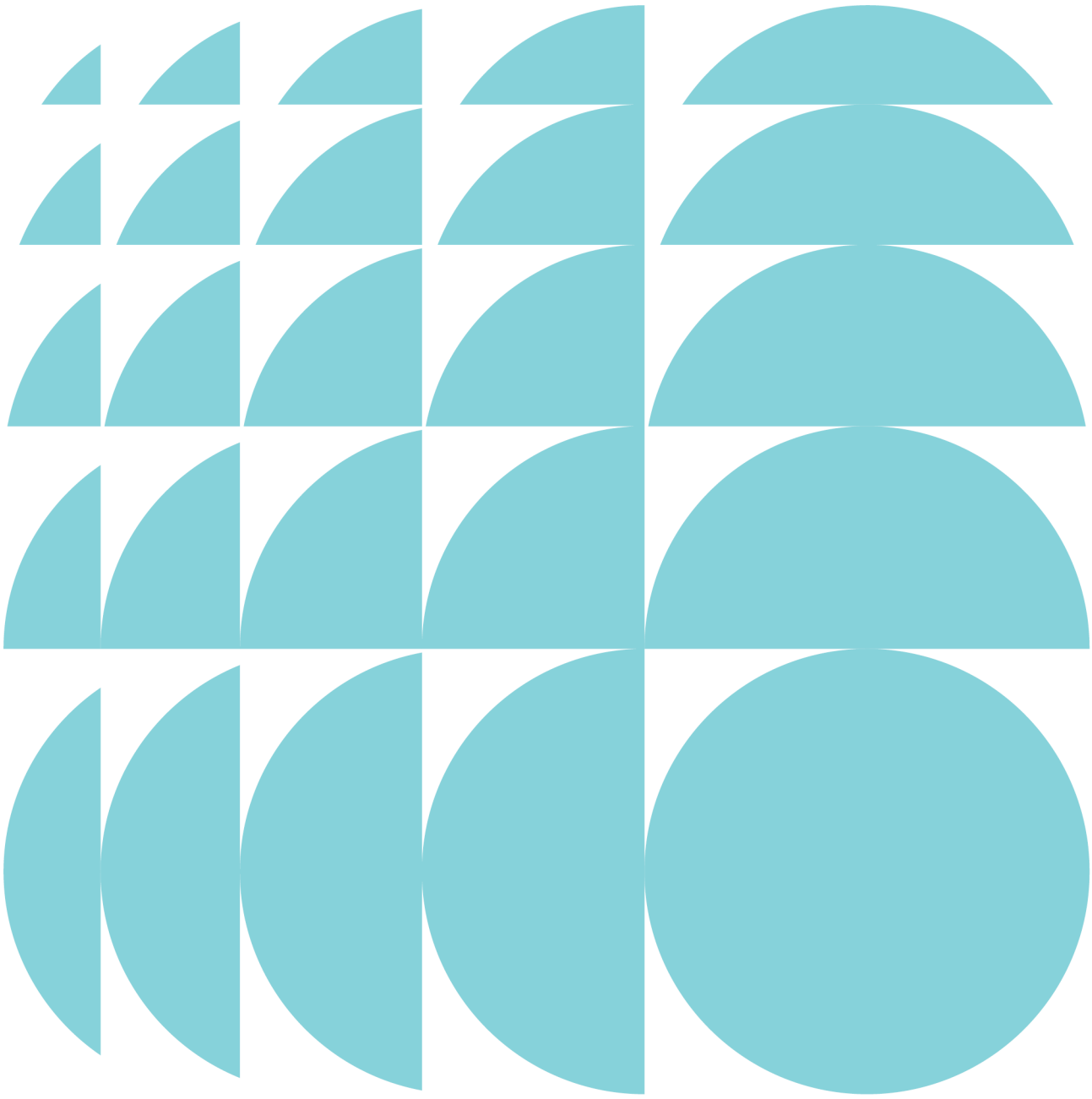
ETHOS URBAN

Response to Submissions

Ivanhoe Estate
SSD17_8707

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

27 September 2018 | 17156



CONTACT

Michael Rowe	Director	mrowe@ethosurban.com	9409 4921

This document has been prepared by:		This document has been reviewed by:	
Frances Mehrtens & James McBride	21 September 2018	Michael Rowe	21 September 2018

VERSION NO.	DATE OF ISSUE	REVISION BY	APPROVED BY
1	21 SEPTEMBER 2018	FM & JMC	MR

Ethos Urban Pty Ltd
ABN 13 615 087 931.
www.ethosurban.com
173 Sussex Street, Sydney
NSW 2000 t 61 2 9956 6952

Figures

Tables

Appendices

F Clause 4.6 Variation – FSR

Ethos Urban

G Ivanhoe Masterplan Design Guidelines

Bates Smart + Ethos Urban

H Arboricultural Impact Assessment

Ecological Australia

I Biodiversity Assessment Report

Ecological Australia

J Visual Impact Assessment

Ethos Urban

K Clause 4.6 Variation – Height

Ethos Urban

L Wind Assessment

Cermak Peterka Petersen

M Transport Assessment

Ason

N Addendum Stormwater and Drainage Assessment

ADW Johnson

O Crime Prevention Through Environmental Design Report

Ethos Urban

P Flood Impact Assessment

BMT WBM

Q Aboriginal Heritage Statement

Ecological

R Waste Management Plan

Elephant's Foot

S Community Operation Outline

Land and Housing Corporation

T Capital Investment Value Letter

Altus Group

U Concept Engineering Plans

ADW Johnson

V Design Excellence Strategy

Ethos Urban

W Acoustic Report

Acoustic Logic

Executive Summary

The Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD DA 17_8707) for a Concept Masterplan for Ivanhoe Estate was publicly exhibited between 12 April 2018 and 9 May 2018. Public exhibition occurred in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposal for the Ivanhoe Estate Masterplan represents a key project as 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.

49 submissions were received in response to the public exhibition of the EIS, including submissions made by government agencies and authorities and the general public, as follows:

- Government agencies and authorities: 11.
- Members of the public: 38.

The Department of Planning and Environment (the Department) has also prepared a letter setting out additional information or clarifications sought prior to the final assessment of the project.

The key issues raised in submissions (agencies and members of the general public) can be grouped into the following categories:

- Floor space ratio and gross floor area
- Built form and urban design
  - Concept Plan design
  - Impacts to adjoining properties
  - Setbacks
  - Open space
- Biodiversity and trees
- Traffic and car parking

The proponent, Aspire Consortium, and its expert project team have considered all issues raised in the submissions made pursuant to the requirements of the EP&A Act.

A detailed response to all submissions made has been provided in the accompanying documentation, with the key issues outlined above discussed at **Section 2.0**.

In responding to and addressing the range of matters raised by government agencies, authorities and the general public, Aspire Consortium has sought to refine the proposal for the Ivanhoe Estate Concept Masterplan. The nature and range of changes made post-public exhibition are summarised as follows:

- Deletion of Building C2 and expansion of the Village Green to create a new subterranean community centre and increased open space
- Reduction in the total GFA
- Increased envelope setbacks
- Retention of additional existing trees
- Improved interface with the Shrimptons Creek riparian corridor
- Redistribution of GFA in the form of increased building height to enable the above design improvements
- Relocation of selected ground floor uses

Section 2 and **Section 4** and the accompanying documentation provide an analysis and assessment of the proposed changes and the refined Masterplan. Final measures to mitigate the impacts associated with the refined proposal are detailed at **Section 6.0**.

In summary, the nature of the changes are considered to result in a development that retains the key elements of the proposal that was publicly exhibited, whilst providing a refined proposal that responds to community and authority feedback to deliver an enhanced outcome on the site.

1.0 Introduction

The Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD DA 17_8707) for a Concept Masterplan for Ivanhoe Estate was publicly exhibited between 12 April 2018 and 9 May 2018. Public exhibition occurred in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

49 submissions were received in response to the public exhibition of the EIS, including submissions made by government agencies and authorities and the general public, as follows:

- Government agencies and authorities: 11.
- Members of the public: 38.

The Department of Planning and Environment (the Department) has also prepared a letter setting out additional information or clarifications sought prior to the final assessment of the project.

The proponent, Aspire Consortium, and its expert project team have considered all issues raised in the submissions made pursuant to the requirements of the EP&A Act.

This Response to Submissions report, prepared by Ethos Urban on behalf of the proponent, sets out the responses to the issues raised in accordance with Clause 85A of the *Environmental Planning and Assessment Regulation 2000* (the Regulation) and details the final project design and mitigation measures for which approval is now sought. The final project design includes amendments made by Aspire Consortium pursuant to Clause 55 of the Regulation, including changes to address matters raised in submissions.

This report provides a detailed response to all of the issues raised by the various government agencies and the general public. Whilst the submissions received from agencies have been addressed individually, the submissions made by the general public have been addressed on an issue by issue basis. This approach has been adopted to reflect that many of the submissions raised similar issues and concerns.

The key issues raised in submissions (government agencies and the general public) can be broadly grouped into the following categories:

- Gross floor area.
- Built form and urban design.
- Biodiversity and trees.
- Traffic and car parking.

This report provides a detailed response to each of the above issues and outlines the proposed amendments to the exhibited EIS. Where individual issues are not discussed in this report, a detailed response can be found in the tables at **Appendix A** and **Appendix B**.

1.1 Amendments to Proposed Development

To address the issues raised in submissions and reflect the resulting design changes, a range of updated plans and documentation has been prepared. The nature and range of changes made post-public exhibition are summarised as follows:

- Deletion of Building C2 and expansion of the Village Green to create a new subterranean community centre and increased open space
- Reduction in the total GFA
- Increased envelope setbacks
- Retention of additional existing trees
- Improved interface with the Shrimptons Creek riparian corridor

- Redistribution of GFA in the form of increased building height to enable the above design improvements
- Relocation of selected ground floor uses

The revised drawings include Masterplan Drawings prepared by Bates Smart (**Appendix C**) and a Supplementary Design Report prepared by Bates Smart and Hassell (**Appendix D**).

The following consultants' reports and supporting information has also been updated or further supplements the material originally submitted in support of the EIS:

- Clause 4.6 Variation Request prepared by Ethos Urban.
- Ivanhoe Masterplan Design Guidelines prepared by Bates Smart.
- Arboricultural Impact Assessment prepared by Ecological.
- Biodiversity Assessment Report prepared by Ecological.
- Visual Impact Assessment prepared by Ethos Urban and Virtual Ideas.
- Wind Assessment prepared by Cermak Peterka Petersen.
- Flood Impact Assessment prepared by BMT WBM.
- CIV Letter prepared by Altus Group.
- Acoustic Assessment prepared by Acoustic Logic.
- Stormwater and Drainage Addendum prepared by ADW Johnson.
- Concept Engineering Plans prepared by ADW Johnson.
- Traffic and Transport Report prepared by Ason.
- CPTED Report prepared by Ethos Urban.
- Aboriginal Heritage Statement prepared by Ecological.
- Waste Management Plan prepared by Elephant's Foot.
- Community Operation Outline prepared by Land and Housing Corporation.
- Concept Engineering Plans prepared by ADW Johnson.

The revised supporting documentation enables the Department to undertake an informed assessment of the amended proposal. The findings of the revised supporting consultant documentation are summarised at **Section 4.0** of this report as relevant.

A final schedule of the mitigation measures proposed is provided at **Section 6.0**.

This report should be read in conjunction with the EIS prepared by Ethos Urban, dated 3 April 2018, as relevant.

2.0 Key Issues and Proponent's Response

This section of the report provides a detailed response to the following key issues raised by the Department, government agencies and authorities and the general public during the public exhibition of the SSD DA:

- Gross floor area.
- Built form and urban design.
- Biodiversity and trees.
- Traffic and car parking.

A response to each of the individual issues raised by the Department and submitters is provided in the tables at **Appendix A** and **Appendix B**.

An overview of the parties who made submissions and their key issues for consideration is provided below. Other issues which require further assessment, such as assessments against statutory policies and plans are considered at **Section 4.0**.

Government Agencies and Authorities

11 submissions were received from government agencies and authorities in response to the exhibition of the EIS. Responses were received from:

- Ausgrid
- City of Ryde Council.
- Department of Education.
- Department of Industry.
- Environmental Protection Authority.
- Fire and Rescue NSW.
- Office of Environment and Heritage – Heritage Division.
- Office of Environment and Heritage – Environment Division.
- Roads and Maritime Services (RMS).
- Sydney Water.
- Transport for NSW (TfNSW).

A detailed response to all issues raised in agency and authority submissions is provided at **Appendix A**. In addition to these submissions, the Department of Planning and Environment has provided an issues letter summarising the key issues to be addressed.

Members of the Public

38 submissions were received from members of the public, comprising:

- Residents and landowners in the local area, including residents from Peach Tree Road.
- Shelter NSW.
- International Environmental Weed Foundation.

These submissions raised a variety of issues relating to built form, biodiversity and the provision of affordable housing. A detailed response to these issues is provided at **Appendix B**.

2.1 Gross Floor Area

2.1.1 Issue

The proposed gross floor area (GFA) and subsequent environmental impacts were raised as an issue by both the Department and Council. It was noted that the appropriateness of the proposed GFA is linked to how the proposal responds to built form, setbacks, open space, deep soil planting, biodiversity and tree removal, overshadowing and solar access, and traffic generation. Further clarification was also sought about the gross floor area that would exceed the FSR control. It was requested that the Clause 4.6 variation is revised to address these matters.

2.1.2 Proponent's Response

The Clause 4.6 Variation request submitted with the exhibited EIS demonstrated that the proposed development will deliver a holistically better outcome for the site and the broader community by establishing a high-quality development that creates significant public benefits.

The basis for the clause 4.6 variation and its strategic merit was not challenged in the submissions, however as recognised in the Department's issues letter, the appropriateness of the proposed GFA is closely linked with how the proposal responds to the other issues raised in the submissions. These issues include built form, setbacks, open space, deep soil planting, biodiversity and tree removal, overshadowing and solar access, and traffic generation.

To address this, changes have been made to the Masterplan to ensure that the environmental impacts of the proposed GFA are appropriate. The key changes to the Masterplan (discussed in detail in **Section 3.0**) are:

- Deletion of Building C2 to:
  - create additional built form relief in the centre of the site.
  - allow for a significant expansion of the Village Green substantially increasing the open space and deep soil provision.
  - allow the inclusion of a community centre.
  - improve solar access to the public domain and retail uses.
- Amending the building envelope setbacks across the site to:
  - reduce the bulk and scale of the buildings.
  - allow for the retention of an additional 119 trees resulting in a total of 350 trees being retained.
  - improve the relationship with the Shrimptons Creek riparian corridor.
  - increase the separation with the adjacent development.
  - reduce overshadowing and improve solar access to the public domain and private dwellings.
  - address the approval of 137 – 143 Herring Road and increase of setbacks and building bulk to this boundary.

In addition to the physical amendments to the Masterplan, the proposed GFA has also been reduced from 283,500m^2 to 278,000m^2. Of the total GFA, 2,500m^2 are additional community uses not previously proposed, therefore the total reduction in potential residential GFA is in the order of 8,000m^2.

As a result of these changes to the Masterplan, a revised Clause 4.6 variation to the FSR standard has been prepared (refer to **Appendix F**). A revised Environmental Assessment is provided at **Section 4**.

The revisions to the Masterplan in conjunction with the reduction in GFA addresses the issues highlighted by the Department (see further discussion in **Section 2.2 - 2.4**), and when combined with the strong justification provided in the Clause 4.6 Variation, the Minister can be satisfied that the proposed variation to the GFA can be supported.

2.2 Built Form and Urban Design

2.2.1 Issue

Clarification was requested on a number of matters relating to the built form and urban design of the proposed Masterplan, relating to:

- Overall Masterplan design, including matters relating to the design of the building envelopes and further information about future development.
- Impacts to adjoining properties.
- Setbacks.
- Provision of open space.

2.2.2 Proponent's Response

Concept Plan Design

The Masterplan, as proposed to be amended, is accompanied by an Indicative Reference Scheme (**Appendix E**) and the Ivanhoe Masterplan Design Guidelines (**Appendix G**), which together illustrate the design concept for the form of future development on the site. In addition to this, a Design Excellence Strategy has been prepared to guide future development across the site (refer to **Appendix V**). The following key built form elements set out in the Design Guidelines have been reflected on the drawings submitted for approval:

- Maximum height for podiums to ensure that tower forms are set back from the street.
- Separation distances to ensure that visual privacy is achieved in accordance with the design criteria recommended by the ADG.
- Deep soil planting zones to ensure that tree planting and other landscaping can be provided across the site and in principal open space areas.

The Indicative Reference Scheme has been prepared to demonstrate how GFA can be accommodated within each building envelope (refer to **Appendix E**). The Indicative Design Scheme has been prepared in accordance with the design criteria recommended by the ADG and achieves the recommended design criteria for solar access and cross ventilation on average across the site.

Impacts to Adjoining Properties

Key changes to the Masterplan have been made to improve the interface to adjoining properties, in particular to the future development at 137-143 Herring Road and existing properties on Peach Tree Road and Epping Road.

1. **137-143 Herring Road**

Development for the purposes of two residential apartment buildings at 137-143 Herring Road, Epping was approved by the Sydney North Planning Panel on 16 February 2018, following lodgement of the Ivanhoe Estate Masterplan Concept SSD DA. The approved DA includes buildings set back less than the minimum separation in the Apartment Design Guide from the common boundary with the Ivanhoe Estate. A condition of consent requires the apartments to have additional privacy screening along the Ivanhoe Estate boundary and the apartments have been orientated to avoid direct overlooking. However, because of the reduced setbacks within the approved DA site, the future development within the Ivanhoe Estate was adversely impacted.

The Masterplan, as proposed to be amended, has taken into consideration the approved development on the adjoining site and made a number of changes to reduce the impacts of the development which have been created by the non-compliances approved at 137-143 Herring Road. As shown in **Figure 1**, the changes include:

- Building A2 and part of Building A1 have been reduced by 30m from 75m to 45m, significantly improving the outlook, privacy and solar access of apartments within both buildings at 137-143 Herring Road.
- The Building A2 footprint has been narrowed to increase the setback within the Ivanhoe Site to 14.7m, 2.7m in excess of the minimum distance set out in the ADG. The increased separation will create a minimum separation distance of 20.8m at the narrowest point, despite the approved development only providing 6.1m within its own

site. The separation increases to 28.5m at its widest point. The narrowed floorplate is likely to support apartments with living rooms facing the Neighbourhood Street, rather than in both directions, further reducing the privacy impacts on the adjoining site.

- Building A3 will provide a 12m setback to the boundary within the Ivanhoe Site, consistent with the ADG. The setback results in a total separation of 16.7m at the narrowest point and 24.4m at the widest, despite the approved development only providing a minimum of 4.7m within its site. The proposed separation is close to the minimum 18m separation in the ADG for a habitable room facing a non-habitable room and allows for the privacy at the closest points to be managed through the detailed design phase to ensure appropriate privacy is achieved.
- The Building A1 footprint has been more tightly defined, including increasing the setback from 5m at the boundary to in excess of 15 metres from the tower.
- Retention of the trees and provision of a deep soil zone within the site along the majority of the common boundary that were previously proposed for removal. The retention of the trees which will improve the outlook and privacy of the future dwellings at the lower levels, noting that no deep soil is provided within the 137-143 Herring Road site along that boundary.
- Building A3's setback to Epping Road has been increased from 10m to 18m, improving the outlook of apartments in the southern building and allowing for the conservation of additional trees, which are part of the endangered ecological community on the site.
- The Total GFA in A2 and A3 has been reduced by approximately 5,800m^2.

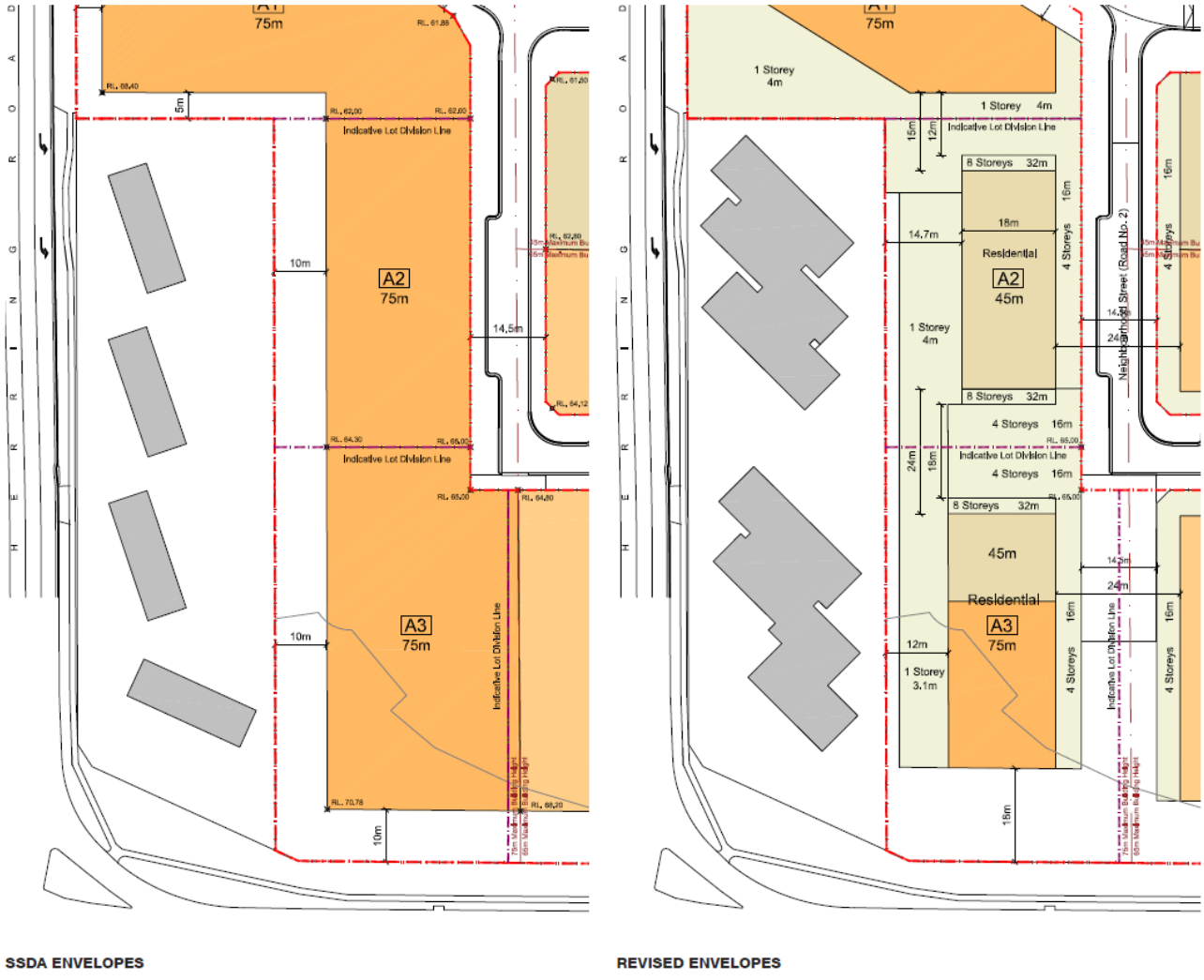


Figure 1 Building separation to 137-143 Herring Road

Source: Bates Smart

2. Peach Tree Road

A number of submissions were received from landowners in apartments fronting Peach Tree Road, concerned about the general loss of amenity as a result of the development. A detailed response to the specific issues raised by the residents is provided at **Appendix B**. In response to the concerns raised by the residents, a number of refinements have been made to the Masterplan along the Peach Tree Road boundary (see **Figure 2**). The changes include:

- Reducing the height of Building B1.1's envelope by 30m from 75m to 45m.
- Introducing the following new provisions to the Design Guidelines to shape the detailed design of the future buildings to mitigate the potential impacts:
  - Avoid blank walls facing neighbouring sites.
  - Where windows are proposed within 7 metres of the boundary, provide screening to mitigate overlooking of neighbouring sites.
- Clarifying the upper level setback of Building B1.1 and B1.2 is 12m, consistent with the ADG.

Figure 2 Revised interface to Peach Tree Road

3. Epping Road

No submissions were received that identified themselves as residents of Epping Road properties, however additional consideration has been given to the impact on these properties in response to the Department of Planning and Environment's feedback. The following changes have been incorporated to improve the relationship to Epping Road properties:

- The setback on Epping Road has been increased from 10 metres to a minimum of 12 metres, allowing for the retention of additional vegetation. This setback also increases to 18 metres for buildings A3 and D3 and 24 metres adjacent to the Shrimptons Creek riparian corridor. This increased setback allows for increased retention of trees to provide a greater vegetated buffer to properties on the opposite side of Epping Road.
- The D2, D3 and D4 building envelopes have been refined to modulate building mass, locating wider parts of the floorplate in the centre of the site and reducing the perception of the bulk when viewed from Epping Road.

A comparison of the refined Epping Road interface is illustrated at **Figure 3**.

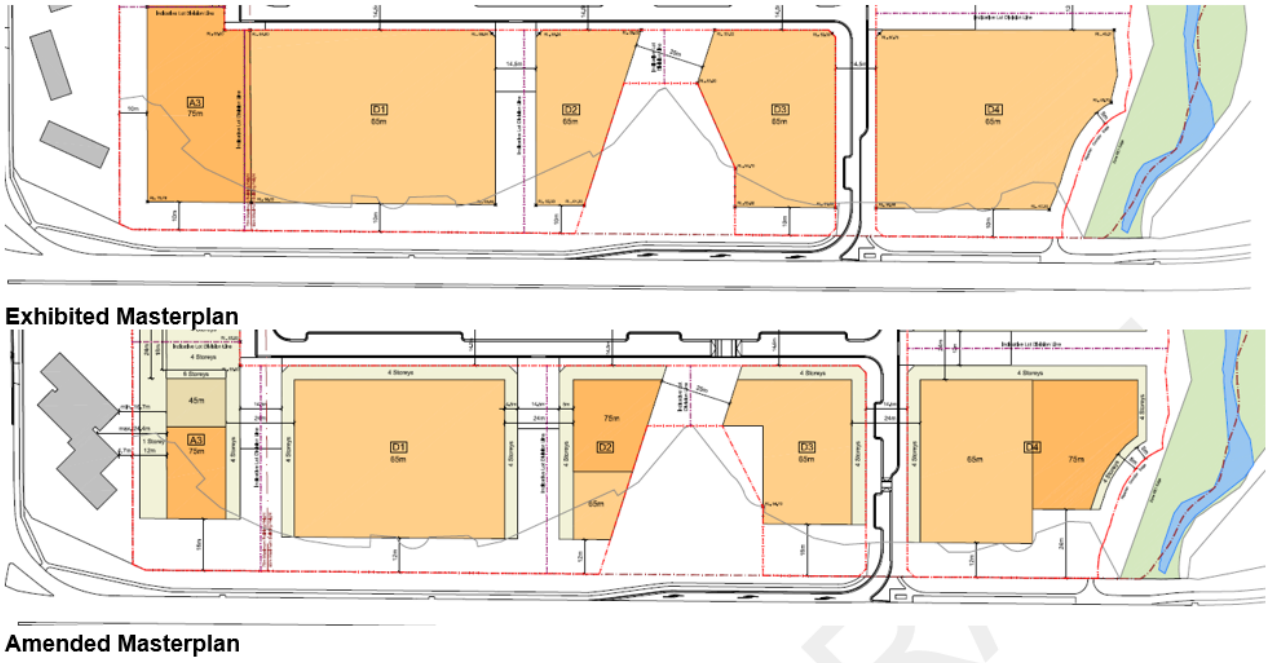


Figure 3 Revised Epping Road setback

Source: Bates Smart

Setbacks

The Masterplan, as proposed to be amended, provides setbacks in accordance with the RDCP and ADG as relevant. The proposed setbacks are shown on the Envelope Control Plan at **Appendix C.**

As discussed above, the detailed setbacks at the interface with the adjoining properties along Peach Tree Road and 137-143 Herring Road have been refined to reduce the impacts of the proposed development. The setbacks along Shrimptons Creek have been refined and increased, which is discussed in **Section 2.3**

The amended Masterplan includes also an increased setback to Epping Road of 12 – 24 metres, in excess of the 10 metres required by the RDCP that was shown in the exhibited Masterplan. The increased setback results in the retention of additional trees along Epping Road and assists with reducing the visual impacts of the development when viewed from Epping Road and the shadows cast by the development.

Open Space

One of the key refinements to the Masterplan is the removal of Building C2 and the provision of approximately 2,900m^2 of additional open space. The increased area of open space will facilitate passive and active recreation opportunities, as well as provide an area for a future community centre that will include recreation facilities. The proposed open space will be publicly accessible for all residents and benefits from a high level of solar access on the winter solstice, with 78.2% of the Village Green receiving at least 2 hours of solar access. Solar access on the winter solstice represents the 'worst case scenario' and the future open space area will benefit from uninterrupted solar access for longer periods during the summer months.

The Community and Recreation Infrastructure Demand Study, prepared by Elton and submitted as part of the original application, found that the proposed open space provision exceeds the amount required for the increased population on the site. As the proposed amended Masterplan will significantly increase the amount of open space, there will be adequate facilities to meet the recreation needs of future residents. As noted in the exhibited EIS, Aspire Consortium will provide community and recreation infrastructure as part of the Voluntary Planning Agreement (VPA) to Ryde Council. The VPA includes:
Construction of a multipurpose hall within the proposed school facilities that will operate on a shared access arrangement with a future school provider.
Construction of a community centre and Village Green, including recreation facilities, pool and gym, within the proposed development.

Upgrades to active recreation paths along Shrimptons Creek that connect to open space in the area.
Design and construction of a 'forest park'.

2.3 Biodiversity and Trees

2.3.1 Issue

The overall amount of tree removal, including portions of the protected Sydney Turpentine Ironbark Forest, was a key issue. The adequacy of the Biodiversity Development Assessment Report was also raised, requiring further clarification of the extent of biodiversity impacts and how the offset scheme would be implemented.

2.3.2 Proponent's Response

The Ivanhoe Estate was the subject of a strategic planning process and was zoned B4 Mixed Use with a height and FSR that provides for high density development across the site, with the exception of Shrimptons Creek. If the intention was for all the trees on the site to be retained in situ the land would have been zoned E2 Environmental Conservation. Instead the underlying planning instrument provides for the redevelopment of the site to a density and scale commensurate with its strategic location and ownership.

Recognising that in some circumstances, impacting on biodiversity is unavoidable, the Office of Environment and Heritage (OEH) has established a framework for development to offset its impacts. The Ivanhoe Estate Masterplan seeks to develop the site consistent with the planning framework, whilst minimising its impact on biodiversity and offsetting those impacts where they do occur in accordance with OEH Policy.

Notwithstanding the above, the Masterplan has been refined to allow for increased retention of existing trees and to reduce impacts on the biodiversity value of the site. The Masterplan, as proposed to be modified, will unavoidably impact on 2.5 hectares of native vegetation and require the removal of 856 trees (including up to 547 trees that are being removed by the demolition works), which represents a significant decrease of 119 trees from the exhibited Masterplan. In response to issues raised by the OEH, the refined planning and siting of the building envelopes seeks to avoid direct impacts on threatened ecological communities. A revised Biodiversity Assessment Report has been prepared by Eco Logical and is provided at **Appendix H**. In addition to this, a detailed response to the matters raised by the OEH is provided at **Appendix A**.

Tree and Vegetation Retention

The Masterplan has been refined to incorporate larger setbacks and increased areas of open space to enable retention of existing trees and vegetation. **Table 1** outlines the improvements made to the Masterplan.

Table 1 Comparison of biodiversity impacts and tree removal

Component	Previous Exhibited Masterplan	Refined Proposed Masterplan	Difference
Area of native vegetation impacted	8.05 hectares	2.5 hectares	An additional 5.55 hectares is retained.
Area of Sydney Turpentine Ironbark Forest (endangered ecological community) impacted	0.41 hectares	0.28 hectares	An additional 0.13 hectares is retained.

The revised Biodiversity Assessment Report and Offset Strategy at **Appendix I** describes in further detail how impacts to native vegetation will be avoided.

The revised Arboricultural Impact Assessment provides an assessment of the exhibited Masterplan against the refined Masterplan and finds that the overall impacts in relation to tree removal are improved.

Excavation and Road Construction Impacts

A Tree Protection Plan has been prepared by Ecological, which describes mitigation measures to be implemented for all trees that are within 10 metres of any construction activities (refer to Arboricultural Impact Assessment at

Appendix H). The following mitigation measures will be implemented for any tree within 10 metres of excavation, road construction or other construction activities:

- Tree protection fencing will be established around the perimeter of the tree protection zone.
- Where required, trunk, branch and ground protection measures will be installed in accordance with *AS 4970-2009 - Protection of trees on development sites.*
- Any additional construction activities within a tree protection zone will be assessed and approved by the appointed project arborist and must comply with *AS 4970-2009 - Protection of trees on development sites.*

The Tree Protection Plan identifies hold points for inspection and certification by the project arborist to ensure that the tree protection measures are implemented.

In addition to this, a Biodiversity Management Plan and Construction Environment Management Plan will be prepared prior to the commencement of works, which will include measures to reduce impacts to native vegetation and other existing flora and fauna. These mitigation measures are described in the revised Biodiversity Assessment Report and Offset Strategy (refer to **Appendix I**) and comprise:

- Installation of temporary fencing during construction to delineate boundaries and protect retained vegetation.
- Installation of sediment barriers, sediment ponds and stormwater management systems.
- Any removal of vegetation adjacent to vegetation to be retained will be removed using a chain-saw, rather than heavy machinery, to avoid any additional impacts.
- Implementation of a monitoring program to monitor infrequent and cumulative impacts of the development.

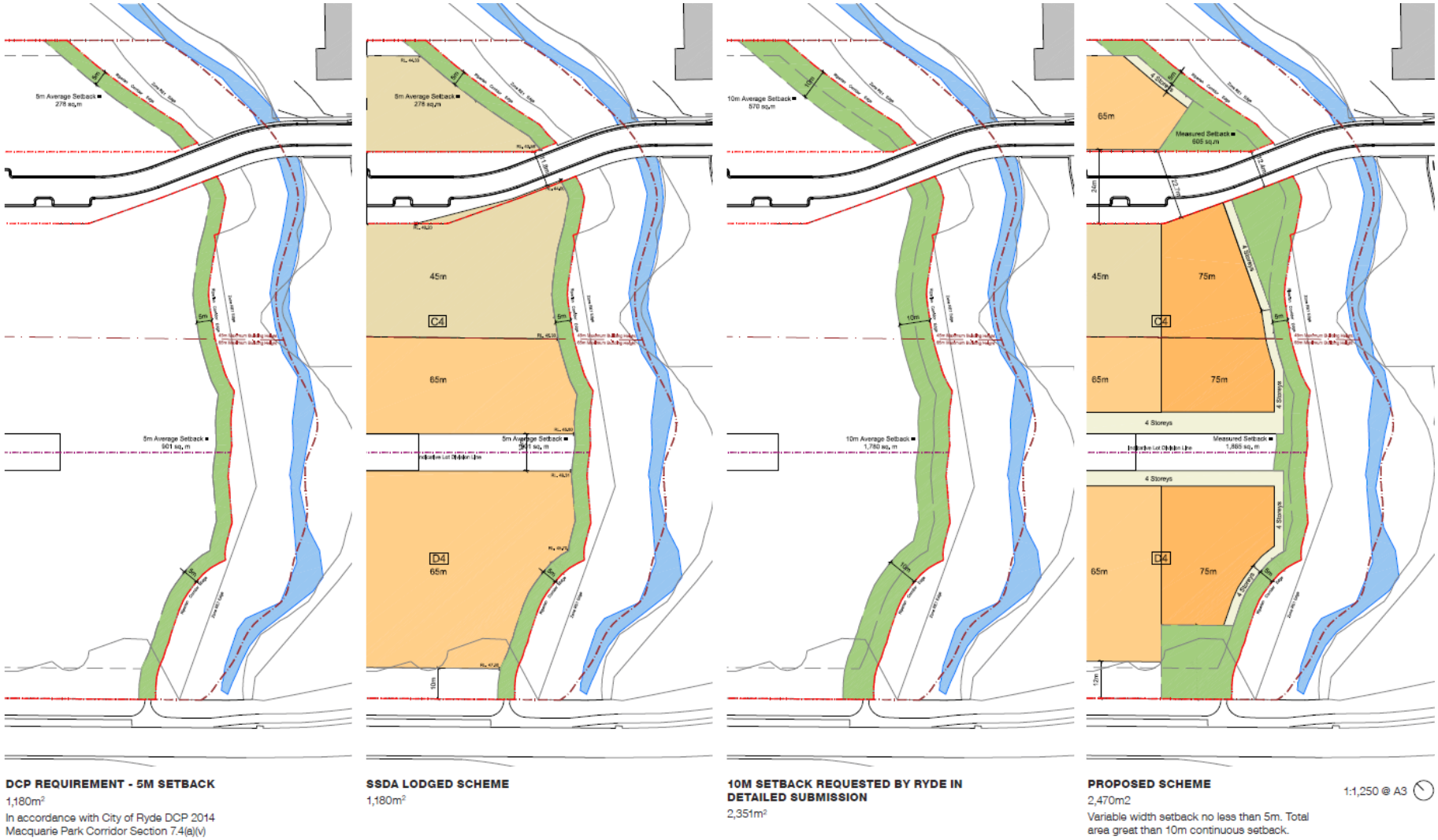
The implementation of these mitigation measures will ensure that any potential impacts as a result of excavation, road construction and other construction works are minimised.

Impacts on Retained Vegetation

The proposed development will result in shadow cast on areas of native vegetation to be retained, however the existing development on the site also cast shadow over existing vegetation. Whilst future development on the site may exacerbate overshadowing, the effects of increased shadow are difficult to measure and quantify and the Framework for Biodiversity Assessment established by the Office of Environment and Heritage does not provide criteria for the assessment of impacts that are not related to clearing. As a result, it is recommended that a monitoring program that assesses ongoing impacts to the Sydney Turpentine Ironbark Forest is implemented as part of a future Vegetation Management Plan. This is further outlined in the Biodiversity Assessment Report at **Appendix I**.

Shrimptons Creek Riparian Buffer

An enhanced riparian buffer has been incorporated into the refined Masterplan. The exhibited design proposed a 20 metre riparian corridor adjoining Shrimptons Creek in accordance with the NSW Office of Water *Guidelines for riparian corridors on waterfront land* and this buffer has been expanded through the incorporation of increased setbacks from the edge of the riparian corridor and additional 'forest threshold' green spaces along the creek. The buildings adjoining the creek are set back at least 5 metres, in accordance with the RDCP, and this setback area has been increased through refinement and reorientation of the building envelopes. The proposed riparian corridor and buffer area comprises a total of 2,470m^2, which is larger than the buffer that would be provided if the 10 metre setback recommended by Council was adopted. The proposed riparian buffer is illustrated at **Figure 4**.



DCP REQUIREMENT - 5M SETBACK
1,180m²
In accordance with City of Ryde DCP 2014 Macquarie Park Corridor Section 7.4(a)(v)

SSDA LODGED SCHEME
1,180m²

10M SETBACK REQUESTED BY RYDE IN DETAILED SUBMISSION
2,351m²

PROPOSED SCHEME
2,470m2
Variable width setback no less than 5m. Total area great than 10m continuous setback.

Figure 4 Revised riparian corridor

Source: Bates Smart

Future Tree Planting

Future tree planting will be provided in accordance with the Public Domain Masterplan prepared by Hassell (refer to **Appendix D**). It is important to note that the development will deliver a net increase of trees on the site. The Public Domain Masterplan illustrates that replacement tree planting will be undertaken throughout the site, with a particular focus on ensuring that a vegetated buffer is maintained to all road corridors and that a tree canopy is established on all new streets throughout the site. **Figure 5** illustrates the proposed tree planting concept, whilst **Figure 6** provides an extract of the Public Domain Masterplan, illustrating that a dense tree canopy will be established across the site as a result of replacement planting. Tree planting will be delivered subsequent to development applications for future stages of development.

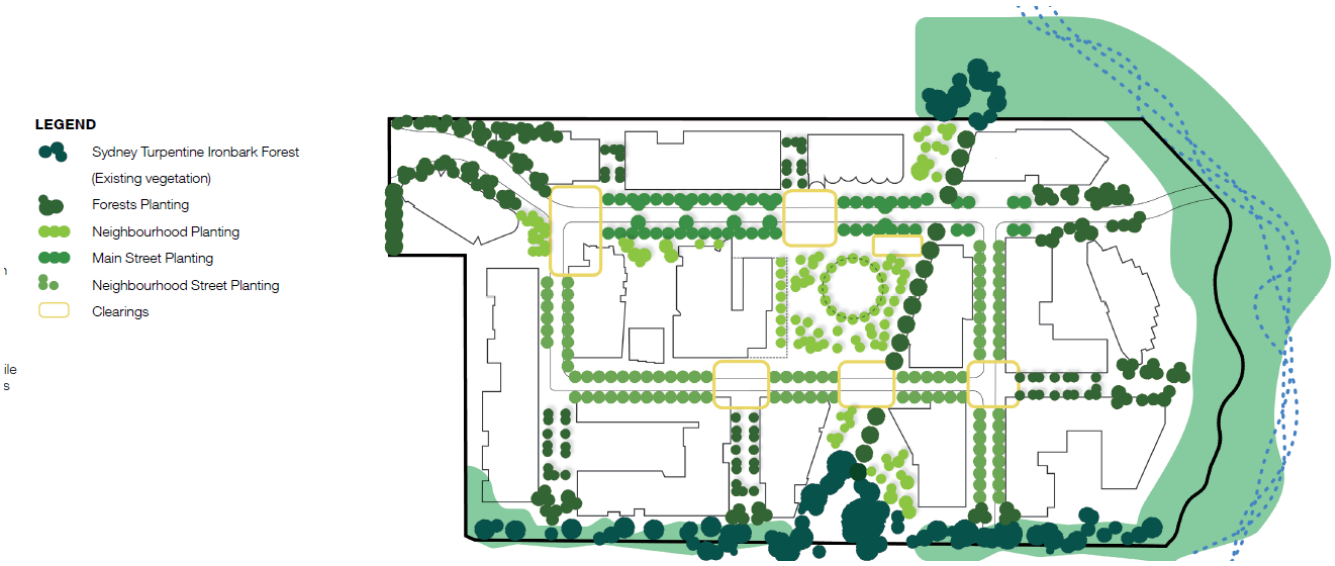


Figure 5 Illustrative tree planting concept

Source: Hassell

Figure 6 Public Domain Masterplan

Source: Hassell

2.4 Traffic and Car Parking

2.4.1 Issue

The primary issue related to traffic and car parking relates to the future road design and the relationship of the development to the surrounding road network. Clarification is sought on the following matters that were raised by Transport for NSW and City of Ryde:

- Traffic generation rates, modelling methodology, trip distribution and traffic assignment.
- Intersection operation.
- Site access.
- Car and bicycle parking.

2.4.2 Proponent's Response

A detailed response to all issues raised by Transport for NSW and Council is provided at **Appendix A** and the response below provides an overview of the key matters for consideration in the assessment of the refined Masterplan. The Transport Management and Accessibility Plan Addendum provides a detailed response to all issues raised in submissions (refer to **Appendix M**).

Following discussion with Council, RMS and the Department of Planning and Environment, the trip generation has been recalculated. The revised trip generation has been used in the development of an agreed, modified modelling methodology for future scenario assessment. The modelling results demonstrate that the critical intersections surrounding the site operate with acceptable, relative intersection performance in a hypothetical network for 2031 scenarios without significant upgrades to the state road intersections. Additional modelling of the intersection of Main Street and Lyonpark Road has been undertaken and demonstrates that the intersection will continue to operate with an acceptable level of service when the development is completed.

The timing of future infrastructure works to support the development of the site has been discussed with the relevant authorities and the timing of the delivery of this infrastructure has been identified based on development yield and modelling results. Allowance for a 'U-turn' will be provided within the site until such time that all future roads are completed, as detailed at **Appendix M**. In addition to this, it is confirmed that the internal road network and bridge connection to Lyonpark Road have been designed to accommodate the required widths for traffic and parking bays to service the development.

The TMAP Addendum demonstrates that residential, visitor and car share parking will be provided in accordance with the maximum parking rates set out in the RDCP. Bicycle parking will be provided for all residential dwellings, with non-residential land uses to be provided with bicycle parking in accordance with the RDCP. In addition to this, bicycle parking will be provided in the public domain to encourage for leisure and recreation use.

A detailed Construction Pedestrian and Traffic Management Plan (CPTMP) will be prepared to accompany each stage of development on the site and will detail how mitigation measures will be implemented to minimise traffic impacts during construction.

An updated assessment of the traffic impacts of the Masterplan, as proposed to be amended, is provided in **Section 4.7** below.

3.0 Proposed Amended Development

Since public exhibition of the proposal, amendments have been made to the Masterplan. The changes include those made in response to the issues and comments by the Department, Council, government agencies and the general public (see Section 2.0).

The proposed changes are shown on the revised Masterplan Drawings prepared by Bates Smart (**Appendix C**), the Supplementary Design Report prepared by Bates Smart and Hassell (**Appendix D**) and the Concept Engineering Plans prepared by ADW Johnson (**Appendix U**).

The following section outlines the updated description of the modified development for which approval is now sought. As illustrated in the following section, the overall changes are positive and aim to deliver an improved outcome.

3.1 Overview of Proposal (as amended)

This application seeks approval for the following development:

- A mixed use development involving a maximum of GFA of 278,000m^2, including:
  - residential flat buildings comprising private, social and affordable housing.
  - seniors house comprising a residential care facilities and self-contained dwellings.
  - a new school.
  - child care centres.
  - minor retail development.
  - community uses.
- maximum building heights and GFA for each development block;
- public domain landscape concept, including parks, streets and pedestrian connections;
- provision of the Ivanhoe Estate Design Guidelines to guide the detailed design of the future buildings; and
- vehicular and intersection upgrades.

3.2 Numerical Overview (as amended)

Table 2 and **Table 3** below provides the key numerical information of the proposed amended development.

Table 2 – Land Use and GFA by Development Block

Development Block	Maximum GFA (m^2) as exhibited	Maximum GFA (m^2) as proposed to be amended	Uses
A1	22,082 – 24,290	19,000 – 24,500	Residential, Child Care Centre
A2	8,378 – 9,216	6,000 – 11,500	Residential
A3	19,047 – 20,952	13,000 – 15,529	Residential
Precinct A Total	**49,507 - 54,458**	**38,000 – 51,529**	
B1	6,265 – 6,892	4,000 – 9,000	Residential
B1.2/3/4	15,010 – 16,511	12,000 – 17,500	Residential aged care
B2	9,006 – 9,907	7,000 – 12,500	School, Child care
B3	12,935 – 14,229	16,000 – 21,500	Residential
Precinct B Total	**43,216 - 47,539**	**39,000 – 60,500**	
C1	33,855 – 37,241	31,000 – 36,500	Residential, Retail
C2	15,811 – 17,392	700 – 2,500	Community

Development Block	Maximum GFA (m^2) as exhibited	Maximum GFA (m^2) as proposed to be amended	Uses
C3	12,094 – 13,303	9,000 – 14,500	Residential, Retail, Community Facilities
C4	32,129 – 35,342	33,000 -38,500	Residential
Precinct C Total	**93,889 - 103,278**	73,700 – 92,000	
D1	26,860 – 29,546	24,500 – 30,000	Residential
D2	17,030 – 18,733	17,500 – 23,000	Residential
D3	19,653 – 21,618	14,000 – 19,500	Residential, Mission Australia Housing Office
D4	31,407 – 34,547	32,500 – 37,500	Residential
Precinct D Total	**94,950 - 104,444**	88,500 – 110,000	
Masterplan Total	283,500	278,000	
Change	-5,500		

Table 3 Building heights

Development Block	Maximum Height (m) as exhibited	Maximum height (m) as proposed to be modified	Change (+/-)
A1	75	75	No change
A2	75	45	-30 metres
A3	75	75	No change
B1.1	Part 75/Part 45	45	-30 metres
B1.2	45	45	No change
B2	45	45	No change
B3	45	Part 45/Part 65	Part +20 metres
C1	Part 65/Part 45	Part 65/Part 45	No change
C2	Part 65/Part 45	3	-62 metres
C3	Part 65/Part 45	Part 50/Part 45	Part -15 metres
C4	Part 65/Part 45	Part 45/Part 65/Part 75	Part +10/Part +30 metres
D1	65	65	No change.
D2	65	Part 65/Part 75	Part +10 metres
D3	65	65	No change.
D4	65	Part 65/Part 75	Part +10 metres

3.3 Removal of Building C2 and Introduction of Community Centre and Increased Open Space

The Masterplan has been refined to remove Building C2, which allows for the provision of approximately 2,900m^2 of additional open space in the Village Green. The building envelope has been revised to include the provision of a dedicated community centre, which would be partially located below existing ground level and comprise a total of three storeys. The future community centre will present as one storey when viewed from ground level and be landscaped with a green roof to allow for an integrated transition to the Village Green The design changes are illustrated in **Figure 7** below.

Exhibited Masterplan

Refined Masterplan (now proposed)
Figure 7 Removal of building C2

Source: Doug and Wolf

3.4 Increased Height

In order to address the feedback received during the public exhibition, the Masterplan, as proposed to be amended, proposes an increase in height on four building envelopes as described in **Table 3** and as illustrated in **Figure 8.** The revised building heights remain below 75 metres, which is the largest of the LEP height limits which apply across the site. The increased building height and subsequent redistribution of height across the site allows floor area to achieve better amenity and reduce impacts to the surrounding area.

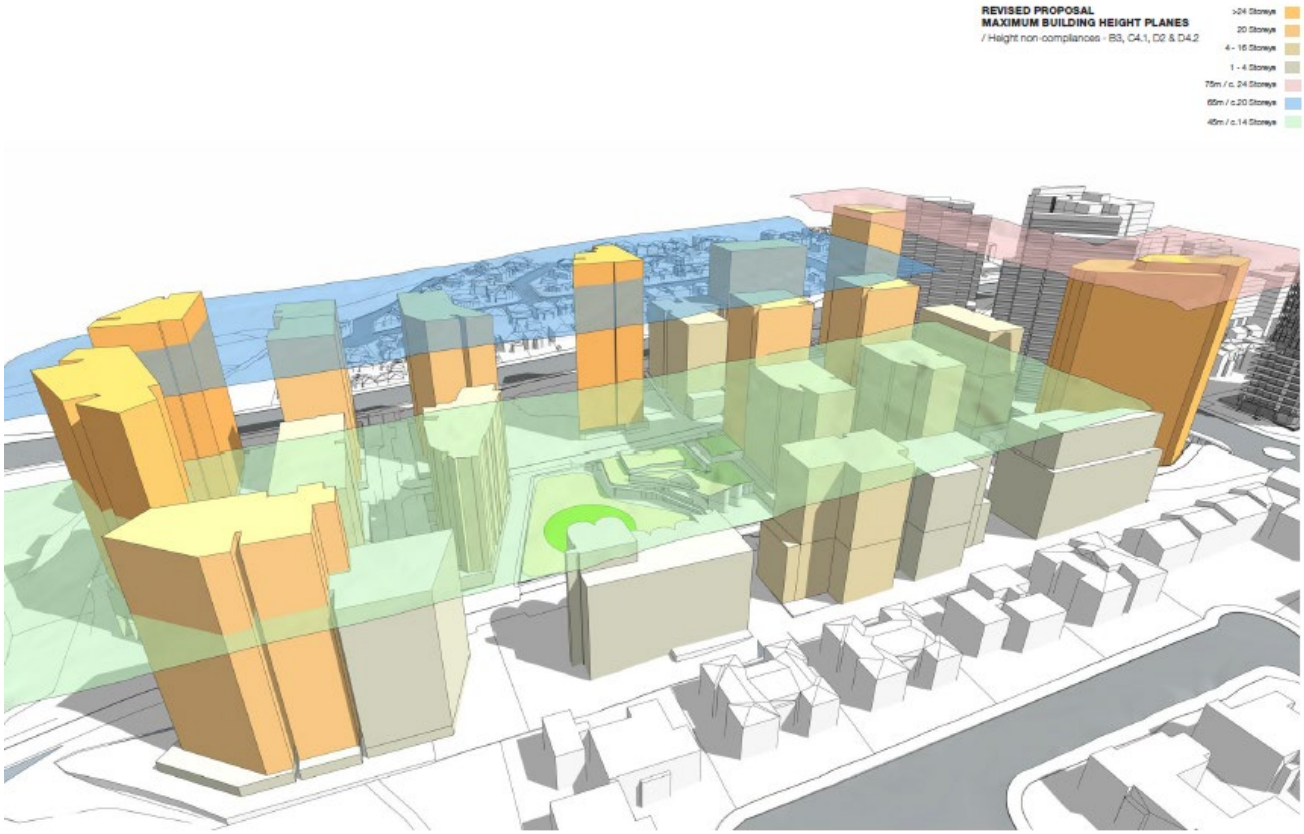


Figure 8 Revised height of buildings

Source: Bates Smart

3.5 Retention of Existing Trees and Endangered Ecological Communities

The refined Masterplan allows for the retention of 119 more trees and 0.13 hectares more of the Sydney Turpentine Ironbark Forest. Overall, the refined Masterplan will result in the removal of 856 trees (including up to 547 trees that are being removed by the demolition works). The amount of Sydney Turpentine Ironbark Forest to be removed has also been reduced from 0.41 hectares to 0.28 hectares. The increased areas of vegetation to be retained are illustrated at **Figure 9**. It is important to note that the development will deliver a net increase of trees on the site.

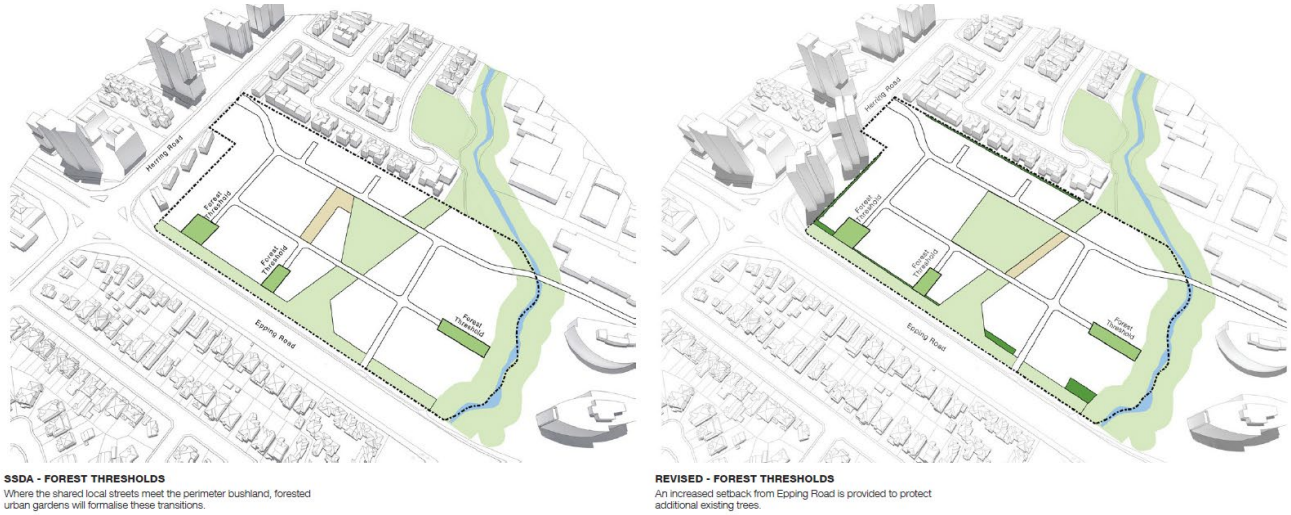


Figure 9 Retention of existing trees

Source: Bates Smart

3.6 Retail Relocated

As a result of the revised building envelopes, the proposed retail uses have been relocated to Building C3. Retail uses will continue to be provided adjoining the Village Green, allowing for an activated village centre and providing local convenience for future residents. This is illustrated at

Figure 10 Revised location of retail

Source: Bates Smart

3.7 Shrimptons Creek Riparian Corridor

An enhanced riparian buffer has been incorporated into the refined Masterplan, comprising a 20 metre riparian setback in accordance with the NSW Office of Water *Guidelines for riparian corridors on waterfront land* and additional setback areas to a minimum of 5 metres, in accordance with the RDCP. The building envelopes adjoining the riparian corridor have been refined and reoriented to achieve an improved relationship with the creek and to provide additional green spaces. The proposed riparian corridor and buffer area comprises a total of 2,470m^2, which

is larger than the buffer that would be provided if the 10 metre setback recommended by Council was adopted. An illustration of the improved interface is provided at **Figure 11**.

Figure 11 Improved Shrimptons Creek riparian corridor

Source: Bates Smart

3.8 Revised Setbacks

137 – 143 Herring Road

Increased setbacks are provided to 137 – 143 Herring Road, as follows:

- Minimum of 14.7 metres to A2 in accordance with the ADG.
- Minimum of 12 metres to A3 in accordance with the ADG.

The A1 building envelope has been reoriented so that a future tower form is angled away from the property boundary, with a one-storey podium provided to the boundary. The revised setbacks are illustrated at **Figure 12**.

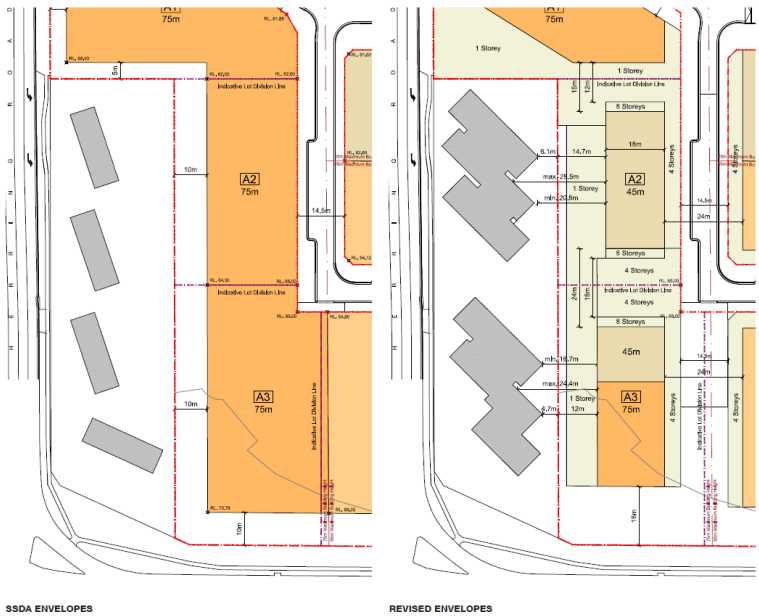


Figure 12 Revised setbacks to 137 - 143 Herring Road

Source: Bates Smart

Epping Road

The setback on Epping Road has been increased from 10 metres to a minimum of 12 metres, allowing for the retention of additional vegetation. This setback increases to 18 metres at buildings A3 and D3 and 24 metres adjacent to the Shrimptons Creek riparian corridor.

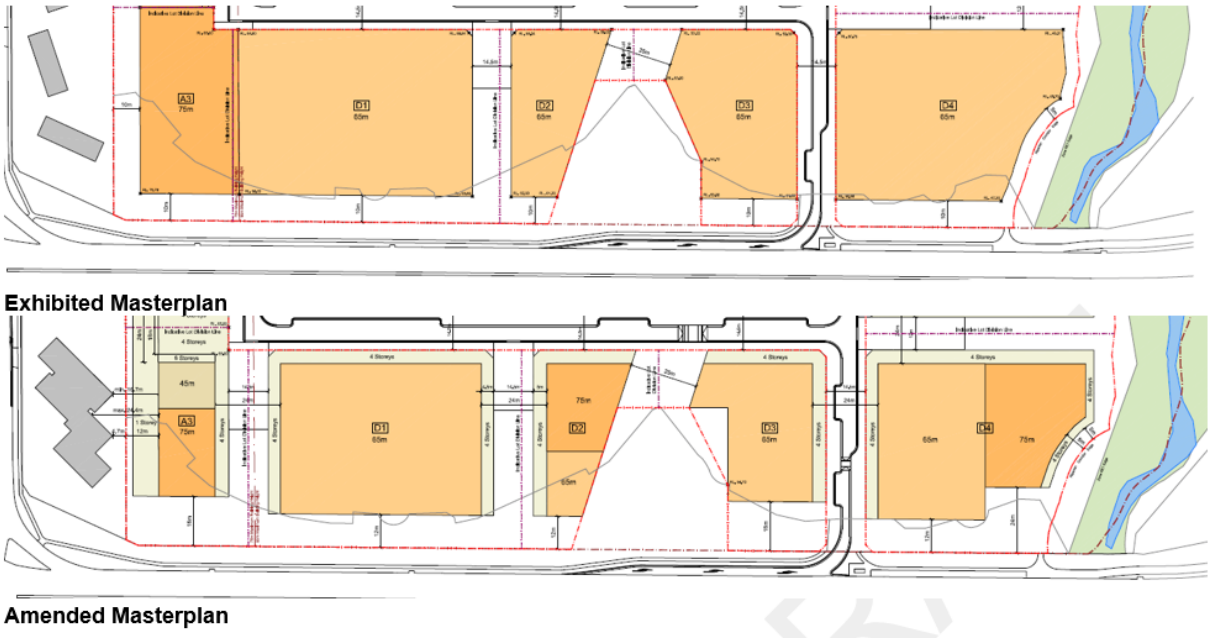


Figure 13 Revised Epping Road setback

Source: Bates Smart

Peach Tree Road

The refined Masterplan clarifies that upper level setbacks to the Peach Tree Road boundary will be a minimum of 12 metres, in accordance with the ADG. This is illustrated at **Figure 14**.

Figure 14 Revised interface to Peach Tree Road

Source: Bates Smart

3.9 Staging

A refined indicative staging plan has been prepared, as shown at **Figure 15** and included in the Supplementary Design Report at **Appendix D**. The indicative staging plan is arranged to maximise the amount of public domain that will be delivered in the first two stages of development.

Figure 15 Staging plan

Source: Bates Smart

3.10 Design Excellence

A Design Excellence Strategy has been prepared by Ethos Urban to set out the principles and procedures that will be followed for the Masterplan delivery program (refer to **Appendix V**). The Design Excellence Strategy will ensure that the architectural and urban design of the future stages achieves design excellence and positively contributes to the broader Macquarie Park Corridor and Ryde Local Government Area.

The design excellence strategy revolves around four key elements:

- the engagement of an expert and varied design team, including use of architectural design competitions and collaborations between larger architectural practices with emerging architects;
- the use of an expert Design Review Panel (DRP) for Stage 1 and the State Design Review Panel (SDRP) thereafter;
- the adoption of Design Guidelines that will guide the design development and assist the DRP/SRP in its deliberations; and
- the implementation of reporting and review processes to safeguard design excellence and design integrity.

Further detail is provided at **Appendix V**.

4.0 Additional Information and Assessment

The exhibited EIS addressed the potential impacts of the overall development against a range of matters relevant to the development. Except where addressed in this report, the conclusions of the original assessment remain unchanged. Therefore, the assessment of the following matters remain unchanged:

- Geotechnical conditions.
- Contamination.
- Utilities.
- Infrastructure delivery.
- Community recreation demand.
- Aboriginal and cultural heritage.
- Consultation.
- Sustainability.

4.1 Consistency with Original SSD DA Scheme

All key elements of the proposed development remain unchanged from what was proposed as part of the exhibited SSD DA. The scheme remains generally consistent with, and does not substantially differ from, the development as originally proposed and exhibited. Design refinements made in response to submissions have resulted in the deletion of a building, provision of increased open space across the site, inclusion of a community centre and redistribution of height across the site, as well as other refinements to improve the amenity of the site and relationship to the surrounding area. Importantly, the development, as proposed to be amended, retains the commitment to deliver social and affordable housing, as well as residential aged care facilities, a school and child care centres.

4.2 Consistency with Relevant EPIs, Policies and Guidelines

The development, as proposed to be amended, remains consistent with the majority of environmental planning instruments, policies and guidelines assessed as part of the exhibited SSD DA. **Table 4** below provides assessment against the relevant provisions only where the Masterplan, as proposed to be modified, results in a change to the assessment contained in the exhibited EIS or as requested by the Department of Planning and Environment.

Table 4 Summary of consistency with relevant strategies, EPIs, policies and guidelines

Instrument/Strategy	Assessment
Greater Sydney Region Plan – A Metropolis of Three Cities	The Greater Sydney Region Plan was adopted in March 2018 and outlines 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 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.

Instrument/Strategy	Assessment

- 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.

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 3,400 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.

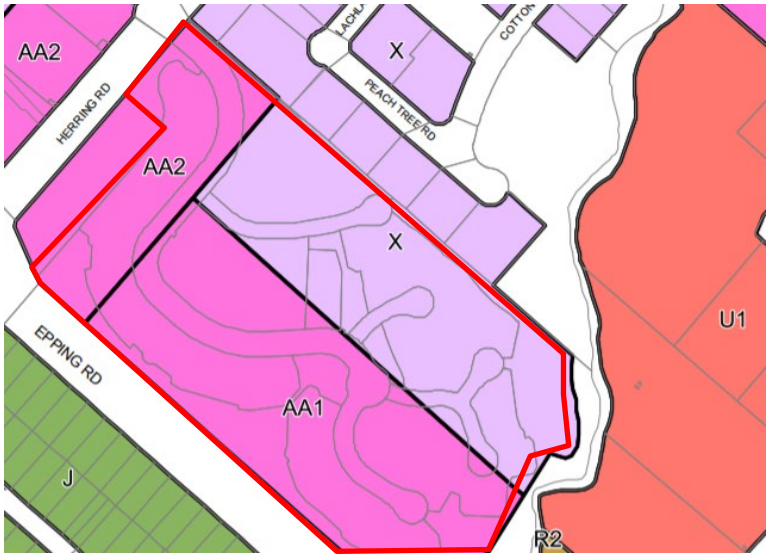
Jobs and skills for the city

- The Masterplan includes a 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.

Instrument/Strategy	Assessment
	• 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.
North District Plan	The North District Plan was adopted in March 2018. The District 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. The 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 District 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.

Instrument/Strategy		Assessment
		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.
Environmental Protection and Biodiversity Conservation Act 1999		The EPBC Act identifies Matters of National Environmental Significance to be protected. The Sydney Turpentine-Ironbark Forest is identified as critically endangered under the Act and is therefore a Matter of National Environmental Significance. The Masterplan has been amended to reduce the amount of Sydney Turpentine-Ironbark Forest that would be removed from 0.41 hectares to 0.38 hectares. Impacts on vegetation are further discussed at **Section 4.10**.
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. There is no change to the proposal's compliance with the relevant provisions of the SEPP, however an updated Clause 4.6 Variation Request is submitted at **Appendix F** and details how the proposed development seeks to utilise the FSR bonus.
SEPP 65 (Design Quality of Residential Flat Development)		An updated 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 4.6.1**.
Ryde Local Environmental Plan 2014	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 result in a variation to the building height, as discussed at **Section 4.4.1** below and in the Clause 4.6 Variation Request at **Appendix K**.
	Clause 4.4 – Floor Space Ratio	The FSR of the site is 2.9:1. The Concept SSD DA seeks to utilise the Affordable Housing SEPP bonus, as well as vary the FSR standard to provide for additional community uses and affordable housing. A full explanation of the proposed FSR and Clause 4.6 Variation Request is provided at **Appendix F**.

4.3 Gross Floor Area

The Concept SSD DA proposed a mixed-use development that will encompass a unique and diverse range of land uses which includes residential, commercial, civic, community and retail uses. Overall, the Concept SSD DA will comprise a total GFA of 278,000m^2, which includes approximately 20,000m^2 of community benefit uses. **Table 2** outlines the composition of the proposed GFA.

4.4 Built Form and Urban Design

4.4.1 Height

The Masterplan, as proposed to be amended, has been designed to be generally consistent with the maximum height limits set by the Ryde LEP, which range from 45 to 75 metres across the site. However, given certain refinements to the Masterplan including the deletion of Building C2 to provide more public open space, and reduced building heights and increased setbacks to reduce the impacts on the neighbouring properties and public open space, a height variation has been sought for four buildings across the Masterplan. These buildings are Building B3, C4, D2 and D4 as outlined in **Table 5**. Buildings A1, A2, A3.1, A3.3, B1.1, B1.2, B2, C1, C2, C3, D1 and D3 all either comply with the maximum height controls or are significantly less than the maximum height permitted.

Table 5 Proposed variations to building height

Building	LEP Height	Proposed Envelope Height (m)	Maximum Variation (m / %)
Building A1	75m	75 metres	-
Building A2	75m	45 metres	-30 metres (-40%)
Building A3.1	75m	75 metres	-
Building A3.3	75m	45 meters	-30 metres (-40%)
Building B1.1	45 / 75m	45 metres	-
Building B1.2	45m	45 metres	-
Building B2 (School)	45m	45 metres	-
Building B3	45m	45/65 metres	20 metres (44%)
Building C1	45 / 65m	45/65 metres	-
Building C2	45 / 65m	10 metres	-35 metres (-78%)
Building C3	45 / 65m	45 metres	-
Building C4	45 / 65m	45/65/75 metres	30 metres (70%)
Building D1	65m	65 metres	-
Building D2	65m	65/75 metres	10 metres (15%)
Building D3	65m	65 metres	-
Building D4	65m	65/75 metres	10 metres (15%)
TOTAL			**-25 metres**

It is prudent to note that 12 of the 16 buildings in the masterplan will comply with the maximum permitted building height. As detailed in **Table 1**, Building B1.1, Building A2 and a part of Building A3 are substantially below the maximum permitted building height by up to 30 metres. Furthermore, Building C2 (originally proposed at 65m in height) has been removed entirely and replaced with open space and a Community Facility building which will be substantially below the height limit by up to 55 metres. The variation as a representation of building mass outside of the LEP compliant envelope is 5.8%. This is balanced by the building massing which is under the LEP compliant envelope totalling 11.3%.

4.4.2 Bulk and Scale

The Masterplan, as proposed to be amended, remains consistent with the applicable FSR of 2.9:1 and applicable GFA bonuses available through the provision of affordable housing, seniors housing and community benefit uses. The revised Masterplan results in an overall reduction in the GFA proposed, from 283,500m^2 to 278,000m^2.

The Supplementary Design Report at **Appendix D** in conjunction with the Indicative Design Scheme at **Appendix E** demonstrate that the bulk and scale of future development on the site is appropriate as:

- Height has been distributed across the site to minimise impacts on adjoining properties and impacts on the surrounding area.
- A significant amount of open space is provided across the site, including an increase of approximately 2,900m^2 from the exhibited Masterplan.
- The future buildings are capable of compliance with the Apartment Design Guide.
- Overshadowing as a result of the amended building envelopes will not result in any unacceptable shadow impacts on the surrounding residential areas.
- The setbacks established for the site ensure the scaled of the buildings as perceived from the public domain, and the amended Masterplan incorporates increased setbacks where relevant to minimise impacts on adjoining properties.
- The updated Visual Impact Assessment concludes that the visual impacts are acceptable.

4.4.3 Setbacks

Boundary Setbacks

The proposed setbacks have been amended in response to submissions at a number of locations across the site, specifically:

- On the boundary adjoining 137 – 143 Herring Road, a minimum setback of 12 metres is provided to A3 and 14.7 metres to A2 in accordance with the ADG.
- On the boundary adjoining Peach Tree Road residential properties, the Building Envelope Control Plan has been updated to show that greater setbacks will be provided at upper levels in accordance with the ADG.
- On the boundary adjoining Epping Road, a minimum 12 metre (and up to 20 metres) setback is provided in excess of the 10 metres required by the RDCP.
- On the boundary adjoining the Shrimptons Creek riparian corridor, a minimum setback of 5 metres is provided which is increased in certain areas to allow for the provision of additional green space.

As outlined in the exhibited SSD DA, minimum perimeter building setbacks are incorporated into the Building Envelope Plan. The Ivanhoe Masterplan Design Guidelines provider further ground and upper level setbacks for each development block. In addition to this, all residential buildings will be set back on upper levels in accordance with the design criteria for visual privacy and building separation recommended by the Apartment Design Guide, as is illustrated on the Building Envelope Control Plan at **Appendix C**.

Internal Setbacks

Setbacks within the site have been determined in accordance with the Ivanhoe Masterplan Design Guidelines as well as the building separation distances recommended by the Apartment Design Guide. The proposed building envelopes are designed to show the maximum development parameters within which a future building could be accommodated, allowing for flexibility in siting and design to achieve a high level of amenity for future residents. The Indicative Design Scheme prepared by Bates Smart at **Appendix E** demonstrates how appropriate setbacks and separation distance could be achieved for future buildings, incorporating building separation distances in accordance with the Apartment Design Guide and with consideration for other amenity criteria such as solar access and provision of landscaping. The public domain surrounding future buildings, including streets and landscaped areas, will be designed in accordance with the Public Domain Concept prepared by Hassell (refer to **Appendix D**) and the Ivanhoe Masterplan Design Guidelines (refer to **Appendix G**). These guidelines illustrate that the public

domain will be appropriately treated with planting, street furniture, lighting and other features to ensure that the areas of set back between buildings will be useable space and contribute to the activation of the precinct.

Riparian setback

The riparian setback to Shrimptons Creek has been increased to provide additional green space outside of the riparian corridor required by the *Guidelines for riparian corridors on waterfront land*, as discussed at **Section 2.3.2** and **Section 3.7**. This results in a 25 metre set back from Shrimptons Creek, comprising the 20 metre riparian corridor and 5 metre setback to the buildings required by the RDCP. Above four storeys, future buildings adjoining the creek will be set back further to enhance the relationship between the built form and the riparian corridor. The building envelopes at this interface have been refined and reoriented to respond to the shape of the riparian corridor by tapering away from the corridor and incorporating additional areas of green space to transition between the riparian zone and future buildings on the site.

Basement setback

The Indicative Design Scheme at **Appendix E** illustrates that the basement design has been refined to provide increased setbacks along Epping Road and the Shrimptons Creek riparian corridor. These increased setbacks allow for additional potential deep soil planting areas. An illustration of the refinement of the basement and the ability for vegetation to be retained and future deep soil planting to be provided is provided at **Figure 16**.

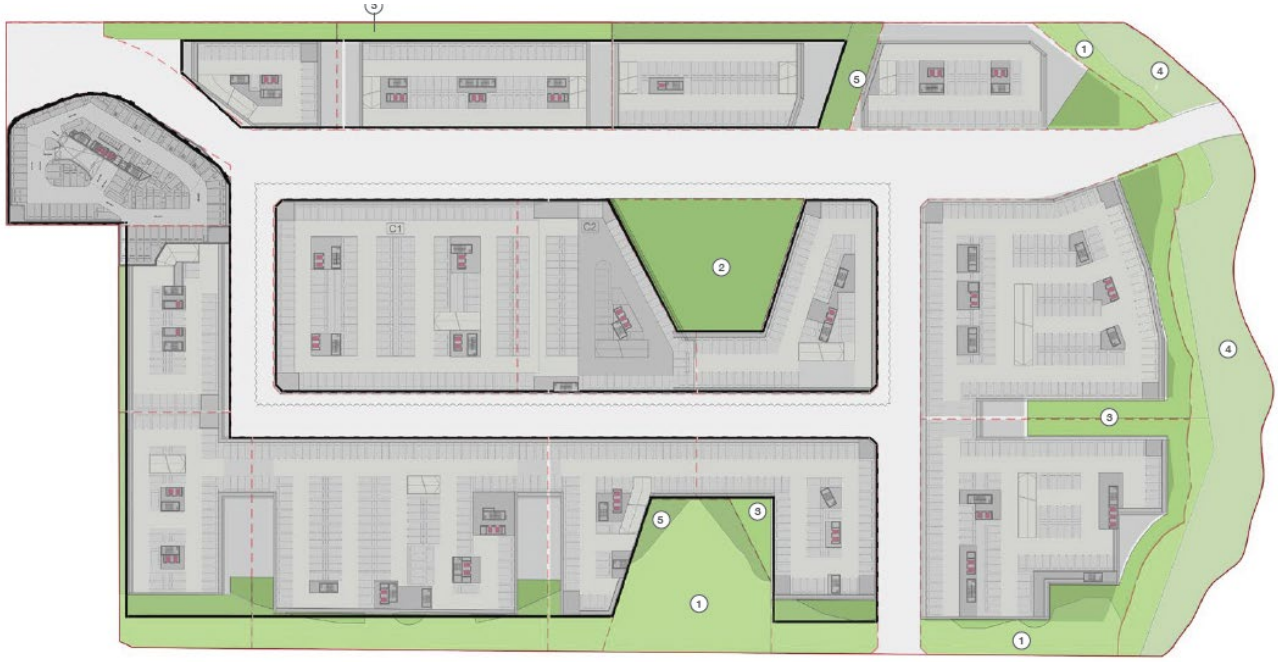


Figure 16 Refined indicative basement design

Source: Bates Smart

4.4.4 Visual Impact Assessment

An updated Visual Impact Assessment has been prepared by Ethos Urban and Virtual Ideas to assess the revised Masterplan design (refer to **Appendix J**). The Visual Impact Assessment finds that the Masterplan, as proposed to be modified, will continue to have a medium visual effect, with a high visual effect from limited view points.

As set out in the exhibited EIS, whilst 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. Whilst the revised Masterplan results in a variation to building height, the refined design continues to incorporate elements which mitigate visual impact, including vegetation buffers, separation distances between building and building alignment. The Visual Impact Assessment is considered to represent an accurate assessment of the proposal as, whilst tree removal will occur across the site, significant trees and vegetation are retained at the interface with the public domain and significant tree replacement planting will be provided in the first two stages of development.

The Visual Impact Assessment considers view of the proposed development from 13 key locations, as shown at **Figure 17** below. This includes five new view point images, as requested by the Department of Planning and Environment.

Figure 17 View impact assessment locations

Source: Virtual Ideas

The visual effect of the proposal from these key points is presented in **Table 6**.

Table 6 Assessment of visual effect

View Location	Visual Effect (as exhibited)	Visual Effect (as proposed to be amended)
Intersection of Epping Road and Herring Road	High	High
Epping Road near Sobraon Road	Low	Low
Shrimptons Creek, north east of Cobar Way	High	High
Cottonwood Crescent near Peach Tree Road	Low	Low
Herring Road at Morling College	Medium	Medium
Macquarie University Station, Herring Road and Waterloo Road	Low	Low
Epping Road, westbound near Whiteside Creek	Medium	Medium

View Location	Visual Effect (as exhibited)	Visual Effect (as proposed to be amended)
Epping Road, north of Lane Cove Road	Low	Low
6-8 Lyonpark Road	N/A	Low
Epping Road, near Booth Reserve bus stop	N/A	High
198 Epping Road	N/A	High

Measures to mitigate visual effects remain generally unchanged from the exhibited Masterplan and will include:

- Rehabilitation of Shrimptons Creek and increased riparian planting.
- Fragmentation of built form along Shrimptons Creek, including refinement of the building envelopes to taper away from the riparian corridor and site boundary.
- Maintaining vegetation along Epping Road, including increased retention of existing trees.
- Provision of vegetation and public domain through the site.
- Transitioning building height and bulk to lower-scale surrounding areas.
- Incorporation of substantial separation distances between buildings.
- Orienting buildings to present the narrow elevation to Epping Road.

The revised Visual Impact Assessment finds that the Masterplan, as proposed to be amended, has an acceptable visual impact.

4.4.5 Ivanhoe Masterplan Design Guidelines

The Ivanhoe Masterplan Design Guidelines have been revised in response to submissions to provide more certainty about the built form of future development on the site (refer to **Appendix G**). The following key changes have been made to the Design Guidelines:

- New provisions have been introduced to guide the design of built form interfacing with Shrimptons Creek.
- Additional design guidance is provided to minimise potential impacts on properties adjoining Peach Tree Road.
- Increased requirements for deep soil planting.
- Additional design guidance is provided treatment of residential uses interfacing with the public domain.

The Guidelines will inform the design of future development within each stage and are provide certainty about the form of future buildings on the site by providing guidance on setbacks, interface with the public domain, provision of deep soil planting, façade expression and materials and design excellence.

4.5 Public Domain and Public Access

Public Domain Concept and Access

The Public Domain Concept developed for the site retains the hierarchy of open spaces linked by pedestrian connections and has been updated to reflect the refinements made to the Masterplan layout. Key changes made to the Public Domain Concept include:

- Addition of a community centre adjoining the Village Green.
- Addition of the expanded Village Green, to provide a total of up to 6,000m^2 of open space in the centre of the site subject to the design of the community centre through VPA negotiations.
- Refinement of the provision of green spaces in setback zones as a result of increased setbacks.

Shrimptons Creek

The Shrimptons Creek riparian corridor and buffer zone has been expanded as a result of the refined Masterplan and will comprise additional areas of green space for riparian planting and recreation space.

Open Space Demand

The refined Masterplan includes approximately 2,900m^2 of additional open space and includes a community centre, which will include recreation facilities. These additional open space and recreation facilities are expected to more than adequately cater for anticipated demand due to increased residential density on the site. The Community Infrastructure and Recreation Demand Study submitted with the exhibited SSD DA found that there will be adequate open space and recreation facilities both on the site and in the surrounding area to meet the needs of a growing population. In addition to this, the Voluntary Planning Agreement offered to the City of Ryde includes the dedication of a multi-purpose indoor recreation facility on the site and a monetary contribution for recreation facilities in the local area.

4.6 Amenity

4.6.1 Residential Amenity

The Concept Masterplan has been designed to achieve a high level of residential amenity in accordance with SEPP 65 and the design criteria recommended by the Apartment Design Guide. The Indicative Design Scheme (refer to **Appendix E**) has been prepared to demonstrate that the proposed building envelopes are capable of accommodating buildings that can achieve key design criteria for solar access, cross ventilation and building separation. Consideration of the key ADG design criteria relevant to the Masterplan, as proposed to be amended, is provided below. An assessment of the Masterplan against the ADG has been prepared by Bates Smart and is included at **Appendix D**.

Building Separation and Visual Privacy

The Indicative Design Scheme demonstrates that building separation in accordance with the recommendations of the ADG can be achieved between all building envelopes with the exception of A1 and A2 which was assessed as part of the exhibited EIS. It is noted that the building envelopes represent the maximum parameters within which a future building could be constructed and that additional building separation may be provided on a site-by-site basis. ADG compliant building separation has been provided to all external boundaries, where required, as shown on the Masterplan Drawings at **Appendix C**.

Solar Access

2 hours of solar access is capable of being achieved to at least 70% of all dwellings on average across the development. Solar access modelling has been undertaken based on the Indicative Design Scheme and will be subject to detailed design and assessment as part of future stages of development.

Communal and Public Open Space

Approximately 9,500m^2 of public open space is provided across the site, including the Village Green, Forest Playground and School Garden. In addition to this, communal open space equal to 25% of each lot is capable of being provided. More than 50% of the Village Green, being the primary open space in the centre of the site, receives solar access for at least 2 hours at mid-winter, in accordance with the recommendations of the ADG.

Cross Ventilation

60% of apartments are capable of achieving cross ventilation in accordance with the design criteria recommended by the Apartment Design Guide. This assessment is based on the Indicative Design Scheme and assessment against the design criteria would be confirmed as part of future detailed design.

4.6.2 Overshadowing

Shadow diagrams have been provided by Bates Smart using the Building Envelope and Indicative Design Scheme. The shadow diagrams depict the shadow cast generated by the Indicative Reference Scheme and the Building

Envelope during the winter solstice and qquinox and outlines the extent of the potential shadow cast generated by the LEP height plane (refer to **Figure 18 - Figure 23**).

During the winter solstice the main impact of the proposed development will be on the low-density residential properties on the opposite side of Epping Road. These shadow impacts are considered to be acceptable for the following reasons:

- The shadows casts are consistent with the impacts associated with a development of this scale and were envisaged for the site as part of the Priority Precinct rezoning process.
- 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 roof areas of the dwellings and not their primary private open space.
- Where overshadowing of the primary private open space occurs (the rear yards), the shadows recede from these areas by midday and is completely clear of the properties by 1pm.

Notwithstanding the shadow impact, the Shadow Diagrams demonstrate that the Indicative Design Scheme will ensure that the primary private open space of adjoining properties along Epping Road to the south will receive at least 2 hours solar access to at least 50% of the private open space area between 9am and 3pm on 21 June as required by the Ryde DCP.

With respect to the height variation, the outline of the LEP height plane demonstrates that the shadow cast generated by Buildings D2 and D4.2 which exceed the height limit will not generate additional shadow cast that would impact nearby residential properties when compared to the shadow cast generated by the LEP height plane. This is primarily because Buildings D2 and D4.2 are significantly setback from Epping Road in excess of the 10m requirement thereby reducing the extent of the shadow cast within the extent of the LEP height plane shadow cast.

The additional shadow generated by the additional height on Buildings B3, C4.1 and D4.2 adjacent to Shrimptons Creek will be dispersed throughout the day and will fall within the RMS Surplus Land on the opposite side of Epping Road, the Epping Road reservation, Shrimptons Creek and 2-4 Lyonpark Road. The additional shadow cast will not affect any nearby residential properties and therefore will not create any adverse impacts. Furthermore, the shadow diagrams clearly illustrate that the height variation will not cause additional shadow cast on Shrimptons Creek given that the compliant LEP height plane generates a shadow cast that would extent beyond the area of the creek.

In this regard, the overshadowing impacts created by the proposal are considered to be minor and acceptable and are not significantly accentuated by the proposed height variation.

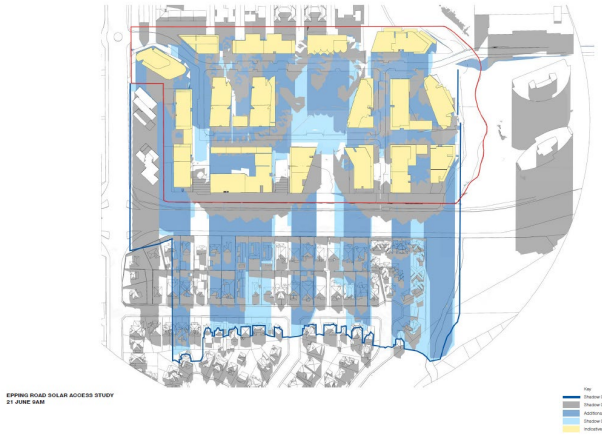


Figure 18 – 9am Shadow Diagram
Source: Bates Smart

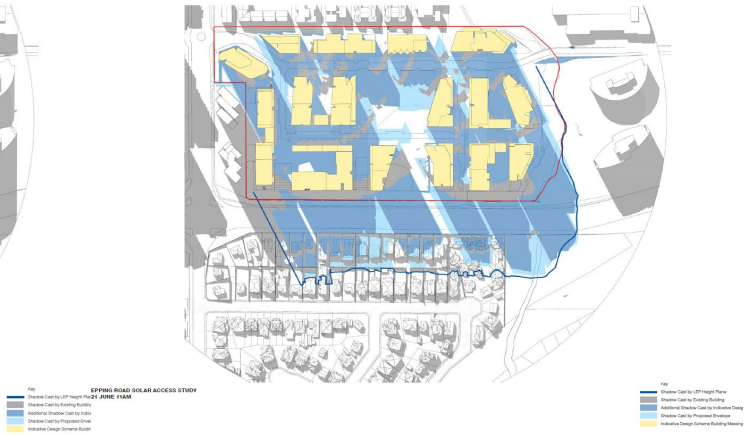


Figure 19 – 11am Shadow Diagram
Source: Bates Smart

Figure 20 – 12pm Shadow Diagram
Source: Bates Smart

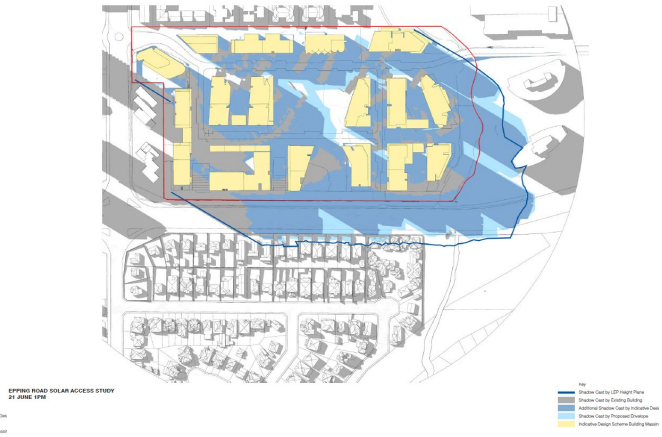


Figure 21 – 1pm Shadow Diagram
Source: Bates Smart

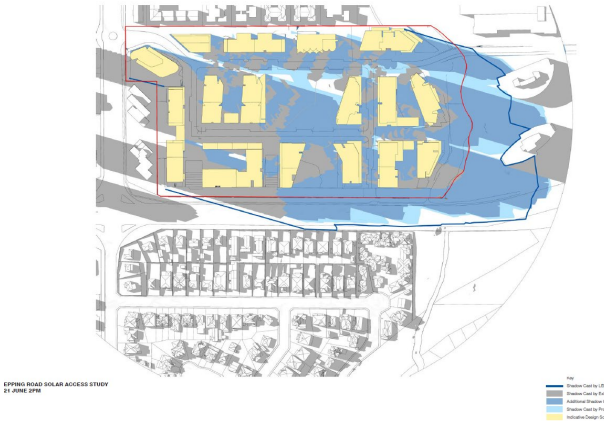


Figure 22 – 12pm Shadow Diagram
Source: Bates Smart

Figure 23 – 12pm Shadow Diagram
Source: Bates Smart

4.6.3 Wind

A revised Wind Assessment has been prepared by Cermak Peterka Petersen (refer to **Appendix L**). The revised assessment considers the removal of Building C2 and changes to the height and massing of the remaining building envelopes. The changes to the Masterplan result in relatively minor changes to the original assessment, which found that the Masterplan is capable of achieving a suitable wind environment for pedestrians and of meeting the relevant safety criterion. The removal of Building C2 is expected to beneficial for wind conditions around the Village Green. Specific mitigation measures will be explored for specific locations prior to the detailed design of each stage of development, as set out at **Section 6.0**.

4.6.4 External Privacy

Setbacks are incorporated into the Building Envelope Control Plan in accordance with the relevant provisions of either the ADG or RDCP. In addition to this, design guidance is incorporated into the Ivanhoe Masterplan Design Guidelines to ensure that future development incorporates design measures and privacy treatments where required to achieve visual privacy. It is noted that future development will be subject to detailed assessment against the ADG, at which time additional privacy measures may be incorporated. As a result of these measures, any external privacy impacts are capable of being appropriately managed.

4.6.5 View Impacts

Public Views

An updated Visual Impact Assessment has been prepared by Ethos Urban (**Appendix J**) to assess the visual impact of the refined Masterplan from key vantage points in the surrounding area. The updated Visual Impact Assessment maintains the finding 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 and will be designed to ensure that future buildings are consistent with the ADG, 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 any loss of valuable views or landscape features.

Private Views

The envelopes proposed by the Masterplan will likely impact on private views for residents of surrounding residential apartment buildings. Whilst some view loss will occur as a result of the refined Masterplan, this view loss is acceptable for the following reasons:

- The proposed building envelopes closest to adjoining residential development are within the permissible height limit.
- Additional height is sought at the lower points of the site, resulting in the offset of perceptions of height from nearby residential apartment buildings.
- The arrangement of building envelopes within the Masterplan continues to maintain view corridor through the site, which allows for 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.

It is noted that no current or future residents of surrounding residential apartment buildings made submissions on the proposed Masterplan.

4.7 Transport, Traffic, Parking and Access

An updated Transport Management and Accessibility Plan has been prepared by Ason (refer to **Appendix M**) and considers the transport impacts of the development, as proposed to be modified, as well as responds to issues raised in submissions.

The key findings of this Transport Management and Accessibility Plan Addendum are:

- Following discussions with Council, RMS, and DP&E, and with consideration of land-use and yield changes, the agreed, updated trip generation has been recalculated.
- Clarified trip distribution and assignment based on the revised trip generation has been used in the development of an agreed, modified modelling methodology for future scenario assessment.

- The modelling results demonstrate that, with the modified proposal, the critical intersections operate with acceptable, relative intersection performance in a hypothetical network for 2031 scenarios without significant upgrades to the state road intersections.
- Additional modelling of the intersection of Main Street with Lyonpark Road with the preferred layout option incorporating a 70m dedicated right turn bay into Main Street and a separate southbound through lane demonstrate that the intersection continues to operate with a good level of service with the addition of the proposed development.
- The timing of future infrastructure works to support the Site development has been discussed with the relevant authorities and the timings have been identified in each stage based on development yields and modelling results.
- The redistribution of vehicles through the provision of connected streets within Ivanhoe Estate, effectively providing a “U-Turn” facility, is supported by RMS. Until such time that roads associated with future stages of the Ivanhoe Estate are constructed—at the completion of Stage 1C—a strategy has been developed to enable sufficient access and turning areas to accommodate the U-Turn manoeuvre with the provision of turning heads at the end of the proposed north and south roads (Main Street and Neighbourhood Street).
- The internal road network and bridge connection to Lyonpark Road have been designed to accommodate the relevant requirements for 14.5m buses including a minimum 3.5m travel lanes and 3.0m wide bus parking bays. 60m of indented bays have also been provided on Main Street to accommodate a minimum of two 14.5m buses.
- Residential, visitor and car share parking will be provided across the Ivanhoe Estate compliant with the maximum parking rates detailed in RDCP2014.
- A detailed Construction Pedestrian and Traffic Management Plan (CPTMP) will be prepared to accompany each stage of development on the Site, and specifically detail how construction will be staged appropriately to manage interactions with future residents of the Site and address hours of operation and construction parking.

It is therefore concluded that the proposed development is supportable from a traffic planning and parking perspective. Further detail in relation to traffic generation, intersection performance, car and bicycle parking and construction traffic management is set out below.

4.7.1 Traffic Generation

Traffic modelling has been undertaken for the development, as proposed to be amended, in accordance with the revised trip generations agreed by the Department of Planning and Environment and RMS. The results of this modelling are presented at **Figure 24**.

3,400 Total Yield (as of 03/08/18)			Trip Rate		AM Peak Trips			PM Peak Trips		
Land Use	**#**	**Unit**	**AM**	**PM**	**Total**	**IN**	**OUT**	**Total**	**IN**	**OUT**
Market Dwellings	2,140		0.14	0.12	300	60	240	257	205	51
Social Dwellings	857		0.03	0.05	26	5	21	43	34	9
Market Independent Living Units	132		0.10	0.10	13	3	11	13	11	3
Social Independent Living Units	143		0.03	0.05	4	1	3	7	6	1
Affordable Units	128		0.14	0.12	18	4	14	15	12	3
Residential Aged Care Facility	120		0.10	0.10	12	2	10	12	10	2
Residential Sub-total					**373**	**75**	**298**	**347**	**278**	**69**
Child Care	150 (15)	Children (staff)	0.1 per child + 1 per staff	0.1 per child + 1 per staff	30	21	9	30	9	21
Mission Australia Offices	596	m^2	0.01	0.01	6	5	1	6	1	5
Ancillary Retail	960	m^2	0.01	0.01	10	5	5	10	5	5
Community Hub	1,000	m^2	1 parking space per $60m^2$, 0.5 trip per space	1 parking space per $60m^2$, 1 trip per space	8	8	0	17	8	8
Community Pool	NA	m^2	25 parking spaces @ 1 trip per space	25 parking spaces @ 2.5 trips per space	25	13	13	63	31	31
Commercial Sub-total (Child Care, Office, Retail, Community Hub & Pool)					**79**	**51**	**27**	**125**	**55**	**70**
High School	1000 (40)	Students (staff)	0.14 per student * 1.4 occupant per car * 2 (in & out) + 1 per staff	0.05 per student * 1.4 occupant per car * 2 (in & out) + 1 per staff	**240**	**140**	**100**	**111**	**36**	**76**
School 75% (external)					180	110	70	84	22	62
School 25% (linked)					60	30	30	28	14	14
Total Generation					**692**	266	426	**584**	369	216

Figure 24 Estimated traffic generation

Source: Ason

4.7.2 Intersection Performance

A detailed assessment of the existing and future level of service of ekey intersections has been undertaken and demonstrate acceptable, relative intersection performance in a hypothetical network for 2031 scenarios without significant upgrades to the state road intersections, as shown at **Figure 25** and **Figure 26**.

Intersection	Criteria	2021		2031
		Base	Base + Dev + Upgrades	Background Growth + Dev + Upgrades
Epping Road / Herring Road	LoS	E	F	F
	Delay (s)	68	77	81
Herring Road / Ivanhoe Place	LoS	A	B	B
	Delay (s)	13	22	22
Lyonpark Road / Main Street	LoS	A	A	B
	Delay (s)	7	12	17
Lyonpark Road / Epping Road	LoS	A	A	A
	Delay (s)	6	6	6
Herring Road / Waterloo Road	LoS	C	D	D
	Delay (s)	39	48	47
Waterloo Road / Byfield Street	LoS	B	B	B
	Delay (s)	17	18	18

Figure 25 SIDRA Results (AM)

Source: Ason

Intersection	Criteria	2021		2031
		Base	Base + Dev + Upgrades	Background Growth + Dev + Upgrades
Epping Road / Herring Road	LoS	E	E	E
	Delay (s)	57	64	67
Herring Road / Ivanhoe Place	LoS	B	B	C
	Delay (s)	23	27	35
Lyonpark Road / Ivanhoe Main Street	LoS	A	A	B
	Delay (s)	6	13	17
Lyonpark Road / Epping Road	LoS	A	A	A
	Delay (s)	6	6	6
Herring Road / Waterloo Road	LoS	C	D	D
	Delay (s)	42	46	44
Waterloo Road / Byfield Street	LoS	B	B	C
	Delay (s)	23	21	36

Figure 26 SIDRA Results (PM)

Source: Ason

In general, the impacts of the development are greater in the morning peak as a result of the trips generated by the proposed school. The impacts of the development are offset by the provision of the new bridge connection between Herring Road and Lyonpark Road, enabling eastbound movements to occur without the need for traversing the Epping Road and Herring Road intersection.

4.7.3 Car and Bicycle Parking

Car Parking

Car parking for the development is proposed in accordance with the requirements of the RDCP and other relevant guidelines, where the RDCP does not set rates for specific land uses. Adoption of the rates set out in the RDCP is supported on the basis that the DCP rates are maximum rates based on the restrictive rates recommended for

adoption under the RMS Guide to Traffic Generating Developments. Car parking will be provided in accordance with the rates shown in **Figure 27** below.

Land Use	Proposed Rate	Comments
Residential (Market, Affordable and Social)		
1 Bed	Max 0.6 spaces per Unit	DCP Requirement
2 Bed	Max 0.9 spaces per Unit	DCP Requirement
3 Bed	Max 1.4 spaces per Unit	DCP Requirement
Visitor	1 spaces per 20 Units	Half DCP requirement: reasonable for a portion to be provided on-street, Site's access to public/active transport
Car Share	1 space per 50 parking spaces	DCP requirement.
Residential Care Facility	1 space per 10 beds + 1 space per 2 employees	SEPP (Housing for seniors or people with a disability)
Independent Living Units	1 space per 5 dwellings	SEPP (Housing for seniors or people with a disability)
Non-Residential		
Retail	Max 1 space per 100m^2	LEP Requirement
Commercial	Max 1 space per 100m^2	LEP Requirement
Community Centre	1 space per 60m^2	The community centre is to service the local community and Ivanhoe development. As such a high proportion of non-car travel is expected.
Community Pool	25 Spaces	Based on review of similar developments within Ryde and neighbouring LGA's
Child Care	1 space per 8 children & 1 space per 2 employees	DCP Requirement
School	Pick Up / Drop Off facilities + maximum 30 staff spaces	No DCP requirement, may be operator driven, however minimal parking should be provided.

Figure 27 Car parking rates

Source: Ason

Visitor parking will be distributed throughout the basement as well as on-street across the site, consistent with the maximum rates set out in the RDCP.

School parking will be provided directly adjacent to the school, with designated short-stay parking provided to accommodate drop-off and pick-up. Approximately 25 spaces will be available for school drop-off and pick-up.

Bicycle Parking

Bicycle parking will be provided for all residential dwellings, with non-residential land uses to be provided with bicycle parking in accordance with the rates set out in the RDCP. In addition to this, bicycle parking will be provided throughout the public domain for recreation and leisure use.

4.7.4 Construction Traffic

A Construction Pedestrian and Traffic Management Plan (CPTMP) will be prepared to accompany each stage of development and will specifically detail how construction will be staged appropriately and include measures relating to:

- Construction traffic management.
- Relationship with residents.
- Management of construction worker parking.

4.8 Community Operation Outline

A Community Operation Outline has been provided by Land and Housing Corporation (refer to **Appendix S**) which outlines how the operation of proposed amenities on the redeveloped Ivanhoe site will facilitate social inclusion and the proposed arrangements for social impact monitoring.

The proposed amenities on Ivanhoe Estate will facilitate social inclusion through:

- Design elements, for example age appropriate playgrounds and access ramps to amenities.
- Programming elements that guide how facilities are used for social inclusion (for example an adult education class), and how facilities operate (for example arrangements for community groups' shared access to a community kitchen).

In addition to this, the operation of the school will foster social inclusion. The school will offer scholarships for disadvantaged students. An agreed number of subsidised places will be made available to young people living in social housing at Ivanhoe on a no fee basis. It is intended that the multipurpose hall be available for public use after hours on weekdays and on weekends. MAH will develop a strategy for optimising the use of key community infrastructure, including the multipurpose hall, where appropriate. Programs will work with residents to implement projects that foster community cohesion and leverage facilities like the multipurpose hall.

Mission Australia Housing (MAH) will lead implementation of a Social Housing Outcomes Plan. As part of this plan, MAH will develop a strategy for optimising the use of key community infrastructure, and for leveraging these facilities (such as the Village Green) when implementing projects that foster community cohesion, belonging and placemaking.

The approach to monitoring the impact of Ivanhoe Estate development is being developed collaboratively with FACS through the application of the Future Directions Evaluation Framework.

The Future Directions Evaluation Framework is in design and will be consistent with the NSW Government Guidelines for Program Evaluation 2016. The Framework will embed evaluation into routine service delivery and performance monitoring systems. It will provide a framework for evaluating the implementation of initiatives, with a focus on quality and access, and the impact on clients and reporting on relevant short-term, intermediate and longer-term outcomes across the NSW Government Human Services Outcomes Framework domains. This Framework provides a common set of population-level wellbeing outcomes across the following domains; social and community, education and skills, empowerment, economic, safety, health and home.

4.9 Safety

A revised Crime Prevention Through Environmental Design report (CPTED) has been prepared by Ethos Urban to consider the refined Masterplan (refer to **Appendix O**). The revised report finds that the refined Masterplan further enhances natural surveillance of the proposed development with an expanded and improved Village Green that provides an active edge on the south eastern site and expanded community centre on the north western side.

The revised CPTED report includes further consideration of the intended surveillance and crime prevention measures for the location of the proposed pedestrian bridge beneath the road bridge and recommends that the same treatments should be applied for the length of the public corridor along Shrimptons Creek. In particular, lighting should achieve a level of illuminance between 50 – 60 Lux and an average uniformity of 0.5 Uo. In addition to this, CCTV will be installed throughout the site in accordance with the recommendations of a security expert prior to the relevant stage of development.

4.10 Flora and Fauna

4.10.1 Impact on Native Vegetation and Threatened Ecological Communities

The Masterplan, as proposed to be modified, will result in unavoidable impacts to 2.5 hectares of native vegetation and the removal of 0.28 hectares of Sydney Turpentine Ironbark Forest, which is a threatened ecological community under the *Biodiversity Conservation Act 2016* and critically endangered under the *Environmental Protection and Biodiversity Conservation Act 1999*. As outlined in **Section 2.3.2**, the Masterplan has been amended to further avoid impacts on native vegetation and will allow for the retention of increased areas of native vegetation and threatened ecological communities. Where endangered ecological communities are required to be removed, the long-term survival of this vegetation is considered unviable due to being located between existing residential development and a major road. Mitigation measures to avoid or minimise impacts on native vegetation remain unchanged from the exhibited SSD DA and include:

- Siting of the development to minimise impacts to endangered ecological communities.
- Removal of vegetation using appropriate tools to minimise further impacts on remaining vegetation and supervision of works by a qualified ecologist.
- 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 nesting boxes to hollow bearing trees.

Following exhibition of the SSD DA, the proposal has been referred to the Commonwealth Department of Environment and Energy under the *Environmental Protection and Biodiversity Conservation Act 1999*,

4.10.2 Tree Removal

It is proposed to remove 856 trees in total (including up to 547 of these trees that are being removed by the demolition works). The amended masterplan allows for the retention of 350 trees in total, an increase of 119 trees since the previously exhibited masterplan. This can be seen in **Table 7** below, and as outlined in the Arborist Assessment prepared by Eco Logical at **Appendix H.**

Table 7 Changes in Number of Trees Removed Onsite

Impact boundary	Trees removed	Trees retained	Total trees
Masterplan as lodged	975 (858 originally assessed plus 117 trees in polygon A & B); includes 547 removed during demolition	231	1,206 (1,089 plus 117 trees in polygon A & B)
Masterplan as amended	856 (includes up to 547 removed during demolition)	350	1,206
Difference	Gain in 119 trees retained onsite		

Source: Eco Logical

4.10.3 Offsets

An updated Biodiversity Offset Strategy has been prepared by Eco Logical in accordance with the NSW Biodiversity Offsets Policy for Major Projects and the *Environmental Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy. A total of 26 ecosystem credits are required to offset the 2.5 hectares of unavoidable impacts of the project. Ecosystem credits will be acquired and retired in a staged manner commensurate to each

area of impact within the future stages of development and all credits will be retired prior to construction of the project.

4.11 Water, Drainage and Stormwater

An Addendum Stormwater and Drainage Assessment has been prepared by ADW Johnson (refer to **Appendix N**). The assessment considers that the main changes effecting the previous Stormwater and Drainage Assessment are the removal of Building C2 and the modification of the shape of future building footprints. It is noted that the water quantity and quality controls are a guide for future development and that detailed measures would be implemented as required as part of future development stages.

The removal of Building C2 will result in a reduction in impervious area and therefore a reduction in peak discharge. As a result, there is likely to be reduced flow to the on-site detention tank servicing that part of the site and there may be a reduction in the size of this tank. This change will result in negligible impacts and does not significantly alter the findings of the previous Stormwater and Drainage Assessment.

The changes to the shape of the footprint of future buildings within each development lot will result in lower peak discharges due to the overall reduction in the size of the roof catchment areas. As the shape of these buildings is likely to be refined as part of future stages of development, the proposed amendments result in negligible impacts to stormwater quantity and quality from the site.

Overall, the proposed stormwater and drainage concept will be capable of adequately capturing and treating stormwater runoff from the site.

4.12 Flooding

An updated Flood Impact Assessment has been prepared by BMT WBM to address comments raised by the Office of Environment and Heritage (refer to **Appendix P** and the detailed response at **Appendix A**). The updated Flood Impact Assessment addresses the Masterplan as exhibited and finds that there are minimal flood impacts during the 20 year ARI and 100 year ARI, with increases in flood levels during the PMF event. Overall the Flood Impact Assessment found that there is no considerable risk to life due to the availability of rising road aces to Herring Road in the event of a flood. Prior to future stages of development, additional analysis will be undertaken to:

- Implement site-specific mitigation measures for buildings near existing flood risk areas.
- Implement water sensitive urban design opportunities to create a flood-resilient public domain.

4.13 Heritage and Archaeology

The conclusions of the Aboriginal and Historical Heritage Due Diligence Assessment remained unchanged from the assessment provided in support of the exhibited SSD DA, as confirmed in the covering letter provided by Eco Logical (refer to **Appendix Q**). Eco Logical prepared the assessment in accordance with the requirements of the *National Parks and Wildlife Act 1974*, the *Heritage Act 1977* and the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* prepared by the Office of Environment and Heritage. Upon completion of the assessment, which included a desktop study and detailed site inspection, it was concluded that the site has low to nil archaeological potential. As a result of this conclusion, there is no requirement for further archaeological assessment within the study area. The mitigation measures contained in the original assessment continue to apply, as detailed at **Section 6.0**.

4.14 Noise

The revised Masterplan will not result in any additional noise impacts that were not considered as part of the original proposal. Detailed mitigation measures will be implemented prior to the relevant Construction Certificate for each stage to ensure that noise impacts on surrounding sensitive receivers will be minimised.

4.15 Waste

An updated Waste Management Plan has been prepared by Elephant's Foot and confirms that the Masterplan, as proposed to be amended, is capable of appropriately managing waste. Refer to **Appendix R** for further detail.

4.16 Contributions

A letter of offer to enter into a Voluntary Planning Agreement was submitted to the City of Ryde on 18 July 2018, following a meeting with council officers on 12 July 2018. The letter of offer includes the dedication of community and recreation facilities both on and off-site. Frasers will continue to work with Council towards execution of the VPA as soon as possible.

5.0 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 28 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 28 – 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. • Implementation of a Biodiversity Management Plan and Construction Environment Management Plan during construction. • Retention of protected and native vegetation where possible. • Provision 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 the 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 affected 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. • Appropriately attenuate school and child care centres to meet recommended acoustic criteria. • Incorporate acoustic treatments into residential buildings where required.	2	2	4

6.0 Final Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed in **Table 8** below.

Table 8 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 take into consideration SEPP 65 and the Apartment Design Guide. • 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 and August 2018). • 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 (August 2018).
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 (August 2018). • 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 (August 2018). • Incorporate acoustic treatments into future residential buildings to comply with the acoustic criteria recommended by the Acoustic Assessment prepared by Acoustic Logic (August 2018). • 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 (August 2018).

7.0 Conclusion

The proponent, Aspire Consortium, and its expert project team have considered all submissions made during public exhibition of the proposal. A considered and detailed response to all submissions made has been provided in this report and in the accompanying documentation.

In responding to and addressing the range of matters raised by the government agencies, authorities and the general public, Aspire Consortium has sought to refine the project design.

As outlined in this report, the assessment of the amendments to the proposed development confirms that the key elements of the original proposed development that was exhibited remain unchanged and that the refinements made post-exhibition result in overall improvements to the Masterplan.

To the benefit of the overall project, the environmental impacts of the amended development remain consistent with and have improved from the original application and deliver a project that results in an overall improvement to publicly exhibited development. The proposal has significant planning merit on the basis that:

- 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 provide an appropriate site-specific response that is generally consistent with the principles established in the Herring Road Priority Precinct process, contributing to the Macquarie Park skyline.
  - 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 variation to the maximum height standard in Ryde LEP 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 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.

In conclusion, the Ivanhoe Estate Masterplan will deliver a new community where social and affordable housing blends with private 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.