***395***	***371***
High School	95	15
Child Care	30	30
Office	6	6
Ancillary Retail	12	12
Non-residential sub-total	***144***	***63***
Total	**538**	**434**

Intersection Performance

A detailed assessment of the existing and future safety and performance of key intersections has been undertaken based on traffic volume data used by Transport for NSW for the Waterloo Road temporary bus shutdown network planning from 2016 and is summarise at **Table 13**. The assessment includes results for both the post-development scenario, as well as when surrounding road upgrades to be undertaken by RMS are completed.

Table 14 – Intersection performance

Intersection	Current Level of Service	Projected Level of Service (without road upgrades)	Projected Level of Services (with road upgrades)
Epping Road and Herring Road	F (AM peak) F (PM peak)	F (AM peak) E (PM peak)	F (AM peak) E (PM peak)
Waterloo Road and Herring Road	F (AM peak) F (PM peak)	C (AM peak) D (PM peak)	C (AM peak) D (PM peak)
Ivanhoe Place and Herring Road	A (AM peak) A (PM peak)	B (AM peak) E (PM peak)	B (AM peak) C (PM peak)
Waterloo Road and Byfield Street	A (AM peak) A (PM peak)	A (AM peak) B (PM peak)	A (AM peak) B (PM peak)
Lyonpark Road and Epping Road	A (AM peak) A (PM peak)	A (AM peak) A (PM peak)	A (AM peak) A (PM peak)

The analysis indicates that the net traffic volumes arising from the development would result in only low increases in delay and the Level of Service would remain unchanged in most locations. Specifically:

- Proposed upgrades to the intersection of Epping Road and Herring Road results in a significant improvement in the operation of the intersection.
- The proposed bridge will provide an alternate east-west route through Macquarie Park and results in substantial redistribution of traffic throughout the precinct.
- The proposal has minimal impact on the operation of the Waterloo Road and Herring Road intersection, with the level of service remaining the same during morning and evening peak periods.
- There will be minimal increase in delays at the intersection of Epping Road and Herring Road, with any additional delays being offset by the proposed bridge to access Lyonpark Road.

The traffic impact analysis shows that the net traffic generation volumes are of a sufficiently low order that, once distributed on to the surrounding road network, the impacts of these volumes at the key intersections would be negligible and the intersections would operate as currently predicted by RMS modelling.

Car Parking

The proposed car parking rates for the development are outlined in **Section 3.7**. Car parking rates are proposed generally in accordance with the City of Ryde Development Control Plan 2014 and State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 where applicable.

Traffic Mitigation Measures

Measures to mitigate the impact of increased traffic on the local road network are detailed in the Transport and Accessibility Management Plan and include:

- Sustainable travel strategies, to include provision of marketing of public transport options and free travel pass.
- Infrastructure improvements to provide easy pedestrian and cyclist access via a safe and efficient shared path and footpath network and an internal road network with low traffic environment.
- Public transport infrastructure to provide safe and convenient means for the future residents to use public transport services and bus priority treatments to reduce the travel times for public transport users.
- Transport service improvements, including the implementation of a new developer funded community bus connecting the development with Macquarie Park employment zones and other local services.
- Road infrastructure upgrades.

Green Travel Plan

Where practical, the future operation of the site will seek to implement these strategies to maximise the use of alternative modes of transport. A Green Travel Plan is provided with Transport Management and Accessibility Plan at **Appendix M** and details proposed measures to encourage sustainable travel through six main strategies:

- Travel planning and demand management.
- Promoting public transport.
- Promoting cycling.
- Promoting walking.
- Restraining parking.
- Influencing travel behaviour.

Construction Traffic

A Preliminary Construction Management Plan prepared by Ason Group is provided in the Traffic and Transport Assessment at **Appendix M** and outlines predicted construction traffic impacts. The assessment

shows that traffic impacts are likely to be minor and that the following measures can be implemented to minimise any potential impacts:

- Implement traffic control to regulate movements into and out of the site.
- Schedule intensive delivery activities outside of peak hours.
- Construction vehicles would be limited to the use of Epping Road, the M2 and necessary local roads during non-peak periods.
- All vehicles will enter and exit the site in a forward direction.
- All vehicles will cover loads.

The preliminary CTMP will be further detailed prior to future development applications.

5.8 Social Assessment

A Social Impact Assessment has been prepared by Elton Consulting (refer to **Appendix W**) to consider the social impacts of the Concept Masterplan. The Social Impact Assessment has been prepared in accordance with the Department of Planning and Environment Social Impact Assessment Guide and is informed by a review of relevant policies and literature relating to urban renewal projects and the delivery of social housing.

The Social Impact Assessment identifies the existing conditions at the Ivanhoe Estate based on a study of the Ivanhoe Estate commissioned by the Land and Housing Corporation, NSW Department of Families and Communities data and Australian Bureau of Statistics data.

The Social Impact Assessment considers these existing conditions at Ivanhoe Estate in the assessment of social impacts, as well as the impact on other key stakeholders including neighbours, future residents, future community service providers, the City of Ryde and the NSW Government.

Social impacts are separated into two types, being:

- Social impacts that arise as a result of urban renewal projects in general.
- Social impacts likely to arise as a result of the Ivanhoe Estate Masterplan.

Overall, the Social Impact Assessment finds that the Concept Masterplan is consistent with best practice for mixed tenure estate renewal and recognises the importance of mitigating potential social impacts. It found the redevelopment may result in a broad range of social impacts, these are balanced by the overwhelming positive social impacts associated with the high quality design of the Concept Masterplan which includes a variety of housing choice and a significant amount of open space and community facilities. The Social Impact Assessment notes that a significant number of mitigation measures to facilitate social inclusion have already been incorporated into the Masterplan, and that any potential negative impacts can be minimised through evaluation, monitoring and community engagement. Through the implementation of future community and place management activities, the Ivanhoe Estate will evolve as an equitable, inclusive and productive community. Section 5.8.1 below outlines how the community will operate and further outlines methods to facilitate social inclusion.

The proposed Masterplan presents a unique opportunity to realise a range of important social benefits, including a significant increase in the supply of social housing, implementing best practice for community integration, enhancing community and open space facilities and providing a high quality public domain. Macquarie Park is identified as a key strategic centre by NSW Government strategic planning policy and future residents will benefit from immediate access to public transport. By providing approximately 1,000 social housing dwellings and 128 affordable housing dwellings in this location, the proposed Masterplan will ensure that there are equitable opportunities for residents of Sydney to live close to employment, public transport and educational establishments in an environment where a high level of residential amenity is achieved.

A detailed description of the potential social impacts arising as a result of the proposed masterplan is presented in **Table 15** below. It is noted that these represent all potential impacts to ensure that appropriate mitigation strategies can be implemented where any potential impacts may arise.

Table 15 – Social impacts

Category of social impact	Potential Impacts
Information and communication strategy	• Residents and affected stakeholders are given certainty about the development process. • Transparency in communication to market residents about housing tenure mix. • A coordinated engagement and communications strategy is required.
Relocation and return of existing residents	• Residents will be able to return to new dwellings which better suit their needs. • Residents will require ongoing support throughout the process. • A relocation and return strategy will be required to ensure an appropriate match between tenants and dwellings.
Social and affordable housing supply	• Improved ability for vulnerable people to access safe housing in a well-connected location. • Social housing tenants require provision of adequate support services.
Social mix	• Opportunities for stronger collective control over surroundings. • Revenue directed to funding programs with the potential increase in inclusive opportunities for groups in the community. • Mixed tenure likely to improve how the wider community perceives the development. • Improved perceptions of safety and security. • Safer by design principles have the potential to improve public safety. • Possible challenges with integration between social, affordable and market housing residents. • Tenure blindness likely to reduce stigma around how future residents perceive the development. • New opportunities for the community to share communal space and interact socially. • Requires effective implementation and delivery of community support and development programs.
Support services	• Improved opportunity to transition out of social housing, including access to education, training and employment. • Requires consistent and effective management and delivery of support services. • Improved quality of life for the safety net cohort.
Asset renewal and tenant match	• Improved housing quality. • Dwellings can better meet the needs of smaller households. • Apartments built to Silver Standard of the Livable Housing Design Guidelines will meet the changing needs of occupants over their lifetime. • Dual key options required to provide additional flexibility and cater for larger households.
Dwelling increase	• Higher density development can bring more activity into major centres. • Higher density in employment destinations can result in increases in walking and cycling and reduce car dependency. • Additional population may support local retail, business and entertainment facilities. • Dwellings in high density can be more affordable and better meet the needs of smaller households. • New provision of local infrastructure. • Cumulative positive impacts with surrounding developments. • Cumulative negative impacts with surrounding development including shadowing, traffic, views, demand on local infrastructure. • Construction impacts.
Community diversity	• Opportunity for better social housing experience. • Opportunity for the creation of a vibrant, mixed community. • Requires effective implementation of community support programs.

Category of social impact	Potential Impacts
Open space and community facility demand	• New pedestrian and cycle connections may improve liveability, especially with positive opportunities for access to local natural ecosystems such as Shrimptons Creek. • New active open space and recreation facilities. • Increased demand on facilities in surrounding areas including public schools, sporting fields and other community facilities.
Health and wellbeing	• Improved physical design of the built environment that contributes to wellbeing. • Positive impacts arising from provision of community development programs.

5.8.1 Community Operation

Integration with the surrounding community is a key objective for the Ivanhoe Estate, achieved through partnerships with not-for-profit organisations, local and State government and the community. Social and affordable housing will be managed by Mission Australia Housing and other community housing providers. Mission Australia Housing is a Tier 1 Registered Community Housing Provider under the National Regulatory System for Community Housing. Mission Australia will have an office on-site and will utilise partnerships with Mission Australia and other organisations to link residents to education, employment, training, support and the wider community. Mission Australia Housing will utilise partnerships and innovative programs to provide:

- More opportunities, support and incentives to build housing independence.
- A better experience for social housing residents where they feel safer and empowered to participate fully in their local community.
- Links to early learning, education, training and employment.
- A community and development program to bring all residents together to develop a range of programs, activities and events that build community at Ivanhoe.

Mission Australia Housing has developed a Social Housing Outcomes Framework has been developed that seeks to create a community that:

- Delivers tailored and personal plans for individual social housing residents.
- Provides links to opportunities.
- Connects people to education and employment.
- Provides early learning options.
- Creates an environment where positive norms are enforced.
- Breaks the generation cycle of housing tenure.

This Framework will be used to develop a detailed Social Housing Outcomes Plan in coordination with Mission Australia Housing, Mission Australia, Land and Housing Corporation and Department of Family and Community Services.

Mission Australia Housing and future community housing providers' tenancy and assets staff will conduct regular inspections of homes, reviews of rent and will work with Mission Australia's Tailored Support Coordinators to ensure all tenants are supported and comfortable in their homes. Tailored Support Coordination Services will assist residents to formulate goals by developing a Personal Support Plan and connect to broader human services, education, training and employment services to help achieve them. In particular, Mission Australia Housing and Frasers Property will:

- Provide a community hub to deliver Mission Australia Housing programs and meeting spaces for the community.
- Establish a Job Hub within the community hub where there will be opportunities for job fairs, practice interviews and other employment education and training sessions.
- Maximise employment opportunities available at the school, childcare centre, residential aged care facilities and retail outlets.

- Work with surrounding business to establish employment pathways for residents.
- Establish connections with Macquarie University and TAFE to provide training and scholarships related to property development.

Mission Australia Housing and future community housing providers will be responsible for maintenance and repairs, facilitating some community activities and administering some social services. The local community will be encouraged to use communal facilities, including multipurpose gymnasium and hall, outdoor exercise facilities, play areas, community hub, a school and community gardens.

Social and affordable dwellings will be distributed throughout the site to achieve 'tenure blindness' and community integration. To ensure that Mission Australia Housing and future community housing providers are able to effectively manage social and affordable housing, social and affordable housing lobbies will be separate from private dwelling lobbies.

Social housing residents will either be former residents of the site and applicants on the Department of Families and Community Services Housing Pathways register. A Local Allocation Plan will set out the allocations process for:

- Returning tenants – first priority will be given to returning tenants.
- Opportunity cohort –allocation to a proportion of people on the housing register who demonstrate that they are able to take advantage of employment and education opportunities at Ivanhoe Estate and transition out of social housing.
- Other priority and general housing tenants –applicants on the NSW Housing Register according to current Department of Family and Community Services policies.

It is assumed that the majority of social housing residents will receive a Commonwealth support payment and would generally fall into the following groups:

- Young people.
- Job seekers.
- Single parents.
- Aged.
- Persons living with a disability.

Through the range of initiatives described above, Ivanhoe Estate will create an integrated community that brings together residents from varied socio-economic backgrounds to benefit from the social and economic opportunities provided. These initiatives are designed to promote social inclusion and foster economic participation, and seek to create a benchmark for future Communities Plus projects.

5.8.2 School Provision

A non-government high school will be provided on the site. The Community Infrastructure and Recreation Demand Study prepared by Elton Consulting (refer to **Appendix U**) demonstrates that the proposed non-government high school will contribute to managing the increasing demand for school places in the Ryde LGA that is occurring due to the increasing residential population. At present, there are three public primary schools and one private primary school located within the vicinity of the site. The closest government high schools are Epping Boys High and Ryde Secondary College, which are within a 2 kilometre radius of the site. The analysis undertaken by Elton Consulting demonstrates that primary school enrolments at local public schools have increased over the past five years, indicating a sustained demand for school places in close proximity to the site. Two local schools are currently at capacity, being:

- North Ryde Public School, which is operating at 114% capacity.
- West Ryde Public School, which is operating at 104% capacity.

The 2017 NSW State Budget committed additional funding for a new primary school at Smalls Road Ryde and a K-12 school at Meadowbank. Moreover, additional funding will be committed to local Kent Road Public School and West Ryde Public School.

The ongoing demand for school places and projected population increase indicates that there is sufficient demand for a non-government high school to be provided. As primary age students progress to high school, there will need to be additional places for students in the local area. The proposed high school will be able to contribute to meeting this demand, as well as potentially benefit from the co-location with Macquarie University. The proposed high school will also provide a range of community and recreation facilities, which will be shared with the surrounding community. This is consistent with the NSW Government policy 'Better Placed' as well as the 'NSW School Assets Strategic Plan.' In addition to these direct benefits, the presence of a high school on the site will be create activity on Main Street, providing a place for members of the community to interact and emphasising the value of education.

5.9 Ecologically Sustainable Development

The Ivanhoe Sustainability Report included at **Appendix N**, has been prepared by Frasers to explore a range of sustainability strategies, and outline examples of best practice sustainable building principles that can be implemented through the delivery of 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.

The three key sustainability commitments for the Ivanhoe Estate comprise:

- 5 Star Green Star Design & As Built v1.1, as the minimum for all buildings;
- 6 Star Green Start Communities v1, for the Ivanhoe Masterplan site; and
- a 'Real Utilities' integrated infrastructure solution.

These commitments will be achieved across the staging and delivery of the development, drawing on various strategies in the design and operation of the Ivanhoe Estate. These comprise initiatives to address the management and maintenance of buildings, the selection of construction materials, demand for resources such as water and power, the use of sustainable modes of transport, impacts to the local ecosystem, emissions, and general community wellbeing. These are further outlined in **Appendix N** and confirm the Consortiums commitment to achieving best practice sustainability strategies.

It demonstrates that there are opportunities to implement best-practice sustainable building principles and improve the environmental performance of the community.

5.10 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 X**) in consultation with NSW Police, that provides commentary on the Concept Proposal, outlines the policy and crime context of the proposal, and makes recommendations about appropriate strategies to reduce the opportunity for crime to occur. The aims of the CPTED strategy are to influence the design of the buildings and places by:

- increasing the perception of risk to criminals by increasing the possibility of detection, challenge and capture;
- increasing the effort required to commit crime by increasing the time, energy or resources which need to be expended;
- reducing the potential rewards of crime by minimising, removing or concealing 'crime benefits'; and
- removing conditions that create confusion about required norms of behaviour.

It is noted that building specific CPTED principles will be carefully considered when completing the detailed design stages of the redevelopment. But, the application of CPTED principles at the Concept Proposal stage is also vital for creating an urban environment that reduces the opportunity for specific types of crime. In this instance, natural surveillance, technical surveillance, lighting, street activity and effective guardianship are key areas for improvement.

In view of this, and with the CPTED principles in mind, the proposed development can provide a safe environment through the fine-grain design of buildings and the public domain and the operation of the Community. These will address:

- designing so that the casual observer cannot distinguish between social, affordable or market housing;
- providing non-residential uses or individual residential entries at ground floor, to activate the street;
- developing social engagement activities and the preparation of a Plan of Management(s) addressing, among other things, regular maintenance;
- delineating between public land (i.e.: roads to be dedicated to Council), community/communal land and private land through fencing, landscaping and signage;
- providing consistent and uniform outdoor lighting, pathways, and CCTV; and
- designing with consideration of sight lines, opportunities for concealment, pedestrian entry/egress points from main roads.

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 discussed in **Section 5.8**, which has been prepared in consultation with Frasers Property, NSW Land & Housing Corporation, Mission Australia and other partners and agencies.

5.11 Flora and Fauna

This section assesses the impact of the propose development on the threatened ecological community located on the site, being the Sydney Turpentine-Ironbark Forest, as well as the impact of tree removal. The proposed offset scheme to mitigate these impacts is outlined at **Section 5.11.3**.

5.11.1 Impact on Threatened Ecological Communities

The Biodiversity Assessment Report prepared by Eco Logical Australia (**Appendix E**) finds that the proposal will impact on the Sydney Turpentine-Ironbark Forest. Where Sydney Turpentine-Ironbark Forest is to be removed, the long-term survival of these plants is considered to be unviable in the long term due to the location of the vegetation either within existing residential development or adjacent to a major roadway. In addition to this, the only potential fauna habitat is within hollow bearing trees along Epping Road. Following a review of species likely to occur on the site and site surveys, no threatened fauna species has been identified on the site.

A significant proportion of the Sydney Turpentine-Ironbark Forest is to be retained and the following measures will be implemented to avoid and minimise impacts:

- Siting of the development to minimise impacts to endangered ecological communities.
- Removal vegetation using appropriate tools to minimise further impacts on remaining vegetation and an ecologist will be present during removal.
- A Biodiversity Management Plan and Construction Environment Management Plan will be implemented prior to construction, which will include operational measures relating to clearance supervision and vegetation management.
- Providing nest boxes to replace hollow bearing trees.

5.11.2 Tree Removal

It is proposed to remove 311 trees, as outlined in the Arborist Assessment prepared by Eco Logical Australia at **Appendix Y**. The proposed tree removal is assessed to be acceptable on the basis that:

- 253 trees are of low retention value.

- 13 trees are of medium retention value, however will be subject to a high impact on the tree protection zone and are unlikely to survive.
- 45 trees are of high retention value, however will be subject to a high impact on the tree protection zone and are unlikely to survive.

In addition to these considerations, offset planting for all trees removed will be provided in accordance with the NSW Biodiversity Offsets Policy for Major Projects, as detailed at **Section 5.11.3** below.

Two trees will be investigated further to be determined if they can be retained, subject to impacts on the tree protection zone.

229 trees will be retained and protected in accordance with the Tree Management Plan provided at **Appendix Y**. The Tree Management Plan outlines guidelines on tree protection fencing, ground protection measures and construction methods.

5.11.3 Offsets

A Biodiversity Offset Strategy has been prepared by Eco Logical Australia in accordance with NSW Biodiversity Offsets Policy for Major Projects and the *Environment Protection and Biodiversity Conservation Act* Environmental Offsets Policy. The proposed offset measures of the project are to acquire and retire the full quantum of ecosystem credits required by the impacts of the project in accordance with the Office of Environment and Heritage BioBanking Credit Calculator. A total of 32 ecosystem credits are required.

The calculation of required ecosystem credits has been calculated based on impacts that require offsetting, being any plant community type that is a threatened species habitat and has a site value score of 17 or more.

The required biodiversity offsets will be retired in a staged manner, commensurate to the area of impacts. The indicative proposed schedule of offsets for each stage of the development is shown at **Figure 53** below.

PCT	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage A	Stage B	Total
ME041	6	0	4	4	2	0	0	0	0	0	16
ME58	1	3	2	1	2	5	0	0	1	1	16
Total	**14**	**3**	**11**	**4**	**4**	**5**	**0**	**0**	**1**	**1**	**32**

Figure 53 – Indicative offset staging

Source: Eco Logical Australia

5.12 Water, Drainage, Stormwater and Groundwater

As noted in **Section 3.13**, adequate water supply is able to be provided to the site.

The Concept Stormwater Drainage Plan is detailed at **Section 3.11** and will comprise a combination of rainwater tanks, on-site detention, surface drainage, pits and pipes and overland flow paths. The Concept Stormwater Drainage Plan has been designed to convey stormwater flows to the level required by the City of Ryde. Specifically:

- The drainage system to be provided on the site will cater for runoff generated from all storm events up to and including the 20 year ARI storm event.
- The road network and dedicated overland flow paths will be provided to safely convey flows which exceed the capacity of the drainage network during the 20 year ARI storm event up to the 100 year ARI storm event.
- Onsite detention will ensure that peak discharge in the post-developed 100 year ARI storm event does not exceed the peak discharge in the post-developed 5 year ARI storm event.

In relation to water quality, analysis undertaken by the MUSIC model indicates that the proposed water treatment and WSUD measures will exceed the targets set by the City of Ryde. The modelling also demonstrates that the water quality targets are met both on a lot-by-lot basis and across the site.

As noted in the Geotechnical Assessment at **Appendix G**, the depth of groundwater below the site is likely to be approximately 5 – 10 metres. The Geotechnical Assessment at **Appendix G** details that any potential groundwater seepage can be readily managed using 'sump and pump methods.' This is detailed further at **Section 5.19** below.

5.13 Flooding

As discussed in **Section 2.3.5**, the site is bound by Shrimptons Creek to the south and is located in the catchment area of this creek. Accordingly, BMT WBM have prepared a Flood Impact Assessment (**Appendix I**) to investigate the flood behaviour within the vicinity of the site and the impacts of the proposed development on this flood behaviour, including stormwater runoff, flows within the underground pipe drainage network, and flows within the Shrimptons Creek corridor. The assessment utilises the same methodology as the Macquarie Park Floodplain Risk Management Study and Plan where appropriate.

The proposed Masterplan results in minimal impacts when considering the 20 year ARI and 100 year ARI flood events. No notable changes in water level or velocity were observed in the 20 year ARI event. In the 100 year ART event, minor increases at the location of Lot 3B were present due to the buildings 100 year flood extent. These impacts are in the order of -0.01 to 0.00m.

During the PMF event, the magnitude of impacts are increased. Increases in peak water levels are present upstream of the site with significant decreases in water levels downstream from the site due to the proposed bridge obstructing the active PMG flow path.

Changes in velocity during the PMF event are relatively localised to the proposed development footprint with some affects upstream and downstream. Increases in velocity within Shrimptons Creek are observed due to shifting in flow path around the development. It is noted that the PMF event is usually used for emergency planning purposes, rather than the assessment of absolute changes to modelled flood levels and velocities.

During the PMF event, all proposed buildings floor levels are above the Shrimptons Creek PMF mainstream flood level, providing flood-free refuge for all events up to the PMF. The Flood Impact Assessment finds that there is no considerable risk to life, due to the availability of rising road access to Herring Road in the event of flood.

5.14 Heritage and Archaeology

An Aboriginal and Historical Heritage Due Diligence Assessment has been undertaken by Eco Logical Australia (refer to **Appendix J**) and found that there are no Aboriginal or historical heritage items located on the site. The preparation of the assessment including a review of the Aboriginal Heritage Information Management Systems register, the NSW State Heritage Register, the Ryde LEP 2014 and other relevant databases, as well as a field survey. During the field survey, it was noted that the majority of the vegetation post-dates construction of the buildings and that a significant amount of excavation is evident throughout the site. These findings confirmed that there is a low potential for Aboriginal archaeological sites or historical relics to be present on the site and that there is no further requirement for archaeological assessment. The proposed Concept Masterplan is unlikely to have any impact on Aboriginal or European heritage and it is recommended that the following measures are implemented:

- 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 case and an archaeologist must assess the finds.

The Assessment finds that a Heritage Interpretation Plan is not required at this stage of the development as there are no listed heritage items on the site and the assessment finds the site to have limited historical significance.

5.15 Contamination

Numerous site investigations have been carried out by DLA Environmental (refer to **Appendix H**), 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.

Based on these investigations, 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 benzo(a)pyrene, which exceeded the adopted ecological criteria at one sample location, as shown in **Figure 54**.

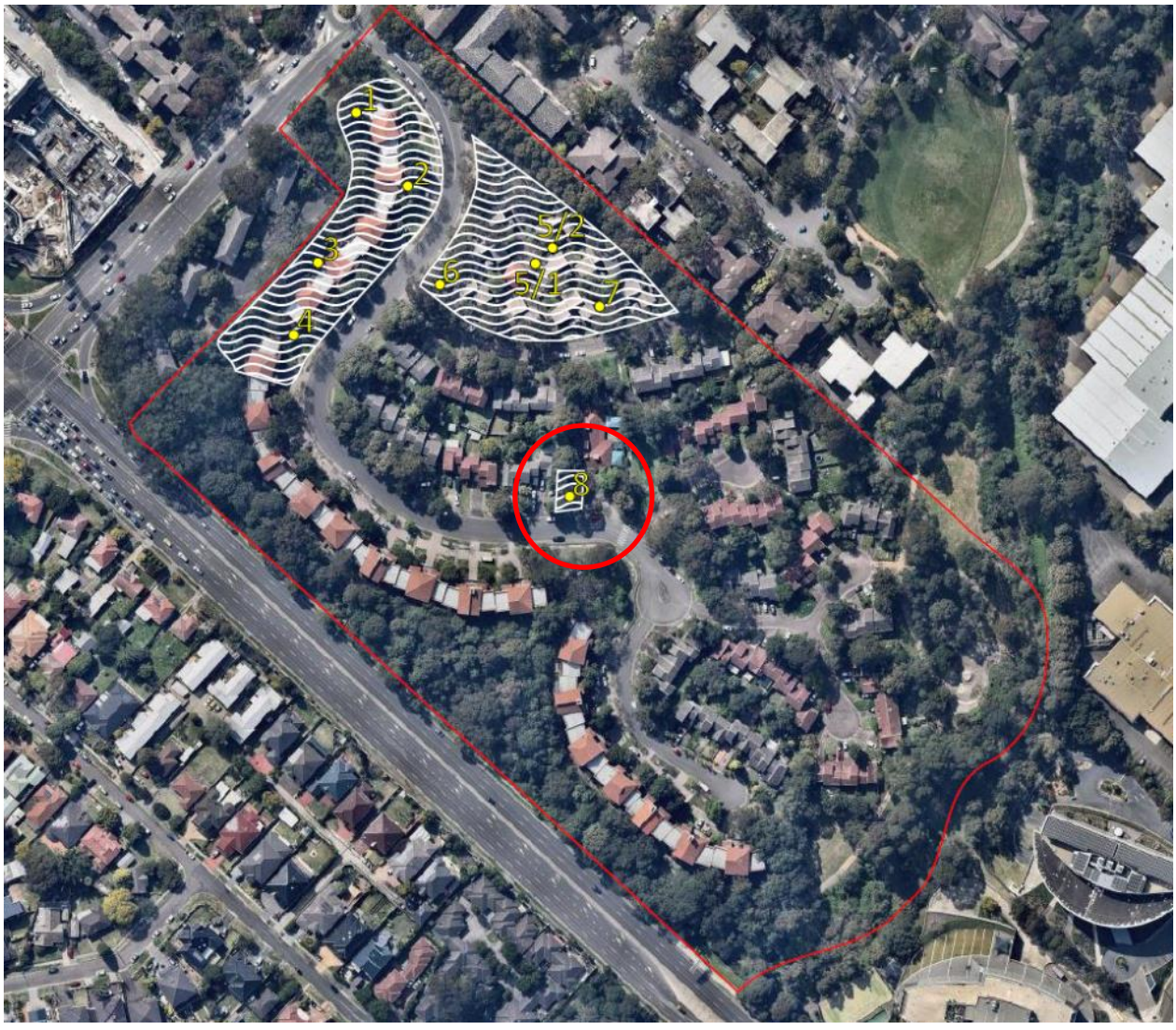


Figure 54 – Location of low-level contamination (circled in red)

This exceedance is not considered to present an unacceptable ecological risk due to its limited effects on plant uptake. The assessment found that the site can be made suitable for the proposed use of the land in accordance with the requirements of SEPP 55, with further assessment and the implementation of an appropriate remediation strategy to remediate the small portion of contaminated land. Further investigation and remediation would involve:

- Delineation soil sampling and laboratory analysis.
- Preparation of a Remediation Action Plan for the site.
- Remediate of the site, involving excavation and appropriate off-site disposal of contaminated soils.
- Validation sampling of the site.
- Preparation of a Site Validation Report.

This investigation would be undertaken prior to the completion of Stage 1.

5.16 Utilities

A Utility Services Report has been prepared by ADW Johnson to assess the capacity for the site to be serviced (refer to **Appendix K**). 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 Report and in Section 3.13 of this EIS. The staging of the augmentation of the utilities will be undertaken in order to ensure that sufficient capacity is provided for each relevant stage of the development.

5.17 Infrastructure Delivery

In addition to the augmentation of utilities outlined in **Section 5.16**, the key infrastructure components being delivered on the site includes roads, open space and community facilities. The final ownership of the infrastructure will be determined with Council as part of the future Voluntary Planning Agreement (VPA) between Council and Aspire Consortium (see further discussion in Section 5.18). The likely ownership of the infrastructure, based on initial discussions with Council, is shown in **Figure 55**.

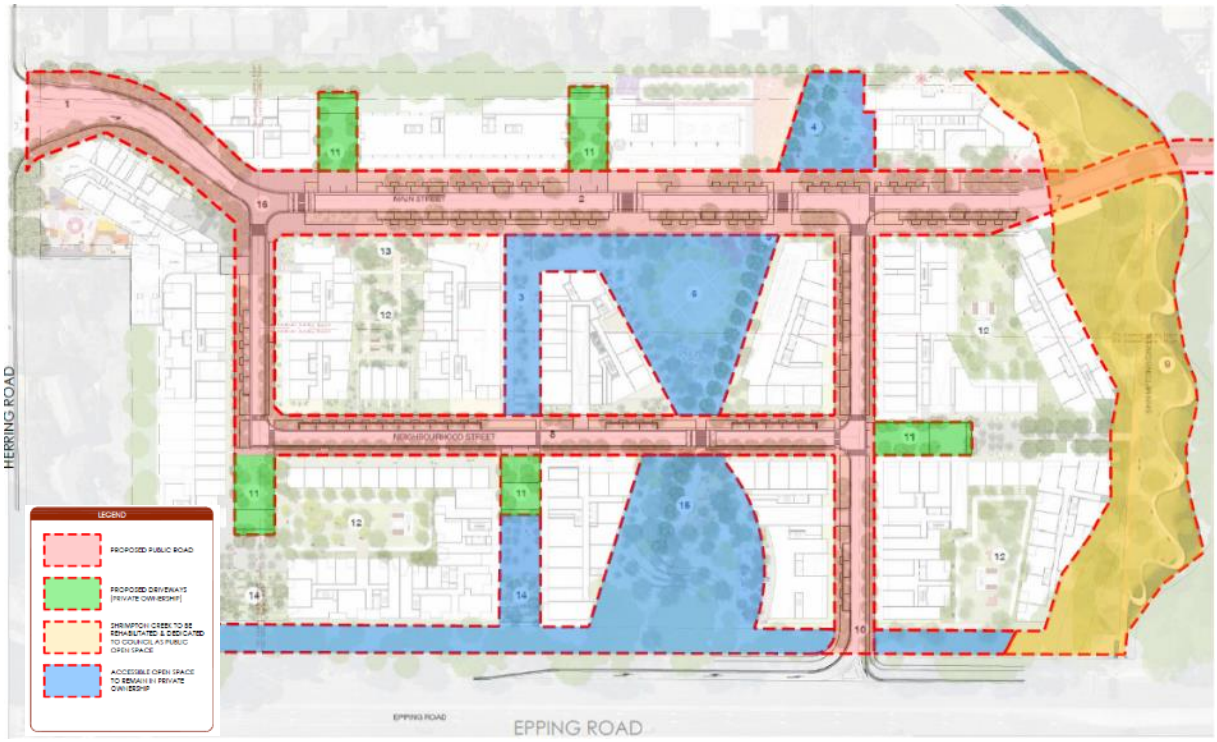


Figure 55 – Potential Infrastructure Ownership Plan

Source: ADW Johnson

The value of the infrastructure and the timing for its delivery will also be determined as part of the future VPA.

The site will generally be developed from Herring Road towards Shrimptons Creek. Infrastructure will largely be provided with the relevant stages as they are developed, with the exception of the construction of Main Street, the Lyon Park Road Bridge and rehabilitation of Shrimptons Creek, which will occur prior to completion of Stage 2.

5.18 Contributions

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 Urban Plaza;
- construction and rights of use of sports facilities in the high school;
- construction and dedication of a 25m swimming pool, learn to swim pool and hydrotherapy pool; and
- construction and use of the community hub.

The off-site works may include:

- Embellishing the Shrimptons Creek Epping Road underpass;
- A range of works as part of the ELS Hall Park and Wright Reserve upgrade, such as provision of synthetic fields and upgrades to amenities;
- Provision of a bike connection between the Epping Road underpass and the Epping Road regional bike path
- Road and intersection upgrades

As the proposed development is generally consistent with the FSR controls, noting the variations proposed relate to the provision of community benefit uses, open spaces and the seniors housing vertical village bonus that could have otherwise been achieved under an application made pursuant to that SEPP, no additional public benefit contributions are proposed beyond those calculated in accordance with the Section 94 Plan. Furthermore, the development in of itself, which provides approximately 1,000 social dwellings and 128 affordable housing dwellings will provide a significant public benefit in its own right.

It is noted that no Special Infrastructure Contribution in accordance with Section 94EF of the EP&A Act is applicable to the site.

5.19 Geotechnical

A Geotechnical Assessment has been prepared by Douglas Partners (refer to **Appendix G**) to assess the existing subsurface soil and groundwater conditions on the site, including both the Ivanhoe Estate and 2 – 4 Lyonpark Road. The assessment identifies a number of potential geotechnical issues and recommended strategies for the future development of the site, as follows:

- **Excavation:** Conventional earthmoving equipment is likely to be suitable for excavation on the site, however excavation methods may be limited by acceptable vibration levels, particularly near existing structures and services. Batters or excavation support will be required and these structures should be protected against erosion. Survey monitoring of excavation would be appropriate to assess movement of any shoring structures during excavation.
- **Groundwater and dewatering:** Groundwater seepage is likely to be readily managed using ‘sump and pump’ methods. Cut-off walls may be required over flood prone parts of the site if basement levels are below the design flood levels.

- **Foundations:** Foundations for structures should be taken down to uniformly bear on bedrock. Shallow or pile foundations are expected to be required for buildings, and pile foundations are expected to be required for the proposed bridge abutments.
- **Earthworks:** New filling areas should be constructed as controlled filling and excavated materials may be appropriate for reuse.
- **Pavements:** Subsurface moisture should be controlled through appropriate drainage to ensure the performance of any pavements.

The engineering recommendations of this Desktop Geotechnical Assessment will be considered in the detailed design of the proposed development and further geotechnical investigation will be undertaken to confirm on-site conditions for specific structures.

5.20 Noise

An Acoustic Assessment has been prepared by Acoustic Logic (refer to **Appendix S**) to assess the impact of noise intrusion on the proposed development as well as any noise emissions as a result of the proposed development. Specifically, the assessment considers:

- Traffic noise intrusion from Epping Road and Herring Road.
- Traffic noise increase generated by the proposed development.
- Industrial noise impact from existing commercial buildings.
- External noise emission from the proposed school, child care centres and plant services.
- Noise emissions during construction.

The Acoustic Assessment establishes internal noise criteria based on the Ryde DCP 2014, SEPP Infrastructure, the 'Development Near Rail Corridors and Busy Roads Interim Guideline' and the relevant Australian Standards.

Noise Impacts

Noise impacts on the proposed development as a result of traffic noise and noise from nearby commercial buildings can be appropriately attenuated provided that detailed design of the future buildings incorporates appropriate noise attenuation measures, including acoustic seals and glazing. Buildings with facades to adjacent to Herring Road and Epping Road will likely require mechanical ventilation, which will ensure that the relevant internal noise criteria can be met. External walls are not expected to require acoustic treatment.

Noise Emissions - Operation

The Acoustic Assessment also considers potential noise emissions from the site and impacts on surrounding residential receivers. The assessment finds that:

- **Plant noise emissions**: Recommended criteria for plant noise emissions are determined based on the Ryde DCP 2014 and the EPA Noise Policy for Industry 2017. Appropriate acoustic controls can be determined prior to construction to ensure that the overall plant noise emissions satisfy the relevant acoustic criteria.
- **School noise**: Recommended criteria for school noise emissions are determined based on the Ryde DCP 2014 and the NSW EPA Industrial Noise Policy. Appropriate acoustic controls can be determined prior to construction.
- **Child care noise**: Recommended criteria for school noise emissions are determined based on the Association of Australian Acoustical Consultants 'Technical Guideline for Child Care Centre Noise Assessment'. Appropriate acoustic controls can be determined prior to construction.

Construction Noise and Vibration

Recommended construction noise criteria are established in accordance with the Ryde DCP 2014, the Australian Standards *Guide to Noise Control on Construction, Maintenance and Demolition Sites* and the

NSW EPA 'Interim Construction Noise Guideline'. Detailed noise emission assessment will be carried out as part of future development applications, when the detailed construction methodology has been determined.

It is recommended that construction vibration is limited by the NSW EPA *Assessing Vibration: A Technical Guide* and the German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.

Overall, noise impacts on the site can be appropriately attenuated in accordance with the relevant acoustic criteria and noise emissions from the site will be capable of meeting the recommended acoustic criteria. Future applications for development will contain detailed acoustic assessment.

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 Ivanhoe Estate 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 56 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 56 – Risk Assessment Matrix

				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	• Visual impact of the development when viewed from the public domain	• The proposed envelopes have been sited to minimise height and bulk whilst utilising the site in accordance with the applicable development standards. • Detailed Design Guidelines have been prepared to ensure that future development incorporates appropriate design mechanisms to appropriately treat the built form and minimise any visual impacts.	3	1	4
Amenity	O	• Potential privacy impacts on adjoining properties. • Potential overshadowing of adjoining properties.	• 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	• Increased traffic on local road network during construction and operation.	• Initiatives to promote alternative forms of transport, including public transport, walking and cycling as well as a car share scheme • Reduced number of car parking spaces. • Green Travel Plan to encourage sustainable transport.	3	1	4
Social	O	• Potential for social integration to be implemented poorly. • Potential pressure on existing infrastructure and community facilities in the area.	• Ensure that community programs and activities as recommended in the Social Impact Assessment prepared by Elton Consulting are implemented. • Ensure that the public domain and delivery of the redevelopment facilitates social interaction. • Provide open space, community facilities and other infrastructure to support the increased residential population.	3	2	5
Safety	O	• Potential for crime and unsafe behaviour.	• Designing so that the casual observer cannot delineate between social, affordable or market housing; • Providing non-residential uses or individual residential entries at ground floor, to activate the street; • Developing social engagement activities and the preparation of a Plan of Management(s) addressing, among other things, regular maintenance; • Delineating between public land (i.e.: roads to be dedicated to Council), community/communal land and private land through fencing, landscaping and signage; • Providing consistent and uniform outdoor lighting, pathways, and CCTV; and	3	2	5

				Risk Assessment		
			• Designing with consideration of sight lines, opportunities for concealment, pedestrian entry/egress points from main roads.			
Flora and Fauna	C/O	• Impact on protected vegetation. • Potential impact on fauna habitat.	• Offset planting in accordance with the relevant State and Commonwealth offsets policy. • Retention of protected and native vegetation where possible. • Provisions of nest boxes.	3	1	4
Water, Drainage, Stormwater and Groundwater		• Potential impacts of flooding during construction. • Potential impacts on neighbouring sites stormwater drainage.	• Implement erosion and sediment control measures, including a temporary detention basin, during construction. • Ensure that future stormwater drainage system adequately caters for adjoining site.	1	2	3
Flooding	C/O	• Potential flood impacts during 20 year ARI and 100 year ARI event.	• Ensure that all floor levels and entrances to basement car parking are located above the PMF event flood levels. • Flood modelling to be undertaken as part of future detailed DAs, where relevant.	2	2	4
Heritage	C	• Potential for Aboriginal archaeological objects to be found during construction. • Potential for European heritage archaeological objects to be found during construction.	• 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	• Potential contamination of small area of the site likely due to a petrol spill.	• Remediate area of the site and undertake further investigation.	1	2	3

				Risk Assessment		
Utilities	O	• Additional demand on existing utilities	• Utilities are agumented to provide appropriate capacity for the development	3	1	4
Geotechnical	C / O	• Noise and vibration as a result of excavation works. • Potential seepage of groundwater. • Potential foundation stability issues during construction.	• Implement appropriate engineering excavation and construction methods, as detailed in the Desktop Geotechnical Assessment prepared by Douglas Partners.	3	2	5
Noise	C / O	• 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 and nearby commercial uses.	• Comply with recommended acoustic and vibration criteria during construction, subject to detailed construction methodology. • Limit outdoor activity from the school to two hours per day. • Appropriately attenuate school and child care centres to meet recommended acoustic criteria. • 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 16** below. These measures have been derived from the previous assessment in Section 5.0 and those detailed in appended consultants' reports.

Table 16 – Mitigation Measures

Mitigation Measures
Built Form and Visual Impact • Future buildings will be designed in accordance with the Ivanhoe Estate Design Guidelines prepared by Bates Smart. • Maintain or strengthen the existing vegetated buffers along the north-east, south-east and south-west boundaries. • The east-west green link through the central part of the site and associated green space should be delivered generally as proposed. • Align buildings to present the narrow elevation to Epping Road, as proposed. • Break down building form to provide a sense of smaller floorplates, particularly where fronting Shrimptons Creek. • Ensure separation distances between buildings comply with the relevant recommendations of the Apartment Design Guide. • Consider view sharing principles relevant to existing development on the northern side of Herring Road. • Include objectives and controls that mitigate visual impacts of building bulk and scale in the Ivanhoe Design Guidelines.
Amenity • Future residential buildings will achieve compliance with SEPP 65 and the Apartment Design Guide, where practicable. • Future residential buildings will be designed in accordance with the Ivanhoe Estate Design Guidelines prepared by Bates Smart.
Wind • Further wind-tunnel testing will form part of future application(s) for the detailed design of buildings, where relevant. • Amelioration measures will be explored for specific locations where local wind speeds may be greater than desired during the detailed design stage. • Opportunities to improve existing wind conditions will be explored during the detailed design phase.
Traffic • Undertake road upgrades detailed in the Traffic and Transport Report prepared by Ason (November 2017). • Implement the travel sustainability measures outlined in the Green Travel Plan prepared by Ason (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).
Ecologically sustainable development • Consider the ESD initiatives outlined in the Ivanhoe Sustainability Report prepared by Frasers (November 2017) when developing the building design to maximise the environmental performance and energy efficiency of buildings.
Safety • Further CPTED certification will form part of future application(s) for the detailed design of buildings, where relevant. • Detailed applications should take into consideration the recommendations contained in the Crime Prevention Through Environmental Design report prepared by Ethos Urban (November 2017).
Flora and Fauna • Prepare a Biodiversity Management Plan and Construction Environment Management Plan prior to construction. • Acquire and retire biodiversity offsets in accordance with the Biodiversity Assessment prepared by Eco Logical Australia (November 2017). • Provide nest boxes to replace hollow bearing trees.
Water, Drainage, Stormwater and Groundwater • Design future stormwater drainage infrastructure in accordance with the Stormwater and Drainage Assessment prepared by ADW Johnson (November 2017).
Flooding • Ensure that all floor levels and entrances to basement car parking are located above the PMF event flood levels. • Flood modelling to be undertaken as part of future detailed DAs, where relevant.

Mitigation Measures

Heritage and Archaeology

- 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.

Contamination

- Undertake targeted remediation of the site to remediate the potentially contaminated portion of the site, as described in the Supplementary Site Investigation prepared by DLA Environmental (June 2017).

Geotechnical

- Undertake further geotechnical investigation during prepartion of future detailed design and implement engineering construction methods, as detailed in the Desktop Geotechnical Asssment for Ivanhoe Estate and 2 – 4 Lyonpark Road prepared by Douglas Partners (August 2017).

Noise

- Carry out construction in accordance with the acoustic and vibration criteria recommended by the Acoustic Assessment prepared by Acoustic Logic (November 2017).
- Incorporate acoustic treatments into future residential buildings to comply with the acoustic criteria recommended by the Acoustic Assessment prepared by Acoustic Logic (November 2017).
- Future design of the plant, school and child care centre will comply with the acoustic criteria recommended by the Acoustic Assessment prepared by Acoustic Logic (November 2017).

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 is a Concept Masterplan for the redevelopment of the Ivanhoe Estate, containing a mix of residential, educational, seniors housing, community, retail and open space uses. The assessment must therefore focus on the identification and appraisal of the effects of the proposed change over the site's existing condition.

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 key driver of this proposal is to renew social housing on the site whilst also contributing to the stock of affordable housing, seniors housing and market housing. 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. There is also a well-recognised demand for affordable housing, housing that caters to an ageing population, and housing that can meet substantial forecast population growth. The proposal will substantially increase the supply of social housing (approximately 1,000 dwellings) and provide affordable housing (128 dwellings), seniors housing including high-care beds, and market housing (approximately 2,500 dwellings), to help meet existing and forecast demands.

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 site represents an ideal opportunity to move away from the former 'housing estate' model, and towards integrated communities with better social outcomes, which is a key driver of the Masterplan. It represents a pioneering development where social housing blends with private and affordable housing, to create a strong, integrated and resilient community with excellent access to transport, employment, improved community facilities and open space.

Community Services and Infrastructure

The Masterplan provides for essential non-residential uses, which will be delivered in coordination with housing, to serve the needs of Ivanhoe Estate and benefit the surrounding area. These comprise a Mission Australia services hub with office space for community organisations, a new community centre, an indoor recreation hall, child care centres, a Residential Aged Care Facility with a wellness centre, a high school accommodating 1000 students, and approximately 10,000m^2 of public open space including a district/regional playground. These bring non-resident users to the site and help to address wider community needs for education, health, social support and cultural expression.

Employment Generation

The Concept Proposal will benefit employment in Sydney of a scale and type that is appropriate for the location of the site. The redevelopment of the site will diversify the exclusively residential Ivanhoe Estate and better transition between the Macquarie Park commercial core to the south and residential and mixed uses to

the north. It has the potential to accommodate a new increase of up to 100 jobs compared to the existing situation, contributing towards meeting targets for an additional 14,500-20,500 jobs in Macquarie Park.

In addition to this, during the delivery phase a further significant number of fulltime equivalent construction jobs will be created by the Concept Proposal (peak of over 1,200 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 by Aspire Consortium is an entirely self-funding program that will capitalise on existing LAHC assets. As each development is completed, new social housing properties are handed over to LAHC as payment for the land. This ensures government resources can be allocated to other areas, whilst at the same time accelerating the supply of social housing. Further, the Consortium will provide 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 Concept Proposal has been designed to avoid impacts to the remaining threatened ecological community, retain significant vegetation where possible, allow for new open space areas, and the rehabilitation of the Shrimptons Creek corridor. A Biodiversity Offset Strategy has also been prepared by Eco Logical Australia in accordance with NSW Biodiversity Offsets Policy for Major Projects and the EPBC Act Environmental Offsets Policy. The proposed offset measures of the project are to acquire and retire the full quantum of ecosystem credits required by the impacts of the project, 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 influence the design, construction and operation of the Ivanhoe Estate.

Intergenerational Equity

Inter-generational equity is concerned with ensuring that the health, diversity and productivity of the environment are 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 that:

- emphasises community integration within the Ivanhoe Estate;
- reduces carbon emissions and the demand on resources;

- reduces waste that goes to landfill via the choice of materials and a centralised waste strategy;
- encourages sustainable transport options; and
- monitoring and tuning the performance and operation of buildings.

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 would 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 significant provision of social, affordable 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 Masterplan will require the removal of some areas of Endangered Ecological Community existing within the site. However, the new Estate has been designed to minimise impacts on existing Turpentine Ironbark Forest, offset those areas being affected, and enhance and maintain functional connections to Shrimpton Creek. 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

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

The landmark project leverages the expertise and capacity of the private and non-government sectors to provide high quality mixed tenure housing at a scale never previously achieved in Australia, and will establish the benchmark for the delivery of social and affordable housing 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 Masterplan is consistent with the NSW Government's 'Future Directions for Social Housing in NSW' and will deliver a significant increase in social and affordable housing as part of a mixed tenure community in accordance with the Communities Plus program.
- The Masterplan has been designed with respect to its unique context so that the most appropriate form and scale is being delivered in each portion of the site.
- The proposal is generally consistent with all the relevant strategic policies, environmental planning instruments, plans and guidelines. Specifically:
  - The building envelopes have been designed to vary in height consistent with the principles established in the Herring Road Priority Precinct process, contributing to the Macquarie Park skyline and consistent with the Ryde LEP.
  - The variation to the maximum FSR standard in Ryde LEP by applying a number of bonusses related to the provision of affordable seniors housing, open space and community uses is supported by a Clause 4.6 Request which demonstrates that the variation is well founded and will provide a significant public benefit.
- The Masterplan accommodates a mix of residential and non-residential uses appropriate for the site, and suitable to meet the needs of the future Ivanhoe Estate community. The provision of community facilities, residential aged care, a high school, retail and child care facilities will support the future residential community and will diversify the character of Macquarie Park.
- The built form of the site will allow for integration of private, affordable and social housing and community facilities and initiatives will foster social interaction between all future residents.
- All residential buildings will provide a high level of residential amenity, consistent with the principles of State Environmental Planning Policy 65 (Design Quality of Residential Flat Buildings) and the Apartment Design Guide.
- The proposal will improve pedestrian and vehicle permeability within Macquarie Park, replacing the one point of access/egress, with multiple connections, including a new bridge and road extension to Lyonpark Road.
- The Masterplan includes a high quality public domain that will be publicly accessible and connect the site to the Macquarie Centre and regional open space network parklands. Rehabilitation works will also be undertaken to improve Shrimptons Creek, as well as improvements to the Epping Road pedestrian underpass.
- The Masterplan seeks to achieve a 6 Star Green Star Communities rating, and 5 Star Green Star v1.1 for all buildings, providing a sustainable community and setting a benchmark for future Communities Plus projects.

- There are no adverse environmental impacts that cannot be appropriately managed by the mitigation measures set out in this EIS.

Given the merits described above it is requested that the application be approved.