ATTACHMENTS DISTRIBUTED UNDER SEPARATE COVER

REPORTS BY COUNCIL OFFICERS

ITEM-116  CCL 24/10/17 - SUPPLEMENTARY REPORT - LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LEP 2012

Attachment A: Original Report and Attachment A to D of CCL 25/07/17 - Land bounded by Mosbri Crescent and Kitchener Parade The Hill - Adoption of Amendment to Newcastle Local Environmental Plan 2012

Attachment B: Applicant's response to matters raised during the Public Voice held on 15 August 2017

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CCL 24/10/17
SUPPLEMENTARY REPORT - LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL ENVIRONMENTAL PLAN 2012

Attachment A: Original Report and Attachment A to D of CCL 25/07/17 - Land Bounded By Mosbri Crescent and Kitchener Parade The Hill - Adoption of Amendment to Newcastle Local Environmental Plan 2012
PURPOSE

This report seeks Council's endorsement of an amendment to Newcastle Local Environmental Plan 2012 (LEP), as per attached Planning Proposal PP_2016_NEWCA_010_00 (Attachment A) and adoption of a new Section 6.14 - 11 Mosbri Crescent, The Hill (Attachment B) for inclusion in Newcastle Development Control Plan 2012 (DCP).

RECOMMENDATION

1 Council resolves to:

   i) Endorse the attached planning proposal PP_2016_NEWCA_010_00, pursuant to section 55 of the Environmental Planning and Assessment Act 1979 NSW (EP&A Act), in order to amend Newcastle Local Environmental Plan 2012 (LEP) and rezone land bounded by Mosbri Crescent and Kitchener Parade, The Hill that comprises the following land parcels:

      a) SP6373, SP3058, Lots 10, 12, 13 DP 216346 and Lot 1 DP204077, Nos 1 - 17 Mosbri Crescent, and

      b) Lot 8 DP216346, SP19610 and Lot 62 DP522440, Nos. 31, 37 and 41 Kitchener Parade, The Hill.

   ii) Forward the planning proposal to the Department of Planning and Environment (DPE) requesting that a draft LEP be prepared and made pursuant to section 59(1) of the EP&A Act.

   iii) Advise the Secretary of the DPE that Council does not seek to exercise delegations for undertaking section 59(1) of the EP&A Act.

   iv) Adopt the new draft Section 6.14 - 11 Mosbri Crescent, The Hill of Newcastle Development Control Plan 2012 and provide public notice advising that this development control take effect on the business day following the date upon which the abovementioned amendment to Newcastle LEP 2012 is made.

KEY ISSUES
2 In accordance with Council's previous resolution of 22 November 2016, Council sought Gateway determination from the Minister for Planning and the Environment.

3 The Gateway determination (Attachment C) was issued on 22 December 2016. This allocated the planning proposal with identifier PP_2016_NEWCA_010_00 and identified the level of consultation required with public authorities and the community (public exhibition).

4 The outcomes of the public authority consultations are reported within the Planning Proposal (Attachment A). No objections have been raised to the Planning Proposal by the public authorities.

5 Planning Proposal PP_2016_NEWCA_010_00 and new draft Section 6.14 - 11 Mosbri Crescent, The Hill of the DCP were both publicly exhibited from 22 May 2017 until 19 June 2017.

6 Council has received eight submissions, which are summarised and addressed within the updated Planning Proposal (Attachment A). The main matters identified within submissions include:

   i) Inconsistency with local character / heritage of The Hill.

   ii) Excessive height and scale for the area.

   iii) Potential increase in traffic along local streets.

   iv) Impacts on on-street parking.

   v) Lack of capacity of local school to cater for additional students.

   vi) Anomalies identified within the documentation supporting the exhibited Planning Proposal and draft Section 6.14 - 11 Mosbri Crescent, The Hill (of DCP); in particular the Urban Design Study prepared by SJB Architects.

7 Responses to the issues raised in submissions are provided in the table at Attachment D. Corrections to documentation supporting the Planning Proposal have been made. No changes are recommended to either the Planning Proposal or new draft Section 6.14 of Newcastle Development Control Plan 2012 as a result of submissions.

FINANCIAL IMPACT

8 Work resulting from the recommendation will be undertaken by Council’s Strategic Planning staff within their current allocated work program and budget.

COMMUNITY STRATEGIC PLAN ALIGNMENT
9 Council adopted the Newcastle 2030 Community Strategic Plan in February 2011, as revised in 2013. The planning proposal primarily aligns to the strategic direction of ‘Liveable and Distinctive Built Environment’ - the proposal supports the strategic objective for “Greater diversity of quality housing for current and future community needs”.

10 Furthermore the planning proposal aligns with a specific action under Section 4.1.2 within Council’s Local Planning Strategy (LPS), which recommends investigating an R3 Medium Density zone for the parcel occupied by the existing NBN television studios.

IMPLEMENTATION PLAN/IMPLICATIONS

11 The attached Planning Proposal (Attachment A) was prepared in accordance with Council’s Local Environmental Plan – Request for Amendment Policy (2012). This policy identifies Council’s processes and responsibilities in applying the requirements of Part 3 of the EP&A Act 1979 for amending an LEP.

12 Should Council adopt the recommendation the Planning Proposal will be forwarded to the DPE for preparation of the legal planning instrument (draft LEP) to be made by the Minister of Planning and Environment. Furthermore, Council will provide notification of the adopted DCP and nominate a date when the DCP comes into effect, preferably upon gazettal of the aforementioned LEP amendment.

RISK ASSESSMENT AND MITIGATION

13 Adoption of the recommendations enables the Planning Proposal to be processed within the timeframes provided within the gateway determination and enable the land to be redeveloped for medium density residential development.

RELATED PREVIOUS DECISIONS

14 At the Ordinary Council Meeting held on 22 November 2016 Council resolved to:

i) Endorse the attached Planning Proposal (Attachment A of CCL 25/10/16), prepared in accordance with Section 55 of the Environmental Planning and Assessment Act 1979 (EP&A Act), to amend Newcastle LEP 2012 to enable medium density residential development on the following land bounded by Mosbri Crescent and Kitchener Parade, The Hill:

   a) SP6373, SP3058, Lots 10, 12, 13 DP 216346 and Lot 1 DP204077, Nos 1 - 17 Mosbri Crescent, and

   b) Lot 8 DP216346, SP19610 and Lot 62 DP522440, Nos. 31, 37 and 41 Kitchener Parade, The Hill.
ii) Forward the Planning Proposal to the Minister for Planning and Environment for Gateway determination pursuant to Section 56 of the EP&A Act.

iii) Advise the Secretary of the Department of Planning and Environment that Council does not seek to exercise delegations for undertaking Section 59(1) of the EP&A Act.

iv) Consult with the community and relevant government agencies as instructed by the gateway determination.

v) Place the draft Section 6.14 - 11 Mosbri Crescent, The Hill to the Newcastle Development Control Plan 2012, as provided in Attachment B of CCL 25/10/16, on public exhibition for a minimum period of 28 days, concurrently with the Planning Proposal.

vi) Receive a report back on the Planning Proposal and draft Development Control Plan guidelines as per the requirements of Section 57 of the EP&A Act.

15 Prior to this, at the Ordinary Council Meeting held on 25 October 2016 Council had resolved to lay the item on the table pending a Councillor workshop with Council officers. A Councillor briefing occurred on 15 November 2016.

CONSULTATION

16 Consultation with public authorities and the community was undertaken in accordance with the Gateway determination as outlined above and further detailed in Attachment A.

17 Council's Urban Design Consultative Group were consulted during the preparation of the Planning Proposal, and their advice was incorporated into the development of the proposed LEP controls and DCP guidelines and previously reported to Council.

OPTIONS

Option 1

18 The recommendation as at Paragraph 1. This is the recommended option.

Option 2

19 Council resolves not to proceed with the Planning Proposal and associated draft DCP guidelines. This is not the recommended option.

BACKGROUND

20 In February 2016 Council received a request to amend the LEP to enable land comprising the NBN television studios at 11 to 17 Mosbri Crescent, The Hill to be redeveloped for medium density housing. Upon review, it was identified that
a strategic approach was needed that incorporated review of zoning on adjoining land to the west, also bounded by Mosbri Crescent and Kitchener Parade. The property owners of these eight additional parcels were contacted to ascertain their desire to have their land included in a Planning Proposal, and no objections were received.

21 A Planning Proposal was prepared for the land in accordance with the DPE guidelines and Council's Local Environmental Plan – Request for Amendment Policy. The Planning Proposal sought to enable the land being redeveloped for medium density housing by rezoning the land from Zone R2 Low Density Residential to Zone R3 Medium Density Residential, and by amending the height of buildings (HOB) map and the floor space ratio (FSR) map within the LEP.

22 Council received a briefing on the Planning Proposal on 15 November 2016 and resolved, at the Ordinary Council Meeting held on 22 November 2016 to endorse the Planning Proposal and seek Gateway determination from the Minister for Planning and the Environment.

23 Council also resolved to exhibit a new draft Section for inclusion into the DCP. The draft Section 6.14 - 11 Mosbri Crescent, The Hill (Attachment B) seeks to guide future medium density development in accordance with the urban design study (previously reviewed by Council’s Urban Design Consultative Group) for 11 to 17 Mosbri Crescent (NBN television studios site).

REFERENCES

ATTACHMENTS


Attachment C: Gateway determination dated 22 December 2016

Attachment D: Summary of submissions

Attachment A to D distributed under separate cover.
CCL 25/07/17
LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE
THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL
ENVIRONMENTAL PLAN 2012


Attachment C: Gateway determination dated 22 December 2016

Attachment D: Summary of submissions

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LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE
THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL
ENVIRONMENTAL PLAN 2012

Land bounded by Mosbri Crescent & Kitchener Parade, The Hill

July 2017
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Summary of Proposal

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Mosbri Crescent &amp; Kitchener Parade, The Hill</th>
</tr>
</thead>
</table>
| Property Details | 1 Mosbri Cres, The Hill (SP6373)  
3 Mosbri Cres, The Hill (Lot 10 DP216346)  
5 Mosbri Cres, The Hill (SP3058)  
7 Mosbri Cres, The Hill (Lot 12 DP216346)  
9 Mosbri Cres, The Hill (Lot 13 DP216346)  
11 to 17 Mosbri Cres, The Hill (Lot 1 DP204077)  
31 Kitchener Pde, The Hill (Lot 8 DP216346)  
37 Kitchener Pde, The Hill (SP19610)  
41 Kitchener Pde, The Hill (Lot 62 DP522440) |

Applicant Details

Nine Network Australia Pty Ltd

Background

Council has received a request to amend Newcastle LEP 2012 in order to enable the land at 11 to 17 Mosbri Crescent, The Hill to be developed from its current use as television studios to medium density housing. Upon reviewing this request it was identified that there was also an opportunity to expand the scope of the Planning Proposal to rationalise the zoning of the adjoining land to the west, also bounded by Mosbri Crescent and Kitchener Parade, from low density residential to medium density residential. The property owners of these eight additional parcels were contacted to ascertain their desire to have their land included under a proposal, and one letter in support was received. This Proposal includes the additional properties.

Site

The proposal consists of land bounded by Mosbri Crescent and Kitchener Parade The Hill, comprising of:

- 1 Mosbri Cres, The Hill (SP6373)
- 3 Mosbri Cres, The Hill (Lot 10 DP216346)
- 5 Mosbri Cres, The Hill (SP3058)
- 7 Mosbri Cres, The hill (Lot 12 DP216346)
- 9 Mosbri Cres, The Hill (Lot 13 DP216346)
- 11 to 17 Mosbri Cres, The Hill (Lot 1 DP204077) - existing NBN television studio
- 31 Kitchener Pde, The Hill (Lot 8 DP216346)
- 37 Kitchener Pde, The Hill (SP19610)
- 41 Kitchener Pde, The Hill (Lot 62 DP522440)

The land is situated on the western edge of a hill, the summit of which is the Obelisk in King Edward Park. The topography across the land drops sharply from Arcadia Park adjoining to the east and Kitchener Parade at the northern edge, into a relatively flat basin in the central and eastern sections of the site where the current NBN studio buildings are located fronting Mosbri Crescent. The remaining properties to the west of the NBN studio parcel are occupied by low
scale residential flat buildings of two to three-storey. The land is adjoined to the south by residential dwellings and residential flat buildings and to the east by Arcadia Park. To the north of the site is Newcastle East Public School. The land contains some scattered trees dispersed between building forms with a number of fig trees surrounding the existing studios. Moving west of the land, the topography continues to slope down towards Darby Street. The land is currently zoned R2 Low Density Residential and adjoins an R3 Medium Density Residential zone to the north.

Refer to Figure 1: Local Context of Site and Figure 2: Air Photo of Site, for visual context.
Figure 1: Local Context of Site
Figure 2: Air Photo of Site, for visual context.
Part 1 - Objectives or Intended Outcomes

To enable the land to be developed for medium density housing.

Part 2 - Explanation of Provisions

The objectives of the planning proposal will be achieved by amending Newcastle LEP 2012 as follows:

1. Land zoning map to reflect a change of zone from R2 Low Density Residential zone to R3 Medium Density Residential zone.

2. Height of building (HOB) map to reflect a maximum building height from 8.5m to a range of heights across the site, including heights above ground of 11m and 12m (three to four-storeys above ground) and also a number of specific reduced levels (RL) up to RL56.8 (seven-storeys above ground).

3. Floor space ratio (FSR) map to reflect a change from a maximum FSR of 0.75:1 to 0.9:1 and 1.5:1.
Part 3 – Justification

Section A - Need for the planning proposal

1. Is the planning proposal a result of any strategic study or report?

Yes. Appendix A of the Local Planning Strategy (LPS) provides the neighbourhood visions and objectives for The Hill, which recognises redevelopment opportunities within The Hill, subject to consideration of character, including city skyline along ridge tops.

Neighbourhood Vision:

- The amenity and heritage character of The Hill will be conserved while supporting new opportunities for expanding population in select areas.

Objectives:

- Facilitate medium density housing in appropriate locations that respects the existing heritage character of the area.
- Protect the character of the city skyline along ridge tops.
- Protect and enhance public open space.

A specific action of the LPS (under Section 4.1.2) recommends investigating an R3 Medium Density Residential zone for the parcel occupied by the existing NBN Television studios.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes, a change of zoning and changes to the height of buildings (HOB) and floor space ratio (FSR) is considered the most appropriate means of enabling the site to be used for medium density housing.

The option of only amending the HOB and FSR but retain the existing zone could also achieve the intended outcome. However, such development controls would be considered contrary to the zone objectives of the low density residential zone and is therefore not the preferred option.
Section B - Relationship to strategic planning framework

3. Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

Hunter Regional Plan 2036

The Hunter Regional Plan 2036 was released by the NSW Government in October 2016. The Plan contains an overarching vision for the Hunter Region, supported by four Goals, 27 directions and associated actions. It also contains local government narratives.

- Vision

The planning proposal supports the vision for the Hunter Region, including:

"Greater housing choice is available in existing and new communities, close to jobs and services and well supported by public transport and walking and cycling options. More housing has reduced the upward pressure on house prices."

- Goals

The planning proposal supports Goal 4 - Greater housing choice and jobs.

- Directions

The planning proposal is consistent with Direction 21 - Create a compact settlement, by supporting the following actions:

  o Promote small-scale renewal in existing urban areas, in consultation with the community and industry to ensure that this occurs in the right locations.

  o Provide greater housing choice by delivering diverse housing, lot types and sizes, including small-lot housing in infill and greenfield locations.

  o Promote new housing opportunities in urban areas to maximise the use of existing infrastructure.

The planning proposal will facilitate medium density housing on an in-fill site, providing housing diversity, within an existing urban area to maximise use of infrastructure and services.

- Newcastle - Local Government Narrative

The narrative of the Regional Plan builds upon the above vision, goals and directions and applies these to the Newcastle Local Government Area. The planning proposal is consistent with the directions, including the priority to "Provide for small-scale renewal and redevelopment of larger sites for infill housing."
Lower Hunter Regional Strategy (2006)

The Lower Hunter Regional Strategy applies to the land. The aim of this Strategy is to ensure that adequate land is available to accommodate the projected housing and employment growth in the Hunter Region over the next 25 years.

The proposal will contribute to generating housing opportunities, including diversity of housing, and is therefore consistent with this aim.

4. Is the planning proposal consistent with the local council’s Community Strategic Plan, or other local strategic plan?

Newcastle 2030 Community Strategic Plan

Council adopted the Newcastle 2030 Community Strategic Plan in February 2011, as revised in 2013. The planning proposal primarily aligns to the strategic directions identified within the Newcastle 2030 Community Strategic Plan, including:

- Open and Collaborative Leadership - Compliance with the LEP amendment process, in particular section 57 – community consultation of the Environmental Planning and Assessment (EP&A) Act 1979, will assist in achieving the strategic objective: “Consider decision-making based on collaborative, transparent and accountable leadership” and the identified strategy 7.2b, which states: “Provide opportunities for genuine and representative community engagement in local decision making”.

- Liveable and Distinctive Built Environment - the proposal supports the strategic objective for "Greater diversity of quality housing for current and future community needs". Also the proposed heights across the land have been managed to achieve the strategic objective "A built environment that maintains and enhances our sense of identity".

Local Planning Strategy (LPS)

Appendix A of the Local Planning Strategy (LPS) provides the neighbourhood visions and objectives for The Hill, which recognises redevelopment opportunities subject to consideration of character, including city skyline along ridge tops.

Neighbourhood Vision:

- The amenity and heritage character of The Hill will be conserved while supporting new opportunities for expanding population in select areas.

Objectives:

- Facilitate medium density housing in appropriate locations that respects the existing heritage character of the area.
- Protect the character of the city skyline along ridge tops.
- Protect and enhance public open space.

A specific action of the LPS (under Section 4.1.2) recommends investigating an R3 Medium Density zone for the parcel occupied by the existing NBN Television studios.

1 The Lower Hunter Regional Strategy has been largely superseded by the Hunter Regional Plan 2036, however still applies to the land through the operation of the Ministerial Direction under section 117 of the Environmental Planning and Assessment Act 1979.
Having regards to the criteria for the Residential Growth Precincts under the LPS, the land is considered to satisfy the criteria for a ‘Substantial Growth Precinct’, being a ten minute walk of a major commercial centre, being Darby Street. The land is also within the walking catchment to the City Centre, although topography to the north is challenging. In accordance with the zone directions under the LPS, an R3 Medium Density zone is to apply to the Substantial Growth Precinct, with typical controls of HOB 10m and FSR 0.9:1. Additionally, the relatively large area and ‘bowl like’ topography of the land containing the existing NBN television studios (11 to 17 Mosbri Crescent) lends itself to being able to physically accommodate additional development beyond the standard R3 Medium Density Residential development controls. The additional development is justified on these unique site attributes and is sympathetic to existing surrounding context, as required under the visions and objectives for the neighbourhood. Due to the large elevation drop from Kitchener Parade, the building heights can maintain a three to four-storey 'human scaled' street edge and overall heights sit comfortably below ridge lines.

5. Is the planning proposal consistent with applicable State Environmental Planning Policies?

Consistency (of the planning proposal) with State Environmental Planning Policies is outlined in the table below.

**Table 1 - Consideration of State Environmental Planning Policies**

<table>
<thead>
<tr>
<th>Name of SEPP</th>
<th>Applicable</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Environmental Planning Policy No 1 (Development Standards)</td>
<td>No</td>
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<tr>
<td>State Environmental Planning Policy No 14 (Coastal Wetlands)</td>
<td>No</td>
<td></td>
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<tr>
<td>State Environmental Planning Policy No 19 (Bushland in Urban Areas)</td>
<td>No</td>
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<td>State Environmental Planning Policy No 21 (Caravan Parks)</td>
<td>No</td>
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<tr>
<td>State Environmental Planning Policy No 26 (Littoral Rainforests)</td>
<td>No</td>
<td></td>
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<tr>
<td>State Environmental Planning Policy No 30 (Intensive Agriculture)</td>
<td>No</td>
<td></td>
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<tr>
<td>State Environmental Planning Policy No 33 (Hazardous and Offensive Development)</td>
<td>No</td>
<td></td>
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<tr>
<td>State Environmental Planning Policy No 36 (Manufactured Home Estates)</td>
<td>No</td>
<td></td>
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<tr>
<td>State Environmental Planning Policy No 44 (Koala Habitat Protection)</td>
<td>Yes</td>
<td>The SEPP applies to the entire LGA, however, the land is urban and does not consist of areas of koala habitat.</td>
</tr>
<tr>
<td>State Environmental Planning Policy No 55 (Remediation of Land)</td>
<td>No</td>
<td>There is no known contamination of the land and the current and former uses of the land are unlikely to have caused risk of contamination.</td>
</tr>
<tr>
<td>State Environmental Planning Policy No 62 (Sustainable Aquaculture)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>State Environmental Planning Policy No 64 (Advertising and Signage)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Name of SEPP</td>
<td>Applicable</td>
<td>Consistency</td>
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<tr>
<td>State Environmental Planning Policy No 65 (Design Quality of Residential Flat Development)</td>
<td>Yes</td>
<td>Yes. The proposal will facilitate the delivery of residential flat building development on the site and is considered applicable. Clause 27 of the SEPP outlines functions of design review panels, including that they may &quot;carry out a review of provisions relating to the design quality of development to which this policy applies in any local environmental plans and development control plans in the area for which it is constituted, and advise the relevant council whether or not it endorses the provisions&quot;. A detailed urban design study has informed the preparation of this Planning Proposal by proposing a preferred master plan for the site. The urban design study has been considered by Council's Urban Design Consultative Group (UDCG), being Council's design review panel. The UDCG were generally supportive of the master plan proposed (noting that heights have been reduced from those requested by the proponent within the concept). Importantly the heights of this Planning Proposal maintain a human scaled street edge and sit comfortably below ridgelines, thereby protecting views from public open space vantage points to the east (Obelisk lookout). This proposal is also supported by draft Development Control Plan (DCP) guidelines, which complement the LEP controls to put into effect the master plan for the site. In accordance with Clause 21A of the Environmental Planning and Assessment Regulations 2000, Council's UDCG have reviewed the draft DCP and comments have been considered, including incorporating appropriate building separations and upper level setbacks. Also in accordance with Clause 21A of the Regulations and Clause 6A of the SEPP the draft guidelines are not inconsistent with the objectives, design criteria and design guidance of the Apartment Design Guide. The draft Development Control Plan guidelines will be exhibited concurrently with the Planning Proposal.</td>
</tr>
</tbody>
</table>
The subject land is within the Coastal Zone. The Planning Proposal is acceptable in relation to the matters for consideration specified under Clause 8 as applying to the preparation of a draft LEP.

- Access to foreshores will not be affected.
- The controls proposed are suitable for the location and relationship with surrounding areas.
- There will be no adverse impacts on the foreshore.
- The scenic qualities of the coast will be protected.
- The land is not subject to coastal hazards.
- The proposal will not impact Aboriginal cultural aspects.
- The proposal will not impact coastal waterbodies.
- The HOB under the proposal responds to surrounding heritage conservation and heritage items.
- The proposal encourages compact cities by increasing density responsive to site context and access to transport and services.

<table>
<thead>
<tr>
<th>Name of SEPP</th>
<th>Applicable</th>
<th>Consistency</th>
</tr>
</thead>
</table>
| State Environmental Planning Policy No 71 (Coastal Protection)                | Yes        | The subject land is within the Coastal Zone. The Planning Proposal is acceptable in relation to the matters for consideration specified under Clause 8 as applying to the preparation of a draft LEP.
- Access to foreshores will not be affected.
- The controls proposed are suitable for the location and relationship with surrounding areas.
- There will be no adverse impacts on the foreshore.
- The scenic qualities of the coast will be protected.
- The land is not subject to coastal hazards.
- The proposal will not impact Aboriginal cultural aspects.
- The proposal will not impact coastal waterbodies.
- The HOB under the proposal responds to surrounding heritage conservation and heritage items.
- The proposal encourages compact cities by increasing density responsive to site context and access to transport and services. |
| State Environmental Planning Policy (Affordable Rental Housing) 2009           | No         |                                                                                                  |
| State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 | No         | Compliance with SEPP (BASIX) will be demonstrated under future development applications. The concept under the urban design study has demonstrated that adequate solar access could be achieved for future development. |
| State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 | No         |                                                                                                  |
| State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 | No         |                                                                                                  |
| State Environmental Planning Policy (Infrastructure) 2007                    | No         | May apply to future development.                                                                  |
| State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 | No         |                                                                                                  |
| State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007  | No         |                                                                                                  |
| State Environmental Planning Policy (Rural Lands) 2008                       | No         |                                                                                                  |
| SEPP (State and Regional Development) 2011                                   | No         |                                                                                                  |
| State Environmental Planning Policy (State Significant Precincts) 2005       | No         |                                                                                                  |
6. **Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?**

Consistency (of the planning proposal) with Ministerial Directions under section 117 of the *Environmental Planning and Assessment Act 1979* is outlined in the table below.

**Table 2 - Consideration of Section 117 Directions**

<table>
<thead>
<tr>
<th>S117 Direction</th>
<th>Applicable</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employment and Resources - No employment and resource directions are applicable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Environment and Heritage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Environment Protection Zones</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2.2 Coastal Protection</td>
<td>Yes</td>
<td>Yes. The proposal is within the Coastal Zone but does not impact or would be impacted by coastal processes or hazards. The proposed HOB is compatible with the context of the area.</td>
</tr>
<tr>
<td>2.3 Heritage Conservation</td>
<td>No</td>
<td>The land of the proposal does not contain any heritage items and is not within a heritage conservation area. However, the land does adjoin heritage conservation areas to the north and east. The proposal is considered compatible with the existing and envisaged built form.</td>
</tr>
<tr>
<td>2.4 Recreation Vehicle Areas</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3. Housing, Infrastructure and Urban Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Residential Zones</td>
<td>Yes</td>
<td>Yes. The Planning Proposal proposes to rezone the land from R2 Low Density Residential to R3 Medium Density Residential zone. This will broaden housing choice, make more efficient use of infrastructure and services, reduce demand for housing on the urban fringe and facilitate good design, responsive to the context. The proposal will not reduce the permissible density of the land and future development will be able to be adequately serviced.</td>
</tr>
<tr>
<td>3.2 Caravan Parks and Manufactured Home Estates</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3.3 Home Occupations</td>
<td>No</td>
<td>The R3 Medium Density residential zone includes home occupations as development without consent, and includes home businesses with consent.</td>
</tr>
<tr>
<td>3.4 Integrating Land Use and Transport</td>
<td>Yes</td>
<td>Yes. The proposal will facilitate medium density residential development within walking distance to transport and services, including the Darby Street commercial centre and Newcastle City Centre.</td>
</tr>
<tr>
<td>S117 Direction</td>
<td>Applicable</td>
<td>Consistent</td>
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<td>4. Hazard and Risk</td>
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<tr>
<td>4.1 Acid Sulfate Soils</td>
<td>Yes</td>
<td>Yes. The land is Class 5, however is within 500m of Class 4 soils to the north and west. Future development must comply with the provisions of the Newcastle LEP 2012 relating to ASS.</td>
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<td>4.2 Mine Subsidence and Unstable Land</td>
<td>Yes</td>
<td>The site is within the Newcastle Mines Subsidence District. As per the Gateway determination issued 22 December 2016 Council has consulted with the NSW Mine Subsidence Board. No objections were raised to this planning proposal but MSB identified that future development would require their approval.</td>
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<td>4.3 Flood Prone Land</td>
<td>No</td>
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<tr>
<td>4.4 Planning for Bushfire Protection</td>
<td>Yes</td>
<td>The site is in proximity to land mapped as bushfire prone land (Arcadia Park to the east). As per the Gateway determination issued 22 December 2016 Council consulted with the Commissioner of the NSW Rural Fire Service and as a result RPS was appointed to prepare and Bushfire Threat Assessment for the land. A copy is included as Attachment D to this planning proposal. Future DAs will need to comply with the requirements of Planning for Bushfire Protection 2006 or subsequent replacement guidelines, particularly in relation to providing adequate asset protections zones to identified bushfire hazard areas. More information is provided in Section 11 of this planning proposal.</td>
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<tr>
<td>S117 Direction</td>
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<td>5. Regional Planning</td>
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<tr>
<td>5.1 Implementation of Regional Strategies</td>
<td>Yes</td>
<td>Yes. The Lower Hunter Regional Strategy applies to the land. The aim of this Strategy is to ensure that adequate land is available to accommodate the projected housing and employment growth in the Hunter Region over the next 25 years. The proposal will contribute to generating housing opportunities, including diversity of housing, and is therefore consistent with this aim. The proposal will facilitate housing in a location that will facilitate efficient travel patterns and more sustainable modes of transport, support increased walking and cycling and improved connectivity.</td>
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<td>5.10 Implementation of Regional Plans</td>
<td>Yes</td>
<td>Yes. The Hunter Regional Plan 2036 applies to the land. As outlined under section 3 previously, this planning proposal is consistent with the vision, goals, directions and actions, along with the narrative for Newcastle Local Government Area, within the Regional Plan. It summary the planning proposal will facilitate medium density housing on an in-fill site, providing housing diversity, within an existing urban area to maximise use of infrastructure and services.</td>
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<td>6. Local Plan Making</td>
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<td>6.1 Approval and Referral Requirements</td>
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<td>6.2 Reserving Land for Public Purposes</td>
<td>No</td>
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<td>6.3 Site Specific Provisions</td>
<td>Yes</td>
<td>Generally consistent. The Planning Proposal will introduce RL height controls to provide certainty with respect to maximum building heights across part of the land. However, it is noted that these RLs enable development in addition to what would typically be provided for the R3 Medium Density Residential zone, generally being 10m above ground.</td>
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</table>
Section C - Environmental, social, and economic impact

7. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The site is currently developed for urban purposes and the Planning Proposal has no potential for critical habitat or threatened species, populations or ecological communities, or their habitats, to be adversely affected.

8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

Built Form and Urban Design

The proposed amended development controls (HOB and FSR) have been informed by a comprehensive Urban Design Study, prepared by the proponent's consultant, SJB Architects (Attachment A). The Urban Design Study has been developed to demonstrate that the proposed R3 Medium Density Residential zoning for the site and accompanying changes to HOB and FSR can produce a high quality residential development that complements the surrounding topography and built form.

The Urban Design Study outlines a master plan for 11 to 17 Mosbri Crescent (NBN television studio site) comprising five separate building forms. The building forms range in scale from three to eight-storey above ground and indicatively predicts some 171 dwellings. The master plan includes detailed massing and view analysis which identified that built form would be just visible from vantage points to the east, including Obelisk lookout. The master plan has been reviewed by Council's Heritage Officer and Council's Urban Design Consultative Group (UDCG), being Council's SEPP 65 design review panel. The master plan was supported in principle with some recommended reduction in height to the three taller residential flat buildings (Buildings A, B and D under the scheme). This Planning Proposal is based upon the reduced heights, now a maximum of seven-storey. The reduction in height was considered necessary to provide an improved 'human scale' streetscape, nominally three to four-storey above the respective street level, thereby relating better to adjoining development, along with respecting the adjoining heritage items and heritage conservation areas.

Building heights (HOB) and floor space ratios (FSRs) are proposed for 11 to 17 Mosbri Crescent (NBN television studio site) based upon the master plan. The buildings heights therefore vary across the site. Fronting Mosbri Crescent and the southern boundary a maximum 12m (measured above ground level) is nominated, which would accommodate up to four-storeys. Four specified sites have been nominated a maximum reduced level (RL) to more specifically limit the maximum height limit. These RLs are proposed for the three taller buildings under the master plan fronting Kitchener Parade and to the eastern boundary, allowing up to a seven-storey building in the north-east corner (RL56.8), but only four-storey above street level. Given the large drop in elevation from Kitchener Parade into the site a height above ground level control would not provide sufficient certainty as to the built form outcome. In this case the actual level of the roof RL (desired at three to four-storeys above street level) is a more important design aspect than the number of floors able to be accommodated between this maximum RL and the ground below. A further building form on Mosbri Crescent is also nominated an RL, however this still results in four-storey scale. Due to ground elevation changes, an RL controls the built form more appropriately than a height above ground. The FSR for the 11 to 17 Mosbri Crescent (NBN television studio site) is proposed at 1.5:1, under which the master plan indicatively predicts some 190 dwellings could be achievable.
The development controls proposed for the additional parcels (west of the NBN television studio site) are 11m maximum height and maximum FSR of 0.9:1, being generally consistent with the standard controls for an R3 Medium Density Residential zone.

Given the large drop in elevation from Kitchener Parade, the overall building heights will still be up to seven-storey scale in the north-east corner (still four-storey above street level), then progressively transitioning down towards the south and west to result in a four-storey scale adjoining Mosbri Crescent. This massing will sit comfortably within the context, by responding to the 'bowl like' topography of the site. The reduction in height to those proposed under the master plan will also protect ridgelines (as desired under Council's Local Planning Strategy) and ensure existing westerly views from King Edward Park, including the Obelisk, would be largely unaffected.

In addition to proposed changes to LEP controls, outlined under this Planning Proposal, the master plan for the land will also be implemented through site specific DCP guidelines. The draft DCP guidelines control aspects such as building footprints, setbacks, access and landscaping. It also controls the size of habitable rooftop access areas to minimise bulk and scale of roof top forms (as these areas are allowed for under the HOB). It is intended that the Urban Design Study and the draft DCP guidelines will be exhibited concurrently should the Planning Proposal proceed through Gateway.

Should the Planning proposal proceed through Gateway the Urban Design Study will be updated to reflect the adjusted HOB, prior to exhibition.

Heritage

There are no listed items of environmental heritage on site. However, the Newcastle East Public School site opposite Kitchener Parade to the north is a listed heritage item, as is Arcadia Park to the east. The Hill heritage conservation area adjoins to the east and north. As outlined above, the Proposal has been informed by a master plan that has considered heritage. Council's Heritage Officer reviewed the master plan and was satisfied that a three to four-storey scale at street level was appropriate, as provided for under this Planning Proposal.

Hydrology and Water Management

The site is not located within a flood prone area. However, there exists a natural gulley from Arcadia Park that would create overland flow through the part of the land occupied by the existing NBN television studios (11 to 17 Mosbri Crescent). Furthermore, there are some existing public underground drainage lines that traverse the same parcel. A preliminary stormwater management plan has demonstrated that the master plan outlined under the Urban Design Study would be capable of managing stormwater. Detailed design would be required as part of future development applications.

Mine Subsidence

The site is within the Newcastle Mine Subsidence District. Consultation with the NSW Mine Subsidence Board (MSB) was undertaken as required by the Gateway determination issued 22 December 2016. MSB raised no objection the the proposal but identified that conditions and standards may be imposed on future development proposals on the land. A desktop geotechnical assessment of the concept development for the site has been undertaken by the proponent's consultant, Douglas Partners (Attachment B). The assessment has found that:
"...the proposed development is considered suitable from a geotechnical perspective provided the following is undertaken at the appropriate stage of the development process:

- Detailed geological site investigations to determine the subsurface conditions at the location of the proposed structures. The information is required for detailed design of foundations, excavations and retaining structures;
- Undertake mine subsidence risk assessment to establish mine subsidence design parameters and guide foundation selection;
- Submission of Mine Subsidence Board (MSB) building application for approval;
- Undertake a condition assessment of existing retaining structures that will not be demolished and are to remain as part of the new development."

The above procedures and assessments will be undertaken as part of future development applications.

**Bushfire**

The site is in proximity to land mapped as bushfire prone land (Arcadia Park to the east). As per the Gateway determination issued 22 December 2016, consultation is required with the Commissioner of the NSW Rural Fire Service, prior to public exhibition. This consultation occurred and is discussed in Section D 11. It is noted that the land is already currently zoned for residential purposes.

Future development is infill development and it would be expected that appropriate performance standards will be required in consultation with the NSW Rural Fire Service for future development on the land.

**Contamination**

There is no known contamination of the land and the current and former uses of the land are unlikely to have caused risk of contamination.

**Traffic Impacts and Vehicular and Pedestrian Access**

The site has direct frontage to Mosbri Crescent and Kitchener Parade. A Traffic Impact Assessment report was prepared by the proponent's consultant, Aecom (Attachment C), to demonstrate the land is capable of supporting medium density residential development. It is noted that the report was based upon development of 11 to 17 Mosbri Crescent (NBN television studio site) and not on the wider land incorporated under this Planning Proposal. Nevertheless, the report is based upon an earlier scheme which indicatively predicted some 208 residential dwellings. The current master plan for 11 to 17 Mosbri Crescent indicatively predicts some 171 dwellings. Accordingly, the findings of the report are considered satisfactory to cover the potential additional dwellings possible under the expanded Planning Proposal.

The report found that the land has good access to Newcastle's strategic road network and to existing public transport services. Two entry points to the site at 11 to 17 Mosbri Crescent could provide access to parking facilities. The report found that the master plan (based upon 208 dwellings) would be expected to generate a net increase of 17 AM vehicle trips and 36 PM trips, and therefore the net vehicular impacts of the proposal are considered negligible. The report also identified that car parking requirements, as per the Newcastle Development Control Plan 2012, could be accommodated within basement car parks.

Assessment of developments at the development application stage would formalise traffic, access and parking.
Acid Sulphate Soils (ASS)

The land is Class 5 ASS, however is within 500m of Class 4 soils to the north and west. Future development must comply with the provisions of the Newcastle LEP 2012 relating to ASS.

Trees

The existing large fig trees at 11 to 17 Mosbri Crescent (NBN television studio site) should ideally be retained and integrated with future development. Successful tree retention will largely depend on the location of building footprints determined under the master plan concept for the site. An arborist report has identified retainable trees and these are detailed under the draft DCP guidelines.

9. Has the planning proposal adequately addressed any social and economic effects?

Cultural Heritage

No items of Aboriginal or European cultural heritage have been identified on the site. It is unlikely given the historic land uses, including extensive excavations, that there is potential for impact on social or cultural heritage.

Housing

A change to the zoning to facilitate medium density residential development will be compatible with the existing residential flat buildings already existing on part of the land along with the surrounding area. This will broaden housing choice, make more efficient use of infrastructure and services, reduce demand for housing on the urban fringe and facilitate good urban design.

Public Benefit

The land is adjacent to Arcadia Park offering future residents opportunities for passive and active recreation. The master plan prepared for 11 to 17 Mosbri Crescent (NBN television studio site) will be implemented through the site specific DCP guidelines. This includes a publicly accessible pedestrian link between Mosbri Crescent and Kitchener Parade and new footpath in Kitchener Parade, both of which will increase pedestrian permeability through the block to the adjoining public school to the north, the Newcastle City Centre and Arcadia Park.

Future development of the land will also be subject to Section 94 development contributions which will also contribute towards local infrastructure.
Section D - State and Commonwealth interests

10. Is there adequate public infrastructure for the planning proposal?

Yes. The site is supplied with necessary infrastructure and services. It would be expected that these could be augmented as required to accommodate an increased demand generated by future development.

11. What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

Consultation, under section 56(2)(d) of the Environmental Planning and Assessment Act 1979, has occurred with the following public authorities as required by the Gateway Determination issued 22 December 2016,

**NSW Mines Subsidence Board (s117 direction 4.2)**

Council wrote to the NSW Mines Subsidence Board (MSB) on 12 January requesting identification of any mine subsidence issues relevant to the planning proposal.

MSB provided written confirmation on 20 February 2017 that they do not raise any objection or identify further requirements to the planning proposal. However MSB identified that they may impose conditions and engineering controls on any future development as appropriate, given the presence and nature of underlying mine workings.

**NSW Rural Fire Service (s117 direction 4.4)**

Council wrote to the NSW Rural Fire Service (RFS) on 12 January requesting identification of any bush fire planning requirements relevant to the planning proposal.

RFS provided feedback on 15 February 2017 identifying that the proposal did not adequately address the requirements of the Planning for Bushfire Protection 2006 in relation to identifying asset protection zone setbacks against the adjacent bushfire hazard. Furthermore the RFS recommended the engagement of a suitably qualified consultant to provide a 'bushfire impact assessment report' to demonstrate that the proposal will be able to comply with Planning for Bushfire Protection 2006 and clause 44 of the Rural Fires Regulation 2008.

As a result RPS were engaged and prepared a *Bushfire Threat Assessment* 11-17 Mosbri Crescent, The Hill 2300, dated 5 April 2017, (see **Attachment D**) which was provided to RFS for consideration on 18 April 2017.

On 1 May 2017 RFS confirmed that based on the assessment of the information provided no objections were raised with respect to the proposal. However subsequent development would need to comply with Table A2.4 of Planning for Bushfire Protection 2006 with respect to provision of APZs.

To ensure that the proposed new DCP accompanying this planning proposal will require future development to comply with this requirement, Council sought confirmation from RPS that this would be the case. RPS confirmed on 17 May 2017 that despite the setbacks in the DCP shown as less than the 10m identified as 'deemed to comply' in Table A2.4 of Planning for Bushfire Protection 2006, subsequent development proposals are still able to meet the Performance Criteria for APZs according to RPS' assessment. Hence the requirements of 4.4 (S117 Directions) are satisfied.
Other
Council's original planning proposal referred for gateway determination had suggested consultation with NSW Roads and Maritime Services and NSW Department of Education; however this has not been required under the gateway determination.

The Department of Education will be notified during public exhibition but as an adjoining land owner of the proposal.
### Part 4 – Mapping

The planning proposal seeks to amend the following maps within Newcastle LEP 2012.

- Land Zoning Map
- Height of Buildings Map
- Floor Space Ratio Map

The Matrix below indicates (with an “X”), which map sheets (of Newcastle LEP 2012) are to be amended as a result of this planning proposal (eg. FSR_001C)

<table>
<thead>
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<th>FSR</th>
<th>LAP</th>
<th>LZN</th>
<th>WRA</th>
<th>ASS</th>
<th>HOB</th>
<th>LSZ</th>
<th>LRA</th>
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</table>

Map Codes:
- **FSR** = Floor Space Ratio map
- **LAP** = Land Application Map
- **LZN** = Land Zoning Map
- **WRA** = Wickham Redevelopment Area Map
- **ASS** = Acid Sulfate Soils Map
- **HOB** = Height of Buildings Map
- **LSZ** = Lot Size Map
- **LRA** = Land Reservation Acquisition Map
- **CL1** = Key Sites Map & Newcastle City Centre Map
- **HER** = Heritage Map
- **URA** = Urban Release Area Map

The following maps illustrate the proposed amendments to the Newcastle LEP 2012 maps:
- **Figure 3:** Existing Land Zoning Map
- **Figure 4:** Proposed Land Zoning Map
- **Figure 5:** Existing Max Height of Buildings Map
- **Figure 6:** Proposed Max Height of Buildings Map
- **Figure 7:** Existing Max Floor Space Ratio Map
- **Figure 8:** Proposed Max Floor Space Ratio Map
EXISTING MAXIMUM FLOOR SPACE RATIO FOR 11-17 MOSBRI CRESCENT, NEWCASTLE
PROPOSED MAXIMUM FLOOR SPACE RATIO FOR 11-17 MOSBRI CRESCENT, NEWCASTLE
The gateway determination issued 22 December 2016 required a minimum public exhibition period of 28 days. This timeframe being consistent with the exhibition of the accompanying draft DCP, being a new section (Section 6.14 - 11 Mosbri Crescent, The Hill) for inclusion within Newcastle DCP 2012 DCP.

The planning proposal was exhibited from the Monday 22 May to Monday 19 June 2017.

A public notice was placed in the Newcastle Herald on 20 May 2017 and Council wrote to landowners within and adjoining the land.

Council received eight submissions, which were reported to Council for consideration on the 25 July 2017.

The main matters identified within submissions include:
- Inconsistency with local character/heritage of The Hill
- Excessive height and scale for the area.
- Potential increase in traffic along local streets
- Impacts on on-street parking
- Lack of capacity of local school to cater for additional students
- Anomalies identified within the documentation supporting the exhibited Planning proposal and draft Section 6.14 - 11 Mosbri Crescent, The Hill (of Newcastle Development Control Plan 2012); in particular the Urban Design Study prepared by SJB Architects.

No changes were recommended to the Planning Proposal as a result of the public exhibition. A detailed summary of submissions with planning response is provided as an attachment to the officer's report to the Council meeting on 25 July 2017 on this matter.
Part 6 – Project Timeline

The project is expected to be completed within 12 months from Gateway determination. The following timetable is proposed:

<table>
<thead>
<tr>
<th>Task</th>
<th>Planning Proposal Timeline</th>
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<tbody>
<tr>
<td></td>
<td>Dec 16 Jan 17 Feb 17 Mar 17 Apr 17 May 17 Jun 17 Jul 17 Aug 17 Sep 17 Oct 17 Nov 17 Dec 17</td>
</tr>
<tr>
<td>Issue of Gateway Determination</td>
<td>Green</td>
</tr>
<tr>
<td>Prepare any outstanding studies</td>
<td>Green</td>
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<tr>
<td>Consult with required State Agencies</td>
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<td>Exhibition of planning proposal and technical studies</td>
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<td>Review of submissions and preparation of report to Council</td>
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<tr>
<td>Report to Council following exhibition</td>
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<tr>
<td>Planning Proposal sent back to Department requesting that the draft LEP be prepared</td>
<td>Red</td>
</tr>
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Attachments


- **Attachment C** - Traffic Impact Assessment - Newcastle NBN site residential development, by AECOM, dated 22 December 2015.

Attachment A - Urban Design Study

11 Mosbri Crescent, The Hill

By SJB Architects, Ver 09, dated 29 June 2017
Urban Design Study

Planning Proposal for:

11 Mosbri Crescent
The Hill, Newcastle

On behalf of:

Nine Network Australia

SJB Architects
Urban Design Study, in support of the
Planning Proposal for

11 Mosbri Crescent
The Hill, Newcastle
Nine Network Australia

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Prepared by: J. Lee, J. Threlfall, F. Layson
Checked by: J. Knapp

Contact Details
SJB Architects
Level 2, 490 Crown Street
Surry Hills NSW 2010
Australia

T: 61 2 9380 9911
F: 61 2 9380 9932
architects@sjb.com.au
www.sjb.com.au
Executive Summary

SJB Architects have been appointed by Nine Network Australia to prepare an Urban Design Study for the NBN Studio at 11 Mosbri Crescent, The Hill, Newcastle. The purpose of the study is to test the development capacity of the site and suitability for future residential uses, and in the process determine appropriate amendments to the Newcastle LEP 2012 Maps for Land Use, Height and Floor Space Ratio.

This study includes analysis of the site, its immediate and broader urban contexts, focusing specifically on the site’s integration with the surrounding movement network, open spaces and landscape, and built form character. Key site features, including the steep topography, a number of mature Moreton Bay Fig trees, and varying edge conditions (i.e. Arcadia Park, single detached housing, walk-up flats, primary school) have all been identified and used to inform the concept design.

Design principles have been prepared that distil the findings of the analysis, key planning objectives, and our knowledge from working on similar projects in Newcastle and throughout the Sydney Metropolitan Area. These principles provide the basis of the options design and testing, and have directly influenced the structure of the site, building orientation, landscape structure and scale of development.

Three concept options for the site have been prepared that investigate variations in development yield and density, built form, residential typologies, stepping with the site topography, car parking, access and circulation. A preferred option has been identified and assessed in terms of the overshadowing and visual impact on the surrounding context. These options have been presented to Council and amendments to the preferred option made to respond to preliminary feedback.

Based on the findings of this study we believe the site is suitable for residential uses to a maximum height of 7-storeys (RL 56.8 including a roof garden), which due to the existing topography will reveal 3-storeys from Kitchener Road with the top storey setback to reduce its visibility. The proposed development yield on the site (approximately 171 dwellings) represents a floor space ratio of 1.39:1.
Baseline

Overview of the regional, urban and local context to provide an initial understanding of the site.
1.1 Introduction

SJB have been appointed by Nine Network Australia to prepare an Urban Design Study for the NBN lands located at 11 Mosbri Crescent, Newcastle, which is currently owned by NBN for the production of television programming.

The purpose of this document is to provide urban design analysis and concept masterplan options leading to a preferred option, which will form the basis of a Planning Proposal for the site.

This analysis and options are undertaken in the context of the current planning controls and strategies which include:

- Newcastle LEP 2012
- Newcastle DCP 2012
- Newcastle Urban Renewal Strategy, July 2012
- Newcastle Strategic Plan

The analysis undertaken within this report includes a review and commentary on the current controls and testing of development approaches that transforms the site from its existing commercial use to residential up to 7 storeys in height, with a floor space ratio of 1.39:1, and a yield of 171 dwellings (combination of 1, 2 and 3 bedroom apartments).
1.2 Site

The site is located at 11 Morisbi Crescent, located in the suburb of The Hill, Newcastle.

The site has an area of 1.22 hectares and is currently used by NBN in the production of local television programming.

The site has one access point which is directly from Mosbri Crescent. It has an irregular shape and is bounded by Kitchener Parade to the north, Arcadia Park to the east, properties of Hillview Crescent to the south and properties of Mosbri Crescent to the west.

The site is located within 900 metres of the city centre which is located directly to the north.

The following page identifies some of the key site characteristics including trees, level changes and surrounding buildings.
Baseline

1.3 Site Photos

01 Existing residential flat block to the west of the site on Mosbri Place
02 Existing residential flat building to west of the site to Kitchener Parade
03 Level changes to the north of the site
04 Boundary conditions to the east of the site
05 Level changes to the east of the site
06 Existing service areas to the east of the site looking south
07 Existing retaining wall to the east
08 Existing trees along the boundary edge
09 Existing tree and retaining walls to the south-west corner
10 Neighbouring properties to the west boundary
11 Properties to the west along Mosbri Crescent
12 Mosbri Crescent Reserve to the west of the site
1.4 Urban Context

The site has a key strategic location within the city of Newcastle.

It is located within less than a kilometre from the City Centre, within The Hill. The Hill is a predominantly residential area made up of detached dwellings and a small number of residential flat buildings.

The site within its wider context is well served by a number of public parks including King Edward Park, Nesca Park and Civic Park. Newcastle Beach is located within 800 metres of the site.

The existing rail line which led into the centre of Newcastle was de-commissioned and the main rail now terminates at Newcastle Station. Numerous bus routes connect the site with the City Centre and beyond.
1.5 Local Context

The site is very well serviced in terms of local amenity. Key local amenities within a 5 minute walk include:

- Numerous parks including Arcadia Park, King Edward Park, Nesca Park and Civic Park.
- James Fletcher Hospital
- Newcastle East Public School, and
- Cafe & Restaurant precinct of Darby Street

The site is well connected to the surrounding areas of Newcastle with numerous bus routes within the immediate vicinity.
1.6 Newcastle Local Environmental Plan 2012

The Newcastle LEP 2012 applies a maximum FSR control of 0.75m to the study site. This height is applicable to the sites to the east and south of the subject site. The Newcastle Strategic Plan, however proposes an increase to the allowable FSR to 0.9:1m. Any FSR proposed beyond this would require a planning submission to change the FSR.

There are no heritage items on the site and the site is not designated within a conservation zone. Immediately adjacent to the site however, to the north and east is The Hill Conservation Area. Newcastle East Public School which sits directly to the north of the site is listed as a heritage item.

The Newcastle LEP 2012 applies a maximum building height control of 8.5m to the study site. This height is applicable to the sites to the east and south of the subject site. The Newcastle Strategic Plan, however proposes an increase to the allowable building heights to 10m. Any height proposed beyond this would require a planning submission to change the height.

The Newcastle LEP 2012 applies a R2 Low Residential zoning to the study site. The surrounding areas are identified as a R2 Low Residential to the south and west, R3 medium-density residential to the northern edge and RE1 Public Recreation to the east of the site.

Newcastle Strategic Plan, proposes an increase to the allowable zoning of the site to R3 Medium Density Residential. Any zoning beyond this would require a planning submission to change the land zoning to R4 (high density residential).

Source: Newcastle LEP 2012
1.7 Development Control Plan Summary

The Newcastle DCP 2013 is the current document which is applicable to the site. The key relevant sections are as follows, with specifics of the controls and their objectives outlined in further detail:

Section 3 - Land Use Specific Provisions

3.04 Attached dwellings and Multi-Dwelling Housing
3.05 Residential Flat Buildings

Section 7 - Development Provisions

7.01 Building Design Criteria
7.02 Landscape, Open Space and Visual Amenity
7.03 Traffic, Parking and Access

Section 3 - Landuse Specific Provisions

Section 3.04 Attached Dwellings and Multi-Dwelling Housing

There are no specific controls in this section.

Section 3.05 Residential Flat Buildings

The following objectives are listed for the design of residential flat buildings. These include:

1. Achieve better built form and aesthetics of buildings and of the streetscapes and the public spaces they define.
2. Better satisfy the increasing demand, the changing social and demographic profile of the community, and the needs of the widest range of people from childhood to old age, including those with disabilities.
3. Maximise amenity, safety and security for the benefit of its occupants and the wider community.
4. Minimise the consumption of energy from non-renewable resources, to conserve the environment and to reduce greenhouse gas emissions.
5. Encourage redevelopment that allows for more compact and sustainable urban form.
6. Create a vibrant place for people to live in proximity to community facilities and services, commercial centres, employment, and transport nodes.
7. Ensure public transport, walking and cycling as alternatives to the car.

Controls

The following controls apply to all development to which this section applies:

1. Compliance with ‘SEPP No. 65 - Design Quality of Residential Flat Development’ and the provisions set out in the ‘NSW Residential Flat Building Design Code’.

Section 7 Development Provisions

Section 7.01 Building Design Criteria

Key criteria which are to be considered during the design stages and will establish the urban design parameters include:

- Height of Buildings
- Density - Floor space ratio
- Minimum Street frontage
- Streetscape and front setbacks
- Side and rear setbacks
- Open Space
- Building Design and Appearance
- Solar Access
- Views and Privacy
- Fencing and Walls
- Utilities and Services

The options presented respond to the controls of each of these sections.

Section 7.02 Landscape, Open Space and Visual Amenity

Objectives

1. Provide an area on sites where appropriate that enables soft landscape and deep soil planting that permit the retention and/or planting of trees and shrubs that will grow to a large or medium size.
2. Ensure areas of significant vegetation are maintained and protected.
3. Retain habitat for native fauna.
4. Ensure the character of development is appropriate for the local environmental context and the landscape character of the setting.
5. Ensure consideration is given to the impact which development may have on adjoining properties.

Controls

Controls applying to all development to which this section applies

1. Landscaping is in scale and context with the proposed development, street reserve width, other buildings and landscape elements within the streetscape, i.e. it is not appropriate to plant a large tree in the front garden of a small terrace or to landscape a large industrial structure with ground covers.

2. Existing trees and vegetation should be preserved particularly street trees and those within the front setback. The existing tree canopy is retained and enhanced wherever possible.
3. Where possible integrate on-site stormwater management with the design of landscaped areas.
4. Plant species are selected and located to avoid structures, services and paths.
5. Undesirable species are not selected (See Appendix 1 of Urban Forest Technical Manual and Appendix B Landscape Technical Manual).
6. Deep soil zones are optimised within a site by:
   a) the design of basement and sub-basement car parking, so as not to fully cover the site and conflict with tree planting
   b) ensuring appropriate front and side setbacks are provided for tree planting
   c) that the soil profile is free draining
   d) works, excavations, infrastructure, services and drainage pipes are located away from the deep soil zone
   e) optimise the extent of deep soil zones beyond the site boundaries by locating them contiguous with the deep soil zones of adjacent properties.
7. Landscape treatment within the front setback is substantial enough to enhance the appearance and integration of the development with the streetscape.
8. Landscape design responds to user requirements, taking into account maintenance, social / recreational needs and aesthetic quality.
9. Plant species are suitable for site conditions, using native species where possible, and local indigenous species adjoining environmentally sensitive sites, such as waterways and bushland.
10. Landscape design is used to enhance the amenity and energy efficiency of the development where possible by providing shade to the northerly and westerly elevations of buildings in summer and adequate solar access in winter.
11. Landscape areas to address privacy issues between dwellings.
12. Significant site vegetation, landscape features incorporated in the public landscape areas of the development and linked to the local open space network where possible.
13. Adequate provision is made for planted buffer.
1.8 Development Control Plan Summary

Section 7.03 Traffic, Parking and Access

Objectives
1. Ensure an appropriate level and mix of parking provision, having regard to the likely demand and the impacts of over/under supply of parking.
2. Establish an appropriate parking standard for the City Centre that recognises its locational advantages in relation to public transport access.

Controls
Controls applying to all development to which this section applies:
1. Car parking is generally provided in accordance with the rates set out in Table 1 – Parking Rates, except for car parking for non-residential development in the Newcastle City Centre, which is provided at the rate of one space per 60m² gross floor area. Council reserves the right to vary the rates, subject to merit assessment of the proposal.
2. Parking provision for major traffic generating development in Newcastle is assessed on merit, with particular reference to:
   (a) likely peak usage times
   (b) the extent to which development will attract additional patronage, as opposed to drawing on existing visitation

Newcastle Development Control Plan 2012 7.03 Traffic, Parking and Access and Access 6.00
(c) the likely use of public transport.
3. Parking provision for developments not listed in Table 1 is assessed having regard to RTA guidelines, and/or demonstration of parking requirements from surveys of comparable establishments and the following criteria:
   (a) the proportion of visitors or patrons likely to arrive by car
   (b) the availability and level of service of public transport relative to the site
   (c) the number of employees and their likely spread of work hours
   (d) the hours of operation
   (e) the location of the premises, particularly in relation to schools, local services, and employment, retail and recreational facilities
   (f) the number of occasions during the year when the proposed development is likely to be fully utilised
   (g) the availability and affordability of public parking within a reasonable distance of the proposed development
   (h) the availability of additional parking facilities to cover peak demands.

4. Provision of car parking and associated internal vehicular access and manoeuvring areas above the maximum rates nominated in Table 1 are included in the gross floor area for the purpose of calculating floor space ratio, except where provided in association with controls 5 and/or 6.

5. Where a development proposal involves alterations or additions to an existing building, a change in use or an intensification of use, the required on-site parking provision is based on the likely demand arising from the additions or the intensification of use, as assessed by Council. The possibility of a future change of use is also considered when preparing a development proposal and, if appropriate, due allowance made for provision of supplementary parking spaces. This applies particularly to premises being constructed for leasing or renting or in those premises where the type of occupation could be subject to variation. Failure to provide adequate parking spaces under these circumstances could result in the refusal of a future development application for a change of use.

6. Where development/redevelopment is proposed that will result in a loss of on-street spaces (arising from the construction of access, loading facilities etc.), Council may require for such spaces to be replaced on site.
7. Stack parking, including mechanical devices, occurs only where it can be demonstrated that it will be operationally efficient and not cause unreasonable obstruction.
8. Service vehicle parking, couriers facilities and loading and unloading facilities are provided on the site in a manner that is conveniently accessible for all developments likely to generate a need for such facilities. The submitted plans clearly indicate that the proposed facilities will be adequate, having regard to:
   (a) intended use of the site
   (b) frequency of deliveries and collections

The rate of parking is as follows:
- Attached Dwellings, Multi Dwelling Housing, Residential
- Flat Buildings, Shop Top Housing - City wide (excluding
- Newcastle City Centre and Renewal Corridors)
- Minimum of 1 space per 1,2 or 3 bedroom dwelling.
- Minimum 1 space for the first 5 dwellings plus 1 space for every 5 thereafter or part thereof for visitors.

Bike parking of 1 space per dwelling is required unless separate storage is provided (Council determine the required class of security) 1 space per 10 dwellings.
1.8 Newcastle Strategic Plan

The Newcastle Strategic Plan is a policy document which identifies the long term plan for the development of the City over the next few decades.

The site has a strategic location within central Newcastle located within Cooks Hill. This is a vibrant entertainment and residential centre with good access to the City Centre, with numerous bus routes. It features quality streetscapes and local character and a large number of rental properties. Institutional buildings, such as the library, art gallery, and conservatorium, help define the edge of Cooks Hill with the City Centre. Some of the key characteristics of the precinct include:

- Darby Street commercial and restaurant centre
- Centennial Park,
- street alignments relating to former railway lines,
- art galleries/library/conservatorium,
- federation housing including terraces, and
- Civic Park.

The area is identified as a Conservation Area under the LEP and the local historical character, viability, high pedestrian amenity and identity of Cooks Hill will be strengthened.

The objectives of the strategy for the precinct include:

- Preserve local services to cater for the needs of residents,
- Facilitate a stronger presence and hence role of public and privately operated cultural facilities,
- Increase housing choice for youth and aged persons,
- Improve the pedestrian accessibility and amenity of Darby Street,
- Facilitate mixed use development in character with existing historical and cultural buildings, namely the library, art galleries and conservatorium,
- Facilitate business opportunities on Darby Street in adaptable mixed use buildings.

The concepts and proposals presented within this report reflect and support the desired future character of the precinct as described above. A key component of the strategy is that it identifies the site as being a 'Moderate Growth Precinct'.

The strategy proposes an increase to the allowable FSR (0.91) and Building Heights (10m), and zones the site R3 Medium Density Residential.
1.9 Newcastle Urban Renewal Strategy, 2012

The Newcastle Urban Renewal Strategy 2012, prepared by the Planning and Infrastructure NSW (PINSW), identifies the challenge being faced by the Newcastle city centre and Hunter Street, which stretches over 3km from Wickham in the west to Pacific Park in the east.

The strategy proposes a range of initiatives which could be implemented to encourage renewal in the city centre. These include:

- Amendments to the planning framework to promote activity, development, and well-located land uses.
- Physical improvements to the city’s key public spaces.
- Economic initiatives that will support urban renewal.
- Actions to improve transport, access and connectivity to and within the city centre.

The objectives of the strategy are to ensure that:

- The strength of the city is recognised and reinforced, relative to other centres within the local government area.
- The city centre is a vibrant, viable and attractive destination for business, residents and visitors.
- The city centre provides accessible and suitable employment opportunities as well as a mix of retail and service facilities.
- The city centre’s retail and employment lands are attractive for investment by local, national and international businesses, both now and in the future.
- All parts of the city centre are well connected and easy to access.

In the three designated precincts, Wickham is to become the new Central Business District (CBD), with commercial towers being supported by new residential development to the north and south of the existing rail line. Civic, located at the mid-point of Hunter Street, is to reinforce existing civic uses, which include the Council Offices, Civic Theatre, Newcastle Museum, and the development of the new Law Courts and Newcastle University Campus. The East End is to become a retail, entertainment and mixed-use precinct, supported by new residential and commercial uses.

Source: Newcastle Urban Renewal Strategy
Site Analysis

Exploring the existing urban conditions and contexts, to assist in developing an appropriate urban response.
2.1 Movement

Vehicular, Pedestrian and Cycle Connections

- Good connections to local roads which link to the City Centre and to arterial roads linking to regional areas.
- Bicycle routes offer good connections through the city.
- Pedestrian permeability is good with walking routes through to all primary and aerial routes.

Public Transport Connections

- A number of bus routes within close proximity of the site.
- Connection to the Queens Wharf Ferry Wharf which links to Stockton
Site Analysis

2.2 Open Spaces

Regional & Local Recreational Areas

The site is in close proximity to multiple regional and local recreational areas. Within a 200m walk to King Edward Park, the site abuts Arcadia Park to the east and Mosbri Crescent reserve to the west.

Legend
- Landmark
- Outdoor Seating
- Shower
- Playground
- Baseball
- Football
- Tennis
- Skateboarding
- Walking
- Dog Walking
- Swimming

Site
- Walking Catchment
- Regional: Catchment Area 5-10km
- District: Catchment Area 2km
- Neighbourhood: Catchment Area 400m
- Pocket: Catchment Area 200m
2.3 Amenities and Services

Local Amenity

The site is well placed amongst a number of services providing retail, leisure, entertainment, business, educational, health and community facilities.

The three precincts of West End, Civic and East End, which form the focus for various amenity within the City Centre, have been identified in the Newcastle Urban Renewal Strategy and are illustrated above.

Precincts

The location of different amenity and facilities within the city centre leads areas to form distinct precincts. The site sits within close proximity of a number of these precincts.
The areas immediately surrounding the site are made up of 2 and 3 storey buildings.

The locality has a mix of single detached dwellings, walk-up flats, terraces and residential flat buildings, that are both privately and publicly owned.
2.5 Topography

The site is situated on along the edge of a hill, with a steep drop in topography of 30m from the sites eastern boundary to Darby Street.

Within the site, retained walls hold up the dramatic drop of topography presented in edges of the northern, eastern, and southern boundary, following a slight level drop from the remainder of the land to Mosbri Crescent.
### 2.6 Landscape

#### Site

A number of substantial mature trees are located around the site boundary, including a number of Moreton Bay Figs at the southern edge of the site. The vegetation along Kitchener Parade blends into the Arcadia Park landscape, located to the east of the site.

*Note:* Moreton Bay Fig Tree to be examined

- [1] Moreton Bay Fig trees along south-west edge of site
- [2] Moreton Bay Fig trees along south-east edge of site
- [3] Moreton Bay Fig trees along north-east edge of site
- [4] Existing vegetation along northern edge of site
- [5] Existing Moreton Bay Fig Trees to be Retained
- [6] Existing Key Trees to be Retained

**Legend**

- [x] Site
- [●] Existing Moreton Bay Fig Trees to be Retained
- [●] Existing Key Trees
- [●] Existing Trees
- [●] Landscape Setback
2.7 Constraints and Opportunities

Constraints

1. Change in level and topography;
2. The built form within close proximity to the site predominately consists of small detached and residential flat buildings. Consideration needs to be given to the transition to surrounding properties to avoid any overlooking issues with neighbours;
3. Significant existing mature trees along the site edges;
4. Challenging pedestrian access to the north and the east due to level differences;
5. Conservation Area (“The Hill”) and listed school within close proximity to the site;

Opportunities

6. Two vehicular entry points to the site from Mosbri Crescent;
7. Strengthen the two street edges of Kitchener Parade and Mosbri Crescent with a strong built form frontage;
8. Provide an opportunity for shared surface at the site’s primary frontage to Mosbri Crescent to improve connections between the reserve and the entry points to the site;
9. Strengthen existing buffer of mature trees at the site’s edges to provide visual privacy between adjoining sites;
10. Maximise outlook and views;
11. Respond to the north-south orientation;
12. Opportunity for height where the view impact is minimised;
13. Landscape setback to provide privacy with neighbouring sites;
Design Concept

Design principles, design concept and three approaches that respond to the site's unique characteristics and opportunities.
3.1 Design Principles

**Frontages**
Strengthen and reinforce the streetscapes of Mosbri Crescent and Kitchener Parade through built frontages and well-defined landscape.

**Landscape**
Incorporate the existing landscape to act as a buffer between the site and neighbouring sites.

**Amenity**
Provide amenity through the inclusion of shared common open space and generous private outdoor spaces for dwellings.

**Sustainability**
Building orientation and footprints designed to maximise solar access and allow for natural ventilation.

**Transition**
Allow for a sensitive transition of height which responds to the surrounding built form.

**Diversity**
Provide a variety of housing typologies to provide interest to the site and also respond to topography.

**Connections**
Increase the opportunity for pedestrian connections to local amenity beyond the site boundary, including Arcadia Park, Mosbri Crescent Park and connections to bus stops.

**Private Open Space**
High quality private open space in the form of balconies for apartments and rear gardens, courtyard spaces and upper level balconies for terrace houses.
3.2 Design Concept

From the design principles above, the key ideas of the scheme are described in the adjacent concept sketch as follows:

1. Create a well-defined frontage to Mosbri Crescent integrating the small pocket park into the scheme

   Reinforce the unique streetscape of Mosbri Crescent through a frontage which responds to the crescent and park, with possible shared surface.

2. Incorporate new pedestrian connections through the site between Kitchener Parade and Mosbri Crescent

   Increase the opportunity for pedestrian connections through the site, between the Newcastle CBD via Kitchener Parade in the north, and Mosbri Crescent and the Darby Street Precinct to the south.

3. Create a frontage to Kitchener Parade

   Incorporate a residential address to this northern edge, reinforcing the existing landscape edge to the conservation area.

4. Incorporate well-defined shared open spaces

   Provide amenity through the inclusion of shared common open space with mews and courtyards. Mews spaces act as a shared surface and access to dwelling parking.

5. Reinforce existing mature landscape

   Incorporate the existing landscape to the edges of the site to act as a buffer between the site and neighbouring sites.
3.3 Options Summary

The concept designs have been prepared that vary the existing LEP controls, most notably height and floor space ratio.

Each option is explained in greater detail on the following pages.

### OPTION 1
Height up to 10 metres; FSR of 0.8:1

**Pros**
- Compliant with controls.
- Terrace house type with integrated garage and possible home office at ground level.
- Sensitive in height to surrounding area.
- Assumed majority of trees retained.

**Cons**
- Lower development yield.
- Single townhouse house type; lack of housing variety.

### OPTION 2
Height up to 20 metres; FSR of 1.19:1

**Pros**
- Greater yield.
- Greater mix of dwelling types.
- Assumed majority of trees retained.
- Basement and semi-basement parking to residential flat buildings.
- Mews style/integrated parking to terrace houses.
- Simple building form to the northern part of the site to respond to levels and maximise opportunities for northern solar access.

**Cons**
- Not compliant with controls.

### OPTION 3 (Preferred)
Height up to 26.4 metres; FSR of 1.39:1

**Pros**
- Greater yield.
- Tower element incorporated - 7 storeys, with north south orientation and minimal impact to surrounding amenity.
- Greater mix of dwelling types.
- Assumed majority of trees retained.
- Basement and semi-basement parking to residential flat buildings.
- Mews style/integrated parking to terrace houses in the south of the site.

**Cons**
- Non-compliant with controls.
- Possible overshadowing by the buildings to the north.
3.4 Option 1 - Masterplan

The design concept features five rows of terrace (attached) housing that complies with the existing height and FSR controls, though it assumes a change in land use to Residential R3/R4.

The residential built form addresses the two adjoining street frontages, at Mosbri Crescent and Kitchener Parade. The internal spaces and connections are also fronted by residential development to ensure a high-level of surveillance and activity is maintained throughout, particularly where new through-site links are proposed.

All major existing trees are maintained as part of new private open spaces that relate to the adjacent properties, particularly along the site’s southern and eastern boundaries.

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<th>Storeys</th>
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<th>GFA (m²)</th>
<th>NSA (m²)</th>
<th>Dwellings</th>
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Site Area 12,235
FSR 0.8:1
Cars 57

Notes:
1. Residential Flat Building: GBA to GFA = 75%; GFA to NSA = 85%
2. Terrace: GBA to GFA = 90%; GFA to NSA = 100%
3. Average unit size = NSA 80m²/unit
4. Car Parking: Residential = Average of 1.19 spot/dwelling, Visitor spot: 1 per 4 dwelling. Parking rates based on Newcastle DCP 2012 of min. 1 space per dwelling, with 1 visitor space for every 5 dwellings.
5. All areas are approximate and subject to further design development.
3.5 Option 2 - Masterplan

The concept design for Option 2 introduces two apartment buildings along the site’s eastern and north boundaries, as this is where the visual and overshadowing impact from the higher density development can be managed and mitigated.

Three rows of terrace housing address the Mosbri Crescent frontage and the two through-site links that connect east-west to Arcadia Park.

### Building Type Summary

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<th>Building Type</th>
<th>Stories</th>
<th>GBA (m²)</th>
<th>GFA (m²)</th>
<th>NSA (m²)</th>
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<td>5,370</td>
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<tr>
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<td>1,494</td>
<td>1,494</td>
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<td></td>
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<td><strong>13,426</strong></td>
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<td><strong>109</strong></td>
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### Nota

1. Residential Flat Building: GBA to GFA = 75%; GFA to NSA = 85%
2. Terrace: GBA to GFA = 90%; GFA to NSA = 100%
3. Average unit size = NSA 80m²/unit
4. Car Parking: Residential = Average of 1.19 spot/dwelling. Visitor spot 1 per 4 dwelling. Parking rates based on Newcastle DCP 2012 of min. 1 space per dwelling, with 1 visitor space for every 5 dwellings
5. All areas are approximate and subject to further design development.
### 3.6 Option 3 (Preferred) - Masterplan

The preferred design concept features three apartment blocks, orientated on a north-south axis to maximise their access to sunlight, whilst also minimising the overshadowing impact on the existing and proposed residential properties. The concept also addresses the neighbouring properties to the west, along Kitchener Parade and Mosbri Crescent, where the amalgamation of these properties into three sites can yield residential development at a comparable scale.

#### 3.6.1 Mosbri Crescent

<table>
<thead>
<tr>
<th>Building Type</th>
<th>Storesy</th>
<th>GBA total (m²)</th>
<th>GFA (m²)</th>
<th>NSA (m²)</th>
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<tr>
<td>B RFB¹</td>
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<td>4,424²</td>
<td>3,761</td>
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<td>C RFB¹</td>
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<td><strong>Total</strong></td>
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#### Notes
- Residential Flat Building: GBA to GFA = 75%; GFA to NSA = 85%
- Terrace: GBA to GFA = 90%; GFA to NSA = 100%
- Average unit size = NSA 80m²/unit
- Building C: GBA to GFA = 70% due to larger building envelope
- Building B&D allocated 10% additional GFA of top floor plate for communal roof access
- Car Parking: Residential - Average of 1.19 spots/dwelling. Visitor spot 1 per 4 dwelling (Parking rates based on Newcastle DCP 2012 of min. 1 space per dwelling, with 1 visitor space for every 5 dwellings)
- All areas are approximate and subject to further design development.

#### 3.6.2 Mosbri Crescent & 33-41 Kitchener Parade

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<th>GFA (m²)</th>
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<td>1,460</td>
<td>1,922</td>
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Legend
- Passive surveillance
- Street connections
- Through site links
- Shared zone
- Private open space
- Terrace Typology
- Residential Flat Building Typology
- Tower Typology
The landscape concept for the site includes a range of open space character areas that respond to varying needs and existing conditions. These include:

- **Deep Soil (Landscape Setback)** - located around the site’s northern, eastern and southern boundaries, this zone of open space is clear of any basement structures and can accommodate existing and new mature trees.

- **Private Amenity Space** - provided at the ground floor of each building and accessed directly by the adjacent dwelling. In the case of the terraces, it includes the front and rear gardens.

- **Communal Space (Public & Private)** - configured at ground (public) and roof (private) level, these spaces are used for passive recreation and feature specific landscape features, including seating, communal gardens, outdoor play or BBQ areas.

- **Green Roofs** - soft landscaping treatments to the roof planes of key buildings reduces the visual impact of the development from key vantage points (Obelisk), whilst also serving an important sustainability benefit (i.e. rainwater capture and cleansing).

---

**Design Concept**

**Legend**

- Site
- Building Envelope
- Trees to be Retained
- Proposed Trees
- Communal Open Space
- Private Open Space
- Landscape Verge
- Green Roof
- Deep Soil

**Notes**

*Top roof RL does not assume inclusion of lift overrun*
3.8 Concept Masterplan - Basement Plan
3.7 Concept Masterplan - Ground Floor Plan

Legend:
- Site
- 1-9 Mosbri Crescent & 33-41 Kitchener Parade Site
- Pedestrian Entry
- Vehicular Entry
- Trees
- Existing Moreton Bay Fig Trees
- Balcony
- Corridor
- Basement
- Pavement
- Core
- Communal Open Space
- Private Open Space
- Level Cut
Design Concept

3.7 Concept Masterplan - First Floor Plan
3.7 Concept Masterplan - Typical Floor Plan

Design Concept
3.9 Concept Masterplan - Section 1
3.8 Concept Masterplan - Section 2
3.8 Concept Masterplan - Section 3
3.11 Concept Masterplan - Detailed Section 6 & 7

**Key Plan**

- **Arcadia Park**
- **Building B**
- **Building D**

- **Rooftop habitable area** is a maximum of 20% of the roof plane.

**Legend**

- **Site**
- **Proposed/Massing**
- **Articulation Zone**
3.12 Concept Masterplan - Detailed Section 8

Detailed section 8, Building A Eastern Interface to Mosbri Crescent Reserve
3.13 Concept Masterplan - Massing Studies

Site

Mosbri Crescent

Kitchener Parade

Arcadia Park

Legend

Site

SJB Architects
Design Concept

3.15 Illustrative Masterplan

Legend:

A
B
C
D
E

Site 1-9 Mosbri Crescent & 33-41 Kitchener Parade Site
Design Concept

3.16 Concept Masterplan - Artist’s Impression
Detailed analysis of the impact of the generated by

Concept Analysis
4.1 Shadow Analysis - June 21

4.1.1 Shadow Analysis - 9AM
At 9am in mid-winter additional shadow impact will occur in the front garden of 10 and 12 Mosbri Crescent to the south-west of the site, and 9 Mosbri Crescent to immediately to the west. Some over-shadowing to the front garden of 19 Mosbri Crescent will also occur; however, this analysis doesn't take into account the existing shadow impact from the Moreton Bay Figs at this location.

4.1.2 Shadow Analysis - 12PM
By midday in mid-winter the shadows will contract and fall immediately to the south of the built form. The north-south alignment of the buildings ensures that during the middle of the day, the shadow impact can be minimised and solar access to the streets and amenity spaces is maximised.

4.1.3 Shadow Analysis - 3PM
By the afternoon (3pm) in mid-winter the shadows extend across the internal open spaces and into Arcadia Park. Due to the steep rising topography to the east, the length of the shadow impacts is reduced.
4.2 View from Sun Study

The view from the sun study illustrates which area of the site and the surrounding context received direct sunlight at a particularly hour of the day in mid-winter (21 June).
4.3 Solar Access

The solar access analysis illustrates the number of hours each building elevation receives direct sunlight during mid-winter (21 June). The warmer the colours the greater amount of sunlight received (Refer to legend).
4.4 View Montage - Kitchener Parade

The view along Kitchener Parade features the Newcastle East Public School and the existing vegetation along the northern boundary of the site, which includes a number of large mature native and introduced species. The steeply falling topography places the school at a higher elevation, with the heritage sandstone retaining wall stepping up from the footpath and road levels. A contemporary school building sits in the foreground of the view, at the corner of Kitchener Parade and Brown Street.

The proposed massing is illustrated in block massing model to indicate where the built form would sit in relation to the surrounding streetscape, vegetation and built form. This form of visual analysis doesn’t take into consideration architectural treatments to the building, materiality or screening from existing features.

A rendered view has also been prepared, which takes into consideration screening from the existing vegetation and impact of proposed architectural treatment to the built form in this particular view.
4.4 View Montage - The Obelisk

The views from the Obelisk are both spectacular and significant. The 360-degree view of Newcastle includes a glimpse of the existing NBN studios through the tree line of Arcadia Park. This northern aspect focuses on the long views to the city skyline and working harbour.

Existing View

The block massing model indicates that the majority of the proposed massing will be screened by the vegetation at Arcadia Park. Part of central building (D, 5 and 6 storeys) is visible above the tree line.

A rendered view has also been prepared, which takes into consideration screening from the existing vegetation and impact of proposed architectural treatment to the built form in this particular view. The inclusion of communal and landscape roof spaces to Buildings B and D, in response to the advice from Council’s expert design review panel, seeks to reduce the visual prominence of the building, allowing it to blend into the tree line.

Block Massing View

Rendered View

Key Diagram

Legend

Block Massing Outline

--- 1-9 Mosbri Crescent & 33-41 Kitchener Parade Site
The view east along Kitchener Parade up the rising topography towards Brown Street features the raised footpath and high sandstone retaining wall to the school. The contemporary school building at the corner sits within the tree line of the mature trees that line both sides of the street.

The driveway to No. 41 Kitchener Parade and pine tree sit in the foreground of this view, with the existing NBN studio building visible between these two features.

The block-massing model indicates that the majority of Building B (7-storeys) will be screened by the existing vegetation along the Kitchener Parade frontage and Building A, which features three storeys addressing the street and a fourth level setback.

A rendered view has also been prepared for this view, which takes into consideration screening from the existing vegetation and impact of proposed architectural treatment to the built form in this particular view. The inclusion of windows, openings, materials and landscaping to Building A reduces its visual prominence when compared to block massing view analysis.
4.4 Wolfe Street (South)

The view north along Wolfe Street along the eastern edge of Arcadia Park features on-street parking, white painted timber fence and a continuous edge of dense planting that includes two mature pine trees in the foreground.

The block massing model indicates that the majority of site will be screened by the existing vegetation within Arcadia Park. A glimpse of Building B and D’s rooftop communal spaces will be visible from this vantage point. Architectural treatment and landscaping will reduce the visual prominence of any built form this view, particularly given the distance and density of vegetation in the foreground.
4.4 View Montage - Wolfe Street (North)

The view from Wolfe Street looking west through Arcadia Park towards the site features a continuous edge of dense planting and mature pine trees in the foreground.

The block massing model indicates that the site will be screened by the existing vegetation within Arcadia Park.
4.4 View Montage - Hillview Crescent

Existing View
The view from Hillview Crescent to the south of the site is taken from a raised elevation and features one of the moreton bay figs, dense vegetation, and partial views to the existing studio building and station car parking.

Block Massing View
The block massing model indicates that the roof line of the terraces at the southern boundary of the site will sit within the foreground and upper levels of Building A, B, C, and D will be visible.
4.4 View Montage - Mosbri Crescent (north)

Existing View

The view east along Mosbri Crescent is typical of the suburban streets of Newcastle, featuring a range of housing typologies from a number of eras, including single detached (1970-80s) houses and walk-up flats (1960s).

Block Massing View

The block massing model indicates that the majority of site will be screened by the existing vegetation and built form, with long views to Building C the key focal point.
4.4 View Montage - Mosbri Crescent (south)

Existing View
The view east along Mosbri Crescent is typical of the suburban streets of Newcastle, featuring a range of housing typologies from a number of eras, including single detached (1970-80s) houses and walk-up flats (1960s).

Block Massing View
The block massing model indicates that the majority of site will be screened by the existing vegetation and built form, with long views to Building C the key focal point.
The Urban Design Study for the NBN studios at 11 Mosbri Crescent, Newcastle, outlines the site’s capacity to accommodate residential development to a scale that sensitively responds to the surrounding urban context, retains and enhances the site’s unique characteristics, and enables the public access to the site for the first time in decades.

The preferred masterplan for the site has been prepared over the past 12 months in consultation with the client and consultant team, and more recently in response to preliminary feedback from Newcastle City Council.

The key figures for the preferred masterplan include:

- **Maximum Height:** RL 56.8 (7 storeys including roof garden)
- **FSR:** 1.39:1
- **Potential Yield:** 171 dwellings
- **Parking:** 237 spaces (203 resident & 34 visitor)

This report should be read in conjunction with the planning report by JBA and the transport report by Aecom.
Appendix 1

Precedent Studies

Spaces and Streets Residential Flat Building

Terrace

Cargo Lane Terraces, NSW, Australia Accordia, Cambridge, UK

Eton Residence, NSW, Australia Accordia, Cambridge, UK

Accordia, Cambridge, UK Accordia, Cambridge, UK Accordia, Cambridge, UK

Accordia, Cambridge, UK

SJB Architects
Attachment B - Geotechnical Assessment

Mosbri Crescent, The Hill

By Douglas Partners, December 2015
Report on
Desktop Geotechnical Assessment

Proposed Apartments
NBN Studio, Mosbri Crescent, The Hill

Prepared for
Nine Network Australia Pty Ltd

Project 81843.00
November 2015
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<td>Richard Merifield</td>
<td>Scott McFarlane</td>
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Appendix A: Proposed Development
Appendix B: About this Report
Appendix C: AGS Slope Stability Documents
1. **Introduction**

This report presents the results of a desktop geotechnical investigation for the proposed apartment development to be located at NBN Studios, Mosbri Crescent, The Hill. The work was carried out for Mr Warwick McInnes on behalf of The Nine Network Australia Pty Ltd.

We understand that the proposed development includes the construction of two six-storey and one 12-storey residential apartment buildings. Two levels of basement car parking is currently proposed for each building. Douglas Partners Pty Ltd (DP) were provided a copy of the architectural plans for the proposed development and these are attached in Appendix A.

The purpose of the geotechnical investigation was to address the following:

- Geotechnical suitability of the site;
- Potential slope stability issues;
- Mine Subsidence requirements.

DP have previously undertaken geotechnical investigations at the site for several proposed antenna, Project 31423 and 31423A, dated October 2001 and September 2005 respectively. The previous investigations included three cored boreholes to a depth of up to 10 m as well as comments on slope stability for part of the site. The results of the field work from the previous investigations have been utilised in this report.

2. **Site Description and Regional Geology**

The site is located at Mosbri Crescent, The Hill and currently contains the NBN studio buildings (refer Figure 1). The existing main NBN studio building covers much of the central part of the site.
The site has been extensively modified by cutting and filling, typified by a number of existing rock and crib walls extending around much of the existing NBN studio building.

The site is bounded on the east by what appears to be a heavily vegetated reserve and easement that adjoins Wolfe Street.

Reference to the Newcastle Coalfield Surface Geology Map published by BHP indicates that the site is within the area of outcrop of the Shepherds Hill Formation of the Lambton Sub Group of the Newcastle Coal Measures. This formation is of Permian Age and is predominantly siltstone and sandstone with some conglomerate. The Nobbys Tuff occurs at the base of the Shepherds Hill formation and is typically about 1 m thick (Ref 1). In Newcastle the Shepherds Hill formation is typically about 27 m thick (Ref 1). The Shepherds Hill Formation is underlain by the Nobbys Coal Seam and overlain by the Victoria Tunnel Seam.
3. Desktop Assessment and Field Work

3.1 Methods

3.1.1 Desktop Assessment

A review of the existing data in relation to the site was undertaken and included:

- Review of in-house geotechnical data for the area;
- Review of published geological and geotechnical maps, including soil landscape maps and mine record tracings;
- Liaison with the mine subsidence board with regards to any restrictions to the development.

3.1.2 Field Work

A site inspection was carried out by a Principal Geotechnical Engineer on 5 November 2015. The purpose of the inspection was to assess the slope stability and photograph relevant aspects of the site. No assessment was made in relation to the design or structural integrity of the adjacent crib block and rock retaining walls.

3.2 Results

3.2.1 Desktop Assessment

Existing geotechnical investigations at the site (Project 31423 and 31423A, dated October 2001 and September 2005 respectively) included three cored boreholes to a depth of up to 10 m. The following is a general summary of the subsurface conditions previously encountered on site (Project 31423A). A more extensive description is provided in the original reports.

Based on the observations made during the site walkover assessment and the results of previous investigations by DP, the residual soil profile on site generally comprises clay overlying weathered rock.

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<th>To (m)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>0.4 / 0.7</td>
<td>Filling / Soil – Typically sandy gravel and silty clay / clayey silt</td>
</tr>
<tr>
<td>0.4 / 0.7</td>
<td>2.5 / 3.4</td>
<td>Siltstone – Extremely low to very low strength, medium strength in parts</td>
</tr>
<tr>
<td>2.5 / 3.4</td>
<td>6.1 / 6.8</td>
<td>Siltstone – Low to medium strength, very low strength in parts</td>
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<tr>
<td>6.1 / 6.8+</td>
<td></td>
<td>Sandstone – Medium strength or better</td>
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</table>
No free groundwater was observed during the previous drilling or the recent site visit. It should be noted that groundwater levels are affected by recent weather conditions and soil / rock permeability and may vary with time.

3.2.2 Field Observations

Topography
Elevation contours for the site are shown in Figure 2. Two existing gully lines were observed during the site visit extending from the eastern site boundary adjacent to Wolfe Street through the adjacent vegetated reserve towards the site.

![Figure 2: Elevation contours (2 m) at Mosbri Street Site Location](image)

The existing NBN building has been extensively cut into the landscape and is surrounded on the northern, eastern and southern edges by crib retaining walls (refer Figure 3).
Figure 3: Existing Crib Retaining Wall along Eastern edge of existing NBN building (looking north, looking south)

Figure 4: Existing Crib Retaining Wall along Southern Site Boundary (looking west)
In addition to the retaining walls surrounding the main NBN building, the northern, eastern and southern car park / pavement areas are also supported by a mixture of crib and rock retaining walls (refer Figure 4, Figure 5 and Figure 6).
From the eastern boundary of the site the terrain slopes down to the west with a slope of about 14° to 17° which terminates at the crest of a cutting which ranges in height from about 1.25 m to 1.75 m. The bottom 1.25 m of the cutting is battered at a 75° angle and faced with mortared rock blocks. No weep holes were observed in the rock facing (Figure 5). The upper section of the cutting, where present, has been battered to a slope ranging from 35° to 50°. The material exposed on the face of the cut batter is predominantly clay soil with some intermittent exposures of extremely weathered siltstone.

From the toe of the rock facing, the terrain slopes at about 5° to the west for a distance of about 12 m. This area is presently a bitumen paved car park.

![Image of exposed siltstone](image.png)

**Figure 7: Exposed Siltstone along parts of eastern boundary (adjacent to air conditioning containers)**

The bitumen car park terminates at a concrete kerb which is about 1 m from the crest of a crib wall. The area between the kerb and the crib wall is also bitumen paved.

The crib wall is about 4.15 m in height with a batter slope of about 75° to 80° (Figure 3). The upper 0.75 m of the crib wall is of different appearance and slightly different batter from the remainder of the wall which may indicate two stages of wall construction.

At the toe of the crib wall a paved area continues to the adjacent studio building.

**Vegetation**

The northern and southern boundaries are grass covered with she-oaks and other shrubs with a basal diameter of up to 200 mm, several very large diameter trees exist along the very far length of the southern boundary.
4. Comments

4.1 Mine Subsidence

The site lies within the Newcastle Mine Subsidence District and the approval of the NSW Mine Subsidence Board (MSB) is required for development of the site (refer Figure 9).

Correspondence between DP and the MSB (email dated 4 November 2015, Mr Ian Bullen, Newcastle District Manager) indicates the allotment is undermined by first workings in the Borehole Seam at 95 m in depth. The guideline for the area is a G09 which is three storey construction, so any development above that height would need to be assessed on its merit. The site would require geotechnical assessment to determine the long term stability of the workings. The colliery was the Australian Agricultural Co, there is no details on the Record Trace and / or lease details.
Restrictions will be necessary in relation to the type of development permitted in specific areas. There will also be special requirements in relation to the type of construction, particularly the foundations. The policy of MSB is that it will not issue general guidelines but will only respond to specific development proposals.

DP can undertake a mine subsidence assessment and prepare a specific MSB application on behalf of Nine Network Australia Pty Ltd at the appropriate stage of the development process.

Figure 9: Mine Subsidence Districts and location of existing site (Adapted from MSB Plan No. MSD12b)
4.2 Footings

The following general advice is provided in relation to footings and foundations. It should be pointed out that further subsurface investigations will be required once the final structural building loads are known, in order to determine the design allowable loads for all foundation types.

Shallow Footings
Due to the relatively shallow depth to rock across the site, it is anticipated that founding on strip or pad footings will be appropriate for most smaller structures and possibly larger buildings. Slab on grade construction is also suitable with the appropriate site preparation. For preliminary design it is considered that pad or strip footings founded within the extremely low strength or better bedrock would be suitable for support of small structural loads provided that they are at least 0.5 m deep. For preliminary design footings in extremely low to very low strength rock should be proportioned for a maximum allowable bearing pressure of 700 kPa. Higher allowable bearing pressures may be possible subject to detailed investigation and assessment of total settlements. Concentrated loads, not able to be adequately supported on shallow footings, may be supported on deeper pad footings and/or bored cast in situ concrete piers.

Deep Footings
Based on the previous geotechnical investigations at this site (Project 31423 and 31423A, dated October 2001 and September 2005 respectively), it is suggested that bored cast in situ piles socketed into the underlying bedrock would be a suitable pile option at this site. The following table presents preliminary allowable shaft adhesion and end bearing capacity of the bedrock.

Table 1: Preliminary Allowable Design Values for Foundations – Compression

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<tbody>
<tr>
<td>Extremely low strength</td>
<td>700</td>
<td>70</td>
</tr>
<tr>
<td>Very low strength</td>
<td>1000</td>
<td>100</td>
</tr>
<tr>
<td>Low Strength</td>
<td>1500</td>
<td>150</td>
</tr>
<tr>
<td>Medium strength or better</td>
<td>3500</td>
<td>350</td>
</tr>
</tbody>
</table>

As the depth to rock and depth of weathering is expected to vary across the site, the actual conditions and allowable pressures should be confirmed by further geotechnical investigations.

The allowable shaft adhesion for tensile loading on piles should be reduced by 50%. The shaft adhesion should only be calculated for that part of the socket length which is greater than 1 m below ground surface.

Bored pile excavation should be cleared of all loose material and if water is present in the bore this should be removed or the concrete should be added to the base of the bore using a tremie pipe to displace water above the concrete.

Subsidence Considerations
The selection of foundation types for structures should be based on adequate consideration of the effects of mine subsidence, including grounds tilts and strains, if applicable.
4.3  Slope Stability Assessment

The following sections present a qualitative risk assessment of the proposed site based on guidelines proposed by the Australian Geomechanics Society (AGS) Landslide Risk Management (Ref 2).

An explanation of risk categories and implications to development is attached in Appendix C. The risk of slope instability affecting the site has been assessed on the basis of the geotechnical units with results presented in Section 3.2.1.

It should be noted that there were no overt signs of deep seated instability at the site and its immediate surrounds at the time of the assessment and site inspection. The absence of visually obvious structural distress in the many retaining walls on site is consistent with this observation.

4.3.1 General Observations

The following general observations can be made based on the site walkover undertaken on 5 November 2015:

- Based on the site walkover, no evidence of deep seated or overall slope instability was observed;
- Some evidence of very minor creep or translational sliding was observed in the gullies of the adjoining property to the east (Figure 2);
- In the absence of detailed design and works-as-executed drawings, it is not possible to comment on the suitability of an existing retaining wall. Nonetheless, the existing crib walls immediately surrounding the NBN building (Figure 3 and Figure 6) do not appear to show evidence of significant distress. The crib walls along the southern, eastern and northern site boundaries (Figure 4 and Figure 6) do show signs of localised distress and spalling that has exposed the internal reinforcement. This reinforcement has corroded significantly where spalling has occurred;
- No groundwater seepage was observed on the site during the inspection. During a previous investigation in 2001, the standing water level in a standpipe piezometer about 2.5 m behind the crest of the eastern site boundary rock / crib wall (Figure 5) was 6.6 m below the level of the car park paving (i.e. below the toe of the crib wall).

4.3.2 Identified Hazards and Inferred Consequences

Using the nomenclature presented in Ref 2, the following potential hazards were identified for the site:

1. Hazard 1 relates to creep of colluvial or residual soils affecting structures. This has been assessed to be ‘unlikely’ given previous subsurface investigations indicate shallow depths to rock over the site;
2. Hazard 2 relates to a slow deep seated failure beneath the constructed building. This has been be considered a ‘rare’ event given no known recent or past occurrence of deep seated failure has been observed at the NBN site;
3. Hazard 3 relates to the stability failure of newly proposed fill embankments and batters affecting adjacent properties. Minor fill embankments could be anticipated to accommodate the proposed development and slide debris impacting on downslope areas is identified as a hazard should these fill slopes collapse. This has been assessed to be ‘rare’ provided engineered batter and/or retaining systems are provided to support all filling when required;

4. Hazard 4 relates to the stability failure of cut embankments and batters (existing retained areas or newly proposed) affecting adjacent properties to the north and south. Cuttings are anticipated to accommodate the proposed development and the failure of these will impact the adjacent residential properties and infrastructure. This has been assessed to be ‘unlikely’ provided engineered batter and/or retaining systems are provided to support all cuttings when required;

5. Hazard 5 relates to the stability failure of slopes modified by earthworks and the propagation upslope towards the eastern vacant property. This has been assessed to be ‘rare’ provided engineered batter and/or retaining systems are provided to support all cuttings when required. This consequence of failure was based on the assumption that no development is proposed on the adjoining eastern property which is currently a Council reserve; and

6. Hazard 6 relates to the stability failure of slopes modified by earthworks and the downslope impacts to properties to the west. This has been considered a ‘rare’ event assuming a thorough engineering assessment of new building foundations and their effects is undertaken.

### 4.3.3 Property Risk

The site has been assessed with reference to the Australian Geomechanics Society Landslide Taskforce “Practice Note Guidelines for Landslide Risk Management” March 2007 (Ref 2). There are no site specific data that would allow a quantitative assessment of risk. Based on site geomorphology, geology and general history of landslips in the Newcastle/Lake Macquarie area, a qualitative assessment of the risk for property can be made as outlined in Appendix C of Ref 2. A copy of that appendix is included in Appendix C.

Table 2 summarises the results of this assessment, together with a qualitative assessment of the likelihood of occurrence of a landslide after construction, its consequence and risk to the building that has been designed and constructed taking the advice contained in this report into account.
### Table 2: Risk Assessment for Property – Proposed Development

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Likelihood</th>
<th>Consequence</th>
<th>Risk to Proposed Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Slow creep of soils within footprint of the development</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Low</td>
</tr>
<tr>
<td>2 Deep seated failure of site affecting current lot and adjacent properties</td>
<td>Rare</td>
<td>Major</td>
<td>Low</td>
</tr>
<tr>
<td>3 Stability failure of fill embankment and batters affecting adjacent properties</td>
<td>Rare</td>
<td>Major</td>
<td>Low</td>
</tr>
<tr>
<td>(provided engineered batter and/or retaining system provided to support all filling)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Stability failure of cut embankment and batters affecting adjacent properties to the north and south.</td>
<td>Rare</td>
<td>Major</td>
<td>Low</td>
</tr>
<tr>
<td>(provided engineered batter and/or retaining system provided to support all cuttings)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Stability failure of slopes modified by earthworks – propagation upslope towards eastern property.</td>
<td>Unlikely</td>
<td>Minor</td>
<td>Low</td>
</tr>
<tr>
<td>(provided engineered batter and/or retaining system provided to support cuttings along eastern boundary)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Stability failure of slopes modified by earthworks – downslope impacts to properties to the west.</td>
<td>Rare</td>
<td>Major</td>
<td>Low</td>
</tr>
<tr>
<td>(provided engineering assessment of new building foundations and their effects is undertaken)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes to Table 2:**

(1) This was based on no development proposed on the adjoining eastern property which is currently assumes to be a Council reserve.

As a guide, in our experience, low and risks to properties from slope failure are commonly accepted by owners, developers and development regulating authorities. Reference to the AGS guidelines indicates that for residential sites, for which an importance Level 2 would apply in accordance with Ref 2, a low risk level is usually acceptable to society and regulators.
4.3.4 Risk to Life

The AGS Practice Note Guidelines (Ref 2) also provides a framework for landslide risk management, guidance on risk analysis methods and information on acceptable or tolerable risks for loss of life.

Risk analysis can be broken up into four components, namely:

- Hazard identification;
- Frequency analysis;
- Consequence analysis; and
- Risk estimation.

For the loss of life, the individual risk can be calculated using:

\[ R_{LOL} = P_H \times P_{S:H} \times P_{T:S} \times V_{D:T} \]

Where:

- \( R_{LOL} \) is the risk, or annual probability of death of an individual;
- \( P_H \) is the annual probability of the hazardous event;
- \( P_{S:H} \) is the probability of spatial impact by the hazard given the event;
- \( P_{T:S} \) is the temporal probability given the spatial impact; and
- \( V_{D:T} \) is the vulnerability of the individual.

Table 3 details the results of the assessment undertaken in relation to risk to life of the hazards identified at this site.
Table 3: Risk Assessment for Life – Proposed Development

<table>
<thead>
<tr>
<th>Hazard</th>
<th>( P(H) )</th>
<th>( P(S:H) )</th>
<th>( P(T:S) )</th>
<th>( V(D:T) )</th>
<th>Risk R(_{LOL} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Slow creep of soils within footprint of the development</td>
<td>( 1 \times 10^{-4} )</td>
<td>1</td>
<td>0.75</td>
<td>( 1 \times 10^{-3} ) (evacuation possible)</td>
<td>( 7.5 \times 10^{-8} )</td>
</tr>
<tr>
<td>2 Deep seated failure of site affecting current lot and adjacent properties</td>
<td>( 1 \times 10^{-5} )</td>
<td>1</td>
<td>0.75</td>
<td>( 1 \times 10^{-3} ) (evacuation possible)</td>
<td>( 7.5 \times 10^{-9} )</td>
</tr>
<tr>
<td>3 Stability failure of fill embankment and batters affecting adjacent properties</td>
<td>( 1 \times 10^{-5} ) (provided engineered batter and/or retaining system provided to support all filling)</td>
<td>0.25</td>
<td>0.75 (people in building three quarters of the time)</td>
<td>( 1 \times 10^{-3} ) (evacuation possible)</td>
<td>( 1.8 \times 10^{-9} )</td>
</tr>
<tr>
<td>4 Stability failure of cut embankment and batters affecting adjacent properties to the north and south.</td>
<td>( 1 \times 10^{-5} ) (provided engineered batter and/or retaining system provided to support all cuttings)</td>
<td>0.5</td>
<td>0.75 (people in building three quarters of the time)</td>
<td>( 1 \times 10^{-3} ) (evacuation possible)</td>
<td>( 3.7 \times 10^{-9} )</td>
</tr>
<tr>
<td>5 Stability failure of slopes modified by earthworks – propagation upslope towards eastern property.</td>
<td>( 1 \times 10^{-4} ) (provided engineered batter and/or retaining system provided to support cuttings along eastern boundary)</td>
<td>0.5</td>
<td>0.05 (people adjacent to fill areas 5% of the time)</td>
<td>0.5</td>
<td>( 1.25 \times 10^{-7} )</td>
</tr>
</tbody>
</table>
Table 3: Risk Assessment for Life – Proposed Development (cont)

<table>
<thead>
<tr>
<th>Hazard</th>
<th>( P(H) )</th>
<th>( P(S:H) )</th>
<th>( P(T:S) )</th>
<th>( V(D:T) )</th>
<th>Risk ( R_{(LOL)} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>( 1 \times 10^{-5} ) (provided engineering assessment of new building foundations and their effects is undertaken)</td>
<td>0.3</td>
<td>0.75</td>
<td>( 1 \times 10^{-3} ) (evacuation possible)</td>
<td>( 2.3 \times 10^{-9} )</td>
</tr>
</tbody>
</table>

Notes to Table 3:
(1) Based on limited access to rear of site as indicated on site plan of proposed development TP-01 attached.

There are no established individual or societal risk acceptance criteria for the loss of life due to a hazardous event such as a landslide or rock fall. Australian Geoguide LR7 of Ref 2 (Included in Appendix C) discusses “acceptable” and “tolerable” levels of risk which have been proposed by several authorities including the ANCOLD Guidelines for Risks from Large Dams, the Australian Geomechanics Society and the Department of Urban Affairs and Planning. The AGS Guidelines (Ref 2) indicates that for most developments in existing urban areas, “tolerable” risk levels can be considered as the “acceptable” risk, with Table 1 of the Practice Note (Ref 2) indicating that a risk of loss of life of \( 10^{-5} \) would be tolerable for new constructed slopes and a risk of life of \( 10^{-4} \), would be tolerable for existing slopes and developments.

Based on this information, given that the risk to life is generally less than \( 10^{-6} \) for the hazards identified above, the risk to life associated with the proposed development is likely to be acceptable to society and regulators.

5. Conclusion

In summary, the proposed development is considered suitable from a geotechnical perspective provided the following is undertaken at the appropriate stage of the development process:

- Detailed geotechnical site investigations to determine the subsurface conditions at the location of the proposed structures. This information is required for detailed design of foundations, excavations and retaining structures;
- Undertake mine subsidence risk assessment to establish mine subsidence design parameters and guide foundation selection;
- Submission of Mine Subsidence Board (MSB) building application for approval;
- Undertake a condition assessment of existing retaining structures that will not be demolished and are to remain as part of the new development.
6. References


7. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report (or services) for this project at NBN Studio, Mosbri Crescent, The Hill in accordance with DP’s proposal dated and acceptance received from Scott Soutar (Station Manager) dated 23rd October 2015. The work was carried out under DP’s Conditions of Engagement. This report is provided for the exclusive use of Nine Network Australia Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP’s field testing has been completed.

DP’s advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.
Proposed Development
Concept Options

3.7 Option 03 (Preferred) - Basement Plan
3.7 Option 03 (Preferred) - Ground Floor Plan
3.7 Option 03 (Preferred) - First Floor Plan
3.7 Option 03 (Preferred) - Typical Floor Plan
Design Concept

3.8 Option 3 (Preferred) - Section 1

Key Plan

Site

RL: 51.5m

RL: 67.5m

RL: 29.6m
3.8 Option 3 (Preferred) - Section 2

Key Plan

Site

Kitchener Parade

RL: 51.5m
RL: 67.5m
RL: 49.2m
RL: 29.9m
3.8 Option 3 (Preferred) - Section 3
Appendix B

About This Report
**Introduction**
These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

**Borehole and Test Pit Logs**
The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

**Groundwater**
Where groundwater levels are measured in boreholes there are several potential problems, namely:
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

**Reports**
The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:
- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.
Site Anomalies
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.
Appendix C

AGS Slope Stability Documents
# Qualitative Terminology for Use in Assessing Risk to Property

## Qualitative Measures of Likelihood

<table>
<thead>
<tr>
<th>Approximate Annual Probability</th>
<th>Implied Indicative Landslide Recurrence Interval</th>
<th>Description</th>
<th>Descriptor</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-7}$</td>
<td>5x$10^{-2}$</td>
<td>10 years</td>
<td>20 years</td>
<td>The event is expected to occur over the design life.</td>
</tr>
<tr>
<td>$10^{-2}$</td>
<td>5x$10^{-3}$</td>
<td>100 years</td>
<td>200 years</td>
<td>The event will probably occur under adverse conditions over the design life.</td>
</tr>
<tr>
<td>$10^{-3}$</td>
<td>5x$10^{-4}$</td>
<td>1000 years</td>
<td>2000 years</td>
<td>The event could occur under adverse conditions over the design life.</td>
</tr>
<tr>
<td>$10^{-4}$</td>
<td>5x$10^{-5}$</td>
<td>10,000 years</td>
<td>20,000 years</td>
<td>The event might occur under very adverse circumstances over the design life.</td>
</tr>
<tr>
<td>$10^{-5}$</td>
<td>5x$10^{-6}$</td>
<td>100,000 years</td>
<td>200,000 years</td>
<td>The event is conceivable but only under exceptional circumstances over the design life.</td>
</tr>
<tr>
<td>$10^{-6}$</td>
<td>1000,000 years</td>
<td></td>
<td></td>
<td>The event is inconceivable or fanciful over the design life.</td>
</tr>
</tbody>
</table>

**Note:** (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not vice versa.

## Qualitative Measures of Consequences to Property

<table>
<thead>
<tr>
<th>Approximate Cost of Damage</th>
<th>Description</th>
<th>Descriptor</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>200% Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.</td>
<td>CATASTROPHIC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>60% Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.</td>
<td>MAJOR</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>20% Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.</td>
<td>MEDIUM</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5% Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.</td>
<td>MINOR</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>0.5% Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)</td>
<td>INSIGNIFICANT</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa.
### Qualitative Risk Analysis Matrix – Level of Risk to Property

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Indicative Value of Approximate Annual Probability</th>
<th>1: Catastrophic 200%</th>
<th>2: Major 60%</th>
<th>3: Medium 20%</th>
<th>4: Minor 5%</th>
<th>5: Insignificant 0.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Almost Certain</td>
<td>10^{-1}</td>
<td>VH</td>
<td>VH</td>
<td>VH</td>
<td>H</td>
<td>M or L (5)</td>
</tr>
<tr>
<td>B – Likely</td>
<td>10^{-2}</td>
<td>VH</td>
<td>VH</td>
<td>H</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>C – Possible</td>
<td>10^{-3}</td>
<td>VH</td>
<td>H</td>
<td>M</td>
<td>M</td>
<td>VL</td>
</tr>
<tr>
<td>D – Unlikely</td>
<td>10^{-4}</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>L</td>
<td>VL</td>
</tr>
<tr>
<td>E – Rare</td>
<td>10^{-5}</td>
<td>M</td>
<td>L</td>
<td>L</td>
<td>VL</td>
<td>VL</td>
</tr>
<tr>
<td>F – Barely Credible</td>
<td>10^{-6}</td>
<td>L</td>
<td>VL</td>
<td>VL</td>
<td>VL</td>
<td>VL</td>
</tr>
</tbody>
</table>

Notes:
1. (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
2. (6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

### Risk Level Implications

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Example Implications (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VH</td>
<td>Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.</td>
</tr>
<tr>
<td>H</td>
<td>Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.</td>
</tr>
<tr>
<td>M</td>
<td>May be tolerated in certain circumstances (subject to regulator’s approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.</td>
</tr>
<tr>
<td>L</td>
<td>Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.</td>
</tr>
<tr>
<td>VL</td>
<td>Acceptable. Manage by normal slope maintenance procedures.</td>
</tr>
</tbody>
</table>

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.
LANDSLIDE RISK

Concept of Risk

Risk is a familiar term, but what does it really mean? It can be defined as “a measure of the probability and severity of an adverse effect to health, property, or the environment.” This definition may seem a bit complicated. In relation to landslides, geotechnical practitioners (GeoGuide LR1) are required to assess risk in terms of the likelihood that a particular landslide will occur and the possible consequences. This is called landslide risk assessment. The consequences of a landslide are many and varied, but our concerns normally focus on loss of, or damage to, property and loss of life.

Landslide Risk Assessment

Some local councils in Australia are aware of the potential for landslides within their jurisdiction and have responded by designating specific “landslide hazard zones”. Development in these areas is often covered by special regulations. If you are contemplating building, or buying an existing house, particularly in a hilly area, or near cliffs, go first for information to your local council.

Landslide risk assessment must be undertaken by a geotechnical practitioner. It may involve visual inspection, geological mapping, geotechnical investigation and monitoring to identify:

- potential landslides (there may be more than one that could impact on your site)
- the likelihood that they will occur
- the damage that could result
- the cost of disruption and repairs and
- the extent to which lives could be lost.

Risk assessment is a predictive exercise, but since the ground and the processes involved are complex, prediction tends to lack precision. If you commission a landslide risk assessment for a particular site you should expect to receive a report prepared in accordance with current professional guidelines and in a form that is acceptable to your local council, or planning authority.

Risk to Property

Table 1 indicates the terms used to describe risk to property. Each risk level depends on an assessment of how likely a landslide is to occur and its consequences in dollar terms. “Likelihood” is the chance of it happening in any one year, as indicated in Table 2. “Consequences” are related to the cost of repairs and temporary loss of use if a landslide occurs. These two factors are combined by the geotechnical practitioner to determine the Qualitative Risk.

<table>
<thead>
<tr>
<th>TABLE 2: LIKELIHOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood</td>
</tr>
<tr>
<td>Almost Certain</td>
</tr>
<tr>
<td>Likely</td>
</tr>
<tr>
<td>Possible</td>
</tr>
<tr>
<td>Unlikely</td>
</tr>
<tr>
<td>Rare</td>
</tr>
<tr>
<td>Barely credible</td>
</tr>
</tbody>
</table>

The terms "unacceptable", "may be tolerated", etc. in Table 1 indicate how most people react to an assessed risk level. However, some people will always be more prepared, or better able, to tolerate a higher risk level than others.

Some local councils and planning authorities stipulate a maximum tolerable level of risk to property for developments within their jurisdictions. In these situations the risk must be assessed by a geotechnical practitioner. If stabilisation works are needed to meet the stipulated requirements these will normally have to be carried out as part of the development, or consent will be withheld.

<table>
<thead>
<tr>
<th>TABLE 1: RISK TO PROPERTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative Risk</td>
</tr>
<tr>
<td>Very high VH</td>
</tr>
<tr>
<td>High H</td>
</tr>
<tr>
<td>Moderate M</td>
</tr>
<tr>
<td>Low L</td>
</tr>
<tr>
<td>Very Low VL</td>
</tr>
</tbody>
</table>
Risk to Life

Most of us have some difficulty grappling with the concept of risk and deciding whether, or not, we are prepared to accept it. However, without doing any sort of analysis, or commissioning a report from an "expert", we all take risks every day. One of them is the risk of being killed in an accident. This is worth thinking about, because it tells us a lot about ourselves and can help to put an assessed risk into a meaningful context. By identifying activities that we either are, or are not, prepared to engage in we can get some indication of the maximum level of risk that we are prepared to take. This knowledge can help us to decide whether we really are able to accept a particular risk, or to tolerate a particular likelihood of loss, or damage, to our property (Table 2).

In Table 3, data from NSW for the years 1998 to 2002, and other sources, is presented. A risk of 1 in 100,000 means that, in any one year, 1 person is killed for every 100,000 people undertaking that particular activity. The NSW data assumes that the whole population undertakes the activity. That is, we are all at risk of being killed in a fire, or of choking on our food, but it is reasonable to assume that only people who go deep sea fishing run a risk of being killed while doing it.

It can be seen that the risks of dying as a result of falling, using a motor vehicle, or engaging in water-related activities (including bathing) are all greater than 1:100,000 and yet few people actively avoid situations where these risks are present. Some people are averse to flying and yet it represents a lower risk than choking to death on food. Importantly, the data also indicate that, even when the risk of dying as a consequence of a particular event is very small, it could still happen to any one of us any day. If this were not so, no one would ever be struck by lightning.

Most local councils and planning authorities that stipulate a tolerable risk to property also stipulate a tolerable risk to life. The AGS Practice Note Guideline recommends that 1:100,000 is tolerable in newly developed areas, where works can be carried out as part of the development to limit risk. The tolerable level is raised to 1:10,000 in established areas, where specific landslide hazards may have existed for many years. The distinction is deliberate and intended to prevent the concept of landslide risk management, for its own sake, becoming an unreasonable financial burden on existing communities. Acceptable risk is usually taken to be one tenth of the tolerable risk (1:1,000,000 for new developments and 1:100,000 for established areas) and efforts should be made to attain these where it is practicable and financially realistic to do so.

<table>
<thead>
<tr>
<th>Risk (deaths per participant per year)</th>
<th>Activity/Event Leading to Death (NSW data unless noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1,000</td>
<td>Deep sea fishing (UK)</td>
</tr>
<tr>
<td>1:10,000</td>
<td>Motor cycling, horse riding , ultra-light flying (Canada)</td>
</tr>
<tr>
<td>1:23,000</td>
<td>Motor vehicle use</td>
</tr>
<tr>
<td>1:30,000</td>
<td>Fall</td>
</tr>
<tr>
<td>1:70,000</td>
<td>Drowning</td>
</tr>
<tr>
<td>1:180,000</td>
<td>Fire/burn</td>
</tr>
<tr>
<td>1:660,000</td>
<td>Choking on food</td>
</tr>
<tr>
<td>1:1,000,000</td>
<td>Scheduled airlines (Canada)</td>
</tr>
<tr>
<td>1:2,300,000</td>
<td>Train travel</td>
</tr>
<tr>
<td>1:32,000,000</td>
<td>Lightning strike</td>
</tr>
</tbody>
</table>

More information relevant to your particular situation may be found in other AUSTRALIAN GEOGUIDES:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR8 - Hillside Construction
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.
Attachment C - Traffic Impact Assessment

Mosbri Crescent, The Hill

By AECOM, December 2015
Nine Network Australia - Newcastle NBN site residential development

Traffic Impact Assessment
Nine Network Australia - Newcastle NBN site residential development
Traffic Impact Assessment

Client: Nine Network Australia
ABN: 88 008 685 407

Prepared by
AECOM Australia Pty Ltd
Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8934 0000  F +61 2 8934 0001  www.aecom.com
ABN 20 093 846 925

22-Dec-2015
Job No.: 60447663

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# Quality Information

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</tr>
<tr>
<td>Date</td>
<td>22-Dec-2015</td>
</tr>
<tr>
<td>Prepared by</td>
<td>Eric Wu</td>
</tr>
<tr>
<td>Reviewed by</td>
<td>Marcel Cruz</td>
</tr>
</tbody>
</table>

## Revision History

<table>
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<tr>
<th>Revision</th>
<th>Revision Date</th>
<th>Details</th>
<th>Authorised</th>
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| A | 21-Dec-2015 | Draft Report | Andy Yung  
Associate Director |
| B | 22-Dec-2015 | Final Report | Andy Yung  
Associate Director |
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Appendix B
  Existing Intersection SIDRA Results

Appendix C
  Future Intersection SIDRA Results
1.0 Introduction

1.1 Background

AECOM has been commissioned by Nine Network Australia Pty Ltd (NNA) to prepare a Traffic Impact Assessment in support of a Planning Proposal for the residential development of the NBN site at 11 Mosbri Crescent, Newcastle. The site is currently used as NBN’s headquarter with administration and studios and also contains a TPG office.

The preferred concept plan proposes a total of 208 residential dwellings comprised of medium to high density dwellings. The project site in relation to its regional context is shown in Figure 1.

Figure 1 Location of the project site

Source: AECOM 2015
1.2 Report structure

The report is structured as follows:

- **Section 2** summarises the existing conditions in the area surrounding the site, including travel patterns and behaviour, public transport, cyclist and pedestrian facilities as well as the existing performance of the road network.

- **Section 3** provides details of the development proposal including vehicular access and parking arrangements.

- **Section 4** provides a traffic impact assessment of the site on the existing road network. This includes the trip generation exercise and intersection performance testing using the SIDRA modelling software.

- **Section 5** provides the potential measures to manage travel demand.

- **Section 6** provides a summary and conclusions of the report.
2.0 Existing Conditions

2.1 Site description

The NBN Newcastle site is located in The Hill which is an inner city, residential suburb of Newcastle, New South Wales. It is located within the Newcastle Local Government Area (LGA) and immediately south (within 500m) of Newcastle’s CBD. Hamilton Railway Station is approximately 3km east of the site which provide train services and connection to Gosford and Maitland areas.

The site is bounded by Kitchener Parade to the north, Mosbri Crescent to the west, Arcadia Park to the east and residential dwellings to the south. The extent of the site is highlighted by the red dotted line in Figure 2.

Figure 2 Site boundary

Source: SJB, 2015; modified by AECOM, 2015

The site is located within 10 minute walking distance to Darby Street, Wolfe Street and Hunter Street which have bus stops providing bus services to key areas in Newcastle. 2011 census data showed that approximately 5 per cent per cent of journey-to-work trips from Newcastle area were made by public transport.

2.1.1 Site access

The NBN Newcastle site is accessed from Mosbri Crescent which provides two access points to on-site parking facilities. The northern access point is located approximately 120m east of Kitchener Parade and the southern access point is located approximately 80m east of Swan Street.

2.1.2 On-site parking provision

There are currently 117 parking spaces provided on site (off street parking), which are reserved for staff and visitors.
2.2 Road network

The site has good access to Newcastle’s strategic road network, with surrounding roads providing links to state and regional roads. The Pacific Highway is less than 2 km east of the site. Hunter Street is classified as arterial road; Darby Street and King Street are the main roads, while other streets as Swan Street, Parkway Avenue are classified as collector and local roads.

Figure 3 Road network

2.2.1 Hunter Street

Hunter Street is a major road in the Newcastle CBD with commercial and retail activity. It is an undivided road with two lanes and a parking lane on both sides and a 50km/h speed limit. Hunter Street links to the Pacific Highway to the west and Darby Street to the east.

2.2.2 King Street

King Street is a regional road which runs parallel to Hunter Street to the south. It is a four lane divided road between Union Street and the Pacific Highway and , it is a four lane road to its western part and two lane road to its eastern part. It has a post speed limit of 40km/h on the eastern part and 50km/h on the western part. King Street also connects to Darby Street and Pacific Highway.

2.2.3 Darby Street

Darby Street is a regional road and a shopping precinct within Newcastle. It runs in a north-south direction with one lane each way and has parking lane on both sides. It has a speed limit of 40km/h and connects Hunter Street and Parkway Avenue. Darby Street also provides connectivity to the residential area of Newcastle with intersections to a number of local roads including Queen Street which provides links to the site.

2.2.4 Mosbri Crescent

Mosbri Crescent is a local road with two lanes and a speed limit of 40km/h. It runs along the proposed site and connects to Kitchener Parade to the north and Swan Street / Hillview Crescent to the south. It provides vehicular access for vehicles in and out of the site.

2.2.5 Swan Street / Kitchener Parade

Swan Street and Kitchener Parade are both local roads linking Mosbri Crescent to the surrounding road network. It is an undivided road with one traffic lane and parking lane on both sides.
2.3 Traffic volumes

2.3.1 Daily traffic counts

Historical traffic data was obtained from RMS to establish background traffic growth in the vicinity of the site. The Average Annual Daily Traffic (AADT) data from selected RMS count survey location in the area surrounding the site are presented in Table 1, with the location of the traffic count stations shown in Figure 4.

<table>
<thead>
<tr>
<th>Station</th>
<th>Location</th>
<th>2011 AADT</th>
<th>2012 AADT</th>
<th>2013 AADT</th>
<th>2014 AADT</th>
<th>2015 AADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>05206</td>
<td>Glebe Road – Merewether West of Henry Street</td>
<td>15,465</td>
<td>15,403</td>
<td>15,369</td>
<td>15,117</td>
<td>15,107</td>
</tr>
</tbody>
</table>

Note: AADT (Annual Average Daily Traffic was calculated on 365 days of data)
Source: RMS, 2015

The data indicates that traffic on Glebe Road in the vicinity of the site has gradually declined between 2011 and 2015. For the purpose of any future year analysis, traffic growth is assumed to be at zero per cent rather than a negative growth as a worst case.
2.3.2 Intersection traffic counts

Classified turning movement counts were undertaken by Trans Traffic Survey (TTS) during the morning (6am to 9am) and evening (3pm to 6pm) peak periods on 12 November, 2015 at the following intersections:

- Darby Street / King Street (I-1)
- Darby Street / Queen Street (I-2)
- Darby Street / Parkway Avenue (I-3)
- Kitchener Parade / Mosbri Crescent (I-4)
- Swan Street / Kitchener Street (I-5)
- Mosbri Crescent / Swan Street / Hillview Crescent (I-6)

Figure 5 Intersection traffic count location

These intersections are considered to be critical in the movement to and from the site, as they are the main intersections connecting to King Street, Glebe Road and Parkway Avenue.

The traffic intersection counts revealed that the AM and PM peak hour occurred during 8am to 9am and 5pm to 6pm respectively. The AM and PM peak hour intersection counts are shown in Appendix A.

Based on the intersection surveys undertaken, a summary of peak hour midblock traffic counts on the local road network at locations surrounding the site is shown in Table 2. Figure 6 shows the total peak hour traffic on the Darby Street and Queen Street approaches as well as the component of traffic generated by the existing operation of Newcastle NBN site (as shown in brackets).
### Table 2  Peak hour traffic volume

<table>
<thead>
<tr>
<th>Midblock location</th>
<th>Direction</th>
<th>AM peak hour (veh/hr)</th>
<th>PM peak hour (veh/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queen Street, East of Darby Street</td>
<td>EB</td>
<td>171</td>
<td>194</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>187</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Total Peak Hour Traffic</td>
<td>358</td>
<td>417</td>
</tr>
<tr>
<td>Darby Street, North of Queen Street</td>
<td>SB</td>
<td>463</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>NB</td>
<td>618</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>Total Peak Hour Traffic</td>
<td>1,081</td>
<td>1,286</td>
</tr>
<tr>
<td>Darby Street, South of Queen Street</td>
<td>SB</td>
<td>376</td>
<td>615</td>
</tr>
<tr>
<td></td>
<td>NB</td>
<td>525</td>
<td>442</td>
</tr>
<tr>
<td></td>
<td>Total Peak Hour Traffic</td>
<td>901</td>
<td>1,057</td>
</tr>
</tbody>
</table>

### Figure 6  Midblock traffic volumes in the vicinity of the site

Source: AECOM 2015
2.3.3 Existing trip generation from site

At present, the staff level at the existing Newcastle NBN site is approximately 143 people (including TPG staff). A travel survey was undertaken on November 2015, where the results would be used to determine current traffic volumes being generated by the site on the surrounding road network during the AM and PM peak hour period.

Approximately 53 per cent of staff participated in the survey which showed majority worked from Monday to Friday, ranging from 83 per cent to 97 per cent, and less than 40 per cent staffs worked on the weekend.

In terms of mode of travel to work, the survey showed 91 per cent of staff would drive, 4 per cent walked, 4 per cent arrived by bicycle/motorbike and 1 per cent were car passengers. For those who drive to work, majority of staff parked within the off-street parking facility.

![Figure 7 Mode Split](source: AECOM, 2015)

Analysis of the survey data indicated 52 per cent of staff driving to the site travelled within the AM peak hour and 40 per cent travelled within the PM peak hour during a typical weekday. Therefore, the total number of trips generated by the site between 8am to 9am is 74, and 57 trips between 5pm to 6pm.

The survey also showed approximately 63 per cent of staff come from the north via King Street, 37 per cent of from the south via Darby Street.

It is assumed 95 per cent of the total traffic generated in AM peak will be inbound, 5 per cent will be outbound, and the opposite will be applied in PM peak.

Table 3 shows the trips into and out of Mosbri Crescent (at Kitchener Parade | Mosbri Crescent and Swan Street | Mosbri Crescent) and validates the inbound and outbound trips assumed to be generated by the Newcastle NBN site. Given the number of inbound trips assumed for the Newcastle NBN site during the AM peak is higher than the intersection counts, it is assumed the total number of inbound trips (65) is associated with the Newcastle NBN site.

<table>
<thead>
<tr>
<th>Mosbri Crescent</th>
<th>AM Peak</th>
<th>PM peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inbound</td>
<td>Outbound</td>
</tr>
<tr>
<td>Intersection counts*</td>
<td>65</td>
<td>47</td>
</tr>
<tr>
<td>Assumption based on Travel Survey</td>
<td>71</td>
<td>3</td>
</tr>
<tr>
<td>Within intersection counts?</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

* the number of trips shown does not include turning movements associated with Hillview Crescent given its proximity to the site it is assumed people who live on this street do not drive to work.
**Figure 8** summarises the assumed turning movements generated by the Newcastle NBN Site at the two intersections providing access to the site. It shows the existing site currently generates 68 and 57 vehicles movements during AM and PM peak respectively.

**Source:** AECOM, 2015
2.4 Existing intersection performance

Intersection performances have been evaluated using SIDRA Intersection 6.1, a computer based modelling package designed for calculating isolated intersection performance.

The main performance indicators for SIDRA 6.1 include:

- **Degree of Saturations (DoS)** – a measure of the ratio between traffic volumes and capacity of the intersection is used to measure the performance of isolated intersections. As DoS approaches 1.0, both queue length and delays increase. Satisfactory operations usually occur with a DoS range between 0.7-0.8 or below.

- **Average Delay** – duration, in seconds, of the average vehicle waiting at an intersection.

- **Level of Service (LoS)** – a measure of the overall performance of the intersection (this is explained further in Table 4).

Table 4 Level of Service criteria for intersections

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Average Delay (sec/veh)</th>
<th>Traffic Signals and Roundabouts</th>
<th>Give Way and Stop Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Less than 14</td>
<td>Good Operation</td>
<td>Good Operation</td>
</tr>
<tr>
<td>B</td>
<td>15 to 28</td>
<td>Good with acceptable delays and spare capacity</td>
<td>Acceptable delays and spare capacity</td>
</tr>
<tr>
<td>C</td>
<td>29 to 42</td>
<td>Satisfactory</td>
<td>Satisfactory, but accident study required</td>
</tr>
<tr>
<td>D</td>
<td>43 to 56</td>
<td>Operating near capacity</td>
<td>Near capacity and accident study required</td>
</tr>
<tr>
<td>E</td>
<td>57 to 70</td>
<td>At capacity; at signals incidents will cause excessive delays</td>
<td>At capacity; requires other control mode</td>
</tr>
<tr>
<td>F</td>
<td>&gt;70</td>
<td>Roundabouts require other control mode</td>
<td>At capacity; requires other control mode</td>
</tr>
</tbody>
</table>

Source: RMS, 2002

The existing performance of the key intersections has been assessed and the results are presented in Table 5 for the AM and PM peak hour period. The table summarises intersection performance based on the 2015 traffic flows for the weekday morning and evening peak hours. SIDRA detail results are provided in Appendix B.

Table 5 Intersection performance – existing 2015 weekday

<table>
<thead>
<tr>
<th>Location</th>
<th>Demand Flow (veh/h)</th>
<th>Level of Service</th>
<th>Degree of Saturation</th>
<th>Ave Delay (sec)</th>
<th>95% Back of Queue (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darby Street / King Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>1,770</td>
<td>D</td>
<td>1.08</td>
<td>46</td>
<td>265</td>
</tr>
<tr>
<td>PM Peak</td>
<td>2,084</td>
<td>D</td>
<td>1.05</td>
<td>46</td>
<td>263</td>
</tr>
<tr>
<td>Darby Street / Queen Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>1,198</td>
<td>A</td>
<td>0.57</td>
<td>13</td>
<td>76</td>
</tr>
<tr>
<td>PM Peak</td>
<td>1,427</td>
<td>A</td>
<td>0.58</td>
<td>13</td>
<td>76</td>
</tr>
<tr>
<td>Darby Street / Parkway Avenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>1,727</td>
<td>A</td>
<td>0.62</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>PM Peak</td>
<td>2,046</td>
<td>A</td>
<td>0.80</td>
<td>12</td>
<td>87</td>
</tr>
<tr>
<td>Hillview / Mosbri Crescent / Swan Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>98</td>
<td>A</td>
<td>0.02</td>
<td>2.9</td>
<td>1</td>
</tr>
<tr>
<td>PM Peak</td>
<td>110</td>
<td>A</td>
<td>0.03</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>Location</td>
<td>Demand Flow (veh/h)</td>
<td>Level of Service</td>
<td>Degree of Saturation</td>
<td>Ave Delay (sec)</td>
<td>95% Back of Queue (m)</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------</td>
<td>------------------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Kitchener Parade / Mosbri Crescent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>168</td>
<td>A</td>
<td>0.05</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>PM Peak</td>
<td>124</td>
<td>A</td>
<td>0.03</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Kitchener Parade / Swan Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>316</td>
<td>A</td>
<td>0.07</td>
<td>5.1</td>
<td>2</td>
</tr>
<tr>
<td>PM Peak</td>
<td>316</td>
<td>A</td>
<td>0.09</td>
<td>4.8</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: AECOM 2015

The modelling results indicate that in the existing AM and PM peak hour, all the intersections in the road network performed satisfactorily with the exception of Darby Street / King Street.

The intersection of Darby Street / King Street performs at a LoS D however operates at capacity with a degree of saturation greater than 1.0 during both the AM and PM peak hour. This is due to high volume of traffic turning right from western approach and insufficient green time allocated for right turn movement. The intersection also experiences queue of approximately 265 m from the western approach during both the AM peak and PM peak.

Figure 9 summarises the performance of the intersections assessed during the AM and PM peak.

Source: AECOM, 2015
2.5 Travel behaviour

2.5.1 Journey to work data

Travel characteristics for NSW residents travelling to work are gathered from the journey-to-work data extracted from the Australian Bureau of Statistics (ABS) 2011 census data. Journey to work data (JTW) includes details of the origin and destination of trips, together with characteristics of the journey such as mode of travel. The project site is located within Newcastle LGA and Travel Zone (TZ) 6355. JTW data from and to the project site has been analysed and is summarised in the tables below.

Table 6 shows the mode share of trips travelling to and from the project site and Table 7 shows the origins and destinations of trips to and from the project site.

### Table 6 Journey to work mode split

<table>
<thead>
<tr>
<th>Mode</th>
<th>Residents Site area as origin (from TZ 6355)</th>
<th>Employees Site area as destination (to TZ 6355)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total JTW Trips</td>
<td>1,069</td>
<td>1,214</td>
</tr>
<tr>
<td>Vehicle Driver</td>
<td>68%</td>
<td>77%</td>
</tr>
<tr>
<td>Vehicle Passenger</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Bus</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Train</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Walked only</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>Other Modes</td>
<td>4%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Note: excludes mode not stated and worked at home or did not work

Source: ABS Census Data 2011

The data indicates employees and residents within the travel zone have a high dependency on private vehicles as a mode of travel to work. Approximately 74 per cent of residents rely on cars with 15 per cent opting to walk to work. For people employed in the area, 82 per cent of JTW trips are made by private vehicle. This is probably due to the high availability of off-street parking in the area.

### Table 7 Journey to work origins / destinations

<table>
<thead>
<tr>
<th>Site Area Travel Zone (TZ 6355)</th>
<th>Residents Proportion</th>
<th>Employees Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newcastle</td>
<td>74%</td>
<td>Newcastle</td>
</tr>
<tr>
<td>Lake Macquarie - East</td>
<td>10%</td>
<td>Lake Macquarie - East</td>
</tr>
<tr>
<td>Port Stephens</td>
<td>5%</td>
<td>Lake Macquarie - West</td>
</tr>
<tr>
<td>Lower Hunter</td>
<td>2%</td>
<td>Maitland</td>
</tr>
<tr>
<td>Lake Macquarie - West</td>
<td>2%</td>
<td>Port Stephens</td>
</tr>
<tr>
<td>Maitland</td>
<td>3%</td>
<td>Wyong</td>
</tr>
<tr>
<td>Sydney Inner City</td>
<td>1%</td>
<td>Lower Hunter</td>
</tr>
<tr>
<td>Wyong</td>
<td>1%</td>
<td>Gosford</td>
</tr>
<tr>
<td>Gosford</td>
<td>1%</td>
<td>Leichhardt</td>
</tr>
</tbody>
</table>

Source: ABS Census Data 2011

The JTW data shows that the majority of trips leaving the site area travel zone are self-contained within the Newcastle area (74 per cent). A high proportion of trips to Newcastle area were either made by vehicle (70 per cent) or walk (19 per cent).
A high proportion of trips coming to the site area to work also originate within the Newcastle area (56 per cent) and a high proportion of trips originate from Lake Macquarie - East (23 per cent) and Lake Macquarie - West (6 per cent).

2.6 Public transport network

2.6.1 Rail services

Hamilton Station is the nearest railway station, approximately 3 km west of the site, which provides connectivity to the Sydney trains network. Figure 10 shows that Hamilton Station is serviced by the Central Coast and Newcastle line which provides services to Newcastle and Central station and the Hunter line which provide services to Newcastle and Maitland, encouraging commuters to use public transport as a viable alternative to private motor vehicle transport. The number and frequency of railway services operating during peak hours is shown in Table 8.

The truncation of the rail line as part of works to revitalise Newcastle’s CBD and deliver a fully accessible transport interchange at Wickham require rails services to terminate at Hamilton Station with rail services no longer operating between Hamilton and Newcastle Station.

Figure 10 Existing rail network

Source: Sydneytrains, 2015
Table 8  Rail services at Hamilton Station

<table>
<thead>
<tr>
<th>Key Destination</th>
<th>AM Peak (0700-0900)</th>
<th>PM Peak (1600-1800)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Maitland</td>
<td>12-20 minutes</td>
<td>15-30 minutes</td>
</tr>
<tr>
<td></td>
<td>6 services</td>
<td>6 services</td>
</tr>
<tr>
<td>From Maitland</td>
<td>6-15 minutes</td>
<td>20-25 minutes</td>
</tr>
<tr>
<td></td>
<td>7 services</td>
<td>5 services</td>
</tr>
<tr>
<td>To Gosford / Central</td>
<td>10-60 minutes</td>
<td>10-30 minutes</td>
</tr>
<tr>
<td></td>
<td>4 services</td>
<td>5 services</td>
</tr>
<tr>
<td>From Gosford / Central</td>
<td>20-40 minutes</td>
<td>3-20 minutes</td>
</tr>
<tr>
<td></td>
<td>4 services</td>
<td>11 services</td>
</tr>
</tbody>
</table>

Source: Sydneytrains, 2015

2.6.2  Bus services

Newcastle Buses operate bus services in close proximity to the site along Darby Street and Wolfe Street which are illustrated in Figure 11, and include:

- Route 310 & 320 Belmont & Warners Bay – Charlestown & Newcastle
- Route 201 Hamilton – Marketown

Two bus services operate along Darby Street, which is less than 400m to the site. These bus services provide direct connection to Charlestown, Newcastle and Belmont. Two bus stops are located just north of Queen Street on Darby Street.

Bus route 201 runs on Wolfe Street and operates between Hamilton and Marketown. Bus stops for this service are located south of Tyrell Street.

Figure 11  Bus services in the vicinity of the site

Source: Newcastle Buses, 2010
The number and frequency of bus services in the area are shown in Table 9.

### Table 9: Frequency of bus services in the vicinity of the site

<table>
<thead>
<tr>
<th>Bus Service</th>
<th>Route</th>
<th>Weekdays</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AM Peak (0700-0900)</td>
<td>Off Peak</td>
</tr>
<tr>
<td>310</td>
<td>Belmont &amp; Warners Bay – Charlestown &amp; Newcastle</td>
<td>60 minutes 2 services</td>
<td>60 minutes</td>
</tr>
<tr>
<td>320</td>
<td>Belmont &amp; Warners Bay – Charlestown &amp; Newcastle</td>
<td>60 minutes 2 services</td>
<td>60 minutes</td>
</tr>
<tr>
<td>201</td>
<td>Hamilton - Marketown</td>
<td>60 minutes 3 services</td>
<td>60 minutes</td>
</tr>
</tbody>
</table>

Source: Sydneybuses.info, 2013

Hunter Street is the main bus corridor for the Newcastle area providing links to a number of surrounding key centres. The following bus services are also provided on Hunter Street, which is approximately a 15-min walk from the site:

**Newcastle Buses**
- Route 100, 106, 107 & 111: Mount Hutton, Charlestown & Jesmond - Newcastle
- Route 104: Jesmond - Newcastle East
- Route 118 (NightOwl bus service): Stockton - Newcastle
- Route 201: Hamilton - Marketown
- Route 222, 224 & 225: Wallsend & Jesmond - Newcastle East
- Route 226, 230, 231 & 235: Glendale, Maryland & Wallsend - Newcastle
- Route 310 & 320: Belmont & Warners Bay - Charlestown & Newcastle
- Route 317: Belmont - Newcastle
- Route 334: Glendale - Newcastle
- Route 349 & 350: Swansea - Newcastle
- Route 363: Warners Bay - Newcastle

**Port Stephens Coaches**
- Route 130: Fingal Bay - Newcastle
- Route 131: Shoal Bay – Newcastle

**Hunter Valley Buses**
- Route 138: Lemon Tree Passage - Newcastle
- Route 140: Raymond Terrace - Newcastle
- Route 267: West Wallsend - University of Newcastle

**Rover Coaches**
- Route 160: Cessnock - Newcastle
2.6.3 Shuttle bus services

Transport of New South Wales is currently constructing a new transport interchange at Wickham, which will be a hub for the new light rail, trains, buses and taxis. Currently trains start and finish at Hamilton Station during the construction of the Wickham Interchange. With the closure of Wickham, Civic and Newcastle station, the Shuttle Bus (Route 110) replaces train services between Hamilton and Newcastle station. The shuttle bus runs every 10 minutes at peak times and regularly at other times, to meet trains arriving and departing at Hamilton Station.

2.7 Pedestrian routes and facilities

Pedestrian footpath is provided intermittently on both sides of Mosbri Crescent, however there is an extensive footpath network in the surrounding area, which allows easy and safe access for pedestrians to nearby shopping areas and restaurants on Darby Street, parks and bus stops.

2.8 Cycling routes and facilities

There are no dedicated cycle facilities along Mosbri Crescent and Darby Street. However, there is a number of on-road and off-road cycle routes in the surrounding area providing connections between key destinations including parks and reserves, and train stations as shown in Figure 12.

Figure 12 Newcastle cycle route map

Source: Newcastle City Council, 2015
3.0 Proposed Development

3.1 Introduction

SJB Architects has prepared a Concept Plan for the redevelopment of the site at 11 Mosbri Crescent, The Hill, NSW. The concept plan proposes a residential development with approximately 208 dwellings which contains a mix of medium and high density dwellings. The preferred concept plan is shown in Figure 13 and features three apartment blocks (A, B and D).

Figure 13 Preferred concept plan

Table 10 Proposed residential development

<table>
<thead>
<tr>
<th>Block</th>
<th>Building type</th>
<th>Dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Residential Flat Building</td>
<td>55</td>
</tr>
<tr>
<td>B</td>
<td>Tower</td>
<td>58</td>
</tr>
<tr>
<td>C</td>
<td>Terrace</td>
<td>16</td>
</tr>
<tr>
<td>D1</td>
<td>Residential Flat Building</td>
<td>32</td>
</tr>
<tr>
<td>D2</td>
<td>Residential Flat Building</td>
<td>27</td>
</tr>
<tr>
<td>E</td>
<td>Terrace</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
</tr>
</tbody>
</table>

Source: SJB, 2015
3.2 **Vehicular access**

Two access points to the site are proposed from Mosbri Crescent. One access point is located 120m from Kitchener Parade which provides direct access to Building A, B, C and D1. The other access point is located 80m from Swan Street / Mosbri Crescent / Hillview Crescent which provides direct access to building C, D2 and E. The two access points are approximately at the same location of the existing access points to the Newcastle NBN site. The distance between these two accesses is about 50m.

The proposed internal road network connects the two access points and provides vehicular access to parking facilities. The width and turning path of the internal road will be designed to allow access by refuse collection vehicles.

3.3 **Parking provision**

The parking rates would be minimum 1 space per dwelling, and with 1 space per 6 dwelling for visitor spot based on Newcastle DCP 2012. Therefore, it requires 208 car parking spaces for residents and 35 spaces for visitor parking. The concept plan proposes basement parking for the three apartment blocks (A, B and D).

Under the Newcastle DCP there is a requirement to provide 4 spaces for delivery and service vehicles based on the rate of 1 space per 50 flats / units for residential flat buildings under 200 flats / units.

3.4 **Pedestrian and Cyclist Facilities**

The design of the internal road network and internal footpaths will provide good connectivity to surrounding pedestrian and cyclist networks. Pedestrian access to the site will be provided from Mosbri Crescent & Kitchener Parade.

In order to encourage sustainable transport choices, the proposed development will include end-of-trip cycle facilities on site in accordance with the Newcastle DCP. The Newcastle DCP has the following bike parking rate for attached dwelling, multi dwelling housing, residential flat buildings and shop top housing:

- 1 space per dwelling unless separate storage is provided (Council determine the required class of security).
- 1 space per 10 dwellings (Class 3 – low security level) for visitors

Based on the bike parking rates set out in the DCP, 208 bike parking spaces for residents and 21 bike parking spaces for visitors are required as part of the development.

The close proximity to shops, parks, and recreational facilities and bus stops will encourage waking and cycling as an alternative to private car transport, which will in turn serve to reduce trip generation from the proposal and traffic impacts on the surrounding area.

3.5 **Public Transport Facilities**

The site has good accessibility to an existing public transport services and facilities. Bus stops at Darby Street can be easily accessed with a walking distance of less than 5-min.

Hamilton Station provides regular and frequent services on the Central Coast and Newcastle Line and Hunter Line. Currently shuttle buses are provided between Newcastle & Hamilton Station to replace train services with a stop at Civic Station which is less than a 15-min walk from the site.

The future Newcastle light rail route proposes light rail stops on Hunter Street, which is approximately an 8 min walk from the Kitchener Parade pedestrian access point.
4.0 Traffic Impact Assessment

This section of the report assesses the likely traffic impacts of the proposed development on the local road network and recommends mitigation measures to alleviate any impacts if required.

The traffic assessment has considered the impacts of the proposed development (up to 208 dwellings) during typical weekday AM and PM peak hour (based on 2015 traffic data collected by AECOM).

4.1 Trip generation

The concept plan contains a mix of medium and high density dwellings. The vehicle trip rate for the proposed development has been based on Roads and Maritime Services survey data for similar dwelling types within regional areas.

The following trip rates have been used to determine the number of trips generated by the development:
- Medium density: 0.51 trips per unit in AM peak and 0.58 trips per unit for PM peak.
- High density: 0.39 trips per unit in AM peak and 0.42 trips per unit for PM peak.

The trip rate for medium density dwellings have been based on surveys for a similar site in Maryville, located approximately 2.8 km north of the NBN site. These surveys were used as Roads and Maritime’s Trip Generation Surveys for Medium Density Residential Dwellings.

The trip rate for high density dwellings have been based on surveys for a similar site in Charlestown, located approximately 8.4 km southwest of the NBN site.

Using the trip rates mentioned above, the forecasted trips generated by the proposed development during AM and PM peak are summarised in Table 11. The proposed development is expected to generate a total of 85 vehicle trips and 93 vehicle trips during the AM and PM peak hour. It is assumed that 10 per cent of trips will enter the site and 90 per cent will leave the site in the AM peak hour, with the reverse occurring in the PM peak.

<table>
<thead>
<tr>
<th>Building</th>
<th>Type</th>
<th>No. of dwelling</th>
<th>Trip Rate</th>
<th>Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
<td>A</td>
<td>High Density</td>
<td>55</td>
<td>0.39</td>
<td>0.42</td>
</tr>
<tr>
<td>B</td>
<td>High Density</td>
<td>58</td>
<td>0.39</td>
<td>0.42</td>
</tr>
<tr>
<td>C</td>
<td>Medium Density</td>
<td>16</td>
<td>0.51</td>
<td>0.58</td>
</tr>
<tr>
<td>D1</td>
<td>High Density</td>
<td>32</td>
<td>0.39</td>
<td>0.42</td>
</tr>
<tr>
<td>D2</td>
<td>High Density</td>
<td>27</td>
<td>0.39</td>
<td>0.42</td>
</tr>
<tr>
<td>E</td>
<td>Medium Density</td>
<td>20</td>
<td>0.51</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Source: AECOM, 2015

As shown in Table 12, the traffic generation of the proposed developments is marginally more than the existing traffic flows generated by the current operation of the Newcastle NBN site during the weekday peak hour. However, it is acknowledged that the direction of travel of the existing trips will be different to the future trips due to the change in land use type.

<table>
<thead>
<tr>
<th></th>
<th>AM peak</th>
<th>PM peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing NBN site</td>
<td>68</td>
<td>57</td>
</tr>
<tr>
<td>Proposed development</td>
<td>85</td>
<td>93</td>
</tr>
<tr>
<td><strong>Net increase</strong></td>
<td><strong>+17</strong></td>
<td><strong>+36</strong></td>
</tr>
</tbody>
</table>

Source: AECOM, 2015
4.2 Trip distribution

In order to determine the net increase in trips in each travel direction, trip distribution for the vehicular movements for the current and future uses of the site have been determined using existing (2011) JTW patterns to and from the site area travel zone and the traffic turning volume survey undertaken for the existing project site respectively.

Table 13 and Figure 14 show the expected travel directions of future residential trips for the AM peak hour. It has been assumed that the reverse travel pattern will occur for the PM peak hour.

Table 13 Distribution of proposed trips – AM peak hour

<table>
<thead>
<tr>
<th>Direction</th>
<th>Strategic road link</th>
<th>In</th>
<th>Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>South</td>
<td>Via Glebe Road</td>
<td>25%</td>
<td>14%</td>
</tr>
<tr>
<td>North, West</td>
<td>Via King Street</td>
<td>39%</td>
<td>42%</td>
</tr>
<tr>
<td>Southwest (Newcastle)</td>
<td>Via Parkway Avenue</td>
<td>17%</td>
<td>21%</td>
</tr>
<tr>
<td>North East (Newcastle)</td>
<td>Via Kitchener Parade</td>
<td>19%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Journey to Work, 2011
4.3 Forecast Traffic Flow

Typically, a traffic impact assessment is undertaken for a future design year of 10 year post opening / completion of the development. However, as historical traffic data on Glebe Road corridor shows a negative average annual growth rate in Section 2.3.1, as a worst case, the assessment has assumed there will be zero growth on the surrounding road network. Therefore forecast traffic flow on the surrounding road network has been estimated by using the existing 2015 traffic flows as background traffic, with the removal of existing traffic generated by the existing operations of the Newcastle NBN site before the addition of the proposed residential development traffic.

Trips have also been distributed on to the road network based on existing road network restrictions, i.e. right turn movement banned from King Street into Darby Street on the eastern approach of the intersection.

Table 14 and Figure 15 show the midblock traffic volumes at locations in the vicinity of the subject site, with the residential development generated traffic present on the local road network (and the removal of existing operations traffic). It is evident that the total net increase of traffic as a result of the change of use of the proposed development is negligible across the network.

Table 14: Midblock traffic volumes with development traffic

<table>
<thead>
<tr>
<th>Midblock location</th>
<th>Direction</th>
<th>AM peak hour</th>
<th></th>
<th>PM peak hour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Base</td>
<td>With Dev</td>
<td>Diff</td>
<td>Base</td>
</tr>
<tr>
<td>Queen Street, East of Darby Street</td>
<td>EB</td>
<td>171</td>
<td>119</td>
<td>-52</td>
<td>194</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>187</td>
<td>242</td>
<td>55</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>358</td>
<td>361</td>
<td>3</td>
<td>417</td>
</tr>
<tr>
<td>Darby Street, North of Queen Street</td>
<td>SB</td>
<td>463</td>
<td>430</td>
<td>-33</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>NB</td>
<td>618</td>
<td>647</td>
<td>29</td>
<td>586</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1081</td>
<td>1077</td>
<td>-4</td>
<td>1286</td>
</tr>
<tr>
<td>Darby Street, South of Queen Street</td>
<td>SB</td>
<td>376</td>
<td>402</td>
<td>26</td>
<td>615</td>
</tr>
<tr>
<td></td>
<td>NB</td>
<td>525</td>
<td>507</td>
<td>-18</td>
<td>442</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>901</td>
<td>909</td>
<td>8</td>
<td>1057</td>
</tr>
</tbody>
</table>

Source: AECOM, 2015
During the peak hours, the increase of traffic on Queen Street is in the range of five to eight per cent of existing traffic volumes in one direction. It should also be noted that there is a decrease in traffic in opposite direction due to the change of the current employment land use to the proposed residential land use.

The highest increase in traffic is expected at Queen Street, on the approach to Darby Street. An increase of 65 vehicles is expected in the eastbound direction during the AM peak and 55 vehicles in the westbound direction during the PM peak. However, the traffic volumes on Queen Street are still within the capacity of a local road.
4.4 Intersection assessment

The key intersections in the vicinity of the proposed development have been remodelled in SIDRA 6.1 in the AM and PM peak hour. The intersection performance results for the road network during the AM and PM peak hour are shown in Table 15 and the detailed results (with development) are contained in Appendix C.

Table 15: Intersection performance of road network – with development

<table>
<thead>
<tr>
<th>Location</th>
<th>Demand Flow (veh/h)</th>
<th>Level of Service</th>
<th>Degree of Saturation</th>
<th>Ave Delay (sec)</th>
<th>95% Back of Queue (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darby Street / King Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM Peak</td>
<td>1,770</td>
<td>D</td>
<td>1.08</td>
<td>46</td>
<td>265</td>
</tr>
<tr>
<td>AM Peak with development</td>
<td>1,766</td>
<td>B</td>
<td>0.72</td>
<td>24</td>
<td>95</td>
</tr>
<tr>
<td>PM Peak</td>
<td>2,084</td>
<td>D</td>
<td>1.05</td>
<td>46</td>
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</table>

Source: AECOM 2015
The SIDRA model outputs from Table 15 were compared with the existing intersection performance to determine the likely changes in traffic performance at key intersections after the proposed development is in place. The intersection modelling results showed, with the proposed development in place, the intersections had comparable results to that of the existing intersection performance, with the exception of Darby Street / King Street.

The performance of the intersection of Darby Street / King Street improves from LoS D to LoS B and LoS C during the AM and PM peak respectively. The intersection also operates with spare capacity with a degree of saturation of less than 1.0. Queuing and average delays also improves.

Figure 16 summarises the performance of the intersections assessed during the AM and PM peak with the proposed development.

4.5 Impacts to on-street parking

The travel survey indicated that staff driving to work parked within the off-street parking facility provided. The proposed development will also provide sufficient off-street car park according to Council’s DCP. Therefore, future residents and visitors are expected to park off-street and not impact the local streets in the surrounding area.

Newcastle City Council may review the on-street parking scheme in the area after the development is in place.
5.0 Travel Demand Management

5.1 Introduction

Travel Demand Management (TDM) strategies involve the application of policies, objectives, measures and targets to influence travel behaviour, to encourage uptake of sustainable forms of transport, i.e. non-car modes, wherever possible and to reduce the need to travel and hence reduce overall transport and travel demand and the impacts of new development.

5.2 Proposed sustainable travel measures

The measures include a range of different types of initiatives which together reinforce the principles and objectives of the sustainable travel strategy.

The measures support delivery of the high level transport and travel demand management objectives and support the wider principles discussed. This is how the precinct planning process will deliver a sustainable precinct, in which travel by car is not the only option for residents and visitors to make the journeys they wish to make.

5.2.1 Household Information Packs (HIPs) for each household

Each household in the proposed development would be provided with a household information pack (HIP) which would be a sustainable travel kit. This would incorporate public transport leaflets, route maps and timetables (including direction to the transport info travel information line and website and bus, train and fare information), pedestrian and cycle network maps including leisure maps, and information on sustainable community initiatives, such as Bicycle User Groups, Car Sharing Schemes, and other local community projects to reduce travel or encourage uptake of sustainable modes.

5.2.2 Car sharing scheme

The extension of providing car share parking spaces on site using an established provider (such as GoGet) for the proposed residential development should be considered. This would reduce residents need to own and operate their own vehicle, safe in the knowledge that there can get access to a vehicle if they require one.

5.2.3 Public transport measures

The public transport service improvements could encourage more people to reduce the car usage. It includes the improvements of:
- Bus network coverage
- Frequency of bus services
- Quality of bus stops.

5.2.4 Bicycle measures

The following measures could encourage bicycle use and promote bicycle rides and initiatives.
- Dedicated, high quality cycle routes
- Bicycle facilities such bicycle parking
- Encourage local Bicycle User Group (BUG)
- Promotion of bicycle initiatives – NSW bicycle week, cycle to work day

5.2.5 Pedestrian Measures

A highly permeable and safe pedestrian network throughout the development will encourage and facilitate pedestrian accessibility.
6.0 Summary and Conclusions

AECOM has been commissioned by Nine Network Australia Pty Ltd (NNA) to prepare a Traffic Impact Assessment in support of a Planning Proposal for the residential development of the NBN site at Mosbri Crescent, Newcastle.

The site has very good accessibility to existing public transport services. Bus services and bus stops at Darby Street, Wolfe Street and Hunter Street can be easily accessed within a walking distance of less than ten-minutes. Bus stops at Darby Street provide services to Charlestown and Newcastle. Bus services on Hunter Street provide connectivity to a number of key areas within and surrounding Newcastle.

The shuttle bus service on Hunter Street provides services to Hamilton Station. Hamilton Station is within cycling distance to the proposed development. The station currently provides services on the Central Coast and Newcastle Line and Hunter Line. A new transport interchange is under construction at Wickham, which will be a hub for the new light rail, trains, buses and taxis. Accessibility to public transport will be further improved with the completion of the Newcastle Light Rail line.

A travel survey was undertaken which indicated 91 per cent of staff would drive, 4 per cent walked, 4 per cent arrived by bicycle/motorbike and 1 per cent were car passengers. For those who drive to work, majority of staff parked within the off-street parking facility. Based on the travel survey it has been assumed the existing NBN site generates a total of 68 and 57 vehicle trips during the AM and PM peak hour respectively. There are currently 117 parking spaces provided on site (off-street parking), which are reserved for staff and visitors.

The Concept Plan proposes a residential development of 208 residential dwellings which comprise a mix of medium and high density dwellings. Two access points to the site are proposed from Mosbri Crescent connected by the proposed internal road network providing access to parking facilities.

The proposed residential development is expected to generate 85 and 93 trips during the AM and PM peak hours respectively. With the removal of trips generated by the existing Newcastle NBN site, the proposed development is expected to generate a net increase of 17 and 36 trips during the AM and PM peak hours respectively.

The net vehicular impacts of the proposed development are considered negligible. SIDRA intersection modelling shows that the intersections assessed operate satisfactorily and no upgrades are required. The performance of the intersection of Darby Street / King Street improves from LoS D to LoS B and LoS C during the AM and PM peak respectively. The intersection also operates with spare capacity with a degree of saturation of less than 1.0.
Appendix A

Existing Intersection Traffic Counts
2015 Intersection Counts

**AM Peak 1 hour (8-9am)**

**PM Peak 1 hour (5-6pm)**
Appendix B

Existing Intersection SIDRA Results
AM Peak

MOVEMENT SUMMARY

Site: King Street - Darby Street - AM turning counts

2015 AM Peak
Signals - Fixed Time Isolated Cyclume Time = 71 seconds (User-Given Phase Times)

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
</tr>
</thead>
<tbody>
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<td><strong>South: Darby Street South Approach</strong></td>
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</tr>
<tr>
<td>2</td>
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<td>5</td>
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<tr>
<td><strong>Approach</strong></td>
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<tr>
<td><strong>East: King Street East Approach</strong></td>
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<tr>
<td>7</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td><strong>North: Darby Street North Approach</strong></td>
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<tr>
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<tr>
<td>9</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td><strong>West: King Street West Approach</strong></td>
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</tr>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td><strong>All Vehicles</strong></td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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<th>Movement Performance - Pedestrians</th>
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<td>----------</td>
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</tr>
<tr>
<td>P3</td>
</tr>
<tr>
<td>P4</td>
</tr>
<tr>
<td><strong>All Pedestrians</strong></td>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
## AM Peak

### MOVEMENT SUMMARY

**Site: Darby Street - Parkway Avenue AM - turning counts**

2015 AM Peak

#### Roundabout

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<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
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<td></td>
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<td>%</td>
<td>vic</td>
<td>sec</td>
<td>Veh</td>
<td>m</td>
<td>per veh</td>
<td>km/h</td>
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**South: Darby Street South Approach**

1. L2 21 4.8 0.616 6.0 LOS A 5.9 42.3 0.75 0.73 45.3
2. T1 493 2.2 0.616 6.0 LOS A 5.9 42.3 0.75 0.73 46.1
3. R2 135 1.5 0.616 10.5 LOS A 5.9 42.3 0.75 0.73 46.4
3u U 5 0.0 0.616 12.2 LOS A 5.9 42.3 0.75 0.73 47.1

Approach 654 2.1 0.616 7.0 LOS A 5.9 42.3 0.75 0.73 46.2

**East: Parkway Avenue East Approach**

4. L2 88 3.4 0.383 6.2 LOS A 2.6 18.5 0.70 0.73 45.1
5. T1 152 1.3 0.383 5.8 LOS A 2.6 18.5 0.70 0.73 46.2
6. R2 92 3.3 0.383 10.3 LOS A 2.6 18.5 0.70 0.73 46.2
6u U 1 0.0 0.383 12.0 LOS A 2.6 18.5 0.70 0.73 47.2

Approach 333 2.4 0.383 7.1 LOS A 2.6 18.5 0.70 0.73 45.9

**North: Darby Street North Approach**

7. L2 24 4.2 0.426 5.6 LOS A 3.0 21.9 0.71 0.70 45.5
8. T1 301 4.7 0.426 5.7 LOS A 3.0 21.9 0.71 0.70 46.4
9. R2 64 0.0 0.426 10.1 LOS A 3.0 21.9 0.71 0.70 46.7
9u U 2 50.0 0.426 13.6 LOS A 3.0 21.9 0.71 0.70 46.7

Approach 391 4.1 0.426 6.4 LOS A 3.0 21.9 0.71 0.70 46.4

**West: Parkway Avenue West Approach**

10. L2 74 0.0 0.559 11.9 LOS A 5.0 36.5 0.93 1.05 42.6
11. T1 220 4.1 0.559 11.7 LOS A 5.0 36.5 0.93 1.05 43.5
12. R2 54 5.6 0.559 16.2 LOS B 5.0 36.5 0.93 1.05 43.5
12u U 1 100.0 0.559 23.7 LOS B 5.0 36.5 0.93 1.05 43.8

Approach 349 3.7 0.559 12.5 LOS A 5.0 36.5 0.93 1.05 43.3

All Vehicles 1727 3.0 0.616 8.0 LOS A 5.9 42.3 0.77 0.78 45.6

---

**Level of Service (LOS) Method:** Delay (RTA NSW)

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: AECOM AUSTRALIA PTY LTD | Processed: Tuesday, 24 November 2015 1:11:01 PM

Project: \ausyd1fp001\Projects\604X\60447663\4.1 Transport Planning\SIDRA\Darby Street - Parkway Avenue.sip6
**AM Peak**

**MOVEMENT SUMMARY**

**Site: Darby Street - Queen Street - AM turning counts**

2015 AM Peak  
Signals - Fixed Time Isolated  
Cycle Time = 63 seconds (User-Given Phase Times)

**Movement Performance - Vehicles**

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Level of Service (LOS) Method: Delay (RTA NSW).  
Vehicle movement LOS values are based on average delay per movement  
Intersection and Approach LOS values are based on average delay for all vehicle movements.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

**Movement Performance - Pedestrians**

<table>
<thead>
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<th>Mov ID</th>
<th>Description</th>
<th>Demand Flow ped/h</th>
<th>Average Delay sec</th>
<th>Level of Service</th>
<th>Average Back of Queue Pedestrian Distance m</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate ped per ped</th>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)  
Pedestrian movement LOS values are based on average delay per pedestrian movement.  
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: AECOM AUSTRALIA PTY LTD | Processed: Tuesday, 24 November 2015 12:20:19 PM  
Project: \ausyd1fp001\Projects\604X\60447663\4. Tech work area\4.1 Transport Planning\SIDRA\Darby Street - Queen Street.sip6
AM Peak

**MOVEMENT SUMMARY**

Site: Mosbri Crescent - Swan Street - Hillview Crescent AM - turning counts

2015 AM Peak
Giveaway / Yield (Two-Way)

### Movement Performance - Vehicles

<table>
<thead>
<tr>
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<th>ODMo v</th>
<th>Demand Flows</th>
<th>HV %</th>
<th>v/c</th>
<th>Average Delay sec</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance m</th>
<th>Prop. Queued veh</th>
<th>Effective Stop Rate per veh</th>
<th>Average Speed km/h</th>
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<td>0.08</td>
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<td>NorthEast: Mosbri Crescent Northeast Approach</td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
## AM Peak

### MOVEMENT SUMMARY

**Site: Mosbri Crescent - Kitchener Parade AM - turning counts**

2015 AM Peak
Giveaway / Yield (Two-Way)

### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>OD Mov</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<tbody>
<tr>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are **Not Applicable** for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

**SIDRA Standard Delay Model** is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: **SIDRA Standard (Akçelik M3D)**.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
## AM Peak
### MOVEMENT SUMMARY

**Site:** Kitchener Parade - Swan Street AM - turning counts

### 2015 AM Peak
**Stop (Two-Way)**

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
<th>Mov ID</th>
<th>ODMo v</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<tbody>
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<td>LOS A</td>
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**Level of Service (LOS) Method: Delay (RTA NSW).**

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Revision B – 22-Dec-2015
**PM Peak**

**MOVEMENT SUMMARY**

**Site: King Street - Darby Street - PM turning counts**

2015 PM Peak
Signals - Fixed Time Isolated  Cycle Time = 90 seconds (User-Given Phase Times)

### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>OD/Mov</th>
<th>Demand Flows</th>
<th>Degree Saturation</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<td>Veh/m</td>
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<td>km/h</td>
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<td><strong>East: King Street East Approach</strong></td>
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**Level of Service (LOS) Method:** Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

### Movement Performance - Pedestrians

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<thead>
<tr>
<th>Mov ID</th>
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<th>Level of Service</th>
<th>Average Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
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**Level of Service (LOS) Method:** SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
### PM Peak

**MOVEMENT SUMMARY**

**Site: Darby Street - Parkway Avenue PM - turning counts**

#### 2015 PM Peak

**Roundabout**

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<th>Mov ID</th>
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<th>95% % Back of Queue</th>
<th>Prop. Queued</th>
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**Level of Service (LOS) Method:** Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement

**Intersection and Approach LOS values are based on average delay for all vehicle movements.**

**Roundabout Capacity Model:** SIDRA Standard.

**SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.**

**Gap-Acceptance Capacity:** SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
PM Peak

MOVEMENT SUMMARY

Site: Darby Street - Queen Street - PM turning counts

2015 PM Peak

Signals - Fixed Time Isolated  Cycle Time = 62 seconds (User-Given Phase Times)

Movement Performance - Vehicles

<table>
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<tr>
<th>Mov ID</th>
<th>Demand Flows</th>
<th>Deg. Satn v/c</th>
<th>Average Delay (sec)</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance (m)</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed (km/h)</th>
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</thead>
</table>
| South: Darby Street South Approach
1 | L2 | 14 | 0.0 | 0.013 | 9.7 | LOS A | 0.2 | 1.3 | 0.45 | 0.57 | 39.4 |
| 2 | T1 | 374 | 2.7 | 0.525 | 10.8 | LOS A | 8.7 | 61.9 | 0.70 | 0.64 | 35.6 |
| 3 | R2 | 54 | 1.9 | 0.525 | 14.3 | LOS A | 8.7 | 61.9 | 0.70 | 0.64 | 38.6 |
| Approach | | 442 | 2.5 | 0.525 | 11.2 | LOS A | 8.7 | 61.9 | 0.70 | 0.63 | 36.1 |
| East: Queen Street East Approach
4 | L2 | 44 | 2.3 | 0.100 | 24.7 | LOS B | 1.1 | 7.5 | 0.81 | 0.71 | 34.4 |
| 5 | T1 | 2 | 0.0 | 0.494 | 22.8 | LOS B | 4.9 | 35.1 | 0.91 | 0.80 | 36.4 |
| 6 | R2 | 177 | 2.8 | 0.494 | 27.4 | LOS B | 4.9 | 35.1 | 0.91 | 0.80 | 33.4 |
| Approach | | 223 | 2.7 | 0.494 | 26.9 | LOS B | 4.9 | 35.1 | 0.89 | 0.78 | 33.6 |
| North: Darby Street North Approach
7 | L2 | 137 | 1.5 | 0.132 | 10.2 | LOS A | 1.9 | 13.8 | 0.50 | 0.63 | 39.2 |
| 8 | T1 | 54 | 1.1 | 0.583 | 9.2 | LOS A | 10.7 | 75.9 | 0.67 | 0.60 | 36.3 |
| 9 | R2 | 16 | 0.0 | 0.583 | 12.6 | LOS A | 10.7 | 75.9 | 0.67 | 0.60 | 39.4 |
| Approach | | 700 | 1.1 | 0.583 | 9.5 | LOS A | 10.7 | 75.9 | 0.64 | 0.61 | 36.9 |
| West: Queen Street West Approach
10 | L2 | 35 | 0.0 | 0.078 | 24.5 | LOS B | 0.8 | 5.8 | 0.80 | 0.70 | 34.4 |
| 11 | T1 | 3 | 0.0 | 0.074 | 20.1 | LOS B | 0.6 | 4.5 | 0.80 | 0.68 | 37.6 |
| 12 | R2 | 24 | 0.0 | 0.074 | 24.6 | LOS B | 0.6 | 4.5 | 0.80 | 0.68 | 34.4 |
| Approach | | 62 | 0.0 | 0.078 | 24.3 | LOS B | 0.8 | 5.8 | 0.80 | 0.69 | 34.5 |
| All Vehicles | | 1427 | 1.8 | 0.583 | 13.4 | LOS A | 10.7 | 75.9 | 0.70 | 0.65 | 36.0 |

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>Description</th>
<th>Demand Flow (ped/h)</th>
<th>Average Delay (sec)</th>
<th>Level of Service</th>
<th>Average Back of Queue Distance (m)</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed per ped</th>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: AECOM AUSTRALIA PTY LTD  |  Processed: Tuesday, 24 November 2015 12:20:20 PM
Project: \ausyd1fp001\Projects\604X\60447663\4. Tech work area\4.1 Transport Planning\SIDRA\Darby Street - Queen Street.sip6
### PM Peak

**MOVEMENT SUMMARY**

Site: Mosbri Crescent - Swan Street - Hillview Crescent PM - turning counts

2015 PM Peak
Giveway / Yield (Two-Way)

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
<th>Mov ID</th>
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<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate per veh</th>
<th>Average Speed km/h</th>
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<td>0.026</td>
<td>0.0</td>
<td>LOS A</td>
<td>0.0</td>
<td>0.0</td>
<td>0.00</td>
<td>0.13</td>
<td>49.2</td>
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<td>50</td>
<td>2.0</td>
<td>0.026</td>
<td>1.1</td>
<td>NA</td>
<td>0.0</td>
<td>0.0</td>
<td>0.00</td>
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<td>0.6</td>
<td>0.05</td>
<td>0.23</td>
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</table>

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

---

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Organisation: AECOM AUSTRALIA PTY LTD | Processed: Tuesday, 8 December 2015 11:26:03 AM
Project: \ausyd1fp001\Projects\604X\60447663\4.1 Transport Planning\SIDRA\Hillview - Mosbri Crescent - Swan Street.sip6
PM Peak

MOVEMENT SUMMARY

Site: Mosbri Crescent - Kitchener Parade PM - turning counts

2015 PM Peak
Giveaway / Yield (Two-Way)

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate per veh</th>
<th>Average Speed km/h</th>
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<tbody>
<tr>
<td>South: Kitchener Parade South Approach</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2 T1 0.0</td>
<td>0.022</td>
<td>1.0 LOS A</td>
<td>0.1 0.5</td>
<td>0.09 0.15</td>
<td>49.0</td>
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<tr>
<td>3 R2 9.1</td>
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<td>4.8 LOS A</td>
<td>0.1 0.5</td>
<td>0.09 0.15</td>
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<td>East: Mosbri Crescent East Approach</td>
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<tr>
<td>4 L2 22</td>
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<td>0.018</td>
<td>4.8 LOS A</td>
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<td>0.14 0.50</td>
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<td>0.018</td>
<td>4.9 LOS A</td>
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<td>0.14 0.50</td>
<td>45.9</td>
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<td>0.018</td>
<td>4.8 LOS A</td>
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<td>0.14 0.50</td>
<td>46.2</td>
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<tr>
<td>North: Kitchener Parade North Approach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 L2 1</td>
<td>0.0</td>
<td>0.030</td>
<td>4.6 LOS A</td>
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<td>8 T1 57</td>
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<td>0.030</td>
<td>0.0 LOS A</td>
<td>0.0 0.0</td>
<td>0.00 0.01</td>
<td>49.9</td>
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<tr>
<td>Approach 58</td>
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<td>0.1 NA</td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
PM Peak
MOBEMENT SUMMARY

Site: Kitchener Parade - Swan Street PM - turning counts

2015 PM Peak
Stop (Two-Way)

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>OD Mov</th>
<th>Demand</th>
<th>Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total veh/h</td>
<td>%</td>
<td>sec</td>
<td></td>
<td></td>
<td>Veh</td>
<td></td>
<td>veh per veh</td>
<td>km/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>veh</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

South: Kitchener Parade South Approach
1  L2   54.0 0.0  0.51 7.6 LOS A 0.2 1.4 0.13 0.92 45.0
2  T1   8.0 0.0  0.51 8.0 LOS A 0.2 1.4 0.13 0.92 44.8
3  R2   3.0 0.0  0.51 7.9 LOS A 0.2 1.4 0.13 0.92 44.6
Approach 65.0 0.0  0.51 7.7 LOS A 0.2 1.4 0.13 0.92 45.0

East: Swan Street East Approach
4  L2   5.0 0.0  0.30 4.6 LOS A 0.0 0.2 0.02 0.08 49.0
5  T1   50.0 0.0  0.30 0.0 LOS A 0.0 0.2 0.02 0.08 49.5
6  R2   3.0 0.0  0.30 4.8 LOS A 0.0 0.2 0.02 0.08 48.5
Approach 58.0 0.0  0.30 0.7 NA 0.0 0.2 0.02 0.08 49.4

North: Kitchener Parade North Approach
7  L2   4.0 0.0  0.092 7.6 LOS A 0.3 2.3 0.28 0.92 44.8
8  T1   16.0 0.0  0.092 7.9 LOS A 0.3 2.3 0.28 0.92 44.6
9  R2   59.0 0.0  0.092 8.3 LOS A 0.3 2.3 0.28 0.92 44.4
Approach 79.0 0.0  0.092 8.2 LOS A 0.3 2.3 0.28 0.92 44.5

West: Swan Street West Approach
10 L2  29.0 0.0  0.063 4.7 LOS A 0.3 1.8 0.12 0.32 47.4
11 T1  43.0 0.0  0.063 0.1 LOS A 0.3 1.8 0.12 0.32 47.8
12 R2  42.0 0.0  0.063 4.7 LOS A 0.3 1.8 0.12 0.32 46.9
Approach 114.0 0.0  0.063 3.0 NA 0.3 1.8 0.12 0.32 47.4

All Vehicles 316.0 0.3  0.092 4.8 NA 0.3 2.3 0.14 0.55 46.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Future Intersection SIDRA Results
AM Peak

MOVEMENT SUMMARY

Site: King Street - Darby Street - AM with development

AM Peak with development
Signals - Fixed Time Isolated    Cycle Time = 71 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>ODO Mo v</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<td>Total HV veh/h</td>
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<td>sec</td>
<td>LOS</td>
<td>veh</td>
<td>per veh</td>
<td>km/h</td>
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<tr>
<td>South: Darby Street South Approach</td>
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<td>1 L2</td>
<td>189</td>
<td>7.4</td>
<td>0.537</td>
<td>21.5</td>
<td>LOS B</td>
<td>10.3, 76.9</td>
<td>0.82</td>
<td>0.75</td>
<td>33.0</td>
</tr>
<tr>
<td>2 T1</td>
<td>194</td>
<td>7.2</td>
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<td>18.0</td>
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<td>10.3, 76.9</td>
<td>0.82</td>
<td>0.75</td>
<td>32.9</td>
</tr>
<tr>
<td>3 R2</td>
<td>156</td>
<td>5.1</td>
<td>0.465</td>
<td>23.1</td>
<td>LOS B</td>
<td>4.1, 30.1</td>
<td>0.91</td>
<td>0.77</td>
<td>31.9</td>
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<tr>
<td>Approach</td>
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<td>LOS B</td>
<td>10.3, 76.9</td>
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<td>0.75</td>
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<td>East: King Street East Approach</td>
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<tr>
<td>4 L2</td>
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<td>5 T1</td>
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<td>LOS C</td>
<td>6.6, 48.6</td>
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<td>LOS C</td>
<td>6.6, 48.6</td>
<td>0.96</td>
<td>0.85</td>
<td>30.2</td>
</tr>
<tr>
<td>North: Darby Street North Approach</td>
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<td></td>
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</tr>
<tr>
<td>7 L2</td>
<td>48</td>
<td>0.0</td>
<td>0.689</td>
<td>34.5</td>
<td>LOS C</td>
<td>9.4, 67.7</td>
<td>0.97</td>
<td>0.92</td>
<td>30.0</td>
</tr>
<tr>
<td>8 T1</td>
<td>240</td>
<td>4.6</td>
<td>0.689</td>
<td>31.3</td>
<td>LOS C</td>
<td>9.4, 67.7</td>
<td>0.97</td>
<td>0.92</td>
<td>29.7</td>
</tr>
<tr>
<td>9 R2</td>
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<td>1.7, 12.7</td>
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<td>0.73</td>
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</tr>
<tr>
<td>Approach</td>
<td>347</td>
<td>4.0</td>
<td>0.689</td>
<td>31.3</td>
<td>LOS C</td>
<td>9.4, 67.7</td>
<td>0.95</td>
<td>0.89</td>
<td>29.8</td>
</tr>
<tr>
<td>West: King Street West Approach</td>
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<td>10 L2</td>
<td>75</td>
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<td>2.7, 19.8</td>
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<td>0.60</td>
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<tr>
<td>11 T1</td>
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<td>0.722</td>
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<td>0.722</td>
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<td>13.3, 95.0</td>
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<td>1.01</td>
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<td>Approach</td>
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<td>21.3</td>
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<td>13.3, 95.0</td>
<td>0.85</td>
<td>0.92</td>
<td>32.4</td>
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<td>All Vehicles</td>
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<td>24.3</td>
<td>LOS B</td>
<td>13.3, 95.0</td>
<td>0.88</td>
<td>0.85</td>
<td>31.6</td>
</tr>
</tbody>
</table>

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

### Movement Performance - Pedestrians

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>Description</th>
<th>Demand Flow</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>Average Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
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<tr>
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<td></td>
<td>ped/h</td>
<td>sec</td>
<td>LOS</td>
<td>m</td>
<td>per ped</td>
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<td>P3</td>
<td>North Full Crossing</td>
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<td>29.8</td>
<td>LOS C</td>
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<td>West Full Crossing</td>
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<td>All Pedestrians</td>
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<td>LOS C</td>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.
MOVEMENT SUMMARY

Site: Darby Street - Parkway Avenue - AM with development

AM Peak with development
Roundabout

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mov ID</td>
</tr>
<tr>
<td>Total ve/h</td>
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</tbody>
</table>

South: Darby Street South Approach
1 L2 21 4.8 0.609 6.2 LOS A 5.8 41.4 0.75 0.74 45.3
2 T1 474 2.3 0.609 6.2 LOS A 5.8 41.4 0.75 0.74 46.1
3 R2 135 1.5 0.609 10.7 LOS A 5.8 41.4 0.75 0.74 46.3
3u U 15 0.0 0.609 12.4 LOS A 5.8 41.4 0.75 0.74 47.0
Approach 635 2.2 0.609 7.2 LOS A 5.8 41.4 0.75 0.74 46.1

East: Parkway Avenue East Approach
4 L2 88 3.4 0.393 6.4 LOS A 2.7 19.2 0.72 0.75 45.0
5 T1 152 1.3 0.393 6.0 LOS A 2.7 19.2 0.72 0.75 46.1
6 R2 92 3.3 0.393 10.5 LOS A 2.7 19.2 0.72 0.75 46.1
6u U 1 0.0 0.393 12.2 LOS A 2.7 19.2 0.72 0.75 47.1
Approach 333 2.4 0.393 7.3 LOS A 2.7 19.2 0.72 0.75 45.8

North: Darby Street North Approach
7 L2 24 4.2 0.452 5.7 LOS A 3.3 23.6 0.72 0.71 45.4
8 T1 310 4.5 0.452 5.8 LOS A 3.3 23.6 0.72 0.71 46.3
9 R2 80 0.0 0.452 10.1 LOS A 3.3 23.6 0.72 0.71 46.6
9u U 2 50.0 0.452 13.7 LOS A 3.3 23.6 0.72 0.71 46.6
Approach 416 3.8 0.452 6.6 LOS A 3.3 23.6 0.72 0.71 46.3

West: Parkway Avenue West Approach
10 L2 75 0.0 0.548 11.3 LOS A 4.9 35.2 0.92 1.03 42.9
11 T1 220 4.1 0.548 11.1 LOS A 4.9 35.2 0.92 1.03 43.8
12 R2 54 5.6 0.548 15.7 LOS B 4.9 35.2 0.92 1.03 43.8
12u U 1 100.0 0.548 23.0 LOS B 4.9 35.2 0.92 1.03 44.1
Approach 350 3.7 0.548 11.9 LOS A 4.9 35.2 0.92 1.03 43.6

All Vehicles 1734 2.9 0.609 8.0 LOS A 5.8 41.4 0.77 0.79 45.6

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
### MOVEMENT SUMMARY

**Site:** Darby Street - Queen Street - AM with development

AM Peak with development

Signals - Fixed Time Isolated  Cycle Time = 63 seconds (User-Given Phase Times)

#### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>ODMo</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<tbody>
<tr>
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<td></td>
<td>Total HV</td>
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<td>veh/h % v/c</td>
<td>sec</td>
<td>veh</td>
<td>Distance</td>
<td>m</td>
<td>per veh</td>
<td>km/h</td>
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**South: Darby Street South Approach**

1. L2 17 0.0 0.016 10.1 LOS A 0.2 1.6 0.46 0.58 39.2
2. T1 455 4.4 0.522 9.4 LOS A 9.4 68.6 0.66 0.60 36.2
3. R2 35 8.6 0.522 13.0 LOS A 9.4 68.6 0.66 0.60 39.2

**Approach**

4. L2 507 4.5 0.522 9.7 LOS A 9.4 68.6 0.66 0.60 36.5

**East: Queen Street East Approach**

4. L2 59 3.4 0.128 24.5 LOS B 1.4 10.3 0.80 0.72 34.4
5. T1 2 0.0 0.459 22.3 LOS B 5.0 35.2 0.89 0.79 36.6
6. R2 181 1.7 0.459 26.9 LOS B 5.0 35.2 0.89 0.79 33.5

**Approach**

4. L2 242 2.1 0.459 26.2 LOS B 5.0 35.2 0.87 0.77 33.8

**North: Darby Street North Approach**

7. L2 80 2.5 0.079 10.4 LOS A 1.1 8.1 0.49 0.62 39.1
8. T1 336 6.0 0.358 8.4 LOS A 6.0 44.1 0.59 0.52 36.6
9. R2 14 0.0 0.358 11.9 LOS A 6.0 44.1 0.59 0.52 39.7

**Approach**

4. L2 430 5.1 0.358 8.9 LOS A 6.0 44.1 0.57 0.54 37.1

**West: Queen Street West Approach**

10. L2 11 0.0 0.023 23.7 LOS B 0.3 1.8 0.77 0.65 34.7
11. T1 5 0.0 0.030 19.3 LOS B 0.3 2.0 0.78 0.61 38.4
12. R2 7 0.0 0.030 23.9 LOS B 0.3 2.0 0.78 0.61 35.1

**Approach**

4. L2 23 0.0 0.030 22.8 LOS B 0.3 2.0 0.77 0.63 35.6

**All Vehicles**

4. L2 1202 4.2 0.522 13.0 LOS A 9.4 68.6 0.87 0.61 36.1

**Level of Service (LOS) Method: Delay (RTA NSW).**
Vehicle movement LOS values are based on average delay per movement

**Intersection and Approach LOS values are based on average delay for all vehicle movements.**

**SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.**

**Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).**
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

#### Movement Performance - Pedestrians

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>Description</th>
<th>Demand Flow</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>Average Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ped/h</td>
<td>sec</td>
<td></td>
<td>m</td>
<td></td>
<td></td>
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</table>

**South Full Crossing**

- P1 53 23.2 LOS C 0.1 0.1 0.86 0.86
- P2 53 9.7 LOS A 0.1 0.1 0.56 0.56
- P3 53 23.2 LOS C 0.1 0.1 0.86 0.86
- P4 53 9.7 LOS A 0.1 0.1 0.56 0.56

**All Pedestrians**

- 211 16.5 LOS B 0.71 0.71

**Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)**

**Pedestrian movement LOS values are based on average delay per pedestrian movement.**

**Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.**

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Project: \ausyd1fp001\Projects\604X\60447663\4. Tech work area\4.1 Transport Planning\SIDRA\Darby Street - Queen Street.sip6

P:\604X\604476636. Draft docs\6.1 Reports\Newcastle NBN_TIA_RevB_Final_151222.docx
Revision B – 22-Dec-2015
# MOVEMENT SUMMARY

**Site:** Mosbri Crescent - Swan Street - Hillview Crescent - AM with development

**AM Peak with development**

**Giveaway / Yield (Two-Way)**

## Movement Performance - Vehicles

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<thead>
<tr>
<th>Mov ID</th>
<th>ODMo</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<td>Total HV v/c</td>
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<td>veh/h sec</td>
<td>%</td>
<td>veh m</td>
<td>per veh</td>
<td>km/h</td>
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**SouthEast: Hillview Crescent Southeast Approach**

| 5     | T1   | 25 0.0 0.015 | 0.0      | LOS A 0.0 0.2 | 0.02 0.08 49.5 |
| 6     | R2   | 4 0.0 0.015  | 4.6      | LOS A 0.0 0.2 | 0.02 0.08 48.6 |
| Approach | 29 0.0 0.015 | 0.6 NA 0.0 0.2 | 0.02 0.08 49.4 |

**NorthEast: Mosbri Crescent Northeast Approach**

| 7     | L2   | 3 0.0 0.043  | 4.6      | LOS A 0.1 1.0 | 0.10 0.53 46.4 |
| 9     | R2   | 51 0.0 0.043 | 4.7      | LOS A 0.1 1.0 | 0.10 0.53 46.0 |
| Approach | 54 0.0 0.043 | 4.7 LOS A 0.1 1.0 | 0.10 0.53 46.0 |

**NorthWest: Swan Street Northwest Approach**

| 10    | L2   | 4 25.0 0.009 | 4.8      | LOS A 0.0 0.0 | 0.00 0.13 48.5 |
| 11    | T1   | 13 0.0 0.009 | 0.0      | LOS A 0.0 0.0 | 0.00 0.13 49.4 |
| Approach | 17 5.9 0.009 | 11 NA 0.0 0.0 | 0.00 0.13 49.2 |
| All Vehicles | 100 1.0 0.043 | 2.9 NA 0.1 1.0 | 0.06 0.33 47.5 |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

---

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Project: \ausyd\1fp001\Projects\604X\60447663\4. Tech work area\4.1 Transport Planning\SIDRA\Hillview - Mosbri Crescent - Swan Street.sip6
### MOVEMENT SUMMARY

**Site:** Mosbri Crescent - Kitchener Parade - AM with development

**Giveaway / Yield (Two-Way)**

<table>
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<tr>
<th>Movement Performance - Vehicles</th>
<th>Mov ID</th>
<th>ODMo v</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue Vehicles</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
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<td>Total HV</td>
<td></td>
<td>sec</td>
<td>veh/m</td>
<td>veh/m</td>
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<td>veh/m/veh</td>
<td>km/h</td>
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<td>0.0 LOS A</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>49.8</td>
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<td>3</td>
<td>R2</td>
<td>3</td>
<td>0.0</td>
<td>0.037</td>
<td>4.7 LOS A</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
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<td>0.13</td>
<td>0.52</td>
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<td>0.00</td>
<td>0.02</td>
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</tr>
<tr>
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<td>8</td>
<td>T1</td>
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<td>0.025</td>
<td>0.0 LOS A</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
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<td>0.0</td>
<td>0.025</td>
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<td>0.00</td>
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<td>48.4</td>
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</table>

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
### MOVEMENT SUMMARY

**Site:** Kitchener Parade - Swan Street - AM with development

**AM Peak with development**

**Stop (Two-Way)**

**Movement Performance - Vehicles**

<table>
<thead>
<tr>
<th>Movement ID</th>
<th>OD Movement</th>
<th>Demand Flows</th>
<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed</th>
</tr>
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<tbody>
<tr>
<td>South: Kitchener Parade South Approach</td>
<td>1 L2</td>
<td>44 veh/h 0.0 v/c</td>
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<td>7.7 sec</td>
<td>LOS A 0.2</td>
<td>1.7 veh</td>
<td>0.17 veh</td>
<td>0.93 veh/km</td>
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<tr>
<td></td>
<td>2 T1</td>
<td>28 veh/h 0.0 v/c</td>
<td>0.065</td>
<td>7.9 sec</td>
<td>LOS A 0.2</td>
<td>1.7 veh</td>
<td>0.17 veh</td>
<td>0.93 veh/km</td>
</tr>
<tr>
<td></td>
<td>3 R2</td>
<td>5 veh/h 0.0 v/c</td>
<td>0.065</td>
<td>7.7 sec</td>
<td>LOS A 0.2</td>
<td>1.7 veh</td>
<td>0.17 veh</td>
<td>0.93 veh/km</td>
</tr>
<tr>
<td></td>
<td>Approach</td>
<td>77 veh/h 0.0 v/c</td>
<td>0.065</td>
<td>7.7 sec</td>
<td>LOS A 0.2</td>
<td>1.7 veh</td>
<td>0.17 veh</td>
<td>0.93 veh/km</td>
</tr>
<tr>
<td>East: Swan Street East Approach</td>
<td>4 L2</td>
<td>8 veh/h 0.0 v/c</td>
<td>0.039</td>
<td>4.6 sec</td>
<td>LOS A 0.0</td>
<td>0.3 veh</td>
<td>0.03 veh</td>
<td>0.10 veh</td>
</tr>
<tr>
<td></td>
<td>5 T1</td>
<td>61 veh/h 1.6 v/c</td>
<td>0.039</td>
<td>0.0 sec</td>
<td>LOS A 0.0</td>
<td>0.3 veh</td>
<td>0.03 veh</td>
<td>0.10 veh</td>
</tr>
<tr>
<td></td>
<td>6 R2</td>
<td>6 veh/h 0.0 v/c</td>
<td>0.039</td>
<td>4.7 sec</td>
<td>LOS A 0.0</td>
<td>0.3 veh</td>
<td>0.03 veh</td>
<td>0.10 veh</td>
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<td>NA</td>
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<td>0.03 veh</td>
<td>0.10 veh</td>
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<tr>
<td>North: Kitchener Parade North Approach</td>
<td>7 L2</td>
<td>1 veh/h 0.0 v/c</td>
<td>0.104</td>
<td>7.5 sec</td>
<td>LOS A 0.4</td>
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<td>0.27 veh</td>
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<tr>
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<td>8 T1</td>
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<td>7.8 sec</td>
<td>LOS A 0.4</td>
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<td>0.92 veh/km</td>
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<tr>
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<td>9 R2</td>
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<tr>
<td>West: Swan Street West Approach</td>
<td>10 L2</td>
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<td>LOS A 0.2</td>
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<td>11 T1</td>
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<td>0.13 veh</td>
<td>0.42 veh/km</td>
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<tr>
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<td>12 R2</td>
<td>27 veh/h 7.4 v/c</td>
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<td>4.8 sec</td>
<td>LOS A 0.2</td>
<td>1.2 veh</td>
<td>0.13 veh</td>
<td>0.42 veh/km</td>
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<td>1.2 veh</td>
<td>0.13 veh</td>
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<td>0.15 veh</td>
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</tbody>
</table>

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
**PM Peak**

**MOVEMENT SUMMARY**

Site: King Street - Darby Street - PM with development

PM Peak with development

Signals - Fixed Time Isolated      Cycle Time = 90 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Mov ID</th>
<th>ODMo v</th>
<th>Demand Flows (veh/h)</th>
<th>Degree Saturation (v/c)</th>
<th>Average Delay (sec)</th>
<th>Level of Service</th>
<th>95% Back of Queue Distance (m)</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>South: Darby Street South Approach</strong></td>
<td></td>
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<td></td>
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<td></td>
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<td><strong>East: King Street East Approach</strong></td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

### Movement Performance - Pedestrians

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<thead>
<tr>
<th>Mov ID</th>
<th>Description</th>
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<th>Level of Service</th>
<th>Average Back of Queue Distance (m)</th>
<th>Prop. Queued</th>
<th>Effective Stop Rate</th>
<th>Average Speed (km/h)</th>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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**MOVEMENT SUMMARY**

Site: Darby Street - Parkway Avenue - PM with development

**PM Peak with development**

**Roundabout**

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<tr>
<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>3u</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td><strong>East: Parkway Avenue East Approach</strong></td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>6u</td>
</tr>
<tr>
<td><strong>Approach</strong></td>
</tr>
<tr>
<td><strong>North: Darby Street North Approach</strong></td>
</tr>
<tr>
<td>7</td>
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<tr>
<td>8</td>
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<td>9</td>
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<td>9u</td>
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<tr>
<td><strong>Approach</strong></td>
</tr>
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<td><strong>West: Parkway Avenue West Approach</strong></td>
</tr>
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<td>10</td>
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<td>11</td>
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<td>12u</td>
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<td><strong>Approach</strong></td>
</tr>
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<td><strong>All Vehicles</strong></td>
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</table>

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
MOVEMENT SUMMARY

Site: Darby Street - Queen Street - PM with development

PM Peak with development

Signals - Fixed Time Isolated  Cycle Time = 62 seconds (User-Given Phase Times)

<table>
<thead>
<tr>
<th>Movement Performance - Vehicles</th>
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<td>5 T1</td>
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<td>Approach</td>
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<td>North: Darby Street North Approach</td>
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<td>8 T1</td>
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<td>11 T1</td>
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<td>12 R2</td>
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<tr>
<td>Approach</td>
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<td>All Vehicles</td>
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</table>

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<table>
<thead>
<tr>
<th>Movement Performance - Pedestrians</th>
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<tr>
<td>P1</td>
</tr>
<tr>
<td>P2</td>
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<td>P3</td>
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<td>P4</td>
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<td>All Pedestrians</td>
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Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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## MOVEMENT SUMMARY

**Site:** Mosbri Crescent - Swan Street - Hillview Crescent – PM with development

**Giveaway / Yield (Two-Way)**

### Movement Performance - Vehicles

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<thead>
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<th>Movement Performance - Vehicles</th>
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<th>Deg. Satn</th>
<th>Average Delay</th>
<th>Level of Service</th>
<th>95% Back of Queue</th>
<th>Prop. Queued</th>
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<td>v/h</td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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### MOVEMENT SUMMARY

**Site:** Mosbri Crescent - Kitchener Parade - PM with development

**PM Peak with development**

**Giveway / Yield (Two-Way)**

#### Movement Performance - Vehicles

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<tr>
<th>Mov ID</th>
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<th>Deg. Satn</th>
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<th>Prop. Queued</th>
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<th>Average Speed</th>
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<td>m</td>
<td>per veh</td>
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Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
### MOVEMENT SUMMARY

**Site:** Kitchener Parade - Swan Street - PM with development

**PM Peak with development**

**Stop (Two-Way)**

#### Movement Performance - Vehicles

<table>
<thead>
<tr>
<th>Movement ID</th>
<th>Demand Flows (veh/h)</th>
<th>V/H Percentage (%)</th>
<th>Degree of Saturation (%)</th>
<th>Average Delay (sec)</th>
<th>Level of Service</th>
<th>95% Back of Queue Prop. Queued (veh)</th>
<th>Effective Stop Rate per veh</th>
<th>Average Speed (km/h)</th>
</tr>
</thead>
</table>
| **South: Kitchener Parade South Approach**  
1. L2 | 54 | 0.0 | 0.50 | 7.5 | LOS A | 0.2 | 1.4 | 0.06 | 0.97 | 45.0  
2. T1 | 8 | 0.0 | 0.50 | 8.2 | LOS A | 0.2 | 1.4 | 0.06 | 0.97 | 44.7  
3. R2 | 3 | 0.0 | 0.50 | 7.9 | LOS A | 0.2 | 1.4 | 0.06 | 0.97 | 44.6  
4. Approach | 65 | 0.0 | 0.50 | 7.6 | LOS A | 0.2 | 1.4 | 0.06 | 0.97 | 44.9 |
| **East: Swan Street East Approach**  
4. L2 | 5 | 0.0 | 0.15 | 4.7 | LOS A | 0.0 | 0.2 | 0.07 | 0.15 | 48.5  
5. T1 | 20 | 0.0 | 0.15 | 0.1 | LOS A | 0.0 | 0.2 | 0.07 | 0.15 | 48.9  
6. R2 | 3 | 0.0 | 0.15 | 4.9 | LOS A | 0.0 | 0.2 | 0.07 | 0.15 | 48.0  
7. Approach | 28 | 0.0 | 0.15 | 1.4 | NA | 0.0 | 0.2 | 0.07 | 0.15 | 48.7 |
| **North: Kitchener Parade North Approach**  
7. L2 | 4 | 0.0 | 0.71 | 7.7 | LOS A | 0.2 | 1.8 | 0.30 | 0.91 | 44.8  
8. T1 | 16 | 0.0 | 0.71 | 8.0 | LOS A | 0.2 | 1.8 | 0.30 | 0.91 | 44.6  
9. R2 | 41 | 2.4 | 0.71 | 8.5 | LOS A | 0.2 | 1.8 | 0.30 | 0.91 | 44.4  
10. Approach | 61 | 1.6 | 0.71 | 8.3 | LOS A | 0.2 | 1.8 | 0.30 | 0.91 | 44.5 |
| **West: Swan Street West Approach**  
10. L2 | 62 | 0.0 | 0.096 | 4.6 | LOS A | 0.3 | 2.1 | 0.06 | 0.30 | 47.7  
11. T1 | 75 | 0.0 | 0.096 | 0.0 | LOS A | 0.3 | 2.1 | 0.06 | 0.30 | 48.1  
12. R2 | 42 | 0.0 | 0.096 | 4.6 | LOS A | 0.3 | 2.1 | 0.06 | 0.30 | 47.2  
13. Approach | 179 | 0.0 | 0.096 | 2.7 | NA | 0.3 | 2.1 | 0.06 | 0.30 | 47.7  
| All Vehicles | 333 | 0.3 | 0.096 | 4.6 | NA | 0.3 | 2.1 | 0.10 | 0.53 | 46.6 |

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Addendum to Attachment C - Traffic Impact Assessment

Prepared by AECOM on 29 June 2017

Revised Figure 14 – Distribution of proposed outgoing trips – AM peak hour
CCL 25/07/17
LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE
THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL
ENVIRONMENTAL PLAN 2012

Amendment history

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<th>Date Adopted by Council</th>
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<td>1</td>
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Savings provisions

Any development application lodged but not determined prior to this section coming into effect will be determined taking into consideration the provisions of this section.

Land to which this section applies

This section applies to land identified in Map 1 – 11 Mosbri Crescent, The Hill:

*Map 1 – 11 Mosbri Crescent, The Hill*
Development (type/s) to which this section applies

This section applies to all development consisting:
- new buildings or structures

Applicable environmental planning instruments and legislation

The provisions of the following listed environmental planning instrument/s also apply to development applications to which this section applies:
- Newcastle Local Environmental Plan 2012
- State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development
- State Environmental Planning Policy No 71 – Coastal Protection.

In the event of any inconsistency between this section and the above listed environmental planning instruments, the environmental planning instruments will prevail to the extent of the inconsistency.

Note 1: Additional environmental planning instruments may also apply in addition to those listed above.

Note 2: Section 74E (3) of the Environmental Planning and Assessment Act 1979 enables an environmental planning instrument to exclude or modify the application of this DCP in whole or part.

Related sections

The following sections of this DCP will also apply to development to which this section applies:
- 3.00 Any applicable landuse specific provision under Part 3.00

Note: Any inconsistency between the locality specific provision and a provision in the following sections, the locality specific provision will prevail to the extent of the inconsistency.

- 4.02 Bush Fire Protection – within mapped bush fire area/zone
- 4.03 Mine Subsidence – within mine subsidence area
- 4.04 Safety and Security
- 7.01 Building Design Criteria
- 7.02 Landscaping, Open Space and Visual Amenity
- 7.03 Traffic, Parking and Access
- 7.05 Energy Efficiency
- 7.06 Stormwater
- 7.07 Water Efficiency
- 7.08 Waste Management.

The following sections of this DCP may also apply to development to which this section applies:
- 5.01 Soil Management – works resulting in any disturbance of soil and/or cut and fill
- 5.02 Land Contamination – land on register/where risk from previous use
- 5.03 Tree Management – trees within 5m of a development footprint or those trees likely to be affected by a development
- 5.04 Aboriginal Heritage – known/likely Aboriginal Heritage item/site and/or potential soil disturbance
- 5.05 Heritage Items – known heritage item or in proximity to a heritage item
- 5.06 Archaeological Management – known/likely archaeological site or potential soil disturbance
- 5.07 Heritage Conservation Areas – known conservation area
\*7.04 Movement Networks – where new roads, pedestrian or cycle paths are required.

**Associated technical manual/s**

- Nil

**Additional information**

- Urban Design Study - 11 Mosbri Crescent, The Hill (SJB Architects, 2016)

**Definitions**

A word or expression used in this development control plan has the same meaning as it has in Newcastle Local Environmental Plan 2012, unless it is otherwise defined in this development control plan.

Other words and expressions referred to within this section are defined within Section 9.00 - Glossary of this plan.

- **Human scale streetscape** - means a streetscape that is scaled for the pedestrian.
- **RFB** - Residential Flat Building

**Strategic overview**

The site is situated on the western edge of a hill, the summit of which is the heritage listed Obelisk in King Edward Park. The topography across the site drops sharply from Arcadia Park and Kitchener Parade on the eastern and northern boundaries into a relatively flat basin in the central and eastern sections of the site where the current NBN studio buildings are located fronting Mosbri Crescent. Moving west of the site, topography continues to slope down towards Darby Street.

Future development on the site should provide for a range of housing typologies which is consistent with Council's Local Planning Strategy. The residential flat buildings are to be located on the northern and central section of the site and orientated on a north-south axis to maximise their sunlight, whilst also minimising overshadowing and impacts on the existing and proposed residential amenity. Residential terraces are to be located along the southern boundary of the site.

Future development on the site should be designed taking into account the significant changes in topography on the site to enable buildings to fit in with, and respect, the surrounding topography (including ridgelines), streetscapes, built form and heritage context.

**Aims of this section**

1. To provide responsive and sustainable redevelopment of the site.
2. To ensure new development incorporates best practice principles and achieves a quality urban renewal outcome.
3. To ensure building orientation and footprints are designed to maximise solar access and allow for natural ventilation.
4. To allow for a sensitive transition of building height which responds to the surrounding built form, heritage and topography, including protection of ridgelines.
5. To provide a variety of housing typologies to provide interest to the site and to respond to topography.

6. To strengthen and reinforce the streetscapes of Mosbri Crescent and Kitchener Parade through human scaled streetscapes and well-defined landscape.

7. To increase the opportunity for pedestrian connections to local amenity beyond the site boundary including Arcadia Park, Mosbri Crescent Park and connections to services and transport.

8. To protect important views through building design and location.

9. To provide amenity and social inclusion through the provision of shared communal open space.

10. To incorporate the existing landscape to act as a buffer between the site and neighbouring sites.

11. To provide high amenity private open space in the form of balconies for apartments and rear gardens, courtyard spaces and upper level balconies for terrace houses.

6.14.01 Land use and development

Objectives

1. To ensure site layout and building typology supports the aims of this section.

Controls

General controls applying to all development to which this section applies

1. The preferred development layout and building typology for the Site is shown in Map 2 – Preferred site layout plan and building typology.

Note 1: "Despite the preferred development layout and building typology for the Site identified within this DCP, any development proposal on the land will need to demonstrate compliance with the minimum provision of Table A2.4 within 'Planning for Bush fire Protection 2006' (or successive guidelines) with respect to the provision of Asset Protection Zones."
Map 2 – Preferred Site layout plan and building typology
6.14.02 Building form

A. Floor space ratios

Objectives

1. To provide an appropriate density of development consistent with the established centres hierarchy.

2. Ensure building density, bulk and scale makes a positive contribution towards the desired built form of the locality as identified by the Local Planning Strategy, including the established centres hierarchy.

3. Encourage built form and massing of development that contributes to increased residential density and reflects the intended building typologies.

Controls

General controls applying to all development to which this section applies

1. Refer to Newcastle Local Environmental Plan 2012 for floor space ratio controls.

B. Height

Objectives

1. Ensure the scale of development enhances and makes a positive contribution towards the desired built form by reinforcing the established centres hierarchy.

2. Allow reasonable daylight access to all developments and the public domain.

3. Ensure building, bulk and scale makes a positive contribution towards the desired built form of the locality as identified by the Local Planning Strategy, including the established centres hierarchy.

4. Encourage built form and massing of development that contributes to increased residential density and reflects the intended building typologies.

5. Encourage a built form that reflects and responds to the site’s topography, including protection of ridge lines.

6. Provide sympathetic built forms that reflect a transition in building height from Kitchener Parade to Mosbri Crescent.

7. Respect the low scale character of adjacent residential precincts and heritage precincts by providing human scaled streetscape edges.

Controls

General controls applying to all development to which this section applies

1. Refer to the Newcastle Local Environmental Plan 2012 for building height controls.
2. Taller buildings are located and designed to maintain views from the Obelisk in King Edward Park.

Note: Refer also to Clause 5.6 Architectural roof features of the Newcastle Local Environmental Plan 2012.

C. Building setbacks

Objectives

1. To ensure setbacks are compatible with the streetscape and define the street edge.
2. Street wall heights retain the human scaled streetscape of Kitchener Parade and Mosbri Crescent.
3. Improve pedestrian amenity and circulation through and around the site.
4. Enable the retention of significant trees and provide the opportunity for street tree planting and public domain improvements.
5. Ensure rooftop communal areas are integrated into building form.

Controls

General controls applying to all development to which this section applies

1. Building setbacks are consistent with those shown on Map 3 – Building setbacks and Figures 1 - 5 – Building Cross sections.

2. Rooftop access is provided to the rooftop communal open space for Buildings A and B (as indicated on Map 4 - Landscape concept plan). This habitable space is limited in area to 20% of the roof plane of the floor below, is contained within the maximum height limit and is integrated with any rooftop architectural features.

Note 1: Building depths also respond to Apartment Design Guidelines (Department of Planning & Environment, 2015).

Note 2: Height limits have been set to enable habitable rooftop access for Buildings A and B. If this is not provided, then heights to roof planes are observed as per Figures 1 to 5.

Note 3: Refer to Clause 5.6 Architectural roof features of the Newcastle Local Environmental Plan 2012.

Note 4: Despite the minimum building setbacks identified within this DCP, any development proposal on the land will need to demonstrate compliance with the minimum provision of Table A2.4 within ‘Planning for Bush fire Protection 2006’ (or successive guidelines) with respect to the provision of Asset Protection Zones.”
Figure 1 – Building A Kitchener Parade cross section
Figure 2 – Building B Kitchener Parade cross section
Figure 3 – Building B Arcadia Park cross section

Detailed section 6, Building B Eastern Interface to Arcadia Park
Figure 4 – Building D Arcadia Park cross section

Detailed section 7, Building D Eastern Interface to Arcadia Park
Figure 5 - Building A Mosbri Crescent Cross Section

Detailed section 8, Building A Eastern Interface to Arcadia Park
D. Building design elements

Objectives

1. Encourage use of design elements and materials that reflect contemporary architectural styles but are sympathetic to adjoining heritage conservation areas.

Controls

General controls applying to all development to which this section applies

1. Building facades incorporate a range of balconies and fenestration for visual interest and improved amenity.

2. Utilise potential open space on upper levels by including roof gardens and terraces.

3. The selection of materials used for new development considers and respects the character of existing buildings in the surrounding streetscape.

4. Exterior colour schemes are co-ordinated and consistent with existing local character. Avoid bright extravagant colour schemes that do not contribute to an integrated streetscape and the local character.

5. Mechanical, service and telecommunication equipment are discreetly enclosed on roof tops so as not to diminish the aesthetic qualities of the precinct and the building.

Note: Refer also to Clause 5.6 Architectural roof features of the Newcastle Local Environmental Plan 2012.

6.14.03 Public Domain

A. Traffic and transport

Objectives

1. Provide for the parking needs of residents and visitors without adverse impacts on building bulk or streetscapes.

2. Minimise the impact of driveways on pedestrian access and streetscapes.

Controls

General controls applying to all development to which this section applies

1. Vehicular access to the site should be provided from Mosbri Crescent in the general locations shown in Map 2 – Preferred Site layout plan.

2. Car, motorcycle and bike parking is provided as per Section 7.03 Traffic, Parking and Access.
3. At grade car parking is only provided where:
   (a) it is set back or sleeved behind other uses
   (b) it is integrated into the built form and covered by upper levels of the development or upper level open space/landscape provision
   (c) it is not within front building setbacks
   (d) it is not impeding ability to meet minimum on-site landscape requirements.

4. New pedestrian footpaths are provided along street frontages.

5. New street tree planting is provided along Mosbri Crescent frontage and Kitchener Parade frontage.

Note: Existing street trees along Kitchener Parade may need to be removed to enable new footpath construction.

B. Open space and landscaping

Objectives

1. Provide high amenity communal and private open space.

2. Incorporate the existing landscape to the edges of the site to act as a buffer between the site and neighbouring sites.

3. Soften the visual impact of development.

Controls

General controls applying to all development to which this section applies

1. Landscape elements are to be provided generally in accordance with Map 4 – Landscape concept plan.

2. Deep soil areas to be located around the site’s northern, eastern and southern boundaries, incorporating existing trees and new tree planting.

2. Private amenity space is to be provided at the ground floor of each building and accessed directly by the adjacent dwelling. In the case of terraces (Building E), it will include the front and rear gardens.

3. Green roofs/soft landscaping treatments are to be provided on the roof planes of key buildings to reduce the visual impact of the development from key vantage points, in particular the Obelisk in King Edward Park.

4. Site fencing adjacent to Arcadia Park should be permeable (eg. metal picket) to enable surveillance and avoid graffiti.

5. Key pedestrian access throughout the site is separated from vehicular driveways.
6. Public pedestrian access through the site is provided between Mosbri Crescent and Kitchener Parade (Refer Map 1). The access shall observe CPTED principles, including clear delineation from private open space areas.

**Note:** The public pedestrian access is to be covered by appropriate easements registered against the title of the land.
Map 4 – Landscape concept plan
CCL 25/07/17
LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE
THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL
ENVIRONMENTAL PLAN 2012

Attachment C: Gateway determination dated 22 December 2016
Mr Peter Chrystal  
Interim Chief Executive Officer  
Newcastle City Council  
PO Box 489  
Newcastle, NSW 2300  

Att: Steve Masia  

Dear Mr Chrystal,

**Planning Proposal to amend Newcastle Local Environmental Plan 2012**

I am writing in response to your Council’s request for a Gateway determination under section 56 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") in respect of the planning proposal to rezone the land bounded by Mosbri Crescent and Kitchener Parade The Hill, so as to enable it to be redeveloped for medium density residential housing.

As delegate of the Minister for Planning, I have now determined the planning proposal should proceed subject to the conditions in the attached Gateway determination.

I have also agreed the planning proposal's inconsistencies with S117 Directions 4.1 Acid Sulfate Soils and 6.3 Site Specific Provisions are of minor significance. No further approval is required in relation to these Directions.

The amending Local Environmental Plan (LEP) is to be finalised within 12 months of the week following the date of the Gateway determination. Council should aim to commence the exhibition of the planning proposal as soon as possible. Council's request for the Department of Planning and Environment to draft and finalise the LEP should be made 6 weeks prior to the projected publication date.

The State Government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under section 54(2)(d) of the EP&A Act if the timeframes outlined in this determination are not met.
Should you have any queries in regard to this matter, I have arranged for Mr Ben Holmes from the Hunter office to assist you. Mr Holmes can be contacted on (02) 4904 2700.

Yours sincerely,

Robert Hodgkins
A/Director Regions, Hunter and Central Coast Planning Services
22/12/16
Gateway Determination

Planning proposal PP_2016_NEWCA_010_00: to rezone the land bounded by Mosbri Crescent and Kitchener Parade, The Hill so as to enable it to be redeveloped for medium density residential housing.

I, the A/ Director Regions, Hunter and Central Coast at Department of Planning and Environment as delegate of the Minister for Planning, have determined under section 56(2) of the EP&A Act that an amendment to the Newcastle Local Environmental Plan (LEP) 2012 to rezone the land bounded by Mosbri Crescent and Kitchener Parade, The Hill so as to enable it to be redeveloped for medium density residential housing should proceed subject to the following conditions:

1. Prior to exhibition Council is to amend the planning proposal to refer to the Hunter Regional Plan 2036 and section 117 Direction 5.10 Implementation of Regional Plans and include Council’s assessment of consistency with that direction.

2. Community consultation is required under sections 56(2)(c) and 57 of the Environmental Planning and Assessment Act 1979 ("EP&A Act") as follows:

   a) the planning proposal must be made publicly available for a minimum of 28 days; and

   b) the relevant planning authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 5.5.2 of A Guide to Preparing LEPs (Department of Planning & Environment 2016).

3. Consultation is required with the following public authorities under section 56(2)(d) of the EP&A Act and must occur prior to exhibition;

   - NSW Mine Subsidence Board (s117 direction 4.2)
   - NSW Rural Fire Service (s117 direction 4.4)

   The public authorities are to be provided with a copy of the planning proposal and any relevant supporting material. The public authorities are to be given at least 21 days to comment on the proposal, or to indicate that they will require additional time to comment on the proposal. Public authorities may request additional information or additional matters to be addressed in the planning proposal.

4. A public hearing is not required to be held into the matter by any person or body under section 56(2)(e) of the EP&A Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).
5. The timeframe for completing the LEP is to be 12 months from the week following the date of the Gateway determination.

Dated 22nd day of December 2016.

Robert Hodgkins
A/Director Regions, Hunter and Central Coast Planning Services
Department of Planning and Environment

Delegate of the Minister for Planning
CCL 25/07/17
LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE
THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL
ENVIRONMENTAL PLAN 2012

Attachment D: Summary of submissions
**Summary of submissions**

The table below provides a summary of the issues raised within the written submissions made in relation to the public exhibition of Planning Proposal PP_2016_NEWCA_010_00 and the new draft Section 6.14 - 11 Mosbri Crescent, The Hill of Newcastle Development Control Plan 2012. Each submission comment is allocated a separate reference code to ensure all issues are addressed and to enable removal of personal information (including names and addresses) to ensure respondents privacy' is maintained. The table includes a response on each issue by the applicant's consultants and also provides comments and/or recommendations by Council's strategic planning staff.

<table>
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<th>Ref</th>
<th>Submission comment</th>
<th>Applicant's response</th>
<th>Staff comments/Recommended action</th>
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<tbody>
<tr>
<td>1A</td>
<td>General - Why were landowners adjoining the rezoning not contacted before the PP was prepared?</td>
<td>Not requested</td>
<td>Landowners who are part of the rezoning are consulted before a PP is prepared and reported to Council. Consultation with the broader community is only carried out during the public exhibition period if Gateway determination is provided to the PP by DPE. Until Gateway is received it is not certain that the planning proposal will proceed.</td>
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<td>1B</td>
<td>Planning Proposal - Section A 1 of the PP states that 'amenity and heritage of The Hill will be conserved while supporting new opportunities for expanding population in select area. Who made this assumption and on what basis?</td>
<td>Not requested</td>
<td>This statement is based on the assessment of background studies by Council's internal LEP Amendment Assessment Panel and Council's Urban Design Consultative Committee. The application was supported by an Urban Design Report, which demonstrated how the proposed bulk and scale of development could be accommodated given the topography of the site and local area.</td>
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<td>1C</td>
<td>Urban Design Study - Errors in notation on mapping (i.e. the distance markers are not consistently identified on different maps although same distance/scale depicted).</td>
<td>Urban Design Report updated.</td>
<td>Amended report attached to Planning Proposal.</td>
</tr>
<tr>
<td>1D</td>
<td>Urban Design Study - James Fletcher is not a medical hospital but a mental health facility.</td>
<td>Not requested</td>
<td>Noted - however this is irrelevant to the determination of the planning proposal. The proposal is not reliant on this facility being a hospital.</td>
</tr>
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<td>1E</td>
<td>Urban Design Study - Newcastle East Public School is already enrolled above capacity.</td>
<td>Not requested</td>
<td>Council is aware of the lack of capacity in the provision of public schools in this locality (and the city centre area), hence Strategic Planning staff have requested a response from State Government to ensure this is considered and addressed within their regional infrastructure planning.</td>
</tr>
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<td>1F</td>
<td>Urban Design Study - Darby Street is no more a commercial centre than most other streets within the City Centre.</td>
<td>Not requested</td>
<td>Darby Street (beyond Civic Park and the Newcastle Regional Art Gallery) is not technically part of the 'Newcastle City Centre' and has its own identity as a commercial centre. The Urban Design study is correct in identifying that the land is within the vicinity of a local commercial centre. Hence an increase in residential density is supported by the Planning Proposal.</td>
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<td>1I</td>
<td>Urban Design Study - Section 3.3 - biased opinion towards option three over the other options, despite no strong justification why this option is preferred.</td>
<td>Not requested</td>
<td>Noted - This proposal was applicant initiated, hence the request sought the option that provides the greatest yields. Council's role in the rezoning process is to assess and determine if the applicant's proposal is justifiable within the locality based on the Council's adopted Local Planning Strategy (LPS). The strategic directions in relation to residential land are aimed at ensuring sufficient housing capacity, diversity and density in well located areas to meet the future needs of the population. This site is identified as an area suitable for investigation for medium density development in the LPS. Option 3 was considered suitable and therefore endorsed within Council's Planning Proposal.</td>
</tr>
<tr>
<td>1J</td>
<td>Urban Design Study - Section 4 - proposed buildings are 16m higher than level of Kitchener Parade, which is not low impact.</td>
<td>Not requested</td>
<td>The taller building at Kitchener Pde (Building B) will appear as 4 levels from street level. The 4th level will be setback 4m. From street level at Kitchener Pde to the 4th level ceiling is 12.8m.</td>
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| 1K  | Traffic Impact Assessment - table 12 - the trip rate of 0.39 is inconsistent with RMS rate of 0.39 and 0.67. | As discussed within the report, the trip rate has been based on survey data for similar dwelling types within regional centres and in proximity to the NBN site. The trip rate used for high density dwelling is consistent with RMS’ Guide for Traffic Generating Developments which show the trip rate for regional areas range between:
  • 0.39 to 0.67 in the AM peak hour – used 0.39 (within RMS range)
  • 0.22 to 0.42 in the PM peak hour – used 0.42 (within RMS range)
As highlighted above, the trip rate used for high density dwellings are in accordance with RMS guidelines. Refer to Section 4.1 of the Traffic Impact Assessment. The Traffic Impact Assessment is included as an attachment to the Planning Proposal document. | No changes recommended |
| 1L  | Traffic Impact Assessment - why are % used rather than vehicle trips? | RMS trip rates were used to determine traffic generated by the proposed site. Refer to Section 4.1 of the Traffic Impact Assessment.
The percentages shown in Table 13 and Figure 14 relate to how the vehicle trips generated by the proposed development have been distributed onto the surrounding road network. | No changes recommended |
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<td>1M</td>
<td>Traffic Impact Assessment - Pit Street does not connect to Wolfe Street as shown in the map, hence where will traffic really go? Also why would traffic be going into the city centre when the site is within walking distance and there is nowhere to park within the city.</td>
<td>Noted, revised figure updated. The distribution of trips generated by the proposed development has been based on travel patterns of residents in the area using 2011 Journey to Work data. The proposed development is located within Travel Zone 6355 which has a high proportion of residents working in the Newcastle area.</td>
<td>Amended figure attached as an addendum to Attachment C - Traffic Impact Assessment of the Planning Proposal</td>
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<tr>
<td>2A</td>
<td>Character - Higher density redevelopment is totally out of character for this area. The area is currently family residential with some low density units. The proposed 190 dwellings with the possibility of more if adjacent rezoning takes place will change that character. It is important that inner city Newcastle retains a family friendly precinct and does not become a ghetto of higher density high turnover dwellings.</td>
<td>The locality of the site has a mix of low and medium density residential character comprising single detached dwellings, terraces, and walk-up apartments. The entire street block west of the site is comprised of medium density walk-ups, and adjoins higher density housing along the northern and western frontages of Kitchener Parade. Given the proximity of the site and the broader precinct to the city centre, this is an ideal area to increase densities and providing more housing within walking distance to jobs and services.</td>
<td>No changes recommended The design study includes a site analysis (section 2.4) which maps built form and typologies in the area. This shows the mix of dwelling types in this area. Higher density neighbourhoods can still be ‘family friendly’. See also comments in relation to the Local Planning Strategy directions in Ref 1I.</td>
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<td>2B</td>
<td>Character - The proposed high rise development significantly impacts on visual amenity and could promote shading of adjacent residential areas. The proposal for high rise dwellings is not mitigated by the area being in the shadow of the ridge. The proposed development is likely to turn Arcadia Park from a haven for people, birds and animals in the inner city into a bland suburban park.</td>
<td>The proposed development does not result in adverse overshadowing impact to adjacent neighbours – consideration has been given to the requirements of the Department of Planning's Apartment Design Guide in preparing the Urban Design Study. Design strategies have been developed to mitigate the development's visual impact through strategic placement of buildings in relationship to site’s topography, including increased landscaped setbacks, orientation of building to address their short frontage to the street, and stepping height to the corner of the site that is the least visible from surrounding streets and spaces. Careful consideration has been given to the impact on Arcadia Park, with no direct connections proposed.</td>
<td>No changes recommended. Refer to shadow analysis in Section 4 of the Urban Design Study. No changes to Arcadia Park are proposed in the future development of the site.</td>
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<td>2C</td>
<td>Traffic - The addition of extra traffic in Kitchener. Mosbri, Swan and Hillview streets would create a safety issue for children attending Newcastle East and their parents.</td>
<td>Traffic modelling forecasts show the proposed development is expected to generate a net increase of 17 and 36 vehicle trips on the road network during the AM and PM peak respectively due to the change in land use from employment to residential. Refer to Section 4.1 of the Traffic Impact Assessment. Figure 15 also highlights the increase in traffic along key roads. Vehicle trips generated by the site would be required to drive to road conditions and adhere to sign posted speed limits (including school zones). RMS crash data indicate one crash (non-casualty – tow away) and zero pedestrian crash have been reported in proximity to Newcastle East Public School in the past five years.</td>
<td>No changes recommended. Existing signage and speed limits designate the school zone.</td>
</tr>
<tr>
<td>2D</td>
<td>Traffic - The increased traffic will create mayhem at the corners of Mosbri and Swan, Kitchener and Swan, and Kitchener and Tyrell. Ultimately this will result in Newcastle Council being responsible for expensive traffic rehabilitation schemes.</td>
<td>An industry standard approach has been used to assess the impacts of the proposed development. Intersection modelling outputs show the performance of intersections assessed with and without the development is comparable to existing performance. It is also shown the intersections operate satisfactorily and at an acceptable level of service. Refer to Section 4.4 of the Traffic Impact Assessment.</td>
<td>No changes recommended.</td>
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<td>2E</td>
<td>Parking - Already at a premium in the area will become a real problem under the proposals.</td>
<td>Not requested</td>
<td>Parking for new residential units will need to be provided onsite as part of any resultant DA.</td>
</tr>
<tr>
<td>2F</td>
<td>Drainage - there is a potential for impacts on adjoining property and infrastructure in storm events if not adequately managed by the proposed development.</td>
<td>Not requested</td>
<td>Existing drainage capacity and impacts will be addressed at the DA stage. However given the level of hard surface on the site, the volume of runoff in extreme events is unlikely to change.</td>
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<td>3A</td>
<td>Strongly opposed to option 3, as over development for Mosbri Crescent. The 7 story (B) and a 6, 7 story's (D) high building this should be stopped and made into larger dwellings (more floor space) less dense buildings for people who live there and surrounding neighbourhood.</td>
<td>The Urban Design Study investigates a range of housing typologies, dwelling sizes and densities on the site, taking into consideration the existing and likely future urban context. Given the site’s proximity to the city centre, and surrounding medium density development, the scale of development being proposed is considered to be appropriate.</td>
<td>No changes recommended Council's adopted LPS supports medium density for this site and supports the provision of a range of dwelling types in all locations. 2016 Census data revealed that in the Newcastle local government area the average number of people per household in all private dwellings was 2.4.</td>
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<td>3B</td>
<td>Open spaces - on the concept plan drawings they look like narrow corridors or through-fares not usable out door space.</td>
<td>A range of private amenity spaces are proposed throughout the project, including those at ground level, along the street frontage, around the site’s boundaries, and on the roof of the residential flat buildings. The site is in close proximity to several regional and local recreational areas, and within close proximity to both Mosbri Crescent Reserve and Arcadia Park. King Edward Park, is located within 200m from the site and provides access to a number of coastal parks, pedestrian connections and the beaches. The proposed open space in the development serves the immediate needs of the residents, including improved amenity and privacy.</td>
<td>While specific details will need to be addressed within any future DA (for the site), Council is satisfied that this matter is adequately addressed for the purpose of supporting the Planning Proposal and the draft new section in Newcastle Development Control Plan 2012 (with respect to the NBN site).</td>
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<td>3C</td>
<td>Balconies looking onto each other are not conducive to private out door space and enjoyment</td>
<td>Balconies looking onto open space encourage activation and engagement in development. It also increases passive surveillance promoting a safer environment. All building separations meet the requirements of the Apartment Design Guide. Balcony orientation, privacy treatments and landscape design requires further investigation at DA stage</td>
<td>While specific details will need to be addressed within any future DA (for the site), Council is satisfied that this matter is adequately addressed for the purpose of supporting the Planning Proposal and the draft new section in Newcastle Development Control Plan 2012 (with respect to the NBN site).</td>
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<td>3D</td>
<td>Traffic - 171 dwellings (and lack of entrances and exits at the building site) will create even more congestion on Mosbri Crescent, lower Kitchener Pde and Swan Street. Over the whole Hill area there is only one set of traffic lights which are on Council/Swan Street and Darby Street to make a right-hand turn, this puts an extra possible 171 cars and only 3 streets to cope with leaving and entering this small residential area, morning and night.</td>
<td>Traffic modelling forecasts show the proposed development is expected to generate a net increase of 17 and 36 vehicle trips on the road network during the AM and PM peak respectively due to the change in land use from employment to residential. Refer to Section 4.1 of the Traffic Impact Assessment. An industry standard approach has been used to assess the impacts of the proposed development. Intersection modelling outputs show the performance of intersections assessed with and without the development is comparable to existing performance. It is also shown the intersections operate satisfactorily and at an acceptable level of service. Refer to Section 4.4 of the Traffic Impact Assessment.</td>
<td>No changes recommended</td>
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<td>3E</td>
<td>The Solution is: Reducing the size of 11 Mosbri Crescent buildings (B) and (D) also there should be at least 3 (car) exits/entrance roads points at the development site of 11 Mosbri Crescent e.g. 1st Upper Kitchener Pde near the Newcastle East Public School and 2nd Ordinance Street (should continue through to the development) and Mosbri Crescent should become (as a one way). This will relieve the pressure on Mosbri Crescent, lower Kitchener Pde and Swan Street.</td>
<td>Noted, however further studies would be required to determine feasibility (suitable topography) and impact (e.g. environmental – loss of vegetation) of the suggested access points for the development. SJB Architects Response - The visual impact of Building B &amp; D is mitigated by placement of development through site's topography. Building B has a 4 storey presence on Kitchener Parade and responds to existing buildings within the streetscape, which includes the school building sitting on the steeply rising topography to the north.</td>
<td>While specific details will need to be addressed within any future DA (for the site), Council is satisfied that this matter is adequately addressed for the purpose of supporting the Planning Proposal. See also the draft DCP for the site.</td>
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<td>3F</td>
<td>Future developments: Council has to consider that when 1-9 Mosbri is re-developed this will also add to traffic on this very small piece of road and 1-9 Mosbri will not have an option where their car entrances and exists are placed, where 11 Mosbri Crescent does have multiple streets to choose from.</td>
<td>Details of the 1-9 Mosbri development were unknown during the preparation of the Traffic Impact Assessment. It is recommended the accompanying traffic assessment undertaken for the future 1-9 Mosbri development takes into consideration traffic impacts of known developments in its vicinity (including the redevelopment of Newcastle NBN).</td>
<td>As noted above, specific details in relation to the re-development of sites will need to be addressed within any future DA (for the 1-9 Mosbri Cr), Council is satisfied that this matter is adequately addressed for the purpose of supporting the Planning Proposal - no changes recommended</td>
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<td>3G</td>
<td>Proposed building 11 Mosbri (B) 7 storey's and Building (D) 6,7 story's (if it were to go ahead, of which I protest the size and density) they at least should have car exits and foot traffic entering and exiting upper Kitchener Pde (near Newcastle East school) and the car park on middle floor to accommodate car exits.</td>
<td>A through-site connection is proposed from Kitchener Parade to Mosbri Crescent. Potential car entry to development on Kitchener Parade is difficult to achieve given the steep topography, which would increase the structure and footprint of the buildings, eroding the size and quality of the open spaces between buildings, and potentially remove the through-site pedestrian link from Mosbri Crescent to Kitchener Parade.</td>
<td>No changes recommended</td>
</tr>
<tr>
<td>3H</td>
<td>Option one: is the preferred option</td>
<td>The block adjacent to the site is comprised of medium density walk-ups. Terrace typology in Option 1 does not fully respond to the range of building types and densities already existing throughout the surrounding area. Terraces are provided along the southern boundary of the site to provide a range of housing typologies.</td>
<td>Council's assessment determined that Option 3 is consistent with Council's adopted LPS, in particular the residential land strategic directions, and is therefore endorsed within Council's Planning Proposal.</td>
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<td>4A</td>
<td>Objection to the proposal for the purpose of increasing the height of buildings from two or three storeys to upward of seven or more storeys due to impacts on character of the surrounding area, the current skyline, or heritage of the area. Existing streets are mostly filled with single storied older style private house or low rise unit blocks.</td>
<td>The locality of the site has a mix of low and medium density residential character comprising single detached dwellings, terraces, and walk-up apartments. The entire street block west of the site is comprised of medium density walk-ups, and adjoins a higher density housing along the northern and western frontages of Kitchener Parade.</td>
<td>No changes recommended. Due to the &quot;bowl like&quot; topography the taller buildings will appear as 3 -4 storey from street level. The Site Analysis in the Urban Design Study* (section 2.4) maps building form and typology in the area. The maps show that there is a range of building heights and type. *The Urban Design Study is included as an attachment to the Planning Proposal document.</td>
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<td>4B</td>
<td>Visually the proposed development will rise above the hill line &amp; park behind the NBN site and mar the landscape and the views currently enjoyed by everyone living in or visiting the area. The residents in Anzac Parade will look out over ugly high rise towers as opposed to the bush land that is visible behind the NBN site.</td>
<td>The visual impact of development in surrounding context has been considered through the design testing process. The proposed development is largely obscured from Wolfe Street and the Obelisk by the existing vegetation in Arcadia Park. Communal open spaces and landscaping on the roofs of Building B &amp; D will mitigate the visual impact even further, as illustrated in Section 4.4 of the Urban Design Report. In terms of the impact on the visual character from neighbouring properties, consideration should be given to the size, scale and blank form of the existing building on the site. This will be replaced by a number of residential buildings with small footprints, far greater articulation and additional landscaping throughout the site.</td>
<td>While further visual assessment may be undertaken as part of the DA stage, Council staff are satisfied that this matter is adequately addressed for the purpose of supporting the Planning Proposal and is also considered in the draft new section in Newcastle Development Control Plan 2012 (with respect to the NBN site).</td>
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<td>4C</td>
<td>Traffic will be massively increased with the hundreds of residents living in the units owning cars. Public transport in Newcastle is virtually non-existent and the residents of the new units will be using their cars to enter and leave the buildings. Traffic entering and leaving the street will greatly increase the noise, danger and reduce the amenities of the community.</td>
<td>Traffic modelling forecasts show the proposed development is expected to generate a net increase of 17 and 36 vehicle trips on the road network during the AM and PM peak respectively due to the change in land use from employment to residential. Refer to Section 4.1 of the Traffic Impact Assessment An industry standard approach has been used to assess the impacts of the proposed development. Intersection modelling outputs show the performance of intersections assessed with and without the development is comparable to existing performance. It is also shown the intersections operate satisfactorily and at an acceptable level of service. Refer to Section 4.4</td>
<td>No changes recommended.</td>
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Attachment D - Summary of submissions - Mosbri Crescent, The Hill Planning Proposal
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<td>5A</td>
<td>The proponents preferred proposal (Option 3) is a gross overreach of R3, does not meet any objectives defined under the R3 zoning and an attempt to maximise returns from the site at the expense of nearby residents and the surrounding built environment.</td>
<td>Option 3 will provide for additional housing needs for the community. Also there will be a greater mix of dwelling types on offer which is consistent with the R3 objectives. The proposed concept addresses neighbouring properties to the west along Kitchener Parade and Mosbri Crescent. Although the scale and height of the buildings are greater than some of the surrounding low density dwellings, it is consistent with the medium density housing principles.</td>
<td>No changes recommended. The R3 zone objectives as stated in the Newcastle LEP 2012, are aimed at meeting housing needs within a medium density environment and include providing a variety of housing types and encouraging increased population levels in locations that can support the commercial viability of centres. New development is to have regard to desired future character and not significantly detract from the amenity of nearby development. While development applications will deal more specifically with impacts on nearby development, the planning proposal contains sufficient information, including a proposed DCP for the site, to be considered consistent with the R3 zone objectives.</td>
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<td>5B</td>
<td>The only possible response to this proposal is that Option 1 (or similar) is acceptable.</td>
<td>Refer to Ref 3H comment</td>
<td>Noted - Refer to earlier responses. Option 3 is supported as a proposal that is consistent with Council’s LPS for residential land and housing.</td>
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| 5C  | Discrepancies in SJB Architects supporting documentation - Option 3 proposes 171 dwellings in total, Block B at an RL 56.8. However documentation submitted by Douglas Partners (Appendix A, 3.8) includes a drawing by SJB Architects showing Block B at RL 67.5, a difference of 10.7m. Additionally the Traffic Assessment Report describes traffic impacts resulting from proposed development based on 208 dwellings, a variation of 37 dwellings. Are the proponents contemplating a variation to DA conditions after the unlikely approval of Option 3?  

**Option 3 proposes 171 dwellings and Block B at an RL of 56.8.**  

No changes to the Height of Building map within the Planning Proposal which shows the height of Block B at RL 56.8.  

The original proposal submitted to Council for consideration was amended by lowering the height of the taller buildings. This reduced the number of units from the originally proposed 208 to the current proposal of 171.  

The traffic impact assessment was based on the original proposal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 5D  | Discrepancies in SJB Architects supporting documentation - Proposal “Concept Analysis 4.4 view montage – Kitchener Parade shows a "Block Massing View" which is clearly misleading. SJB Architects indicate an RL 40.2m for Kitchener Parade, an RL of 50.7m for the roof of a school building near Block B on the northern side of Kitchener Parade. Block B has a proposed RL 56.8m and yet the “Block Massing View” indicates the top of Block B at an estimated RL 45m, a discrepancy of 11.8m.  

**Error in map legend in View Montage 4.4 Kitchener Parade. The view is looking east to Kitchener Parade and block massing is reflection of Building A (currently have a proposed RL of 47.5). Legend updated accordingly.**  

No changes to Planning Proposal required as a result of the error in the legend to the view montage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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<td>6A</td>
<td>The proposed re-zoning from R2 to R3 achieves the stated objectives of the planning proposal “To enable the land to be developed for medium density housing.” however the documents fail to outline or describe why it is necessary to amend the HOB and FSR to the extent proposed (triple-fold and doubling for HOB and FSR respectively) reflecting option 3 in the SJB Urban Design Study. Option 3 provides for a maximum yield of 171 dwellings across a 1.22 hectare site, equating to a density of 140 dwellings per hectare. This far and away exceeds typical densities expected for medium density residential development which might range from 25 up to a typical maximum of 80 dwellings/hectare.</td>
<td>Not requested</td>
<td>Zoning is used to identify the objectives for the land and to list which land uses are permissible, require consent, or are prohibited. Whilst dwellings per hectare is one means of measuring density, in NSW density and scale (of development) are required to be controlled through a nominated height of building (HOB) and floor space ratio (FSR) within the LEP. Council’s may nominate general HOB or FSR applying to certain zones; these controls may also be customised to better reflect the particulars of a location. As such the proposal has demonstrated that the topography of the land is able to accommodate the nominated HOB and FSR while meeting the objectives of the R3 Medium Density Residential Zone.</td>
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<td>6B</td>
<td>Planning proposal justification is deficient in both scope and logic, in that it identifies the proposal as the best means of achieving the objective of providing medium density housing. Clearly, the other HOB and FSR options presented with the site Urban Strategy Study, do provide scope for much better outcomes for conserving the amenity and heritage character of The Hill (while also allowing medium density housing). The planning proposal indicates that the option of only amending HOB and FSR but retaining the existing zone could also achieve the intended outcome but was not preferred. This seems a curious and illogical option to even consider. The more obvious alternative option would be to adopt an R3 zoning but apply lower HOB and FSR limits that could better conserve amenity and heritage character of The Hill.</td>
<td>Newcastle Local Planning Strategy identifies the site as a Medium Growth Precinct and proposes a R3 re-zoning be investigated. The large lot size and its close proximity to open spaces, recreational amenities and the city centre provide an ideal opportunity for the site to support greater housing density and diversity. The proposed built form is recessed into the existing topography and relative position to its surrounding allows for placement of height while mitigating view and solar impact.</td>
<td>As per the comment above in 6A, in NSW zoning is not used for controlling density or scale of development; this is the role of the HOB and FSR maps in the LEP. The HOB and FSR nominated in the planning proposal were determined having regard to the particulars of the land and the objective of enabling medium density residential development - no recommended change.</td>
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<td>6C</td>
<td>Section 4.4 of the Urban Design Study Concept includes two sets of photos showing view montages from the northern boundary being from Kitchener Pde and Kitchener Pde (west). However no montages have been provided for the other critical viewing points from the north such as viewing south along Brown St and viewing west from Pit St. This is considered a significant omission given these viewing points would provide very important information in understanding and assessing the visual amenity impacts of the proposals. Had these montages been provided it is likely that the proposed development would be shown to figure very prominently when looking south down Brown St and have a very significant impact on visual amenity</td>
<td>View Montages for Kitchener Parade and Kitchener Parade West address a similar vantage point as Pit Street. Building B is designed to have a 4 storey street presence from Kitchener Parade and would be perceived the same on Brown Street.</td>
<td>No changes to Planning Proposal recommended</td>
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<td>6D</td>
<td>Amendments are framed such that, in substance, they directly align with the proponents preferred option for redevelopment of the site. It appears that the amendments have been formulated simply to facilitate a specific development outcome, rather than provide a framework to inform, guide and regulate the potential development</td>
<td>The planning proposal sets out a clear framework of how the increased height and density should be supported. It outlines that the planning proposal would allow for medium density housing which would deliver an increased mix of dwellings ranging from studios to 3 bedroom apartments in order to meet the projected growth of the area. Furthermore, the rezoning would provide a good range of housing supply with good access to services and jobs, considering the subject site is within 800m of the City Centre. The rezoning and redevelopment of the site underpins the status of the NBN facility in terms of economic viability and value of the site.</td>
<td>Refer to previous comments in relation to the assessment against the LPS. Design studies canvass various options and ultimately settle on the most efficient design that achieves maximum potential. Development sites achieving maximum potential is essential in the delivery of affordable housing and is supported.</td>
</tr>
<tr>
<td>7A</td>
<td>Submission seeking to protect Arcadia Park and its bushland. Building B at seven stories is too high and over shadows a section of Arcadia Park</td>
<td>The proposed development has a 1 hour overshadowing impact by the western edge of Arcadia Park during mid-winter (June 21). The overshadowing is not severe and occurs in the bushland portion of the park, illustrated in View from Sun Position diagram in Section 4.2 of the Urban Design Report.</td>
<td>No changes to Planning Proposal recommended. No changes to Arcadia Park are proposed as a result of this proposal.</td>
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<td>7B</td>
<td>There should be no direct access provided into Arcadia Park from the proposed development (such access is indicated on some plans in the Traffic Report)</td>
<td>The proposed design does not allow for access to Arcadia Park.</td>
<td>Future DAs will need to comply with Council’s policy regarding direct access from land adjoining open space. This is no different from what Council would allow from existing residents adjoining the park.</td>
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<td>7C</td>
<td>The development should be responsible for repairing and maintaining the western boundary fence of Arcadia Park</td>
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<td>Fencing between Council and private land is a policy matter not controlled by either the LEP or DCP - hence no changes recommended.</td>
</tr>
<tr>
<td>7D</td>
<td>The potential for resident’s pets to roam in Arcadia Park and threaten native birds and animals needs to be addressed</td>
<td>The question of pets on site will be a body corporate issue and will be addressed by the owner’s corporation. This issue is not relevant at the planning proposal stage.</td>
<td>This is a compliance matter, governed by the Companion Animals Act and Council's Parkland Plan of Management, which will be applied consistently as it is for existing residents within the area. Pet ownership or behavior is not governed by the LEP or DCP, hence no changes recommended.</td>
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<td>7E</td>
<td>On the north east corner of the development site there is a mature Fig Tree which contributes to the rainforest habitat of Arcadia Park. This tree should be retained</td>
<td>There are 8 Fig Trees on Site. Trees 1, 2, 3, 4 and 7 are retainable and tree protection measures are proposed. Tree 8 is not retainable, because of the extent of encroachment into the Tree Protection Zone - the retaining wall is to be reset and soil level will be cut too close to the trees structural Root Zone causing structural issues. Compensatory planting will be required to offset its removal in the DA assessment. This can be accommodated in the landscape plan between the two northern buildings.</td>
<td>No changes recommended</td>
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<td>7F</td>
<td>To complement and enhance the biodiversity and native habitat of Arcadia Park the project should minimise the loss of existing native vegetation on the development site, and landscaping should incorporate only trees and shrubs endemic to the Newcastle coastline</td>
<td>The proposed landscaping plan is conceptual at this stage and will include a range of open space character areas that respond to varying needs and existing conditions. These include: Deep Soil - located around the site's northern, eastern and southern boundaries, these zones of open space can accommodate existing and new mature trees. Proposed new species will be likely to include some native species and will be resolved at the detailed design development application stage.</td>
<td>Landscape details of any proposed development will need to be consistent with the requirements already set out within the Newcastle DCP 2012. This will be dealt with at development application stage.</td>
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<td>8A</td>
<td>Supportive of proposal but request a minimum Height Limit (12m) and FSR (1:1) should be adopted across all the land subject to the planning proposal and not just the NBN site. This would be consistent with medium density zoning in some other Council areas.</td>
<td>Not requested</td>
<td>An increase in HOB and FSR over adjoining land may be warranted but would require further investigation and justification to be supported this late in the process. Minor variations to the proposed HOB and FSR may be addressed through the provisions of the existing clause 4.6 if suitable justification is provided for a specific DA. No changes recommended.</td>
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CCL 24/10/17
SUPPLEMENTARY REPORT - LAND BOUNDED BY MOSBRI CRESCENT AND KITCHENER PARADE THE HILL - ADOPTION OF AMENDMENT TO NEWCASTLE LOCAL ENVIRONMENTAL PLAN 2012

Attachment B: Applicant's response to matters raised during Public Voice held on 15 August 2017.
12 October 2017

14359

Johannes Honnef
Senior Urban Planner
The City of Newcastle
PO Box 489 Newcastle 2300

REQUEST TO AMEND NEWCASTLE LOCAL ENVIRONMENTAL PLAN 2012
11-17 MOSBRI CRESCENT, THE HILL

Dear Johannes,

The purpose of this letter is to respond to the matters raised during the Public Voice Hearing of 15th August 2017 for the proposed Amendment to Newcastle Local Environmental Plan 2012 for land bounded by Mosbri Crescent and Kitchener Parade, The Hill. It also sets out the planning proposal process that has been undertaken to date.

The Proponent requested that the item be deferred from the Council meeting on 22nd August 2017 to allow sufficient time to provide a detailed response to issues raised in the Public Voice Hearing. Council deferred the item and it will be relisted for Council's consideration at a future meeting.

1.0 Response to Issues raised in Public Voice Hearing on 15th August 2017

The following points respond to the issues raised in the Public Voice Hearing at Council on 15th August 2017.

1.1 Was the traffic report appropriately assessed given Figure 14 shows traffic flows through Pits Street?

The traffic report was prepared by AECOM to identify potential increases in traffic generation on the local street network. Figure 14 identifies trip distribution of the potential traffic flows, based on travel patterns of residents in Travel Zone 6355 using 2011 Journey to Work data. The original Figure 14 shows traffic flows through Pits Street to Wolfe Street rather than via Brown Street.

It is acknowledged that Pits Street is not a through road. AECOM updated Figure 14 and the traffic report as part of the information submitted prior to the last Council meeting (25th July 2017), refer to Revised Figure 14 below.
The traffic report considered by Council appropriately assessed the potential traffic impact of the area. Furthermore, the negligible increase in vehicle trips generated by the proposed development in comparison to the existing NBN site (+17 in the AM peak and +36 for the PM peak) did not trigger Council’s Senior Development Officer to undertake further investigation of potential impacts.

1.2 What impact will the increase in traffic have during AM and PM peaks on Newcastle East Public School?

Traffic modelling forecasts show the proposed development is expected to generate a net increase of 17 and 36 vehicle trips on the road network during the AM and PM peak respectively due to the change in land use from employment to residential. The afternoon peak, does not correlate with school hours.

Vehicle trips generated by the site would be required to drive to road conditions and adhere to sign posted speed limits (including school zones). RMS crash data indicate one crash (non-casualty – tow away) and zero pedestrian crash have been reported in proximity to Newcastle East Public School in the past five years. Given the above, the increase of 17 vehicles trips in the AM period is highly unlikely to have an adverse impact on the Newcastle East Public School.
1.3 Were there errors and unsupported assumptions in the report?

The presenter (Mr Munson) who identified that there were several errors in the report in his public voice submission previously identified these in his submission during the public exhibition period. Hence, each issue was addressed in the summary of submissions attachment to item 81 of the report to Council of 25 July 2017. Errors identified were typographical errors within the Urban Design Assessment report and are not of consequence to the outcome of the proposed amendments. Assumptions in the traffic report were based on travel patterns of residents in Travel Zone 6355 using 2011 Journey to Work data, and was addressed above.

1.4 Were all Urban Design Consultative Group issues addressed in the design and reporting?

The proposal was reported to the UDCG on two occasions, 17th February 2016 and 15th June 2016. On both occasions, the Proponent’s project team attended the UDCG meeting, presented the planning proposal scheme and answered questions posed by the group. The matters raised by the UDCG assessment were incorporated and reflected in the final proposal and DCP. This included the following:

- A reduction in height of Buildings B and D to ensure new development is not visible from the Heritage Conservation Area locations such as the Obelisk and Wolfe Street.
- Buildings A and B having their upper floor(s) set back from Kitchener Parade
- Increased building separation to enable solar access and increase landscape opportunities
1.5 **What streetscape analysis was carried out for the south side of the site to ensure visual impacts identified in the Urban Design Report are realistic?**

The urban design assessment prepared by SJB Architects provides a thorough analysis of the proposed building envelopes on the site and takes into consideration the potential impacts to each neighbouring boundary. This includes a view montage from Hillview Crescent, along the southern boundary and block massing view along Mosbri Crescent when viewed from the northwest and southwest.

1.6 **What is the visual impact of the proposed building heights on the view from Wolfe Street?**

The urban design assessment prepared by SJB Architects demonstrates that the building heights have been maintained at a level as not to impact views from Wolfe Street. As outlined earlier, following advice from the UDCG, the proposed development scheme was revised to lower the proposed height of Buildings B and D.

1.7 **Are the montages credible?**

The montages provided reflect the nominated levels for the HOB on the site. These images were prepared by a professional registered Architect; and considered by the UDCG. It is understood that Council Staff have compared these levels against the level of items with a known RL (such as the mobile phone tower in the area), and therefore acknowledge the accuracy.

1.8 **Is the Proponent willing to enter into independent mediation with objectors in order to reach an agreed position on the level of development proposed?**

It is important to note that the statutory requirements for a planning proposal does not include mediation, therefore this planning proposal should not be subject to mediation. Further, given there have been 2 public voice sessions, and a 28-day notification period where only seven objections were received, it is considered that sufficient opportunity to comment has been provided and that the community are generally supportive of the scheme in its current form.

It is important to note that this application is a planning proposal and a concept building envelope design, not a detailed development application. As part of a future development application process, the building envelopes will be further refined and articulated to establish final built form. Many of the comments raised in the submissions are more appropriately addressed at this stage.

The Department of Planning and Environment (DPE) issued a Gateway determination for the planning proposal on 22nd December 2016, and gave Council a 12-month period to provide a recommendation back to the Minister. Council does not have delegation to make the plan. The Proponent has undertaken an extensive and collaborative process with Council’s planning staff and the UDCG. It should also be noted that the proposal was exhibited in accordance with the legislative requirements and only attracted seven objections, which indicates general community satisfaction.
with the proposal. Should the Proponent be subject to a mediation process, it is considered unlikely that the planning proposal will meet its statutory timeframe required by DPE. It is noted that DPE is committed to reducing time taken to complete Local Environmental Plans.

The inevitable delays that would arise as a result of a mediation process, for which there is no clear community support, would also place in jeopardy the Nine Network Australia’s future investment plans in Newcastle and associated employment outcomes. This is of great concern to a company that has been a key part of the local and regional community for over 60 years.

2.0 Planning Process to Date

To understand the ongoing responsive consultation between Council and the Proponent throughout the planning proposal it is important to provide a timeline of events, as outlined below.

- **January 2016**: The planning proposal for 11-17 Mosbri Crescent, Newcastle was submitted to Council (1 year and 9 months to date).
- **February 2016**: Council’s LEP Advisory Panel and Urban Design Consultative Group met and was satisfied for the Planning Proposal to proceed.
- **March 2016**: Council provided an initial assessment and requested amendments including the following:
  - Reduction in height and the number of storeys for buildings fronting Kitchener Parade, Building A, B and D1 and D2,
  - Altering the roofs to green roofs;
  - An additional view analysis from Stewart Avenue and Parry Street to the Obelisk;
  - Requesting that the proposal should include the land to the west 1-9 Mosbri Crescent and 31 to 41 Kitchener Parade;
  - Site Specific Development Control Plan Guidelines to be developed; and
  - An arborist report and stormwater management plan/study.
- **May 2016**: An amended Urban Design Study was submitted, reflecting most of the requests by Council, plus an additional view analysis and draft site DCP guidelines.
- **June 2016**: Council’s Urban Design Consultative Group met and Council requested further amendments to the height of building map and the FSR map.
- **July 2016**: Council requested further amendments to the proposal principally requesting reduced heights and setbacks.
- **August 2016**: The Proponent responded to these requests with reduced height, bulk and scale and provided an arborist and stormwater management report.
- **August 2016**: Council requested further alterations to the maps and diagrams which the Proponent provided.
• **27th September 2016**: The planning proposal was scheduled to be considered at the Council meeting (27/9) but was not formally listed on the agenda to provide an opportunity for a Public Voice Hearing on 18th October 2016. The Public Voice meeting did not occur.

• **25th October 2016**: Council considered the endorsement of the planning proposal to proceed to the DPE for Gateway Determination. However, Council deferred the item pending a Councillor workshop.

• **15th November 2016**: An internal Councillor workshop briefing was held at which no changes to the proposal were requested.

• **22nd November 2016**: Council resolved to seek Gateway determination from the Minister for Planning and the Environment (DPE).

• **22nd December 2016**: DPE issued a Gateway determination.

• **February 2017**: The planning proposal was sent to the Rural Fire Service and Mine Subsidiary Group. No objections were raised by the public authorities.

• **22nd May and 19th June 2017**: A 28-day exhibition period occurred. Council received eight submissions (seven objections, one in support) including:
  - Inconsistency with local character / heritage of The Hill.
  - Excessive height and scale for the area.
  - Potential increase in traffic along local streets.
  - Impacts on on-street parking.
  - Lack of capacity of local school to cater for additional students.
  - Anomalies identified within the documentation supporting the exhibited Planning Proposal and draft Section 6.14 - 11 Mosbri Crescent, The Hill (of DCP); in particular the Urban Design Study prepared by SuB Architects.

• **25th July 2017**: Council’s planning report responded to the issues raised in submissions, outlining that the Proponent made corrections to Planning Proposal documentation. Councillors did not consider the report at the meeting but resolved to lay the item on the table until a Public Voice session can be held with both the objectors and Proponent.

• **15th August 2017**: A Public Voice Hearing was held.

• **22nd August 2017**: Council deferred the item from the Council meeting to allow the Proponent to respond to the issues raised in the Public Voice Hearing.

The Proponent has responded to every request from Council and followed due procedure. There has been ample opportunity for the public and Council to understand the planning proposal, through a public voice session, a Council workshop and 28-day notification period. It should again be stated that only seven objections were received in response to the public exhibition, despite the proposal being located in a built up inner-city location, clearly demonstrating that there is general community satisfaction with the proposal.
We urge Councillors to support the professional Council’s staff recommendation in their planning report and endorse the planning proposal and forward it to the DPE requesting that a draft LEP be prepared and made pursuant to section 59(1) of the EP&A Act.

Yours sincerely,

Belinda Thomas
Senior Planner
0449 829 488
bthomas@ethosurban.com