ATTACHMENTS DISTRIBUTED UNDER SEPARATE COVER

REPORTS BY COUNCIL OFFICERS

ITEM-124  CCL 28/11/17 - FORT WALLACE STOCKTON - ENDORSEMENT OF AMENDMENT TO NEWCASTLE LEP 2012 AND DCP 2012

Attachments A to C - Volume 1

Attachment A: Planning Proposal - Fort Wallace, Stockton
Appendices A to C of Planning Proposal
Appendix D of Planning Proposal
Appendix E of Planning Proposal
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(distributed under separate cover)
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Attachment B: Draft Section 6.14 - Fort Wallace, Stockton

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CCL 28/11/17
FORT WALLACE STOCKTON - ENDORSEMENT OF AMENDMENT TO NEWCASTLE LEP 2012 AND DCP 2012

Attachment A: Planning Proposal - Fort Wallace
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- Appendix L – Servicing Report
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Introduction

This planning proposal has been prepared in accordance with Section 55 of the Environmental Planning and Assessment Act 1979 (NSW). It explains the intended effect of a proposed local environmental plan (LEP) and sets out justification for making the plan.

'A guide to preparing planning proposals' has been used to guide and inform the preparation of this planning proposal.

This planning proposal is for everyone. It will be used to decide whether the proposal should proceed or not.

The planning proposal may evolve over time due to various reasons, such as feedback during exhibition. It will be updated at key stages in the plan making process.

Summary of proposal

<table>
<thead>
<tr>
<th>Proposal</th>
<th>To rezone the Fort Wallace site from SP2 Infrastructure (Defence) to R2 Low Density Residential, RE2 Private Recreation and E3 Environmental Management and amend controls relating to building height, lot size and heritage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Details</td>
<td>338 Fullerton Street, Stockton (Lot 100 &amp; 101 DP 1152115)</td>
</tr>
<tr>
<td>Applicant Details</td>
<td>Defence Housing Australia</td>
</tr>
</tbody>
</table>

Background

Council has received a request to amend Newcastle Local Environmental Plan (LEP) 2012 in order to enable the land to be used for mixed purposes, including residential and recreational. The site was previously owned by the Department of Defence and was recently transferred to Defence Housing Australia (DHA) to provide housing for Defence members and family. The request will allow for approximately 100 dwellings, half of which are to house Defence members and family and the remainder to be placed in private ownership. The site was considered a good option to house defence members due to proximity to Williamtown RAAF base, the Stockton commercial centre and Newcastle city centre.

The site is currently vacant and contains a number of disused defence related buildings and infrastructure. The most significant items include the gun emplacements, observation tower, radio station, casualty station, search lights, drill hall, administration building and plotting room. These items are listed on the Commonwealth Heritage List as they reflect Australia’s development as a nation. The concept plan prepared for the site, proposes that the bulk of these military items form a Heritage Precinct Park. Options exist to adapt some of the scattered buildings for other uses such as a community facility, kiosk or café or tourism related.

The planning proposal has been informed by various strategic and technical assessments, including preparation of an Urban Design and Landscape Report. Investigations to understand the site’s unique character, sensitivities, constraints and opportunities are documented in the
Urban Design Report. The concept plan was formed as part of this process. It shows the sites potential to provide housing and directly relates to proposed zone boundaries, height controls and the draft DCP prepared to implement the vision for the site.

A completed 'Information Checklist' is provided at Appendix A. It identifies issues considered in the preparation of this planning proposal.

Site

The proposal concerns land at 338 Fullerton Street, Stockton and is legally referred to as Lots 100 & 101 DP 1152115.

The Fort Wallace site is approximately 32 hectares in size. The Stockton Centre, a residential care facility for people with disability, is located north of the site and a decommissioned wastewater treatment works to the south. The site runs along Fullerton Street. To the east is Stockton Beach. The Hunter River or "Hunter Estuary", which contains nationally recognised (Ramsar) wetlands, is west of Fullerton Street. See Figure 1 Local context of the site.

The site is formally accessed by a single entry off Fullerton Street. There is also an emergency access track off Fullerton Street. It is a 16 minute car trip (approximately 15km) to the RAAF base at Williamtown, 25 - 30 minute car trip or short ferry ride to Newcastle city centre and 4 minute car trip to Stockton commercial centre.

There is a shared path between the site and Stockton ferry terminal. It is located on the opposite side of Fullerton Street.

Key features of the site include:

- Significant military heritage
- Importance to local Aboriginal community
- Undulating topography with a mix of disturbed native vegetation and introduced species ie bitou bush
- A modified landform due to previous defence related uses.

The site is currently zoned SP2 Infrastructure for Defence purposes in the Newcastle LEP 2012. It is vacant, non-operational and inaccessible to the public. Defence ceased activity on the site in 2003. The most recent use of the site was accommodation for the Australian Navy (see Figure 2 Air photo of the site).
Figure 1 - Local context of the site
Figure 2 - Air photo of the site
Part 1 - Objectives or intended outcomes

To amend the Newcastle LEP to allow a diversity of housing on part of the site that is cleared or highly disturbed due to previous defence related uses. Approximately 100 dwellings are proposed. See Figure 3 for concept plan. The amendment will enable the remainder of the site to be used for recreational purposes and protection or enhancement of the natural environment and heritage contained on the site.

Part 2 - Explanation of provisions

The proposed outcome will be achieved by making the following amendments to the Newcastle LEP 2012:

- Rezoning the site from SP2 Infrastructure (Defence) to part R2 Low Density Residential, part RE2 Private Recreation and part E3 Environmental Management.
- Introducing a varied approach to heights and lot sizes** across the site, to reflect the typologies proposed in the concept plan. Heights vary from 8.5m (approximately two storeys) for single dwellings, cluster housing and town house style development and 11m and 14m for apartments. A maximum height limit of 8.5m is proposed for the remainder of the site.
- Including the site as a local item within Schedule 5 Environmental Heritage.

Refer to Part 4 - Mapping for proposed maps.

** Further explanation on lot sizes: Smaller lots (such as 200sqm) to accommodate cluster housing and townhouses are considered appropriate in order to create housing choice. The recommended option is to create 200sqm lots by applying clause 4.1A Exceptions to minimum lot size. This approach is considered a means to achieve diversity. A development application would be lodged for the development and subdivision of land to create multiple lots. The other option is by applying clause 4.6 Exceptions to development standards. It is considered that sufficient justification has been provided as part of this planning proposal.
Part 3 - Justification

Section A - Need for the planning proposal

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

The planning proposal is not a result of a strategic study or report. However, it is considered consistent with many aspects of the Local Planning Strategy (LPS). In 2011, census data, used to inform the LPS indicated that existing housing stock in Stockton were dominated by single dwellings (with 3+ bedrooms) and that lone person households accounted for 34% of all households. This household type is expected to be the fastest growing household type into 2031. Recent census data reflect this same scenario. An objective of the planning proposal is to deliver a mix of housing types (and bedrooms) including single dwellings, clusters, townhouses and apartments.

The planning proposal is also considered consistent with the following neighbourhood vision and objectives for Stockton:

Vision

The existing beach and harbour side character and historic identity of Stockton will be protected and enhanced.

Objectives

- Encourage development that is sympathetic to the existing character of Stockton.
- Future development considers coastal erosion processes.

The proposed bulk and scale for the proposed residential development is considered appropriate. Testing of designs and an analysis of the site demonstrates that the development can respond positively to the sloping topography and coast line.

The site is likely to be affected by coastal erosion by 2100. No development is proposed within this area, which is consistent with Council’s recently adopted Coastal Zone Management Plan 2016. This area of the site, along the beach, is proposed to be included in the E3 Environmental Management Zone.

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

Yes, amending the Newcastle LEP 2012 is considered the best means of achieving residential development (for everyone not just defence members), creating recreational opportunities and further enhancement and protection of the natural environment and heritage at the Fort Wallace site.
Section B - Relationship to strategic planning framework

3. Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

Hunter Regional Plan 2036

The Hunter Regional Plan 2036 (HRP) is the NSW government’s plan to guide land use planning and infrastructure priorities and decisions over the next 20 years. The plan includes an overarching vision for the Hunter Region, supported by four goals, directions and actions. It also contains local government narratives.

The planning proposal is considered consistent with the HRP, particularly in relation to the following components:

Vision

“The leading regional economy in Australia with a vibrant new metropolitan city at its heart”

Housing is required for defence members and family. The defence sector is considered a major employment generator for the region. The HRP recognises this. The site at Fort Wallace can accommodate additional and diverse housing to support defence employees as well as the general community. Fort Wallace is well located, in proximity to the RAAF base at Williamtown, the Stockton commercial strip along Mitchell Street and the Newcastle city centre.

Redevelopment of the site will allow for the creation of recreational facilities and related activities while enhancing and protecting the natural environment. The concept plan and proposed controls reflect such uses. The opportunity also exists to use existing infrastructure such as heritage building and roads.

Directions of relevance

Direction 7: Develop advanced manufacturing, defence and aerospace hubs. This Direction highlights the defence as an important sector contributing to the economy of the hunter region. The defence sector directly relates to housing, logistics, technology, education and manufacturing industries. The Australian Government is seeking to grow the defence and aerospace industries in and around the RAAF base at Williamtown and has committed to upgrading national air defence infrastructure in the precinct.

Direction 9: Grow tourism in the region. The site holds opportunities for visitors to enjoy and learn about the sites unique and multi layered heritage and admire the scenic coastal views. The proposed controls will ensure important views are protected, which is detailed in the HRP as being appealing to visitors.

Direction 14: Protect and connect natural areas. The residential component of the concept plan is proposed to be located on cleared or highly disturbed parts of the site eg accommodation for the Australian Army. The site was cleared prior to the construction of the fort for the development of a rocket brigades storage shed. The shed contained heavy rocket propulsion gear and cables used to carry life lines to ships in distress. The ecological assessment (Appendix B) undertaken to support the planning proposal (and inform the concept plan) discusses the highly disturbed nature of the native vegetation on the site but it still is important to provide habitat for certain fauna species, particularly bats and flying foxes and birds. The sandy dunes are considered important for migratory birds. The proposed zoning is considered the best mechanism to ensure ongoing protection. These areas are proposed to be located within the E3 Environmental Management Zone. Opportunities exist to provide better connections to these areas.
Direction 16: Increase resilience to hazards and climate change. The HRP discusses the vulnerabilities faced by coastal communities, particularly due to coastal erosion and bushfire impacts. No development is proposed within the area likely to be impacted by coastal erosion. This is in accordance with Council’s recently adopted Coastal Zone Management Strategy, 2016. The Bushfire Assessment (Appendix C) prepared to inform the concept plan and support the planning proposal indicates that bush fire risks needs careful management but would not prevent a rezoning to allow for residential development on the site.

Direction 17: Create healthy built environments through good design. The Urban Design and Landscape Report (Appendix D) details the process undertaken to achieve good quality built design. This detail has been incorporated into the draft site specific DCP. See Attachment B to Council report for DCP.

Direction 18: Enhance access to recreational facilities and connect open space. As discussed opportunities to deliver this direction are available and identified in the concept plan, related urban design report and proposed zoning / controls in the planning proposal. A park, including a playground, heritage precinct park, adaptive reuse of buildings to accommodate a café and for education purposes exist and can be accommodated in the redevelopment of the site.

Direction 19: Identify and protect the region’s heritage. The HRP states that cultural heritage is important to communities as it provides tangible connections to the past. Heritage items can also attract tourism, which can contribute to local economies. There is potential to adaptably reuse certain heritage buildings /structures to accommodate more uses.

Direction 22: Promote housing diversity. Housing diversity is a key objective of the concept plan for the site.

Direction 24: Protect the economic functions of employment land. The planning proposal to allow a rezoning supports the function of the nearby Williamtown RAAF base and the sustainability of the defence sector in the region by delivering housing.

4. Is the planning proposal consistent with a council’s local strategy or other local strategic plan?

Newcastle 2030 Community Strategic Plan

The Newcastle Community Strategic Plan (CSP) reflects the community’s vision for the city and is Council’s guide for action. It contains the strategies to be implemented and the outcomes that will indicate achievement of the defined goals. Council adopted the Newcastle 2030 Community Strategic Plan in February 2011. It was revised and updated in 2013. The following relevant strategic directions and their objectives from the Newcastle CSP are addressed in relation to this planning proposal.

The planning proposal primarily aligns to the strategic direction ‘Open and Collaborative Leadership’ identified within the Newcastle 2030 Community Strategic Plan.

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

Planning Proposal – Fort Wallace
Transport networks and services have been considered in the redevelopment of the site to allow for 100 dwellings and is supported.

The planning proposal aims to maintain, enhance and better connect the natural environment on the site. Environment and climate change risks and impacts are understood and managed through appropriate zoning.

The aim to enable a vibrant and activated place, where culture, heritage and place is valued, shared and celebrated is envisaged as the site redevelops and social connections can strengthen. Passive surveillance has been assessed in the preparation of the concept plan.

The planning proposal aims to allow a mixed community (50% defence members and family and 50% privately owned). Opportunities exist to strive for caring and inclusive community at Fort Wallace.

An objective of the planning proposal is to maintain and enhance the history of Fort Wallace. A diversity of housing is also proposed, which supports this direction.

The planning proposal can create educational opportunities associated with its rich history.

**Local Planning Strategy**

The Local Planning Strategy was adopted by Council in 2015. It was prepared in accordance with the CSP.

The strategy is a comprehensive land use strategy prepared to guide the future growth and development in Newcastle to 2030 and beyond. It underpins the LEP. Consistency with the LPS has been discussed throughout this planning proposal. The planning proposal is consistent with the strategic directions contained within the LPS, particularly as it seeks to create more housing choice on part of the site while striving for protection or enhancement of the natural environment and heritage on the other.
5. Is the planning proposal consistent with applicable State Environmental Planning Policies?

An assessment of the planning proposal against the relevant SEPPs is provided in the table below.

**Table 1 - Relevant State Environmental Planning Policies**

<table>
<thead>
<tr>
<th>Relevant SEPPs</th>
<th>Consistency and Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEPP 14 (Coastal Wetlands)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP to ensure that proposed development does not impact on coastal wetlands to ensure ongoing preservation and protection. SEPP 14 Coastal wetlands are located to the east of the site. An assessment of significance (See Appendix B) concluded that, based on the current concept plan, the proposed rezoning was unlikely to result in a significant impact on threatened species occurring or potentially occurring in the Study Area. Furthermore, due to the nature of the proposed rezoning and that no direct or indirect impacts are likely to occur on surrounding lands, it is unlikely that the proposed rezoning would impact the Hunter Estuary Wetlands Ramsar Site or Stockton Sandspit known to provide habitat for EPBC Act-listed threatened and migratory species. See Appendix E for Stormwater Report. Any changes to the concept plan following this assessment, as part of a future development application, will require a revised Assessment of Significance under the EPBC Act.</td>
</tr>
<tr>
<td><strong>SEPP 44 (Koala Habitat Protection)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP. The Ecological Assessment in Attachment B concluded that the site does not contain koala habitat. No evidence of koala habitat was found.</td>
</tr>
<tr>
<td><strong>SEPP 55 (Remediation of Land)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP. A Site Audit Statement (and Report) has been prepared and provided at Attachment F. The site has been remediated to meet certain standards to allow a rezoning of land to facilitate housing and recreational activities. More detail is provided in the Statement.</td>
</tr>
<tr>
<td><strong>SEPP 64 (Advertising and Signage)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP.</td>
</tr>
<tr>
<td><strong>SEPP 65 (Design Quality of Residential Flat Development)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP. The Urban Design and Landscape Report (Attachment D) was used to guide the draft site specific DCP. The designs and controls were informed by SEPP65 design quality principles and Apartment Design Guide. Councils design review panel, (UDCG) reviewed the controls, provided advice and informed the draft DCP and planning proposal. Overall, the panel showed support for the proposal.</td>
</tr>
<tr>
<td>Relevant SEPPs</td>
<td>Consistency and Implications</td>
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<tr>
<td><strong>SEPP 71  (Coastal Protection)</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP. Fort Wallace is located within the coastal zone which means careful planning and management is required in the redevelopment of the site. In accordance with the SEPP, a concept / master plan has been prepared to not negatively impact the natural, cultural, recreational and economic attributes on the site. Due to the highly disturbed nature of the natural landscape at Fort Wallace (including significant weed invasion such as bitou bush at present) there is an opportunity to improve the quality of vegetation, which in turn can lessen impacts of coastal erosion. A Coastal Engineering Report was prepared to guide the concept plan and support the planning proposal. It can be found at Appendix G. All proposed development is landward of the Council adopted ‘unlikely 2100 hazard line’ so it satisfies requirements. The Urban Design and Landscape Report (Appendix D) documents the process undertaken to ensure appropriate type, bulk and scale of development in this sensitive setting. The heritage documentation, including Aboriginal Cultural Heritage and Archaeological Assessment Report (Appendix H) supports the aims of the SEPP.</td>
</tr>
<tr>
<td><strong>SEPP (Building Sustainability Index: BASIX) 2004</strong></td>
<td>The planning proposal can meet BASIX requirements and satisfy overall requirements of the SEPP.</td>
</tr>
<tr>
<td><strong>Draft Coastal Management SEPP 2016</strong></td>
<td>The planning proposal can satisfy the requirements of the SEPP. See above comment on coastal management. An E3 Environmental Management Zone is proposed for the more sensitive parts of the site eg landward of the 2100 unlikely hazard line.</td>
</tr>
</tbody>
</table>
6. Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

An assessment of the planning proposal against the relevant Ministerial Directions is provided in the table below.

**Table 2 - relevant Ministerial Directions (Section 117 directions)**

<table>
<thead>
<tr>
<th>Relevant Section 117 Directions</th>
<th>Consistency and implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Employment and Resources</strong></td>
<td></td>
</tr>
<tr>
<td>1.4 Oyster Aquaculture</td>
<td>The NSW Oyster Industry Sustainable Aquaculture Strategy, 2006 identifies the proposed discharge area as a ‘Priority Oyster Aquaculture Area’ in the Hunter River. A Stormwater Assessment (<a href="#">Appendix E</a>) has been undertaken to consider potential impacts and concluded that proposed rezoning to accommodate residential development as outlined within the concept plan will not directly impact the oyster aquaculture area, though stormwater runoff from the site has the potential to harm healthy oyster growth. It is also noted that the existing developed site does not utilise appropriate treatment systems and therefore it is anticipated that suitable provision of treatment will enhance the stormwater quality discharged from the site irrespective of the proposed additional development within the site. It is recommended that the Department of Primary Industries are consulted after gateway determination.</td>
</tr>
<tr>
<td><strong>2. Environment and Heritage</strong></td>
<td></td>
</tr>
<tr>
<td>2.1 Environment Protection Zones</td>
<td>The planning proposal is consistent with the aims of this Direction. Development is proposed within cleared or highly disturbed parts of the site. The E3 Environmental Management Zone is proposed to protect and conserve environmentally sensitive areas.</td>
</tr>
<tr>
<td>2.2 Coastal Protection</td>
<td>The planning proposal is consistent with the aims of this Direction. Detail provided in the Coastal Engineering Report (<a href="#">Appendix G</a>) and discussed above.</td>
</tr>
</tbody>
</table>
### Relevant Section 117 Directions

<table>
<thead>
<tr>
<th>Relevant Section 117 Directions</th>
<th>Consistency and implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.3 Heritage Conservation</strong></td>
<td>The planning proposal is consistent with the aims of this Direction. The Heritage Precinct Park (which consists of highly significant defence related buildings and structures such as the observation tower and gun emplacements) are proposed to be placed within the E3 Environmental Management Zone. The planning proposal also recommends that the site be included as a local listing in Schedule 5 Environmental Heritage of the Newcastle LEP 2012. A suite of controls relating to heritage ie buffer zone and views to significant items are also included in the draft DCP to facilitate the vision of the concept plan. The Heritage Impact Statement and Aboriginal Cultural Heritage and Archaeological Assessment Report (and review of these) have informed the concept plan / draft site specific DCP and proposed rezoning and controls contained with the planning proposal. See Attachments H and I.</td>
</tr>
<tr>
<td><strong>3. Housing, Infrastructure and Urban Development</strong></td>
<td></td>
</tr>
<tr>
<td><strong>3.1 Residential Zones</strong></td>
<td>The planning proposal is consistent with the aims of this Direction. The intention of the concept plan and planning proposal is to create a variety of housing choice on the site and to use or adapt existing infrastructure on the site where possible e.g. roads and heritage buildings. The site is not far from the Stockton commercial strip and Newcastle city centre. Smaller building footprints are proposed on land previously cleared for development or disturbed by defence related uses.</td>
</tr>
<tr>
<td><strong>3.4 Integrating Land Use and Transport</strong></td>
<td>The planning proposal is consistent with the aims of this Direction. The proposal is to facilitate and deliver housing to defence members and family. The site is considered a good distance for employees at the RAAF base at Williamtown. The planning proposal is informed by a Transport Study as provided at Attachment J. The study concludes that the site is well serviced by public transport and that local roads have capacity to accommodate the additional vehicles that may result from the recreation of 100 dwellings.</td>
</tr>
<tr>
<td><strong>4. Hazard and Risk</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4.1 Acid Sulfate Soils</strong></td>
<td>The planning proposal is consistent with the aims of this Direction. The site is affected by class 4 and 5 Acid Sulfate Soils. Future development must comply with Clause 6.1 Acid Sulfate Soils of the Newcastle LEP 2012.</td>
</tr>
</tbody>
</table>
### Relevant Section 117 Directions

<table>
<thead>
<tr>
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<th>Consistency and implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.4 Planning for Bushfire Protection</strong></td>
<td>The planning proposal is consistent with this Direction. The proposal has been assessed for its compliance with bushfire protection legislation and policy in detail in the Bushfire Assessment Report, provided at Attachment C. The assessment confirmed that the proposed development can achieve BAL 29 providing recommended APZ are managed. Water and access provisions are deemed suitable for the proposed development.</td>
</tr>
</tbody>
</table>

### 5. Regional Planning

| 5.10 Implementation of Regional Plans | The planning proposal is considered consistent with the vision, land use strategy, goals, directions and actions contained within the HRP. See Section 3 of the planning proposal for discussion. |

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### 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?

**Flora and fauna**

The vision for the site is to retain and protect significant vegetation that can provide important habitat for fauna. An Ecological Assessment has been undertaken to inform the planning proposal. The assessment (Attachment B) included a desktop analysis, review of previous surveys and records, site surveys and recordings to identify the flora and fauna communities present or likely to be present onsite. In order to consider the likely impacts that development associated with delivering the concept plan (approximately 100 dwellings) an assessment was undertaken.
The assessment found that the Fort Wallace site contains three native vegetation communities and one exotic vegetation community being Frontal Dune Blackbutt-Apple Forest, Coastal Tea-tree – Banksia Scrub, Bitou bush-dominated Scrub and Foredune Spinifex. See Figure 4 below.

**Figure 4 - Vegetation Community Mapping - Fort Wallace**

A wide range of flora and fauna species have been recorded within and surrounding the Study Area as part of previous ecological surveys. Generally, the habitats on the site are moderately to highly disturbed and degraded as a result of previous disturbances and weed invasion.

Three threatened species listed under the Threatened Species Conservation Act and/or EPBC Act have been recorded on the site being pied oystercatcher (Haematopus longirostris), greyheaded flying-fox (Pteropus poliocephalus) and east coast freetail-bat (Mormopterus norfolkensis). See Figure 5 below for mapped threatened species.
Technical assessments of the concept plan demonstrate how a residential development may be appropriately facilitated on the site. It is considered unlikely that redevelopment of the site for residential uses would result in a significant impact on threatened species occurring or with the potential occur on the site. Future development applications will be required to be accompanied by a report assessing the significance of the development on the ecological significance of the site.

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

The planning proposal is not likely to result in development that will create any significant adverse environmental effects. A range of strategic and technical reports and assessments have been undertaken to ensure that potential impacts of the planning proposal to rezone the land are acceptable, including the ecological assessment summarised in the previous section of this report.
Traffic and Transport Considerations

Local traffic and transport / Public transport

A Transport Study Report (Appendix J) was prepared to assess the high level potential of the transport network to accommodate residential development of the site. In order to understand potential impacts and development levels the concept plan to allow for approximately 100 dwellings was assumed.

Forecast traffic flows would be in the order of 156 trips AM and 172 trips PM for the Fort Wallace site. The existing flow levels on Fullerton Street coupled with the initial predictions of site traffic flows suggest the site will need an intersection configuration with an Auxiliary Left (AUL) turn lane, and a Channelised Right short turn slot to cater for predicted site movements onto and from Fullerton Street.

The assessment concludes that the external road network is capable of absorbing these levels of additional trips, while remaining at a good operational level of service.

Cycle and pedestrian movement

In terms of cycling and pedestrian access, a shared path links the site to the shopping strip and ferry terminal in Stockton.

Figure 6 identifies potential future connections to neighbouring sites, which are expected to redevelop in the future.

Figure 6 - Potential future connections - Fort Wallace

![Figure 6 - Potential future connections - Fort Wallace](image-url)
Environmental Considerations

**Bushfire hazard**

A Bushfire Assessment (Appendix C) has been prepared to understand bushfire risk with respect to the redevelopment of the site to allow for approximately 100 dwellings. It included a review of the concept plan in order to recommend appropriate bushfire risk mitigation measures. The report found that the predominant bushfire hazard is located in the north, east and south boundaries of the subject site.

The Assessment concludes that the concept plan and associated design principles can comply with all performance criteria’s outlined for integrated (residential subdivision) development and minimum construction requirements at detailed design stages. The assessment also finds that the proposed design provides for suitable access and water provisions for emergency management. See Figure 7 for mapped Asset Protection Zones.

It is recommended that the planning proposal be forwarded to RFS for comment post gateway determination.

**Figure 7 - Asset Protection Zones - Fort Wallace**
**Acid Sulfate Soil**

The site is affected by Acid Sulfate Soils. Future development must comply with Clause 6.1 Acid Sulfate Soils of the Newcastle LEP 2012.

**Water quality / Stormwater management**

The Stormwater Management Plan (Appendix E) specifically addresses stormwater quantity and quality. It has addressed the impacts of the development of the site on the existing drainage regime, determined the stormwater discharge constraints and identified proposed stormwater device measures to adequately treat the stormwater prior to discharging to receiving waters.

Based on review of the existing site topography, it has been identified that stormwater discharging from the site will be conveyed to Fullerton Street and discharge across Fullerton Street and Council reserve to the Hunter River South Arm.

A MUSIC model was used to simulate pollutant source elements for the concept master plan to confirm that stormwater could be adequately treated within the limits of the development in the case of a residential development of the site. The results from this study demonstrate that there is adequate capacity within the site to achieve the required performance objectives of the stormwater management.

**Flooding**

The site is not affected by flooding.

**Land/site contamination (SEPP55)**

A Site Audit Statement (and report) is attached. See Appendix F. There is sufficient information to conclude that contamination has been adequately investigated, remediated and validated to support the proposed rezoning based on the site auditors review and conclusions.

It is however noted that an array of contaminants have been found on the site including buried asbestos, ordinance (e.g. hand grenade, mortar shell, small arms projectiles), polycyclic aromatic hydrocarbons (PAHs) and lead. The auditor notes the possibility of unexpected finds and existing sources of contamination such as PAH contaminated pavements and asbestos infrastructure which will have to be appropriately considered and managed during future development and there will need to be an appropriate long term management plan to manage these risks.

The conclusion is that the site has been adequately remediated and validated however, residual contamination issues will require further consideration and management as part of the redevelopment process.

**Resources (including drinking water, minerals, oysters, agricultural lands, fisheries, mining)**

**Coastal erosion**

Changes to the coastal system to the east of the Fort Wallace site have been investigated to assess the potential impacts of short and long term erosion, sea level rise, and ongoing recession. The Coastal Engineering Assessment (Appendix G) demonstrates three scenarios for erosion by 2100 and the impact of each scenario on the Fort Wallace site, considering specifically the concept plan as an example of a potential residential development of the site.
The three scenarios are as follows: an ‘almost certain’ erosion scenario including short and medium term erosion, ongoing recession (due to the Newcastle Harbour breakwaters), but excluding the impacts of sea level rise; a ‘likely’ erosion scenario including short and medium term erosion, ongoing recession, and future recession due to sea level rise of 0.4 m by 2100 (equivalent to the current rate of sea level rise); and an ‘unlikely’ erosion scenario including short and medium term erosion, ongoing recession, and future recession due to sea level rise of 0.9 m by 2100 (equivalent to highest emission scenario along which we are tracking). The ‘unlikely’ scenario is the typical conservative estimate used for planning purposes in NSW. See hazard scenarios mapped in Figure 8. Replace map with updated one

In accordance with Council policy and best practice planning for residential subdivision and development potentially at risk from coastal hazards, all residential development in the concept plan is located westward of the 2100 ‘unlikely’ hazard line. The report recommends that the proposed rezoning be supported.

Figure 8 - Coastal erosion - Fort Wallace
Urban Design Considerations

The Urban Design and Landscape Report (Appendix D) informed the concept plan and proposed LEP amendments contained within the planning proposal.

The vision is to create a new place to enjoy without compromising the site’s unique history and coastal landscape character. The following planning and design principles underpin future development of the site:

1. touch lightly on the land
2. embrace the coastal ecology
3. celebrate history and cultural heritage
4. utilise interesting architectural forms.

The vision indicates potential to open the site for community access.

The concept plan has been developed to incorporate best practice planning and design principles, which is reflected in the draft DCP section.

The Urban Design Consultative Group (UDCG) has reviewed the documentation prepared to inform the planning proposal (Attachment C of Council report) and formally on the draft DCP.

In summary, the UDCG:

- Support a mixture of development densities and typologies for the site, but suggested that apartments are restricted to a maximum of three habitable floors.
- Development is massed in a stepped formation rather than long uniform roof forms.
- Varied heights, not exceeding 14m.
- Further consideration in respect to possible building design, given high bushfire requirements. This may limit material selection and impact landscape outcomes given need for APZs.
- Consultation with local Worimi Aboriginal representatives is recommended in respect to procedure for archaeological finds and use of interpretative information in relation to Indigenous heritage that could be displayed for visitors.
- The group also raised concerns around lack of areas for recreational activities such as “kicking a ball” or other play and inclusion of a small convenience shop as part of the proposal.

Response

Council engaged heritage consultants to review the supporting heritage reports. As part of this review, a workshop with Registered Aboriginal Parties (RAPs) took place. RAPs advised that interpretation strategies be developed in consultation with RAPs and that signage is to obtain general information regarding the nature of the study area and the possibility that interpretation signage be written in both English and the native Worimi language.

In terms of recreational activities, the concept plan and proposed zone changes will allow for these. A shop is not proposed as part of this concept plan however, the zoning does not prohibit it. A location for a retail offering is currently being investigated in the development of a draft land use strategy for the larger area.
In terms of the review, minor changes were made to the concept plan, DCP and proposed LEP amendments contained within the original request. These include:

- Reducing one of the apartment blocks to 11m near a highly sensitive part of the site and removal of four dwellings in proximity to this area.
- The creation of a heritage buffer zone.
- Mapping important views to heritage items that require protection.
- Updating the Conservation Management Plan (CMP) to direct the design process.

Social and Cultural Considerations

Heritage impacts

A Heritage Impact Statement (Appendix I) was prepared to assess the likely heritage impacts of the planning proposal on the European heritage on the site. A survey of heritage items and their condition has been undertaken and each item has been mapped and categorised. Previous studies and relevant documentation such as the CMP and heritage management strategy for the site have been considered.

Fort Wallace has heritage significance due to its former defence use and the structures remaining on the site associated with those uses. Fort Wallace was the third fort constructed for the defence of Newcastle in 1912, and is a relatively rare example of three consecutive defence phases on the one site.

Aboriginal archaeology

An assessment of the aboriginal cultural values and archaeology of the site was undertaken in consultation with local aboriginal parties. See Appendix H. Notifications of work on the site were developed and publicly displayed, with four parties registering their interest in ongoing consultation.

A pedestrian survey of the site was undertaken with all groups. In summary, the survey response noted the entire site is important to local Aboriginal community. The recommendations have been incorporated into the concept plan for the site and planning proposal.

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

The planning proposal is intended to facilitate redevelopment of the site to allow for residential and recreational purposes.

The planning proposal would deliver some important social benefits, as described below:

- New and unique public domain. The planning proposal is intended to facilitate a substantial area of public recreation, including the beach and area around the heritage precinct. They will also provide habitat for local flora and fauna, as described in the Ecological Assessment Report provided in Appendix B and ensure the ongoing protection and public enjoyment of heritage items, as described in the Heritage Impact Statement (Appendix I).
The proposed planning controls are based on principles for sustainable development, including ensuring that built form delivers high levels of amenity for future residents. Redevelopment of the site would result in approximately 100 dwellings of different sizes and typologies, catering for a diverse range of residents. Approximately 50% of these would be available to the market, with 50% reserved for defence personnel to be retained and managed by DHA. DHA provides subsidised housing for members of defence and their families, generally focusing on defence personnel with dependants (with single defence personnel often renting privately, which also receives some subsidy). This model ensures that appropriate, affordable housing is supplied in proximity to amenity and members places of work. The model also seeks to integrate private and defence housing in a socially and financially sustainable development.

- The planning proposal provides opportunities for recreational activities and to experience the site’s heritage.

- Residential development of the site would increase demand for local retail and commercial uses, increasing the feasibility of a wide range of local businesses, particularly in the Stockton Town Centre.

Social and community infrastructure in the area has been reviewed and mapped as shown in Figures 9 and 10. The site is also close to essential emergency services, including a fire station and police station in Stockton.
Figure 9 - Social Infrastructure - Fort Wallace
Figure 10 - Social Infrastructure - Fort Wallace
**Social and cultural impacts**

A Social Impact Assessment (SIA) has been prepared to support the planning proposal. See (Appendix K). It has been prepared in accordance with Newcastle City Council’s *Social Impact Assessment Policy, 1999*. It discusses social considerations in the interests of DHA and the local community.

The concept plan includes improvements, including options to adaptively reuse heritage buildings. A café, kiosk, community facility, viewing platform and park are proposed options. The proposed park aims to emphasize principles of nature play through selection of play facilities and materials. An active sports lawn and playgrounds could be included in the spaces. The proposed zoning allows for such uses. There is opportunity for residents and visitors to engage with the site’s unique military heritage. The military and indigenous history contained on the site can offer education and provide for enjoyment.

The SIA has not identified any social considerations that would preclude the development of the site for residential development. The site would likely accommodate approximately 270 residents, would affect provide for renewal of the currently unutilised land and facilitate access to local heritage items and natural areas. There are existing unmet needs for social infrastructure. Additional social infrastructure (facilities, services and programs) would be required to support the development of a sustainable, healthy and inclusive community. See summary of social impacts recommended for consideration:

**Figure 11 - Social impact options for consideration - Fort Wallace**

<table>
<thead>
<tr>
<th>Area of Change</th>
<th>Proposed mitigation or enhancement measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social infrastructure</strong></td>
<td>• Short term increases to Sibbald Library hours and increased frequency of Port Stephens mobile library service.</td>
</tr>
<tr>
<td></td>
<td>• New multipurpose facility to meet diverse community needs (community/youth/cultural seniors, library).</td>
</tr>
<tr>
<td></td>
<td>• Port Stephens Council to facilitate private sector delivery of preschool and OOSH services in the local area, and explore options for sports courts and fields in Fern Bay.</td>
</tr>
<tr>
<td></td>
<td>• Regional Councils issue with Department of Education to determine appropriate school catchments for Fort Wallace.</td>
</tr>
<tr>
<td><strong>Access and mobility</strong></td>
<td>Future site planning include pedestrian access to the Sibbald Centre bus stop and pedestrian crossing.</td>
</tr>
<tr>
<td></td>
<td>• Regional Councils consider pedestrian and cycle crossed options for Fullerton Road and/or shared pathway east of Fullerton Road.</td>
</tr>
<tr>
<td></td>
<td>• Any site developer ensure adequate mobile phone reception throughout the site.</td>
</tr>
<tr>
<td><strong>Community cohesion and connectedness</strong></td>
<td>Regional Councils consider a multipurpose community centre. A community development and welcome program be pursued by any site developer.</td>
</tr>
<tr>
<td><strong>Health and wellbeing</strong></td>
<td>Active travel promotion be a component of a Community Development and Welcome plan for any new development at Fort Wallace.</td>
</tr>
<tr>
<td><strong>Crime and safety</strong></td>
<td>Undertake a CPTED assessment for any future master plan.</td>
</tr>
<tr>
<td></td>
<td>Implement Community Development and Welcome Plan to address existing crime issues and improve passive surveillance.</td>
</tr>
</tbody>
</table>

**Conclusion**

The LEP can be completed within a reasonable timeframe and identified potential impacts can be addressed.
Section D - State and Commonwealth interests

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

Existing infrastructure is adequate to serve or meet the needs of the proposal.

An assessment of the capacity of key services has been undertaken to inform the development of the concept plan and planning proposal. The assessment of services has been prepared and includes consideration of portable water supply, sewer, electricity, telecommunications, and gas. The report has been provided in Appendix L of this planning proposal.

The assessment concludes that residential development on a portion of the site would be adequately serviced by surrounding infrastructure and as such there are no constraints to the proposed rezoning due to the provision of services. Some further assessment and potential upgrades to the Stockton 4 Waste Water Pump Station is likely to need to be undertaken at subdivision and development stages.

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

Public authorities will be consulted in accordance with the Gateway determination. It is suggested that the following State and Commonwealth public authorities should be consulted with prior to public exhibition:

- Rural Fire Services
- Roads and Maritime Services
- Office of Environment and Heritage (both divisions)
- Department of Primary Industries
- National Parks and Wildlife Services

Conclusion

The LEP can be completed within a reasonable timeframe and identified potential impacts can be addressed.
Part 4 - Mapping

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

- Land Zoning Map
- Height of Buildings Map
- Minimum Lot Size Map
- Heritage 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>
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<th>HOB</th>
<th>LSZ</th>
<th>HER</th>
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</table>

Map Codes:

- LZN = Land Zoning Map
- HOB = Height of Buildings Map
- LSZ = Lot Size Map
- HER = Heritage Map
The following maps illustrate the proposed amendments to the Newcastle LEP 2012 maps:

- **Figure 12**: Existing Land Zoning Map
- **Figure 13**: Proposed Land Zoning Map
- **Figure 14**: Existing Max Height of Buildings Map
- **Figure 15**: Proposed Max Height of Buildings Map
- **Figure 16**: Existing Min Lot Size Map
- **Figure 17**: Proposed Min Lot Size Map
- **Figure 18**: Existing Heritage Map
- **Figure 19**: Proposed Heritage Map
Figure 13 - Proposed Land Zoning Map
Figure 14 - Existing Max Height of Buildings Map
Figure 17 - Proposed Min Lot Size Map
Figure 18 - Existing Heritage Map
Figure 19 - Proposed Heritage Map
Part 5 - Community consultation

The planning proposal will be exhibited in accordance with the Department of Planning and Environment's guidelines, ‘A guide to preparing local environmental plans’. It is proposed that the planning proposal will be publicly exhibited for 28 days.

Relevant public authorities will be consulted in accordance with the requirements of the Gateway determination.

Early consultation has been undertaken by DHA and consultants mid to late 2016. A number of methods of community consultation were undertaken, including meetings, newsletters, online activities, phone calls, emails and community information and feedback sessions. During this process the indicative concept plan for the site was made available for comment. The process and outcomes of early consultation is documented in the Consultation Report at Appendix M.
**Part 6 - Project timeline**

The plan making process is shown in the timeline below. It will be undertaken in accordance with the Gateway determination.

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<td>Anticipated timeframe for the completion of required studies</td>
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<td>Timeframe for government agency consultation</td>
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<tr>
<td>Commencement and completion dates for public exhibition period</td>
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<td>Timeframe for consideration of submissions</td>
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<tr>
<td>Timeframe for the consideration of a proposal post exhibition</td>
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<tr>
<td>Anticipated date RPA* will make the plan (if delegated)</td>
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<tr>
<td>Anticipated date RPA* will forward to the Department for notification (if delegated) or for finalisation (if not delegated)</td>
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</table>

*RPA Relevant Planning Authority
## Appendix A - Information checklist (completed)

### STEP 1: REQUIRED FOR ALL PROPOSALS
(under s55(a)-(e) of the EP&A Act)

- Objectives and intended outcome
- Mapping (including current and proposed zones)
- Community consultation (agencies to be consulted)
- Explanation of provisions
- Justification and process for implementation (including compliance assessment against relevant section 117 direction/s)

### STEP 2: MATTERS CONSIDERED ON A CASE BY CASE BASIS
(Depending on complexity of planning proposal and nature of issues)

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<tr>
<th>Planning matters or issues</th>
<th>To be considered</th>
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</tr>
</thead>
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<tr>
<td><strong>Strategic Planning Context</strong></td>
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</tr>
<tr>
<td>Consistent with the relevant regional plan, district plan, or corridor/precinct plans applying to the site, including any draft regional district or corridor/precinct plans released for public comment; or</td>
<td>❌</td>
<td>❑</td>
</tr>
<tr>
<td>Consistent with a relevant local council strategy that has been endorsed by the Department; or</td>
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<td>❑</td>
</tr>
<tr>
<td>Responding to a change in circumstances, such as the investment in new infrastructure or changing demographic trends that have not been recognised by existing planning controls, or</td>
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</tr>
<tr>
<td>Seeking to update the current planning controls if they have not been amended in the last 5 years.</td>
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<td><strong>Site Description/Context</strong></td>
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<td>Aerial photographs</td>
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<td>Site photos/photomantage</td>
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<td><strong>Traffic and Transport Considerations</strong></td>
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<td>Cycle and pedestrian movement</td>
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<td>Acid Sulphate Soil</td>
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<td>Flora and/or fauna</td>
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### Planning Matters or issues

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<td>Stormwater management</td>
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<td>Flooding</td>
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<td>Land/site contamination (SEPP 55)</td>
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<td>Resources (including drinking water, minerals, oysters, agricultural lands, fisheries, mining)</td>
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<td>Sea level rise</td>
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#### Urban Design Considerations

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<th>Urban Design Consideration</th>
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<tr>
<td>Existing site plan (buildings vegetation, roads, etc)</td>
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<td>Building mass/block diagram study (changes in building height and DSR)</td>
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<td>Lighting impact</td>
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<td>Development yield analysis (potential) yield of lots, houses, employment generation</td>
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#### Economic Considerations

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<td>Retail centres hierarchy</td>
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#### Social and Cultural Considerations

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<td>Social and cultural impacts</td>
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<td>Stakeholder engagement</td>
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#### Infrastructure Considerations

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<tr>
<td>Infrastructure servicing and potential funding arrangements</td>
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#### Miscellaneous/Additional Considerations

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<tbody>
<tr>
<td>List any additional studies that should be undertaken post Gateway determination</td>
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</tbody>
</table>

Meeting date: April 2017
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©Umwelt (Australia) Pty Ltd
Umwelt (Australia) Pty Limited (Umwelt) has been commissioned by Defence Housing Australia (DHA) to prepare an Ecological Assessment for a rezoning application for the land known as Fort Wallace, the boundary of which is Lots 100 and 101 DP1152115 (the Study Area) in Stockton, NSW. It is proposed to rezone the Study Area from the current Infrastructure (SP2 Defence) to Low Density Residential under the Newcastle Local Environmental Plan (LEP) 2012 to allow for a residential subdivision.

DHA has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle-based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. In response to this, DHA have recently purchased two sites: Fort Wallace, Stockton, NSW and the Rifle Range, Fern Bay, NSW. DHA intends to obtain the necessary planning approvals to develop these sites for residential use with a mix of housing suitable for both Australian Defence Force (ADF) personnel and the private market.

The proposed Master Plan for the Fort Wallace site includes a mix of residential typologies including townhouses, dune apartments, coastal cluster houses, courtyard homes and single eco-homes primarily placed within the former Fort Wallace footprint. The Master Plan has sought to retain the Fort Wallace landscape and focus development within the previously disturbed areas of the site.

This Ecological Assessment was prepared to be appended to the Planning Proposal to rezone the Fort Wallace site.

The Fort Wallace site contains three native vegetation communities and one exotic vegetation community being Frontal Dune Blackbutt-Apple Forest, Coastal Tea-tree – Banksia Scrub, Bitou bush-dominated Scrub and Foredune Spinifex. A wide range of flora and fauna species have been recorded within and surrounding the Study Area as part of previous ecological surveys. Generally, the habitats in the Fort Wallace site are moderately to highly disturbed and degraded as a result of previous disturbances and weed invasion.

Three threatened species listed under the TSC Act and/or EPBC Act have been recorded on the site being pied oystercatcher (*Haematopus longirostris*), grey-headed flying-fox (*Pteropus poliocephalus*) and east coast freetail-bat (*Mormopterus norfolkensis*).

As the proposed rezoning has focused on the retention of as much intact vegetation and important ecological features as possible, the impacts to local biodiversity and threatened species are very minimal. Based on the current Master Plan, it is considered unlikely that the potential redevelopment of the site for residential uses would result in a significant impact on threatened species occurring or with the potential to occur on the site.

A range of mitigation and management measures are proposed to minimise the adverse impacts of the rezoning on local biodiversity. The rezoning aims to protect approximately 23 hectares of the site, via a proposed rezoning to E3 Environmental Management.
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# List of Abbreviations and Acronyms

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<th>Definition</th>
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<tbody>
<tr>
<td>ADF</td>
<td>Australian Defence Force</td>
</tr>
<tr>
<td>APZ</td>
<td>Asset Protection Zone</td>
</tr>
<tr>
<td>BC Act</td>
<td><em>Biodiversity Conservation Act 2016</em></td>
</tr>
<tr>
<td>BVT</td>
<td>Biometric Vegetation Type</td>
</tr>
<tr>
<td>DHA</td>
<td>Defence Housing Australia</td>
</tr>
<tr>
<td>DoEE</td>
<td>Commonwealth Department of the Environment and Energy (formerly DoE)</td>
</tr>
<tr>
<td>EEC</td>
<td>Endangered Ecological Community</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td><em>Environmental Planning and Assessment Act 1979</em></td>
</tr>
<tr>
<td>EPBC Act</td>
<td><em>Environment Protection and Biodiversity Conservation Act 1999</em></td>
</tr>
<tr>
<td>FM Act</td>
<td><em>Fisheries Management Act 1994</em></td>
</tr>
<tr>
<td>IBRA</td>
<td>Interim Biogeographic Regionalisation for Australia</td>
</tr>
<tr>
<td>LEP</td>
<td>Local Environmental Plan</td>
</tr>
<tr>
<td>LGA</td>
<td>Local Government Area</td>
</tr>
<tr>
<td>MNES</td>
<td>Matters of National Environmental Significance</td>
</tr>
<tr>
<td>NCC</td>
<td>Newcastle City Council</td>
</tr>
<tr>
<td>NPWS</td>
<td>National Parks and Wildlife Service</td>
</tr>
<tr>
<td>OEH</td>
<td>NSW Office of Environment and Heritage</td>
</tr>
<tr>
<td>PCT</td>
<td>Plant Community Type</td>
</tr>
<tr>
<td>RAAF</td>
<td>Royal Australian Air Force</td>
</tr>
<tr>
<td>SAT</td>
<td>Spot Assessment Technique</td>
</tr>
<tr>
<td>TEC</td>
<td>Threatened Ecological Community</td>
</tr>
<tr>
<td>TSC Act</td>
<td><em>Threatened Species Conservation Act 1995</em></td>
</tr>
<tr>
<td>VIS</td>
<td>Vegetation Information System</td>
</tr>
</tbody>
</table>
1.0 Introduction

Umwelt (Australia) Pty Limited (Umwelt) has been commissioned by Defence Housing Australia (DHA) to prepare an Ecological Assessment for a rezoning application for the land known as Fort Wallace, the boundary of which is Lots 100 and 101 DP1152115 (the Study Area) in Stockton, NSW (refer to Figure 1.1). It is proposed to rezone the Study Area from the current Infrastructure (SP2 Defence) to Low Density Residential under the Newcastle Local Environmental Plan (LEP) 2012 to allow for a residential subdivision.

The Study Area has been subject to ongoing investigations (including ecological survey) as a potential development site since 2008. The ecological features identified as part of such investigations (including current and previous field survey) have been used to guide the design of an appropriate Master Plan that informs the planning proposal, with the aim of providing a development approach which balances the economic potential of the study area with appropriate biodiversity conservation outcomes for the broader Stockton area.

1.1 Project Description

DHA has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle-based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. In response to this, DHA have recently purchased two sites: Fort Wallace, Stockton, NSW and the Rifle Range, Fern Bay, NSW. DHA intends to obtain the necessary planning approvals to develop these sites for residential use with a mix of housing suitable for both Australian Defence Force (ADF) personnel and the private market.

The two sites are located close to the Royal Australian Air Force (RAAF) Base Williamtown which lies 11 to 12 kilometres to the north of the sites. The Newcastle central business district lies a few kilometres to the south across the Hunter River.

1.1.1 Proposed Master Plan – Fort Wallace

The proposed Master Plan for the Fort Wallace site includes a mix of residential typologies primarily placed within the former Fort Wallace clearance footprint (refer to Figure 1.2). The Master Plan has sought to retain the Fort Wallace landscape and focus development within the previously disturbed areas of the site. The residential typologies for the Fort Wallace include the following:

- **Townhouses** – up to 30 attached 1-3 storey dwellings with a lightweight design that facilitates layouts that are responsive to site features and context.
- **Dune apartments** – up to 42 designed to minimise the overall building footprint and bulk and maximise visual connections with the surrounding landscape.
- **Coastal cluster houses** – up to 21 townhouse style dwellings set within natural landscape areas. Private open space is limited to decks and immediate terrace areas attached to each dwelling.
- **Courtyard homes** – up to 3 large courtyard family homes including 4 bedrooms, 3 bathrooms, open plan living space, single garage and an ample rear garden.
- **Single eco-homes** – up to 7 lightweight, climate responsive individual homes set within generous lots.
1.1.2 Guiding Principles

It is envisaged that a residential development at the Fort Wallace would develop the site and the areas of Stockton and Fern Bay as unique coastal communities with strong links to Newcastle and the growing Hunter region. The rezoning aims to provide residential housing while balancing the natural coastal environment and cultural heritage assets of the site.

Guiding principles for the rezoning of Fort Wallace, which have shaped the design considerations of the Master Plan, include the following:

- **Touch lightly on the land** – raised building (no slabs), working with the existing natural topography to minimise earthworks.

- **Embrace the coastal ecology** – minimisation of private open space and boundary fencing, native endemic planting only, maximise views to the ocean, dunes, river and bushland.

- **Celebrate history and cultural heritage** – retain heritage structures, connect with the history of the site.

- **Create a diverse community** – mix of building typologies for defence, private and affordable housing needs, recreational opportunities for visitors.

- **Open the gates to the public** – provide public access via the local road, pedestrian and cycle networks, controlled access to the beach and dunes.

- **Utilise interesting architectural forms** – staggered building heights, natural materials and finishes, varied street setbacks.

1.2 Approval Pathway

This ecological assessment is part of a suite of specialist assessments of the site that have informed consideration of the site’s potential for redevelopment. These assessments have been used as the basis of master plan options and the development of a recommended master plan, which has subsequently informed proposed revised planning controls for the site with respect to land use, height of buildings, and heritage.

It is intended that a planning proposal will be lodged with Newcastle City Council, seeking support of the strategic merit of the proposal to proceed to a Gateway Determination by the Department of Planning and Environment (DPE). It is intended that the planning proposal, if supported by both Council and DPE, would then proceed to public exhibition and finalisation through an amendment to the LEP. Key outcomes of the master plan may be established in a site specific Development Control Plan or Stage 1 Development Application. Appropriate approvals will then be sought for the subdivision and development of the site under the amended planning controls.

The Master Plan has been used as a demonstration of how the site could appropriately accommodate residential uses in response to best practice urban design and planning principles. Where appropriate, this report has considered the likely impacts of the Master Plan on the ecology of the site to enable as detailed an assessment as possible. However, it is acknowledged that further detailed work will be undertaken and consideration given to potential ecological impacts at the subdivision and detailed design stage.
1.3 Objectives of the Ecological Assessment

This Ecological Assessment will be appended to the Planning Proposal to rezone Fort Wallace. Specifically, the objectives of the Ecological Assessment are to:

- describe the flora and fauna species and other important ecological features recorded within the Study Area and locality from previous studies on the site, local studies and ecological database searches
- identify any threatened species, endangered populations, threatened ecological communities (TECs), or their habitats listed under the NSW Threatened Species Conservation Act 1995 (TSC Act), NSW Fisheries Management Act 1994 (FM Act), and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), that may be adversely affected as a result of the proposal
- assess the potential impact of the proposal in relation to identified and potential important ecological features, according to the requirements of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the EPBC Act and
- develop impact mitigation measures (including consideration of offsetting opportunities) to avoid or reduce any potential significant impacts of the proposal on the important ecological values of the Study Area.

The Biodiversity Conservation Act 2016 was implemented on 25 August 2017, repealing the TSC Act. It should be noted that this Ecological Assessment was prepared and submitted to Council prior to the repeal of the TSC Act (February 2017). This report (Version 3) has been updated to reflect the changes requested following Council’s review of the Planning Proposal in relation to building heights, zoning amendments and heritage considerations.

The assessments in this report have not been updated to reflect the minor changes in relation to the replacement of the TSC Act by the BC Act. It is understood that threatened entities previously listed under the TSC Act were automatically transferred to be listed under the BC Act and the amended Assessment of Significance Test (now outlined in Section 7.3 of the BC Act) does not materially change the assessment outcome. Consideration of the BC Act and its implications on the Project will be addressed at the DA phase of the project, as required.

1.4 Document Outline

The Ecological Assessment includes the following sections:

- Section 1 – provides the introduction to the report
- Section 2 – outlines the methods used in the ecological assessment
- Section 3 - describes the ecological features of the Study Area
- Section 4 – assesses the likely impacts on important ecological features
- Section 5 – describes impact avoidance, mitigation and offsetting opportunities
- Section 6 – outlines recommendations for additional ecological investigations during the development application phase of the project
- Section 7 - provides a list of references used throughout the report and analysis.
2.0 Methods

The methods employed as part of the desktop and field components of the Ecological Assessment are discussed in the following sections, including those of the current and previous surveys within the Study Area.

2.1 Literature Review

A review of all relevant and available literature was undertaken in order to gain a holistic understanding of the ecological values of the Study Area. Documents reviewed included regional vegetation mapping reports, site-specific monitoring surveys, ecological surveys undertaken in the vicinity of the Study Area and also relevant ecological database searches.

The following key documents were reviewed during the preparation of this Ecological Assessment:

- Ecological Constraints Assessment – Fort Wallace, Stockton Peninsula (Kleinfelder 2015)
- Ecological Constraints Report, Fort Wallace, Stockton, NSW (SMEC 2008)
- Vegetation of the Worimi Conservation Lands Port Stephens, NSW: Worimi NP, Worimi SCA and Worimi RP (Bell and Driscoll 2010)
- Greater Hunter Native Vegetation Mapping (Sivertsen et al. 2011).

2.2 Database Searches

In order to identify threatened species, endangered populations and TECs with the potential to occur in the Study Area, a review of relevant ecological databases was completed. These database sources comprised:

- Office of Environment and Heritage (OEH) Threatened Species Profile Database for known/predicted threatened species and TECs in the Hunter Interim Biogeographic Regionalisation for Australia (IBRA) subregion, accessed September 2016
- PlantNET (Royal Botanic Gardens Sydney) database search for Rare or Threatened Australian Plant species within the Newcastle LGA, accessed September 2016
- Department of Environment and Energy (DoEE) Protected Matters Search Tool for known/predicted EPBC Act-listed TECs, accessed September 2016
- VIS Classification Database (OEH 2016), accessed September 2016.
2.3  Field Surveys

2.3.1  Previous Field Surveys

Ecological field surveys have been carried out in the Study Area over many years and seasons including in April 2007 (SMEC 2008) and September 2015 (Kleinfelder 2015). Throughout these surveys, the following has been undertaken:

- Flora surveys including four 20m x 20m quadrats
- Diurnal fauna observations including signs of presence surveys and targeted bird surveys
- Habitat assessments
- Nocturnal spotlighting, call playback and Anabat surveys and
- Reconnaissance vegetation mapping and weed mapping.

The results of these surveys have been reviewed as part of the literature review outlined in Section 2.1.

2.3.2  Ecological Site Inspection

A site inspection was undertaken by Umwelt ecologists on 25 May 2016 in order to complete ground-truthing of previous surveys and identification of any important ecological features. This included:

- Rapid vegetation mapping reconnaissance
- Recording dominant weed species and infestations
- Habitat assessments for threatened species
- Diurnal bird surveys
- Spot Assessment Technique (SAT) surveys for koala (*Phascolarctos cinereus*) as per Phillips and Callaghan (1995)
- Call playback for masked owl (*Tyto novaehollandiae*), powerful owl (*Ninox strenua*), squirrel glider (*Petaurus norfolcensis*) and koala
- Spotlighting searches for nocturnal threatened fauna
- One remote camera survey location over seven nights targeting ground-dwelling threatened mammal species
- One Anabat survey location over seven nights targeted threatened micro-bat species and
- Opportunistic observations throughout the site inspection.

The remote camera and the Anabat were set up on 25 May 2016 and collected after seven nights on 1 June 2016.
2.3.3 Targeted Orchid Surveys

Site walkovers of the Study Area were undertaken by two Umwelt ecologists on 8 September 2016 to determine the presence or otherwise of sand doubletail (*Diuris arenaria*) and rough doubletail (*Diuris praecox*) within suitable habitats within the Study Area. Both species are known to occur along the Tomaree peninsula in sandy soils in association with sclerophyll forest and disturbed habitat margins.

The timing of these surveys was dependent on the known flowering times of these species within the Port Stephens area. Furthermore, known records of the threatened orchids (control sites) were visited prior to the surveys to confirm the flowering of the species in the local area. Survey was undertaken in early September 2016 to cover the beginning of the sand doubletail flowering period and the end of the rough doubletail flowering period as per the flowering times outlined in Table 2.1.

### Table 2.1 Threatened Orchid Species Known Flowering Period in Port Stephens

<table>
<thead>
<tr>
<th>Targeted Orchid Species</th>
<th>Flowering Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>sand doubletail (<em>Diuris arenaria</em>)</td>
<td>August to September</td>
</tr>
<tr>
<td>rough doubletail (<em>Diuris praecox</em>)</td>
<td>July to September</td>
</tr>
</tbody>
</table>
3.0 Results

3.1 Ecological Local Context

Fort Wallace (the Study Area) is situated on a sand peninsula that occurs between the Hunter River and Stockton Beach, east of Newcastle, NSW. The Study Area is located within the Newcastle City Council Local Government Area (LGA) and in the Sydney Basin Bioregion and the Hunter subregion.

Table 3.1 Study Area Location in the Landscape

<table>
<thead>
<tr>
<th>Fort Wallace</th>
<th>Sydney Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBRA Bioregion</td>
<td>Hunter</td>
</tr>
<tr>
<td>IBRA Subregion</td>
<td>Hunter/Central Rivers</td>
</tr>
<tr>
<td>Major Catchment Area</td>
<td>Sydney – Newcastle Barriers and Beaches</td>
</tr>
<tr>
<td>Mitchell Landscape</td>
<td>Newcastle City Council</td>
</tr>
<tr>
<td>LGA</td>
<td>Lot 100 DP1152115</td>
</tr>
<tr>
<td>Lot and DP</td>
<td>Lot 101 DP1152115</td>
</tr>
</tbody>
</table>

The Study Area is approximately 32 hectares in size and is broadly located between Fullerton Street, Stockton, and the high water mark at Stockton Beach, south of the Stockton Bridge. The land is currently zoned as SP2 Infrastructure (Defence) under the Newcastle City Council Local Environmental Plan (LEP) 2012.

The Study Area is surrounded by residential development to the north, the Pacific Ocean, waste water facilities to the south and the northern arm of the Hunter River to the west. The Study Area provides minimal connectivity to higher quality habitats in the north of Stockton being Worimi Conservation Lands, which provides an important habitat link within a broader wildlife corridor from the Hunter Wetlands National Park in the northwest, Tomaree National Park and Tilligerry State Conservation Area in the north.

Vegetation in the Study Area has been subjected to several human disturbances including activities during the active use of the site in World War II and defence training activities and vehicle recreation. These disturbances have led to a reduction in vegetation condition, particularly within the dune system. Retained vegetation in the northern and southern portion of the Study Area represents an isolated and fragmented area of lower quality habitat. Fauna habitats in the locality include disturbed forests, coastal sand scrub and sand dunes.
### 3.2 Flora and Native Vegetation

A total of 46 flora species have been recorded in the Study Area following floristic surveys undertaken by SMEC (2008), Kleinfelder (2015) and Umwelt. A full list of the flora species recorded during surveys of the Study Area is presented in Appendix A.

Three native vegetation community types have been mapped within the Study Area, being:

- Frontal Dune Blackbutt-Apple Forest
- Coastal Tea-tree – Banksia Scrub
- Foredune Spinifex.

One exotic vegetation community type has been mapped within the Study Area, being:

- Bitou Bush-dominated Scrub.

These communities have been aligned with the Vegetation of the Worimi Conservation Lands (Bell and Driscoll 2010) and assigned (where possible) to Plant Community Types (PCTs) and Biometric Vegetation Types (BVTs) as per the Vegetation Information System (VIS).

Table 3.2 outlines the native vegetation community types within the Study Area. Figure 3.1 shows vegetation mapping of the Study Area.

#### Table 3.2  Vegetation Communities in the Study Area

<table>
<thead>
<tr>
<th>Vegetation Community (Bell and Driscoll 2010)</th>
<th>Likely Associated PCT/BVT</th>
<th>Area within the Study Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal Dune Blackbutt-Apple Forest</td>
<td>PCT1646/HU860 – Smooth-barked Apple – Blackbutt – Old Man Banksia woodland on coastal sands of the Central and Lower North Coast</td>
<td>4.1</td>
</tr>
<tr>
<td>Coastal Tea-tree – Banksia Scrub</td>
<td>PCT1646/HU860 – Smooth-barked Apple – Blackbutt – Old Man Banksia woodland on coastal sands of the Central and Lower North Coast</td>
<td>5.0</td>
</tr>
<tr>
<td>Bitou Bush-dominated Scrub</td>
<td>No equivalent PCT or BVT</td>
<td>8.9</td>
</tr>
<tr>
<td>Foredune Spinifex</td>
<td>PCT1204/(no equivalent BVT) – Spinifex beach strand grassland, Sydney Basin Bioregion and South East Corner Bioregion</td>
<td>2.3</td>
</tr>
<tr>
<td>Cleared land/sand dunes</td>
<td>No equivalent PCT or BVT</td>
<td>11.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>31.9</strong></td>
</tr>
</tbody>
</table>
FIGURE 3.1
Preliminary Vegetation Community Mapping

Legend
- Site Boundary
- Fenual Dune/Rackhutte-Apple Forest
- Coastal Tea-tree - Banksia Scrub
- Biloela Bush dominated Scrub
- Fowndine Spinifex
- Cleared Land/Sand Dunes

Image Source: Nearmap (May 2016)
Data Source: LPI NSW (2009)
### 3.2.1 Vegetation Community Descriptions

Tables 3.3 to 3.6 below describe the vegetation communities occurring in the Study Area.

#### Table 3.3 Frontal Dune Blackbutt-Apple Forest

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Frontal Dune Blackbutt-Apple Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely Plant Community Type (PCT)</td>
<td>PCT1646/HU860 – Smooth-barked Apple – Blackbutt – Old Man Banksia woodland on coastal sands of the Central and Lower North Coast</td>
</tr>
<tr>
<td>Vegetation Formation</td>
<td>Dry Sclerophyll Forests (Shrubby sub-formation)</td>
</tr>
<tr>
<td>Vegetation Class</td>
<td>Coastal Dune Dry Sclerophyll Forests</td>
</tr>
<tr>
<td>Total Area in Study Area (ha)</td>
<td>4.1</td>
</tr>
</tbody>
</table>

**General Description**

This vegetation community occurs on the Holocene sands along the Stockton Bight coastline where there is protection from direct coastal winds. This vegetation community condition class is located primarily to the north of the Study Area. This community also occurs in two smaller patches in the south of the Study Area.

**Floristic Description**

This community is a moderately open forest with a shrubby understorey. The canopy is dominated by smooth-barked apple (*Angophora costata*) and blackbutt (*Eucalyptus pilularis*) with occasional occurrences swamp mahogany (*Eucalyptus robusta*). The midstorey was dominated by old man banksia (*Banksia serrata*), Sydney golden wattle (*Acacia longifolia*) and coastal tea-tree (*Leptospermum laevigatum*), with occasional coast banksia (*B. integrifolia*). The ground cover consisted primarily of bracken fern (*Pteridium esculentum*) with raspwort (*Gonocarpus teucrioides*), blady grass (*Imperata cylindrica*) and kangaroo grass (*Themeda triandra*) also present. The exotic bitou bush (*Chrysanthemoides monilifera*) and lantana (*Lantana camara*) also occur in this community.

**TSC Act Status**

This vegetation zone does not conform to a TEC listed under the TSC Act.

**EPBC Act Status**

This vegetation zone does not conform to a TEC listed under the EPBC Act.
Table 3.4  Coastal Tea-tree – Banksia Scrub

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Coastal Tea-tree – Banksia Scrub</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely Plant Community Type (PCT)</td>
<td>PCT1646/HU860 – Smooth-barked Apple – Blackbutt – Old Man Banksia woodland on coastal sands of the Central and Lower North Coast</td>
</tr>
<tr>
<td>Vegetation Formation</td>
<td>Dry Sclerophyll Forests (Shrubby sub-formation)</td>
</tr>
<tr>
<td>Vegetation Class</td>
<td>Coastal Dune Dry Sclerophyll Forests</td>
</tr>
<tr>
<td>Total Area in Study Area (ha)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

General Description
This vegetation community occurs on the Holocene sands along the Stockton Bight coastline where there is protection from direct coastal winds. This vegetation community condition class is likely to be derived from the Frontal Dune Blackbutt-Apple Forest occurring in the north and south of the Study Area. Historical disturbances from the former use of Fort Wallace have modified this community with groundcovers and shrubs now dominating. This community occurs in the central portion of the Study Area associated with the edges of the Fort Wallace existing disturbed areas.

Floristic Description
This community occurs as a shrubland and is primarily dominated by coastal tea-tree (*Leptospermum laevigatum*) with occurrences of coastal wattle (*Acacia longifolia* subsp. *sophorae*) and coast banksia (*Banksia integrifolia*). The native groundcover consisted primarily of pig face (*Carpobrotus glaucescens*), spiny-headed mat-rush (*Lomandra longifolia*) and dune fan flower (*Scaevola calendulacea*). The exotic bitou bush (*Chrysanthemoides monilifera*) and lantana (*Lantana camara*) also occur in this community. Disturbance of this community is varied with some areas recently cleared with sparse vegetation cover and other areas presenting dense coastal tea-tree stands.

This community also extends to the dune margins to the east of the Study Area where it is dominated by bitou bush (*Chrysanthemoides monilifera*) with occurrences of pig face (*Carpobrotus glaucescens*).

TSC Act Status
This vegetation zone does not conform to a TEC listed under the TSC Act.

EPBC Act Status
This vegetation zone does not conform to a TEC listed under the EPBC Act.
### Table 3.5 Bitou Bush-dominated Scrub

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Bitou Bush-dominated Scrub</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Likely Plant Community Type (PCT)</strong></td>
<td>No equivalent PCT</td>
</tr>
<tr>
<td>Vegetation Formation</td>
<td>N/A</td>
</tr>
<tr>
<td>Vegetation Class</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Area in Study Area (ha)</td>
<td>8.9</td>
</tr>
</tbody>
</table>

**General Description**

This vegetation community occurs on the sand dunes on the eastern sections of the Study Area, where Coastal Tea-tree – Banksia Scrub has been overtaken by a monoculture stand of bitou bush.

**Floristic Description**

The dominant species in this community is bitou bush (*Chrysanthemoides monilifera*) with occasional instances of coastal wattle (*Acacia longifolia* subsp. *sophorae*) and coast banksia (*Banksia integrifolia*).

**TSC Act Status**

This vegetation zone does not conform to a TEC listed under the TSC Act.

**EPBC Act Status**

This vegetation zone does not conform to a TEC listed under the EPBC Act.
Table 3.6  Foredune Spinifex

<table>
<thead>
<tr>
<th>Community Name</th>
<th>Foredune Spinifex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likely Plant Community Type (PCT)</td>
<td>PCT1204/(no equivalent BVT) – Spinifex beach strand grassland, Sydney Basin Bioregion and South East Corner Bioregion</td>
</tr>
<tr>
<td>Vegetation Formation</td>
<td>Grasslands</td>
</tr>
<tr>
<td>Vegetation Class</td>
<td>Maritime Grasslands</td>
</tr>
<tr>
<td>Total Area in Study Area (ha)</td>
<td>2.3</td>
</tr>
</tbody>
</table>

General Description
This vegetation community occurs on the incipient foredunes on the far eastern sections of the Study Area. This community occurs sporadically along the mobile sands of Stockton Bight, and is characterised by the colonising, sand-stabilising grass *Spinifex sericeus*. These are often temporary communities found growing on mobile sand deposits such as beach foredunes and dune blowouts. Beach spinifex grassland is found across beach strands in New South Wales.

Floristic Description
The dominant species in this community is hairy spinifex (*Spinifex sericeus*) with patches of bitou bush (*Chrysanthemoides monilifera*). In some patches, bitou bush appears to be threatening the persistence of the spinifex community.

TSC Act Status
This vegetation zone does not conform to a TEC listed under the TSC Act.

EPBC Act Status
This vegetation zone does not conform to a TEC listed under the EPBC Act.

3.3  Fauna and Fauna Habitats

3.3.1  Fauna Species

A wide range of fauna species have been recorded within and surrounding the Study Area as part of previous ecological surveys.

Thirty four bird, six mammal, two reptile and two amphibian species have been previously recorded in the Study Area utilising a wide range of habitats. Of these, three threatened species listed under the TSC Act and/or EPBC Act have been recorded. These are further discussed in Section 3.4.

Commonly recorded species observed in the forest and shrubland habitats include Australian raven (*Corvus coronoides*), magpie lark (*Grallina cyanoleuca*), red-browed finch (*Neochmia temporalis*), red wattlebird (*Anthochaera carunculata*) and swamp wallaby (*Wallabia bicolor*). Introduced fauna species observed within the Study Area include red fox (*Vulpes vulpes*) and the European rabbit (*Oryctolagus cuniculus*). A full fauna list for the Study Area is included in Appendix B.
3.3.2 Fauna Habitats

Several general fauna habitat types occur in the Study Area. Each of these broad habitat types has a range of characteristics which influence the habitat value, and the range of fauna species that are likely to be identified within each type. The broad habitat types within the Study Area consist of forest, shrubland and dune spinifex habitat. Generally, the habitats in the Study Area are moderately to highly disturbed and degraded as a result of previous disturbances and weed invasion.

Forested habitats of the Study Area are dominated by eucalypts species which are likely to provide a seasonally prolific nectar resource for birds such as honeyeaters and lorikeets. The forested habitats of the Study Area contain low hollow resources due a general lack of mature and old growth trees. The forest understorey provides potential foraging habitat for micro-bats, macropods, birds and some limited nesting potential in protected areas for small woodland birds. The ground cover is dense providing foraging and refuge resources for reptiles and small terrestrial mammals.

The shrubland habitat in the central portion of the Study Area may provide habitat resources for a wide range of nectarivorous species. This habitat is considered to be derived from the surrounding forest habitat, with the community likely a result of ground disturbance in this area. Small birds such as the superb fairy wren (Malurus cyaneus) and red-browed finch (Neochmia temporalis), and reptiles such as the eastern striped skink (Ctenotus robustus) are provided foraging habitat as well as refuge habitat within the dense shrub layers.

The dune spinifex and wetland habitat in the Study Area is subject to coastal winds with minimal vegetation and no fauna species were recorded at the time of the surveys. Despite this, it is likely that sea birds such as gulls and terns would occasionally utilise these areas for foraging or roosting. Common species such as silver gull (Chroicocephalus novaehollandiae), crested tern (Thalasseus bergii) and red-capped plovers (Charadrius ruficapillus) are likely to occur in these habitats. There is potential for migratory wader birds to forage along the tideline or nest on sandflats between the dunes immediately behind the beach.

3.3.3 Koala Habitat

Koalas feed on the foliage of eucalypt tree species and in some areas exhibit extremely strong preferences for particular eucalypt species. State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) lists preferred koala feed trees as does the Approved Recovery Plan for the Koala (DECC 2008). One of these feed species, swamp mahogany (Eucalyptus robusta), is known to occur in the Study Area within the Frontal Dune Blackbutt-Apple Forest.

An assessment under SEPP 44 is based on an initial determination of whether the land constitutes potential koala (Phascolarctos cinereus) habitat. This is determined by assessing whether the eucalypt species present in Schedule 2 of the policy constitute 15 per cent or more of the total number of trees in the upper or lower strata of the tree component. Swamp mahogany (Eucalyptus robusta) did not constitute more than 15 per cent of total number of trees in the Frontal Dune Blackbutt-Apple Forest. Furthermore, according to the Koala Habitat Assessment Tool in the EPBC Act Referral Guidelines for the Vulnerable Koala (DoE 2014), the habitats within the Study Area are not considered to contain habitat critical to the survival of the species (DoE 2014).

The koala was targeted during surveys undertaken in May 2016 including SAT, call playback and spotlighting surveys (refer to Section 2.3.2). No evidence (scats, scratches, etc) of koala occupation was recorded in the Study Area. While the koala has not been specifically recorded within the Study Area, the species has been recorded as recently as 2015 in habitats associated with Fern Bay approximately 1.5km north of the Study Area.
3.4 Important Ecological Features

3.4.1 Threatened Species, Populations and Communities

Threatened species relevant to the Study Area are discussed in the sections below and shown in Figure 3.2.

3.4.1.1 Threatened Flora Species

No threatened flora species listed under the TSC or EPBC Acts have been previously recorded within the Study Area.

A range of threatened flora species have been previously recorded in the wider locality in similar habitats. Table 3.7 below outlines the threatened flora species that have been recorded in the Study Area or are likely to occur in the Study Area due to local records and the availability of suitable habitat. A full list and assessment of the threatened species previously recorded within 10km of the Study Area is provided in Appendix C.

Table 3.7 Threatened Flora Species Recorded or Likely to Occur in the Study Area

<table>
<thead>
<tr>
<th>Species Name</th>
<th>TSC Act</th>
<th>EPBC Act</th>
<th>Records and Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>coast groundsel</td>
<td>E</td>
<td>-</td>
<td>Not recorded within the Study Area. Has been previously recorded on the Stockton sand dunes approximately 10km northeast of the Study Area (Bell and Driscoll 2010). May occur on the sand dunes in the east of the Study Area.</td>
</tr>
<tr>
<td>Senecio spathulatus</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
E endangered
3.4.1.2 Threatened Fauna Species

Three threatened fauna species listed under the TSC or EPBC Acts have been previously recorded within the Study Area being:

- pied oystercatcher (*Haematopus longirostris*), listed as endangered under the TSC Act
- grey-headed flying-fox (*Pteropus poliocephalus*), listed as vulnerable under the TSC and EPBC Acts and
- east coast freetail-bat (*Mormopterus norfolkensis*), listed as vulnerable under the TSC Act.

Table 3.8 below outlines the threatened fauna species that have been recorded in the Study Area or are likely to occur in the Study Area due to local records and the availability of suitable habitat. A full list and assessment of the threatened species previously recorded within 10km of the Study Area is provided in Appendix C.

**Table 3.8 Threatened Fauna Species Recorded or Likely to Occur in the Study Area**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>TSC Act</th>
<th>EPBC Act</th>
<th>Records and Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>white-bellied sea eagle</td>
<td>V</td>
<td>-</td>
<td>Not recorded within the Study Area. The Study Area is likely to provide suitable foraging habitat and potential nesting habitat for the species, however no nests have been recorded in the Study Area.</td>
</tr>
<tr>
<td><em>Haliaeetus leucogaster</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pied oystercatcher</td>
<td>E</td>
<td>-</td>
<td><strong>Recorded</strong> within the Study Area (OEH 2016). Pied oystercatcher was recorded on Stockton Beach in January 2002. The sand dune habitat is likely to provide suitable foraging habitat for the species.</td>
</tr>
<tr>
<td><em>Haematopus longirostris</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grey-headed flying-fox</td>
<td>V</td>
<td>V</td>
<td><strong>Recorded</strong> within the Study Area. Up to two individuals were observed foraging in coastal banksias (<em>Banksia integrifolia</em>) in the north of the site in May 2016. No flying-fox camps have been recorded in the Study Area. The Study Area is likely to provide suitable foraging habitat for the species.</td>
</tr>
<tr>
<td><em>Pteropus poliocephalus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>little bentwing-bat</td>
<td>V</td>
<td>-</td>
<td>Not recorded within the Study Area. Detected north of the site near the Worimi Conservation Lands in May 2016. The Study Area is likely to provide suitable foraging habitat for the species.</td>
</tr>
<tr>
<td><em>Miniopterus australis</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eastern bentwing-bat</td>
<td>V</td>
<td>-</td>
<td>Not recorded within the Study Area. Detected north of the site near the Worimi Conservation Lands in May 2016. The Study Area is likely to provide suitable foraging habitat for the species.</td>
</tr>
<tr>
<td><em>Miniopterus schreibersii oceanensis</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species Name</td>
<td>TSC Act</td>
<td>EPBC Act</td>
<td>Records and Further Information</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>east coast freetail-bat</strong>&lt;br&gt;<em>Mormopterus norfolkensis</em></td>
<td>V</td>
<td>-</td>
<td><strong>Recorded</strong> in the Study Area. Detected in the site using an Anabat detector in April 2007 (SMEC 2008) in the forested habitats in the Study Area. The Study Area is likely to provide suitable foraging habitat for the species.</td>
</tr>
<tr>
<td><strong>greater broad-nosed bat</strong>&lt;br&gt;<em>Scoteanax rueppellii</em></td>
<td>V</td>
<td>-</td>
<td><strong>Not recorded within the Study Area.</strong>&lt;br&gt;Previously recorded in Fern Bay within 2km to the northeast of the Study Area in similar habitats. The Study Area is likely to provide suitable foraging habitat for the species.</td>
</tr>
</tbody>
</table>

**Notes:**

V  vulnerable  
E  endangered  
PD preliminary determination

### 3.4.1.3 Endangered Populations

No endangered populations listed under the TSC or EPBC Acts have been previously recorded within the Study Area and none are likely to occur.

### 3.4.1.4 Threatened Ecological Communities

No threatened ecological communities listed under the TSC or EPBC Acts have been recorded within the Study Area. **Table 3.9** below outlines the TECs that have the potential to occur in the Study Area due to local records and the availability of suitable habitat. A full list of the TECs previously recorded within 10km of the Study Area is provided in **Appendix C**.

**Table 3.9 Threatened Ecological Communities with the Potential to Occur in the Study Area**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>TSC Act</th>
<th>EPBC Act</th>
<th>Records and Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney Freshwater Wetlands in the Sydney Basin Bioregion</td>
<td>EEC</td>
<td>-</td>
<td><strong>No beach wetlands were recorded in the Study Area at the time of survey. It is acknowledged that these communities are dynamic and respond to seasonal conditions. This community is restricted to freshwater swamps in swales and depressions on sand dunes and low nutrient sandplain sites in coastal areas (NSWSC 2000) and does not currently occur within the Study Area.</strong></td>
</tr>
</tbody>
</table>

**Notes:**

EEC endangered ecological community
3.4.2 Matters of National Environmental Significance

Under the Commonwealth EPBC Act, the approval of the Commonwealth Minister for DoEE is required for any action that may have a significant impact on matters of national environmental significance (MNES). These matters are:

- listed threatened species and communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- the Commonwealth marine environment
- the Great Barrier Reef Marine Park
- World Heritage properties
- National Heritage places
- nuclear actions
- a water resource, in relation to coal seam gas development and large coal mining development.

One MNES has been recorded within the Study Area, being:

- grey-headed flying-fox (*Pteropus poliocephalus*), listed as vulnerable under the EPBC Act.

Grey-headed flying-fox was recorded in April 2007 feeding within the Frontal Dune Blackbutt-Apple Forest in the north of the Study Area. In accordance with the draft National Recovery Plan for the species (DECCW 2009), all foraging habitat has the potential to be productive during general food shortages and to therefore provide a resource critical to survival for the species.

The following MNES are considered to have the potential to occur within the Study Area due to local records and the availability of suitable habitat:

- swift parrot (*Lathamus discolor*), critically endangered under the EPBC Act
- regent honeyeater (*Anthochaera phrygia*) critically endangered under the EPBC Act
- little tern (*Sternula albifrons*), migratory under the Bonn Convention, China –Australia Migratory Bird Agreement (CAMBA), Japan- Australia Migratory Bird Agreement (JAMBA) and Republic of Korea – Australia Migratory Bird Agreement (ROKAMBA)
- crested tern (*Thalasseus bergii*), migratory under JAMBA
- white-throated needletail (*Hirundapus caudacutus*), migratory under the CAMBA, JAMBA and ROKAMBA
- fork-tailed swift (*Apus pacificus*), migratory under the CAMBA, JAMBA and ROKAMBA
- eastern osprey (*Pandion cristatus*), migratory under the Bonn Convention.
A wide range of threatened and migratory shorebird species, listed under the EPBC Act, are known to occupy the Stockton Sandspit located approximately 300 metres to the northwest of the Study Area. The Stockton Sandspit foreshore is one of the most important high tide roosts for shorebirds in the Hunter Estuary (Herbert 2007) containing saltmarsh, mudflats and lagoon areas suitable for foraging and roosting habitat. Species such as black-tailed godwit (*Limosa limosa*), eastern curlew (*Numenius madagascariensis*), marsh sandpiper (*Tringa stagnatilis*), great knot (*Calidris tenuirostris*), sharp-tailed sandpiper (*Calidris acuminata*) and curlew sandpiper (*Calidris ferruginea*) are regularly recorded in the summer months.

Furthermore, the Hunter Estuary Wetlands Ramsar Wetland of International Importance occurs within 300 metres to the northwest of the Study Area, mapped along the edges of the northern arm of the Hunter River, north of the Stockton Bridge. The Hunter Estuary Wetlands are listed internationally under the Ramsar Convention due to their unique mix of wetland types, importance for maintaining biological diversity and conservation of migratory shorebirds, including regularly supporting between 2 per cent and 5 per cent of the East Asian–Australasian Flyway population of eastern curlew (*Numenius madagascariensis*) (Australian Wetlands Database 2016).

### 3.4.3 Corridors and Connectivity

The Study Area occurs within an existing fragmented landscape north of the Stockton residential area and south of Fern Bay. Extensive areas of forested habitat occur approximately 1.7 km to the north in the Worimi Conservation Lands, which provide connectivity and movement corridors for a wide range of flora and fauna species from Stockton in the south to Tomaree and Nelson Bay in the north. The Study Area has minimal connectivity to this area due to existing cleared land associated with the Stockton Centre to the north. Connectivity from the south of the site to Stockton is currently highly fragmented as a result of previous residential and urban development.

Dune habitat along the eastern portion of the Study Area contains minimal and sparse vegetation, however is part of a large coastal dune system reaching from Stockton to Nelson Bay. Consequently the dune system provides an important corridor along the length of the Stockton Bight.
4.0 Assessment of Impacts

4.1 Avoidance Measures

DHA undertook a detailed constraints study to guide the design of the Master Plan. Through this process, different development concepts were considered and DHA has sought to minimise the biodiversity impacts associated with the proposed rezoning. Key factors in selecting the location of the disturbance footprints included the likely impacts on important ecological features, including threatened species, TECs and/or their habitats.

Ecological site inspections were undertaken in May 2016 within the Study Area to provide information on the early design phase of the Master Plan. The final layout of the Master Plan was determined in consideration of the biodiversity and heritage values of the Study Area. It was found that the vegetated areas to the north and south of the Study Area contained higher value vegetation and fauna habitat in structured woodland areas than the lower quality scattered woodland trees and exotic groundcovers dominating the central portion of the Study Area and therefore the disturbance area for the development was focused in the areas of lower ecological value.

In addition to avoiding areas of high conservation value, the proposed rezoning includes provision for large lots with minimal building envelopes to retain as much vegetation surrounding and within the residential buildings as possible. This was considered to provide an important mechanism particularly for the movement of species may occur in the habitats surrounding the Study Area, and also allows for the targeted selected retention of important habitat features such as hollow-bearing trees or key foraging tree species.

4.2 Assessment of the Master Plan

The proposed rezoning has been designed with the aim of providing a development approach which balances the economic potential of the Study Area with appropriate biodiversity conservation outcomes for the broader Stockton area. In order to achieve this outcome, focus has been paid to the retention of as much intact vegetation as practical as well as the retention and protection of identified important ecological features of the Study Area.

The current Master Plan indicates a maximum disturbance of 7.2 hectares (approximately 23 per cent) within the Study Area. It is notable that this is a maximum potential impact, and does not take into account the existing disturbed nature of a substantial part of the vegetation in the area to be developed, nor vegetation that will be able to be retained within the larger lots. Impacts are inclusive of Asset Protection Zones (APZs) that will require maintenance and thinning activities to provide suitable fire protection to residential buildings across the development.

The majority of the area to be impacted comprises the existing cleared land and the Coastal Tea-tree – Banksia Scrub.

Section 4.2.1 describes the likely direct impacts and Section 4.2.2 describes the likely indirect impacts associated the proposed rezoning.
4.2.1 Direct Impacts

The construction and operation of the proposed rezoning may result in a range of direct impacts on biodiversity values within the Study Area. Direct impacts include the loss of native vegetation and fauna habitats as a result of direct vegetation clearance for the construction of residential buildings, roads, gardens and parklands. Key ecological impacts include:

- the loss of native vegetation communities and fauna habitats
- reduction in known threatened species habitat, including:
  - known foraging habitat for the grey-headed flying-fox (*Pteropus poliocephalus*)
  - likely foraging habitat for threatened micro-bat species.

Table 4.1 summarises the area of each vegetation community that may be impacted by the current Master Plan. It should be noted that the current Master Plan provides an indicative impact area and will likely be refined and finalised in the future development application.

A range of impact mitigation measures have been formulated to minimise the impact of vegetation loss, as discussed in Section 5.0.

Table 4.1 Vegetation Community Impacts as a Result of the Proposed Rezoning

<table>
<thead>
<tr>
<th>Vegetation Community</th>
<th>Area within the Study Area (ha)</th>
<th>Indicative Area to be Impacted by the current Master Plan (ha)^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal Dune Blackbutt-Apple Forest</td>
<td>4.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Coastal Tea-tree – Banksia Scrub</td>
<td>5.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Bitou Bush-dominated Scrub</td>
<td>8.9</td>
<td>0.1</td>
</tr>
<tr>
<td>Foredune Spinifex</td>
<td>2.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Cleared land/sand dunes</td>
<td>11.6</td>
<td>5.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31.9</strong></td>
<td><strong>7.2</strong></td>
</tr>
</tbody>
</table>

^ to be refined and finalised for the development application

4.2.2 Indirect Impacts

The proposed rezoning is not expected to result in any substantial indirect impacts on the biodiversity values of surrounding lands during the construction or operational phases of the proposed rezoning. However, the following minor indirect impacts may occur during the construction and operational phases of the proposed rezoning:

- Edge effects resulting in increased weed species could invade naturally through removal of native vegetation.
- Increases in the occurrence of feral fauna species such as foxes, rabbits, pigs, dogs and cats resulting from disturbances.
• Noise impacts have the potential to adversely impact native species such as disturbing the roosting and foraging behaviour of fauna species and reducing the occupancy of areas of suitable habitat.

• Dust impacts have the potential to adversely impact native species during construction. Potential impacts include dust covering vegetation thereby reducing vegetation health and growth.

• Vehicle strike impacts on ground-dwelling fauna species with increase vehicle movements in the post-construction landscape.

Mitigation measures outlined in Section 5.0 will minimise the potential for these indirect impacts occurring as a result of the proposed rezoning. These impacts and mitigation measures will be further detailed at the Development Application stage.

4.3 Preliminary Seven Part Tests of Significance under the EP&A Act

The potential level of impact on threatened species listed under the TSC Act was assessed using a preliminary ‘Seven Part Test of Significance’ as detailed in Section 5A of the EP&A Act and the Threatened Species Assessment Guidelines (DECC 2007). As outlined in Section 1.3, the assessments in this report have not been updated to reflect the minor changes in relation to the replacement of the TSC Act by the BC Act. Threatened entities previously listed under the TSC Act were automatically transferred to be listed under the BC Act and the amended Assessment of Significance Test (now outlined in Section 7.3 of the BC Act) does not materially change the assessment outcome.

The Seven Part Tests of Significance were undertaken following an initial screening process to identify species that have a reasonable likelihood to be impacted by the proposed rezoning (refer to Appendix C). Preliminary assessments were undertaken for a range of species to determine the likelihood of significant impacts occurring on listed species and communities as a result of the rezoning proposal. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.

The Seven Part Tests of Significance do not take into account the full range of impact mitigation strategies and offsets proposed for the development, rather they consider the impacts of the proposed rezoning without any mitigation or offsetting, consistent with the requirements of the Threatened Species Assessment Guidelines (DECC 2007). Seven Part Tests of Significance were undertaken in consideration of the following threatened species and communities listed under the TSC Act:

Threatened Flora Species

• coast groundsel (*Senecio spathulatus*).

Threatened Fauna Species

• pied oystercatcher (*Haematopus longirostris*)

• little tern (*Sternula albifrons*)

• regent honeyeater (*Anthochaera phrygia*)

• swift parrot (*Lathamus discolor*)

• white-bellied sea eagle (*Haliaeetus leucogaster*)
• eastern osprey (*Pandion cristatus*)
• grey-headed flying-fox (*Pteropus poliocephalus*)
• eastern false pipistrelle (*Falsistrellus tasmaniensis*)
• little bentwing-bat (*Miniopterus australis*)
• eastern bentwing-bat (*Miniopterus schreibersii oceanensis*)
• east coast freetail-bat (*Mormopterus norfolkensis*)
• hoary wattled bat (*Chalinolobus nigrogriseus*)
• greater broad-nosed bat (*Scoteanax rueppellii*)
• yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*)
• southern myotis (*Myotis macropus*).

The Seven Part Tests of Significance concluded that, based on the current Master Plan, the proposed rezoning was unlikely to result in a significant impact on threatened species or communities occurring or potentially occurring in the Study Area. Any changes to the Master Plan following this assessment, as part of a future development application, will require a revised Seven Part Test of Significance under the EP&A Act.

### 4.4 Preliminary Assessments of Significance under the EPBC Act

The potential level of impact on threatened species listed under the EPBC Act was assessed using the ‘Assessments of Significance’ as detailed in the Significant Impact Guidelines 1.1 (DoE 2013). The assessments of significance were undertaken following an initial screening process to identify species that have a reasonable likelihood to be impacted by the proposed rezoning (refer to Appendix C). Preliminary assessments were undertaken for a range of species to determine the likelihood of significant impacts occurring on listed species and communities as a result of the rezoning proposal. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.

As per the assessments under the EP&A Act (refer to Section 4.3), the assessments of significance do not take into account the full range of impact mitigation strategies and offsets proposed for the development, rather they consider the impacts of the proposed rezoning without any mitigation or offsetting.

Assessments of Significance were undertaken in consideration of the following threatened and migratory species listed under the EPBC Act:

**Endangered and Critically Endangered Species**

• swift parrot (*Lathamus discolor*)
• regent honeyeater (*Anthochaera phrygia*)

**Vulnerable Species**

• grey-headed flying-fox (*Pteropus poliocephalus*).
Migratory Species under International Conventions

- little tern (*Sternula albifrons*)
- crested tern (*Thalasseus bergii*)
- white-throated needletail (*Hirundapus caudacutus*)
- fork-tailed swift (*Apus pacificus*)
- eastern osprey (*Pandion cristatus*).

The Assessments of Significance concluded that, based on the current Master Plan, the proposed rezoning was unlikely to result in a significant impact on threatened species occurring or potentially occurring in the Study Area. Furthermore, due to the nature of the proposed rezoning and that no direct or indirect impacts are likely to occur on surrounding lands, it is unlikely that the proposed rezoning would impact the Hunter Estuary Wetlands Ramsar Site or Stockton Sandspit known to provide habitat for EPBC Act-listed threatened and migratory species.

Any changes to the Master Plan following this assessment, as part of a future development application, will require a revised Assessment of Significance under the EPBC Act.
5.0 Mitigation and Management

5.1 Mitigation Strategy

DHA has sought to avoid and minimise potential impacts on the ecological values of the Study Area throughout the design and planning process. This has included avoidance and minimisation of disturbance of key vegetation communities and fauna habitats. These avoidance measures are described in detail in Section 4.1.

DHA is committed to the design and implementation of a comprehensive strategy to mitigate the adverse impacts of the proposed rezoning. This section details the mitigation strategies that are designed to minimise impacts on important ecological features known to occur in the areas to be disturbed as part of any residential development that would result from the rezoning.

5.1.1 Pre-clearance Surveys and Clearance Supervision

A robust tree felling procedure will be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species) as a result of the clearing of habitat trees. The tree felling procedure is designed to minimise impacts to hollow-dependent fauna such as hollow-dependent micro-bats.

5.1.1.1 Pre-clearance Surveys

Pre-clearance surveys will be required within areas of woody native vegetation that are to be cleared. Pre-clearance surveys will be undertaken by suitably qualified and experienced ecologist and involve the following:

- the demarcation of areas approved for clearing to reduce risk of accidental clearing
- habitat resources and habitat trees should be identified and marked (note: habitat trees are those containing hollows, cracks or fissures and spouts, active nests, drey or other signs of recent fauna usage. Other habitat features to be identified include fallen timber/hollow logs, burrows and boulder piles)
- the potential presence of threatened flora and fauna species, endangered populations and TECs should be identified
- the identification of species or habitat features that are suitable for translocation or salvage
- the presence of weed species and vertebrate pest species should be assessed, if relevant and
- disturbance activities should be targeted for specific times of the year to minimise impacts to target species usage of habitat features for breeding and roosting, where practicable.
5.1.1.2 Clearance Supervision

Tree clearing will be completed as close to the completion of pre-clearance surveys as practicable to limit the potential for new issues to arise (such as new active nests being built). Tree felling supervision will be undertaken by an appropriately qualified and experienced ecologist after pre-clearance surveys have identified potential threatened species habitat. The supervising ecologist will be licensed by the relevant field survey and ethics authorities to allow for capture, housing, transport and possibly ethical euthanizing of injured fauna. The tree-felling procedure will include the following:

- Prior to clearing identified habitat trees, the felling of non-habitat trees will be completed as close to the felling of habitat trees as possible, with all surrounding habitat trees to be vigorously shaken with heavy machinery.

- On the day of habitat tree felling, the following is to be undertaken:
  - all habitat trees will be subject to a visual inspection to survey for threatened species
  - trees previously identified as containing fauna will be shaken and then felled, providing no threatened species are identified
  - all reasonable attempts will be made to reduce the impact of felling on all fauna species. This may include delaying felling trees with fauna present or felling in sections to reduce potential for injury
  - the lowering of hollow-bearing trees will be done as gently as possible with heavy machinery
  - if a threatened species is identified in a habitat tree on the day of felling, the supervising person is to advise the most appropriate method to minimise potential harm. This may include leaving the tree overnight, further shaking to encourage the animal to vacate the tree, gradual removal of branches to discourage ongoing use, soft-felling of the tree with the animal in the tree, or measures to capture and relocate the animal to secure habitats
  - uninjured animals should be released on the day of capture into nearby suitable secure habitat and should not be held for extended periods of time, and
  - injured animals will be taken to the nearest veterinary clinic or wildlife carer as soon as possible for assessment and treatment. If required, the supervising person may ethically euthanize fauna

- Following felling, habitat trees will be inspected for remaining or injured fauna species and to ensure that no hollows are blocked against the ground. This may require the tree to be rolled to ensure adequate access

- All felled habitat trees should remain in place for at least one night to allow any fauna still present to move on

- Habitat features identified for translocation or salvage operations should be extracted and stored appropriately, and

- Detailed records should be maintained regarding the type and number of habitat features cleared, the type and number of fauna encountered and their fate. This will assist in informing mitigation programs such as nest boxes and habitat augmentation programs.
5.1.2 Weed Control

Weed species could be inadvertently brought into the Study Area with imported materials, or could invade naturally through removal of native vegetation. The increased presence of weed species within the Study Area has the potential to decrease the value of extant vegetation to native species, particularly threatened species.

The following management measures will be undertaken to minimise the potential impacts and spread of weeds during the construction of the proposed rezoning:

- Any vehicles or equipment being brought onto the Study Area to be involved in ground disturbance activities and/or travelling around the site must be inspected and cleaned prior to commencing work to limit the spread of seeds and plant material between sites.
- The limits of ground disturbance will be clearly demarcated and no unnecessary disturbance will be undertaken outside of these areas.
- Regular inspections will be undertaken in the Study Area to monitor the spread of weed species.
- Training of environmental personnel on the identification of target weed species.

Any outbreak of noxious weeds will be controlled and eradicated as required under the Noxious Weeds Act 1993, and as required by the Local Land Services and other relevant authorities. Weed control and eradication techniques may include:

- spraying with herbicides
- physical removal e.g. chipping, or
- minimisation of area available for weed infestation, through prompt revegetation of bare areas.

5.2 Site Management

5.2.1 Flora and Fauna Protection

DHA has sought to avoid areas of higher quality fauna and flora habitat in the Study Area. The following management measures are proposed to minimise the impacts on the local flora and fauna as a result of the proposed rezoning:

- Traffic control measures including 40 km/h speed limits and speed bumps installed in suitable locations.
- Signage within the development to minimise fauna injury/road kills, as much as possible.
- Minimisation of fencing between properties to reduce impacts on wildlife movement through the development.
- Where fencing is required, fauna-friendly fencing is to be used to allow for dispersal and safe fauna movement throughout the Study Area.
- Dog and cat ownership policies, such as requiring on-lead dogs and inside cats.
- Restricted vehicle and controlled pedestrian access along frontal dune system.
5.2.2 Vegetation and Dune Rehabilitation

The aim of the dune rehabilitation will be to remove current weed infestations (particularly the areas within the Bitou Bush-dominated Scrub) to establish and improve native coastal vegetation communities and fauna habitats occurring in the Study Area. Rehabilitation biodiversity objectives will be used in future rehabilitation planning as appropriate according to coastal hazard recommendations and should:

- aim to create a sustainable and stabilising vegetation community on the fore dunes, where suitable
- focus on the planting of endemic coastal flora species
- aim to provide fauna movement habitat between the northern and southern boundaries of the site and
- encourage ecological stewardship by promoting community planting days and wildlife watching.

Dune rehabilitation should consist of stabilising and returning the fore dune landscape to a condition characteristic of the natural coastal environment. Dune rehabilitation and landscaping between the development footprints should be conducted progressively during the construction and establishment of the development to self-sustaining native and coastal vegetation communities in line with the proposed vision of the Master Plan and coastal hazard mitigation recommendations. Any rehabilitation works will use local provenance endemic species (for native communities), including the consideration of seed availability.

5.3 Biodiversity Buffers

This report has identified the numerous measures that have been undertaken as part of the planning and design of the Master Plan to avoid, minimise and then mitigate/offset the potential impacts of the proposed rezoning on the ecologically significant features of the Study Area. The implementation of these measures has resulted in a Master Plan that is likely to result in minimal residual impact on important ecological features.

The Master Plan also indicates the retention of up to approximately 23 hectares within the Study Area, via rezoning to E3 Environmental Management. This area includes the important dune habitats in the Study Area. A range of options are being considered to ensure the ongoing protection, management and long-term security of these lands, including potential to dedicate lands to Council.
6.0 Recommendations

It is recommended that the following is undertaken for the future development application phase of the project:

- Detailed floristic surveys, including systematic plots and transects in order to refine and finalise vegetation mapping.

- Collection of vegetation integrity data and targeted species-credit species surveys for inclusion in a Biodiversity Development Assessment Report (BDAR) under the Biodiversity Assessment Method (BAM) under the BC Act, if applicable.

- If an assessment under the BAM is not applicable at the time of preparing the development application, the Seven Part Tests of Significance under the EP&A Act should be revised and updated as per the final disturbance footprint and be undertaken in accordance with Section 7.3 of the BC Act. Similarly, the Assessments of Significance under the EPBC Act should also be updated following the finalisation of the impact boundaries.

This assessment concludes that the proposed rezoning and use of the land for residential purposes could facilitate and acceptable ecological outcome on the site, subject to future detailed design and approvals.
7.0 References


Department of the Environment (DoE) (2014) EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Qld, NSW and the ACT).


NSW Scientific Committee (NSWSC) (2016) Preliminary Determination to support a proposal to list the White-bellied Sea-eagle Haliaeetus leucogaster as a Vulnerable species in Part 1 Schedule 2 of the Act, April 2016.


Appendix A – Flora Species List

The following flora list was developed from surveys of the Study Area by SMEC (2008) Kleinfelder (2015) and Umwelt (2016). The list will not be comprehensive, because not all species are readily detected at any one time of the year. Many species flower only during restricted periods of the year, and some flower only once in several years. In the absence of flowering material, many of these species cannot be identified, or even detected.

Names of classes and families follow a modified Cronquist (1981) System.

Any species that could not be identified to the lowest taxonomic level are denoted in the following manner:

sp. specimens that are identified to genus level only

The following abbreviations or symbols are used in the list:

asterisk (*) denotes species not native to the Study Area
subsp. subspecies

All vascular plants recorded or collected were identified using keys and nomenclature in Harden (1992, 1993, 2000 and 2002) and Wheeler et al. (2002). Where known, changes to nomenclature and classification have been incorporated into the results, as derived from PlantNET (Botanic Gardens Trust 2016), the on-line plant name database maintained by the National Herbarium of New South Wales.

Common names used follow Harden (1992, 1993, 2000 and 2002) where available, and draw on other sources such as local names where these references do not provide a common name.

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Appendix B - Fauna Species List

The following fauna list was developed from surveys of the Study Area by SMEC (2008), Kleinfelder (2015) and Umwelt (2016).

The following abbreviations or symbols are used in the list:

- asterisk (*) Denotes species not indigenous to the Study Area
- subsp. Subspecies
- MIG Listed migratory species under the EPBC Act
- V Vulnerable under the TSC and/or EPBC Act
- PD Preliminary Determination

Birds recorded were identified using descriptions in Pizzey and Knight (2012) and the scientific and common name nomenclature of BirdLife International Taxonomic Checklist (2015) (formerly Birds Australia). Reptiles recorded were identified using keys and descriptions in Cogger (2000) and Wilson and Swan (2008) and the scientific and common name nomenclature of Cogger (2000).

Amphibians recorded were identified using keys and descriptions in Cogger (2000), Robinson (1998), Anstis (2002) and Barker et al. (1995) and the scientific and common name nomenclature of Cogger (2000). Mammals recorded were identified using keys and descriptions in Menkhorst and Knight (2010). Bat species recorded were identified using keys and descriptions in Churchill (1998) and ecological information was obtained from Churchill (2008).

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<td><em>Oryctolagus cuniculus</em></td>
<td>European rabbit</td>
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</table>
Threatened Species Assessment
Appendix C - Threatened Species Assessment

Threatened and migratory species, endangered populations and threatened ecological communities (TECs) listed under the *Threatened Species Conservation Act 1995* (TSC Act) and/or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) having the potential to occur in the Study Area have been identified based on the results of the searches of the Office of Environment and Heritage (OEH) Atlas of NSW Wildlife Database and Commonwealth Department of the Environment and Energy (DoEE) Protected Matters Database and are outlined in Table 1.

Additionally, migratory species listed under international agreements being the Bonn Convention (Bonn), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) with potential to occur in the Study Area have also been identified based on the results of the searches and are outlined in Table 2.

Purely marine and pelagic species have been omitted from Table 1 and Table 2 due to a lack of suitable habitat.

The likelihood of a community/species to occur in the Study Area is noted using the following definitions:

- **Recorded** Species/community has been recorded within the Study Area.
- **Likely** Suitable habitat is present for this species/community and/or records of the species are known to occur in the immediate locality
- **Potential** Suitable habitat is present for this species/community and/or however records of the species are not known to occur in the immediate locality
- **Unlikely** Species/community is considered unlikely to occur within the Study Area due to lack of local records and/or lack of suitable habitat.
- **Not present** Species/community was not recorded in the Study Area and is not expected to occur due to its distribution, habitat requirements or lack of local records.

Species/communities with a reasonable potential to be impacted by the proposed rezoning were subject to preliminary Seven Part Tests of Significance under the EP&A Act and/or Assessments of Significance under the EPBC Act. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.

Abbreviations used within Table 1 and Table 2 include the following:

- **V** Vulnerable
- **E** Endangered
- **EEC** Endangered Ecological Community
- **EP** Endangered Population
- **CE** Critically Endangered
- **CEEC** Critically Endangered Ecological Community
- **VEC** Vulnerable Ecological Community
- **C** CAMBA
- **J** JAMBA
- **K** ROKAMBA
- **B** Bonn
## Table 1 - Threatened Species and TECs Recorded or with Potential to Occur within 10 kilometres of the Study Area

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
<th>Likelihood to Occur within the Study Area</th>
<th>Reasonable Potential to be Impacted by the Proposal</th>
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<tbody>
<tr>
<td><strong>Threatened Ecological Communities</strong></td>
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<td>Subtropical and Temperate Coastal Saltmarsh (EPBC Act)</td>
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<td>VEC</td>
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<td>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</td>
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<td>Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (TSC Act)</td>
<td></td>
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<td>EEC</td>
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<tr>
<td>Littoral Rainforest and Coastal Vine Thickets of Eastern Australia (EPBC Act)</td>
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<td></td>
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<td>Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (TSC Act)</td>
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<td>CEEC</td>
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<td>Lowland Rainforest of Subtropical Australia (EPBC Act)</td>
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<td>Sydney Freshwater Wetlands in the Sydney Basin Bioregion</td>
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<td>Themeda grassland on seafiffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions</td>
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</tr>
<tr>
<td>terek sandpiper</td>
<td>Xenus cinereus</td>
<td>V</td>
<td>-</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Mammals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>large-eared pied bat</td>
<td>Chalinolobus dwyeri</td>
<td>V V</td>
<td></td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>spotted-tailed quoll</td>
<td>Dasyurus maculatus</td>
<td>V E</td>
<td></td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>eastern false pipistrelle</td>
<td>Falsistrellus tasmaniensis</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>little bentwing-bat</td>
<td>Miniopterus australis</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>eastern bentwing-bat</td>
<td>Miniopterus schreibersii oceanensis</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>eastern freetail-bat</td>
<td>Mormopterus norfolkensis</td>
<td>V</td>
<td>-</td>
<td>Recorded</td>
<td>Yes</td>
</tr>
<tr>
<td>hoary wattled bat</td>
<td>Chalinolobus nigrogriseus</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>greater broad-nosed bat</td>
<td>Scotinops rueppellii</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>yellow-bellied sheathtail-bat</td>
<td>Saccolaimus flaviventris</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>southern myotis</td>
<td>Myotis macropus</td>
<td>V</td>
<td>-</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>greater glider</td>
<td>Petauroides volans</td>
<td>- V</td>
<td></td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>squirrel glider</td>
<td>Petaurus norfolcensis</td>
<td>V</td>
<td>-</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>koala</td>
<td>Phascolarctos cinereus</td>
<td>V</td>
<td>-</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>TSC Act</td>
<td>EPBC Act</td>
<td>Likelihood to Occur within the Study Area</td>
<td>Reasonable Potential to be Impacted by the Proposal</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------</td>
<td>---------</td>
<td>----------</td>
<td>------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>long-nosed potoroo</td>
<td>Potorous tridactylus</td>
<td>V</td>
<td>V</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>New Holland mouse</td>
<td>Pseudomys novaehollandiae</td>
<td>-</td>
<td>V</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>grey-headed flying-fox</td>
<td>Pteropus poliocephalus</td>
<td>V</td>
<td>V</td>
<td>Recorded</td>
<td>Yes</td>
</tr>
<tr>
<td>black rockcod</td>
<td>Epinephelus daemelii</td>
<td>-</td>
<td>V</td>
<td>Not present</td>
<td>No</td>
</tr>
<tr>
<td>Fishes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Table 2 Migratory Species Recorded or with Potential to Occur within 10km of the Study Area

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>International Convention</th>
<th>Likelihood to Occur within Study Area</th>
<th>Reasonable Potential to be Impacted by the Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>little tern</td>
<td>Sternula albifrons</td>
<td>B, C, J, K</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>crested tern</td>
<td>Thalasseus bergii</td>
<td>J</td>
<td>Potential</td>
<td>Yes</td>
</tr>
<tr>
<td>common sandpiper</td>
<td>Actitis hypoleucos</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>ruddy turnstone</td>
<td>Arenaria interpres</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>sharp-tailed sandpiper</td>
<td>Calidris acuminata</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>red knot</td>
<td>Calidris canutus</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>curlew sandpiper</td>
<td>Calidris ferruginea</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>pectoral sandpiper</td>
<td>Calidris melanotos</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>red-necked stint</td>
<td>Calidris ruficollis</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>great knot</td>
<td>Calidris tenuirostris</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>double-banded plover</td>
<td>Charadrius bicinctus</td>
<td>B</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>greater sand-plover</td>
<td>Charadrius leschenaultia</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>lesser sand-plover</td>
<td>Charadrius mongolus</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>oriental cuckoo</td>
<td>Cuculus optatus</td>
<td>C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Latham's snipe</td>
<td>Gallinago hardwickii</td>
<td>B, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Swinhoe's snipe</td>
<td>Gallinago mega</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>pin-tailed snipe</td>
<td>Gallinago sterna</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>white-throated needletail</td>
<td>Hirundapus caudacutus</td>
<td>C, J, K</td>
<td>Likely</td>
<td>Yes</td>
</tr>
<tr>
<td>fork-tailed swift</td>
<td>Apus pacificus</td>
<td>C, J, K</td>
<td>Recorded</td>
<td>Yes</td>
</tr>
<tr>
<td>eastern osprey</td>
<td>Pandion cristatus</td>
<td>B</td>
<td>Likely</td>
<td>Yes</td>
</tr>
<tr>
<td>broad-billed sandpiper</td>
<td>Limicola falcinellus</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>bar-tailed godwit</td>
<td>Limosa lapponica</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>black-tailed godwit</td>
<td>Limosa limosa</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>black-faced monarch</td>
<td>Monarcha melanopsis</td>
<td>B</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>spectacled monarch</td>
<td>Monarcha trivirgatus</td>
<td>B</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>eastern yellow wagtail</td>
<td>Motacilla tschutschensis</td>
<td>C, J</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>satin flycatcher</td>
<td>Myiagra cyanoleuca</td>
<td>B</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>eastern curlew</td>
<td>Numenius madagascariensis</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>little curlew</td>
<td>Numenius minutus</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>whimbrel</td>
<td>Numenius phaeopus</td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>International Convention</td>
<td>Likelihood to Occur within Study Area</td>
<td>Reasonable Potential to be Impacted by the Proposal</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------</td>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>ruff</td>
<td><em>Philomachus pugnax</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>Pacific golden plover</td>
<td><em>Pluvialis fulva</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>grey plover</td>
<td><em>Pluvialis squatarola</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>rufous fantail</td>
<td><em>Rhipidura rufifrons</em></td>
<td>B</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>grey-tailed tattler</td>
<td><em>Tringa brevipes</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>common greenshank</td>
<td><em>Tringa nebularia</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
<tr>
<td>terek sandpiper</td>
<td><em>Xenus cinereus</em></td>
<td>B, C, J, K</td>
<td>Unlikely</td>
<td>No</td>
</tr>
</tbody>
</table>
Preliminary Seven Part Tests under the *Environmental Planning and Assessment Act 1979*

Threatened species and TECs known to occur or considered to have reasonable likelihood to occur within the Study Area (based on known distribution and habitat requirements) and with reasonable potential to be impacted by the proposed rezoning are addressed in the following preliminary Seven Part Tests of Significance. These assessments have been conducted in accordance with Section 5A of the EP&A Act, based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.

It is acknowledged that the *Biodiversity Conservation Act 2016* was implemented on 25 August 2017, repealing the TSC Act. The assessments in this report have not been updated to reflect the minor changes in relation to the replacement of the TSC Act by the BC Act. It is understood that threatened entities previously listed under the TSC Act were automatically transferred to be listed under the BC Act and the amended Assessment of Significance Test (now outlined in Section 7.3 of the BC Act) does not materially change the assessment outcome. Consideration of the BC Act and its implications on the Project will be addressed at the DA phase of the project, as required.

The following threatened species have been recorded in the Study Area, or are likely to occur and therefore have the potential to be impacted by the proposed rezoning:

**Threatened Flora Species**
- coast groundsel (*Senecio spathulatus*)

**Threatened Fauna Species**
- little tern (*Sternula albifrons*)
- regent honeyeater (*Anthochaera phrygia*)
- swift parrot (*Lathamus discolor*)
- white-bellied sea eagle (*Haliaeetus leucogaster*)
- eastern osprey (*Pandion cristatus*)
- grey-headed flying-fox (*Pteropus poliocephalus*)
- eastern false pipistrelle (*Falsistrellus tasmaniensis*)
- little bentwing-bat (*Miniopterus australis*)
- eastern bentwing-bat (*Miniopterus schreibersii oceanensis*)
- east coast freetail-bat (*Mormopterus norfolkensis*)
- hoary wattled bat (*Chalinolobus nigrogriseus*)
- greater broad-nosed bat (*Scoteanax rueppellii*)
- yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*)
- southern myotis (*Myotis macropus*).
All assessments are undertaken without any consideration of impact mitigation or offsetting and are based on the current indicative Master Plan. Any changes to the indicative Master Plan following this assessment may require a revised Seven Part Test assessment under the EP&A Act.

Species descriptions are referenced from the Office of Environment and Heritage (OEH 2016) and Department of the Environment and Energy (2016) online species profiles, unless otherwise noted.

**Threatened Flora Species**

The following threatened flora species are considered in this assessment:

- coast groundsel (*Senecio spathulatus*)

Coast groundsel (*Senecio spathulatus*) has not been recorded within the Study Area, but has been previously recorded on the Stockton sand dunes approximately 15km northeast of the Study Area (Bell and Driscoll 2010).

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

Coast groundsel has not been recorded in the Study Area however suitable habitat occurs on the frontal sand dunes on the far eastern portion of the Study Area. This species has been previously recorded on the Stockton sand dunes (Bell and Driscoll 2010). No development is proposed in this area, however the proposed rezoning may result in increased human access to the sand dunes.

The proposed rezoning may result in minor indirect disturbances to areas of suitable habitat for coast groundsel. It is not considered that the loss of this habitat may result in an adverse effect on the life cycle of this species such that a viable local population of this species will be likely to be placed at risk of extinction.

b) *in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;*

Not applicable.

c) *in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed;*

Not applicable.

d) *in relation to the habitat of a threatened species, population or ecological community:*

i) *the extent to which habitat is likely to be removed or modified as a result of the action proposed;*

The proposed rezoning may result in minor indirect impacts to suitable habitat for coast groundsel, however it is unlikely that this species depends on the habitats within the Study Area.

ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action; and*
The proposed rezoning may result in minor indirect impacts to suitable habitat for coast groundsel. Consequently the level of fragmentation and isolation will increase for this species where these impacts occur.

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

The proposed rezoning would result minor indirect impacts to suitable habitat for coast groundsel. The Study Area occurs near the southern extent of continuous dune habitat within the Worimi Conservation Lands occurring between Nelson Bay and Fern Bay to the north. The Study Area has been previously disturbed as part of the activities on the Fort Wallace and the dune habitats for this species are generally weed infested by bitou bush and subject to dune driving impacts.

It is unlikely that the habitat to be disturbed as part of the proposed rezoning would be considered important to the long-term survival of this species in the locality and the region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

The Study Area is not located in proximity to any areas of declared or recommended critical habitat. The proposed rezoning will not have an adverse effect on any critical habitat.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan; and

No recovery plans have been prepared for coast groundsel.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed rezoning will contribute to the operation of the following key threatening processes listed under the TSC Act relevant to this species:

- Invasion of native plant communities by *Chrysanthemoides monilifera*.

**Conclusion**

Based on the information provided above, and considering the application of the precautionary principle, the proposed rezoning is unlikely to result in a significant impact on coast groundsel due to the minor and indirect impacts on potential habitat and no impact on known individuals.

This assessment has been undertaken based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.
Threatened Fauna Species

The following threatened fauna species are considered in this assessment:

- little tern (*Sternula albifrons*)
- regent honeyeater (*Anthochaera phrygia*)
- swift parrot (*Lathamus discolor*)
- pied oystercatcher (*Haematopus longirostris*)
- white-bellied sea eagle (*Haliaeetus leucogaster*)
- eastern osprey (*Pandion cristatus*)
- grey-headed flying-fox (*Pteropus poliocephalus*)
- eastern false pipistrelle (*Falsistrellus tasmaniensis*)
- little bentwing-bat (*Miniopterus australis*)
- eastern bentwing-bat (*Miniopterus schreibersii oceanensis*)
- east coast freetail-bat (*Mormopterus norfolkensis*)
- hoary wattled bat (*Chalinolobus nigrogriseus*)
- greater broad-nosed bat (*Scoteanax rueppellii*)
- yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*)
- southern myotis (*Myotis macropus*)

Potential habitat occurs within the Study Area for woodland birds such as regent honeyeater and swift parrot, coastal birds such as little tern, eastern osprey and white-bellied sea-eagle and threatened microbat species being eastern false pipistrelle, hoary wattled bat, greater broad-nosed bat, yellow-bellied sheathtail bat, eastern bentwing-bat, little bentwing-bat and southern myotis.

Pied oystercatcher, grey-headed flying-fox and east coast freetail-bat have been previously recorded utilising the habitats of the Study Area.

White-bellied sea eagle is currently being assessed under a preliminary determination to be listed as vulnerable under the TSC Act (NSWSC 2016) and should be considered in any future development applications for the project.
a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction;

Pied oystercatcher, grey-headed flying-fox and east coast freetail-bat have been recorded utilising the habitats of the Study Area. Up to two grey-headed flying-foxes were observed foraging in coastal banksia (*Banksia integrifolia*) in the north of the Study Area in May 2016. No flying-fox camps have been recorded in the Study Area. East coast freetail-bat was detected using Anabat recorders in April 2007 (SMEC 2008). The forested areas of the Study Area are likely to provide suitable foraging habitat for these species.

Potential habitat also occurs for regent honeyeater, swift parrot, eastern osprey, white-bellied sea-eagle, eastern false pipistrelle, hoary wattled bat, greater broad-nosed bat, yellow-bellied sheathtail bat, eastern bentwing-bat, little bentwing-bat and southern myotis. Little tern has been previously recorded nesting in mined dunes along the south-western edge of the Worimi Conservation Lands and may also use the similar habitats of the Study Area. These species have not been recorded in the Study Area.

The proposed rezoning may result in the loss of approximately 1.0 hectare of potential and likely forest foraging habitat for a range of threatened species in the forested areas of the site. Hollow resources in the Study Area occur in low densities in these habitats.

It is not considered that the loss of this habitat may result in an adverse effect on the life cycle of these species such that a viable local population of these species will be likely to be placed at risk of extinction.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;

Not applicable.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed;

Not applicable.

d) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed;

The proposed rezoning may result in the loss of approximately 1.0 hectare of forest habitat being likely foraging habitat for a range of threatened species. Given the availability of other higher quality habitat in the Worimi Conservation Lands to the north of the site, it is unlikely that these species depend on the habitats within the Study Area.

ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action; and

The proposed rezoning would result in the loss approximately 1.0 hectare of forest habitat being likely foraging habitat for a range of threatened species. The proposed rezoning may introduce significant barriers for some of these species such that it will prevent movement of individuals between proximate areas of habitat. Highly mobile species such as grey-headed flying-fox, micro-bats and birds are unlikely to be substantially affected. The Study Area contains intact vegetation primarily along its northern and southern boundaries. While this allows some east to west fauna movement from the
coastal dune area to the Hunter River estuary, the value of this is limited due to residential areas and Fullerton Road to the west of the Study Area. Connectivity from the south of the site to Stockton is currently highly fragmented as a result of previous residential and urban development.

As some forest habitat may be removed as part of the proposed rezoning, the level of fragmentation and isolation within the Study Area will increase for these species.

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

The proposed rezoning would result in the loss approximately 1.0 hectare of forest habitat that contains likely foraging habitat for a range of threatened species. Hollow-bearing tree resources for roosting habitat occur in low densities in the Study Area. Key foraging trees being swamp mahogany (*Eucalyptus robusta*) for species such as grey-headed flying-fox (*DECCW 2009*), regent honeyeater (*DoE 2016*) and swift parrot (*Saunders 2011*) occur in small discrete areas of the Study Area. Sand dune habitat in relation to the little tern, which has been recorded nesting in mined dunes along the south-western edge of the Worimi Conservation Lands, is not expected to be impacted by the proposed rezoning, however the proposed rezoning may result in increased human access to the sand dunes.

The Study Area occurs south of high quality continuous habitat within the Worimi Conservation Lands occurring between Nelson Bay and Fern Bay. It is unlikely that the habitat to be disturbed as part of the proposed rezoning would be considered important to the long-term survival of these species in the locality and the region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);

No critical habitat has been listed within or adjacent to the Study Area for these threatened species. The proposed rezoning will not have an adverse effect on any critical habitat.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan; and

The following recovery plans have been prepared:

- National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (*DoE 2016*)
- National Recovery Plan for the Swift Parrot (*Lathamus discolor*) (*Saunders 2011*)
- Little tern (*Sterna albifrons*) Recovery Plan (*NPWS 2003*)

Any impacts to known habitat for these species in the Study Area are likely to contravene the objectives of these recovery plans.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed rezoning may contribute to the operation of the following key threatening processes listed under the TSC Act relevant to these species:

- Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*).
• Clearing of native vegetation.

• Invasion, establishment and spread of *Lantana camara*.

• Invasion of native plant communities by *Chrysanthemoides monilifera*.

• Removal of dead wood and dead trees.

**Conclusion**

Based on the information provided above, and considering the application of the precautionary principle, the proposed rezoning is unlikely to result in a significant impact on little tern, regent honeyeater, swift parrot, eastern osprey, white-bellied sea-eagle, eastern false pipistrelle, hoary wattled bat, greater broad-nosed bat, yellow-bellied sheathtail bat, eastern bentwing-bat, little bentwing-bat and southern myotis due to the minor and indirect impacts on potential habitat and no impact on known individuals.

Furthermore, due to the highly mobile nature of these species and the availability of higher quality habitats in the locality, the proposed rezoning is unlikely to result in a significant impact on pied oystercatcher, grey-headed flying-fox or east coast freetail-bat, which have been recorded utilising the habitats of the Study Area. While the Study Area contains known habitat, this area is minimal and fragmented. Based on the current Master Plan, the proposed rezoning is unlikely to result in a significant impact on these species.

This assessment has been undertaken based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.
Preliminary Assessment of Significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires an Assessment of Significance relating to the potential impacts of a project on listed matters of national environmental significance (MNES). These assessments have been conducted in accordance with the Significant Impact Guidelines 1.1 (DoE 2013), based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.

Under the EPBC Act, the approval of the Commonwealth Minister for the Environment is required for any action that may have a significant impact on MNES. These matters are:

- listed threatened species and ecological communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- the Commonwealth marine environment
- World Heritage properties
- National Heritage places
- Great Barrier Reef Marine Park
- nuclear actions
- a water resource, in relation to coal seam gas development and large coal mining development.

A search of the Department of Environment and Energy Protected Matters Search Tool in September 2016 and collated information from literature reviews identified three threatened ecological communities, 32 threatened species and 36 terrestrial migratory species listed under the EPBC Act that are known to occur, or considered to have the potential to occur on the basis of habitat modeling within the Study Area. Each of these has been included in Tables 1 and 2 (note that purely marine or pelagic species were excluded due to lack of habitat), together with an indication of those species that warrant further assessment by way of an Assessment of Significance.

As outlined in Tables 1 and 2, the following EPBC Act listed species and communities are considered to have the potential to occur or be impacted by the Project and are subject to an Assessment of Significance below:

**Critically Endangered and Endangered Species**

- swift parrot (*Lathamus discolor*)
- regent honeyeater (*Anthochaera phrygia*)

**Vulnerable Species**

- grey-headed flying-fox (*Pteropus poliocephalus*)
Migratory Species Listed under International Conventions

- little tern (*Sternula albifrons*)
- white-throated needletail (*Hirundapus caudacutus*)
- fork-tailed swift (*Apus pacificus*)
- eastern osprey (*Pandion cristatus*).
Critically Endangered and Endangered Species

The following critically endangered and endangered species are considered in this assessment:

- swift parrot (*Lathamus discolor*)
- regent honeyeater (*Anthoecaera phrygia*)

Species descriptions, in the Assessments of Significance below, are referenced from the Office of Environment and Heritage (OEH 2016) and Department of the Environment and Energy (2016) online species profiles, unless otherwise noted.

In this case, a **population** means:

- a geographically distinct regional population, or collection of local populations; or
- a regional population, or collection of local populations, that occurs within a particular bioregion.

The swift parrot occurs as a single population that migrates annually from breeding grounds in Tasmania to the winter foraging grounds on the coastal plains and slope woodlands of mainland eastern Australia (Saunders 2011). Approximately 200 mature birds (10 per cent of the total estimated population) are known to over-winter in the Lower Hunter Region of New South Wales (Saunders 2002). The swift parrot has not been recorded within the Study Area however it has been recorded approximately 15 km north of the Study Area near Williamtown feeding on swamp mahogany.

Although there appears to be minor behavioural differences between regent honeyeaters in the three main areas inhabited by the species (the Bundarra-Barraba area in NSW, the Capertee Valley in NSW, and north-eastern Victoria), the direction and extent of movements, including evidence of movement between breeding sites, and a lack of discernable genetic differences between the sites suggest that the regent honeyeater occurs as a single, contiguous population (Garnett and Crowley 2000). The regent honeyeater has not been recorded within the Study Area however it has been recorded approximately 20 km north of the Study Area near Medowie.

*An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:*

- lead to a long-term decrease in the size of a population; or
- reduce the area of occupancy of the species; or

No **populations** of the swift parrot or regent honeyeater have been recorded within the Study Area. The proposed rezoning may result in the loss of approximately 1.0 hectares of potential key feed tree foraging habitat in the form of swamp mahogany trees for swift parrot and regent honeyeater. The Study Area is not known as a historical or important foraging site for these species.

It is considered unlikely that the proposed rezoning will lead to a decrease in the size of a **population** of the swift parrot or regent honeyeater.

The swift parrot and regent honeyeater have not been recorded within the Study Area. The proposed rezoning may result in the loss of approximately 1.0 hectares of potential foraging habitat for these species. While the proposed rezoning will remove potential habitat for these species, it is not likely to lead to a significant reduction in known habitat in the region. Substantial areas of similar habitats for these species
are protected in proximity to the Study Area, including the Worimi Conservation Lands and the Tilligerry State Conservation Area.

The proposed rezoning may result in a reduction of the potential area of occupancy for the swift parrot or regent honeyeater, however this is unlikely to substantially reduce the area of known occupancy in the locality or region.

- **fragment an existing population into two or more populations; or**

  The swift parrot and regent honeyeater have not been recorded within the Study Area. The swift parrot and regent honeyeater are highly dispersive and it is unlikely that the proposed rezoning would create a significant change to the species’ dispersal capacity or create a significant barrier the movement of the species. Connectivity from the south of the site to Stockton is currently highly fragmented as a result of previous residential and urban development and the proposed rezoning is unlikely to fragment an existing population of these species.

  It is unlikely that the proposed rezoning would result in the fragmentation of an existing population into two or more populations.

- **adversely affect habitat critical to the survival of a species; or**

  Habitat critical to the survival of the swift parrot includes those areas of priority habitat for which the species has a level of site fidelity or possess phenological characteristics likely to be of importance to the swift parrot (Saunders 2011). The Study Area contains 1.0 hectares of forest containing swamp mahogany (*Eucalyptus robusta*) being a key feed tree species for the swift parrot. The proposed rezoning is unlikely to substantially adversely affect habitat that is critical to the survival of the species.

  Habitat critical to the survival of the regent honeyeater includes any breeding or foraging areas where the species is likely to occur and any newly discovered breeding or foraging locations (DoE 2016). The Study Area contains 1.0 hectares of forest containing swamp mahogany (*Eucalyptus robusta*) being a key feed tree species for the regent honeyeater. The proposed rezoning is unlikely to substantially adversely affect habitat that is critical to the survival of the species.

- **disrupt the breeding cycle of a population; or**

  The swift parrot breeds and nests exclusively in Tasmania and migrates to mainland Australia during the non-breeding season. There is no potential for breeding habitat to occur in the Study Area.

  The regent honeyeater mainly breeds in three key sites from the Bundarra-Barraba area NSW, the Capertee Valley in NSW, and north-eastern Victoria. Breeding has also been recorded within the Hunter Valley, with the species recorded breeding in open forest close to Kurri Kurri in 2007. Nests are usually placed in the canopy of mature trees with rough bark, e.g. ironbarks, sheoaks (*Casuarina*) and rough-barked apple (*Angophora floribunda*). The regent honeyeater has not been previously recorded in the Study Area and it is unlikely to contain breeding habitat for the species.

  The proposed rezoning is not expected to disrupt the breeding cycle of populations of the swift parrot or regent honeyeater.
• modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline; or

The proposed rezoning may involve the removal of approximately 1.0 hectares of potential foraging habitat for swift parrot and regent honeyeater. The Lower Hunter and Port Stephens area supports other areas of habitat that contain suitable woodland and forest vegetation that would also provide potential habitat for these species, including the Worimi Conservation Lands and the Tilligerry State Conservation Area.

It is considered unlikely that the proposed rezoning will modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the swift parrot or regent honeyeater decline.

• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat;

The proposed rezoning is not expected to result in invasive species that are harmful to the swift parrot or regent honeyeater becoming established in the species’ habitat.

• introduce disease that may cause the species to decline; or

Relevant for the swift parrot, psittacine beak and feather disease is a common and potentially deadly disease of parrots caused by a circovirus named beak and feather disease virus. The disease appears to have originated in Australia and is widespread and continuously present in wild populations of Australian parrots. Beak and feather disease affecting endangered psittacine species (parrots and related species) was listed in April 2001 as a key threatening process under the EPBC Act.

It is considered unlikely that the proposed rezoning will introduce beak and feather disease or any other disease that may cause the swift parrot or regent honeyeater to decline.

• interfere with the recovery of the species.

The following recovery plans have been prepared:

• National Recovery Plan for the Swift Parrot (*Lathamus discolor*) (Saunders 2011)
• National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (DoE 2016)

Any impacts to known habitat for these species in the Study Area are likely to contravene the objectives of these recovery plans. The swift parrot and regent honeyeater have not been recorded within the Study Area, however potential foraging habitat has been identified. It is considered unlikely that the proposed rezoning will interfere with the recovery of the swift parrot or regent honeyeater throughout Australia.

**Conclusion**

The proposed rezoning is unlikely to result in a significant impact on the populations of the swift parrot or regent honeyeater. Although the Study Area provides potential foraging habitat for these species, they have not been recorded utilising the potential habitat within the Study Area or in the immediate surrounds.

This assessment has been undertaken based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.
Vulnerable Species

The following vulnerable species are considered in this assessment:

- grey-headed flying-fox (*Pteropus poliocephalus*)

In the case of a vulnerable species, an **important population** is a population that is necessary for a species’ long-term survival and recovery. This may include populations that are:

- key source populations either for breeding or dispersal; or
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

Grey-headed flying-fox (*Pteropus poliocephalus*) has been recorded within the Study Area. Up to five individuals were observed foraging in the coastal banksia (*Banksia integrifolia*) in the Study Area in May 2016. No flying-fox camps have been recorded in the Study Area. The closest active camp is located approximately 4 km to the southwest of the Study Area near Carrington (DoEE 2016). From these camps, the species can travel up to 50 km in one night in search of food where they feed on the nectar and pollen of native trees, in particular *Eucalyptus*, *Melaleuca* and *Banksia*, and fruits of rainforest trees and vines. It is likely that the species utilises the Study Area as foraging habitat. The Study Area is likely to provide suitable foraging habitat for a local population the species.

**An action has, will have, or is likely to have a significant impact on threatened species if it does, will, or is likely to:**

- lead to a long-term decrease in the size of an **important population** of a species;

  Known habitat for grey-headed flying-fox has been recorded in the Study Area, however the Study Area is unlikely to be important for an **important population** of this species. The proposed rezoning may result in the loss of approximately 1.2 hectares of foraging habitat for grey-headed flying-fox. The Study Area is unlikely to be depended on by local grey-headed flying-fox colonies.

  It is considered unlikely that the proposed rezoning will lead to a decrease in the size of an **important population** of grey-headed flying-fox.

- reduce the area of occupancy of an **important population**, or;

  The proposed rezoning may result in the loss of approximately 1.2 hectares of foraging habitat for grey-headed flying-fox. Due to the small area of impact, retention of forested vegetation and existing fragmentation within the Study Area, the proposed rezoning is unlikely to reduce the area of the **important population** of grey-headed-flying-fox.

- fragment an **existing important population** into two or more populations, or;

  The grey-headed flying fox is highly dispersive and it is unlikely that the proposed rezoning would create a significant change to the species’ dispersal capacity or create a significant barrier the movement of the species.

  It is unlikely that the proposed rezoning may result in the fragmentation of an existing **important population** into two or more populations.
- adversely affect habitat critical to the survival of a species, or;

According to the draft National Recovery Plan for the grey-headed flying-fox (DECC 2009), foraging habitat is considered critical to the survival of the species if it is productive during winter and spring and productive during the final weeks of gestation, and during the weeks of birth, lactation and conception. Forest communities containing swamp mahogany (*Eucalyptus robusta*) and shrubland containing coastal banksia (*Banksia integrifolia*) in the Study Area are productive during winter, during which food bottlenecks have been identified. The Study Area is considered to comprise an area of foraging habitat for this species but is unlikely to contain significant breeding and roosting habitat.

- disrupt the breeding cycle of an important population, or;

No grey-headed flying-fox breeding populations or camps have been identified in the Study Area. The proposed rezoning is not expected to disrupt the breeding cycle of an important population of this species.

- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or;

The proposed rezoning may result in the loss of approximately 1.2 hectares of foraging habitat for grey-headed flying-fox an. The Study Area is unlikely to be depended on by local grey-headed flying-fox colonies. It is considered unlikely that the proposed rezoning will modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the grey-headed flying-fox would decline.

- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat;

There are not any invasive species that are likely to become established as a result of the proposed rezoning that may impact upon any habitat relevant to the grey-headed flying-fox.

- introduce disease that may cause the species to decline; or

No diseases that may cause grey-headed flying-fox to decline are likely to be introduced as a result of the proposed rezoning.

- interfere substantially with the recovery of the species.

The following recovery plans have been prepared:


Any impacts to known habitat for grey-headed flying-fox in the Study Area are likely to contravene the objectives of this recovery plan. It is considered unlikely that the proposed rezoning will interfere with the recovery of the grey-headed flying-fox throughout Australia.

**Conclusion**

Based on the information provided above, and considering the application of the precautionary principle, the proposed rezoning is unlikely to result in a significant impact on grey-headed flying-fox. While the Study Area contains known habitat, this area is minimal and fragmented. Based on the current Master Plan, the proposed rezoning is unlikely to result in a significant impact on these species.
This assessment has been undertaken based on the current Master Plan. It is expected that these assessments will be reviewed and revised following the finalisation of the Master Plan and impact boundaries as part of the future development application.
Migratory Species under International Conventions

The following migratory species are considered in this assessment:

- little tern (*Sternula albifrons*)
- white-throated needletail (*Hirundapus caudacutus*)
- fork-tailed swift (*Apus pacificus*)
- eastern osprey (*Pandion cristatus*)

Fork-tailed swift has been recorded flying over the habitats of the Study Area in May 2016. Little tern, white-throated needletail and eastern osprey have not been recorded within the Study Area, however potential habitat for these species occurs in the Study Area.

**An area of important habitat is:**

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; or
- habitat utilised by a migratory species which is at the limit of the species range; or
- habitat within an area where the species is declining.

The habitats within the Study Area for migratory species listed under international conventions is not considered to meet the criteria listed above, and important habitat is not likely to occur.

The Draft Referral Guideline for 14 Birds Listed as Migratory Species under the EPBC Act (DoE 2015) defines important habitat for the white-throated needletail, fork-tailed swift and eastern osprey. Important habitat for white-throated needletail includes tree hollows in tall trees on ridge tops (DoE 2015). Otherwise the species is almost entirely aerial (DoE 2015). Important habitat for fork-tailed swift includes open plains to woodland areas, however the species is almost entirely aerial (DoE 2015). Important habitat for the eastern osprey includes Bays, estuaries, along tidal stretches of large coastal rivers, mangrove swamps, coral and rock reefs, terrestrial wetlands and coastal lands of tropical and temperate Australia and off shore islands (DoE 2015).

No guidelines are available for little tern. Little terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches (DoE 2016). The Study Area contains suitable sand dune habitat to the east of the site. Little tern has been previously recorded nesting in mined dunes along the south-western edge of the Worimi Conservation Lands, however this has not been recorded within the Study Area. While this is not expected to be impacted by the proposed rezoning, the proposed rezoning may result in increased human access to the sand dunes.

The habitats within the Study Area for migratory species listed under international conventions is not considered to meet the criteria listed above, and *important habitat is not likely to occur*. 
The proposed rezoning is considered likely to result in a significant impact on migratory species if there is a real chance or possibility that it will:

- **substantially modify and/or destroy an area of important habitat for a migratory species**;
- **seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species; and/or**
- **result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.**

The Study Area is not considered to comprise *important habitat* for any of the identified migratory species listed above, and therefore the proposed rezoning is not likely to substantially modify or destroy important migratory species habitat. Similarly, the proposed rezoning will not seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species; or result in an invasive species that is harmful to migratory species becoming established within the Study Area.

**Conclusion**

The proposed rezoning is not likely to result in a significant impact on any migratory species listed under the EPBC Act or international conventions.
Fort Wallace Bushfire Assessment

338 Fullerton Street, Stockton
NSW

Ref: 97963 - 20170283

Document Log: NCA16R39083

12 October 2017
Bushfire Threat Assessment

Fort Wallace

338 Fullerton Street, Stockton NSW

Kleinfelder Job No. NCA16R39083

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Please note:


This report is not an insurance policy. Owing to the unpredictable nature of bushfires and of weather conditions at the time of a bushfire, this report cannot be taken as a warranty that the recommended bushfire mitigation measures will protect the property from damage in every possible bushfire event. Ultimately, the onus is on the land owner to accept the risks associated with development on the site in light of the identified bushfire threat.

Document Control:

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<th>Author</th>
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## EXECUTIVE SUMMARY

**Report Type**  
Bushfire Threat Assessment

**Applicant’s Name**  
Defence Housing Australia

**Applicant Contact Details**  
Gully.Coote@dha.gov.au

**Site Address**  
338 Fullerton Street, Stockton NSW

**Lot No.**  
Lot 100

**Deposited Plan No.**  
DP 1152115

**Local Government Area**  
Newcastle City Council

**Zoning under Newcastle City Council LEP**  
SP2 – Infrastructure

**Fire Danger Index Area Name**  
Greater Hunter Region, FDI 100

**Bushfire Prone Land**  
Yes

**Source methodology/s**  

**Site visit date**  
20 July 2016

**Document date**  
12 October 2017

**Document number**  
NCA16R39083

**Site plan/s attached**  
No

**Conclusion**  
This bushfire assessment provides the proponent with information regarding the assessment of the classified bushfire prone vegetation within and surrounding the subject site and the minimum performance provisions that must be addressed to comply with Chapter 4 of PBP (2006) for residential subdivisions.

This bushfire assessment confirmed that the proposed development can achieve BAL 29 providing recommended APZ are managed. Water and access provisions are deemed suitable for the proposed development.
1. SCOPE OF ASSESSMENT

Under the *Rural Fires and Environmental Assessment Legislation Amendment Act 2002* (amends the *Environmental Planning and Assessment Act 1979*) local councils are required to ensure that all developments in bushfire prone lands conform to documented bushfire protection specifications.

DHA are seeking to lodge a planning proposal with Newcastle City Council to rezone the site to allow a diversity of residential uses. A master plan has been developed to demonstrate how the site would develop in accordance with best practice planning and urban design principles.

This report assesses the performance of the illustrated master plan on Lot 100 (DP 1152115), 338 Fullerton Street, Stockton NSW, against the criteria as detailed in the NSW RFS Planning for Bushfire Protection (PBP).

This report cannot be used for any other design unless authorised and amended by the author of this report. Future detailed Development Applications (DA’s) will be supported by detailed bushfire assessment.

1.1 PROJECT DESCRIPTION

The proponent has engaged Kleinfelder to conduct a bushfire threat assessment to inform the planning proposal, which involves the residential uses within an existing Australian Defence Force (ADF) land holding. The subject site known as Fort Wallace covers a total area of 31 ha and was previous used by the ADF as a strategic military defence positon.

The subject site location and surrounding vegetation and landscape characteristics are shown in Figure 1.

1.2 SITE ASSESSMENT METHODOLOGY

The site assessment methodology used to determine the level of bushfire attack for this development has been sourced from Appendix 2 of the NSW RFS Planning for Bushfire Protection (PBP) (2006). The assessment procedure used to determine the category of bushfire attack level (BAL) is in accordance with AS3959 - 2009.
1.2.1 Integrated Development

Section 91 of the EP&A Act defines integrated development – i.e. residential subdivisions. Integrated developments require a formal approval from the NSW Rural Fire Service under s100B of the Rural Fires Act 1997.

Section 100B of the Rural Fires Act 1997 states that the NSW Rural Fire Service can issue a BFSA approval provided the development meets certain requirements and standards. A BFSA authorises development to the extent that it complies with standards regarding setbacks (to mitigate radiant heat), provision of water supply, emergency management and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bushfire. A BFSA requires a bushfire assessment to be prepared in accordance with Clause 44(1) of the Rural Fires Regulation 2013, which specifies the information requirements for consideration of a BFSA under section 100B of the RF Act.
Subject Site

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Legend

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Fort Wallace Site Layout

Defence Housing Australia
Bushfire Assessment
Fort Wallace
338 Fullerton Street, Stockton NSW

Legend

- Proposed Dwellings and Existing Heritage Buildings
- Proposed Emergency Egress
- Major Roads
- Local Roads
- Contours (2m)

APZ
BAL 29
BAL 19
BAL 12.5

Fort Wallace Site Layout

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- Proposed Dwellings and Existing Heritage Buildings
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2. BUSHFIRE THREAT ASSESSMENT

2.1 LOCATION AND SURROUNDING LAND USE

The subject site is situated on start of the Stockton Peninsula, within the Newcastle City Council LGA, positioned between the North Channel Hunter River to the west, and Stockton Beach to the east.

The subject site is currently zoned under the Newcastle City Council LEP (2013) as SP2 – Infrastructure, however the proponent intends to submit a rezoning application with Newcastle City Council to rezone the subject site to E3 – Environmental Management and a proportion of the subject site as R2 – Low Density Residential and RE2 – Private Recreation.

The surrounding land is comprised of residential park land, residential development and the Stockton Centre (Disability Services) to the north.

2.2 FIRE WEATHER

Newcastle City Council LGA is within the Greater Hunter Region and has an FDI value of 100 (Table 2.1, AS3959-2009).

2.3 ENVIRONMENTAL FEATURES

The site is located on the Stockton Sand Spit, and has considered seas level rise, dune movement, and coastal vegetation. There are no known environmental features that would be adversely impacted by the proposed development. Detailed ecology and coastal environmental reports have been prepared for the planning proposal (Umwelt 2016).

2.4 THREATENED SPECIES

No threatened species constrain the bushfire mitigation actions proposed (Umwelt, 2016).
2.5 ABORIGINAL ARTEFACTS

No heritage or artefacts would constrain the bushfire mitigation actions proposed (Umwelt, 2016).

2.6 BUSHFIRE ASSESSMENT

2.6.1 Bushfire Hazard (Vegetation Classification)

The vegetation classification is identified in all directions from the development out to a distance of 140 metres.

The area of vegetation within the subject site has been mapped by Newcastle City Council in 2004 as Category 1 bushfire prone vegetation as shown on Figure 3.

The predominant bushfire hazard is located in the north, east and south boundaries of the subject site. During the site inspection the bushfire prone vegetation to the north and south was identified as Coastal Sand Apple Blackbutt Forest and assessed as forest and the Bushfire prone vegetation to the east was identified as coastal shrubland and was assessed as shrubland.

![Figure 3: Newcastle Bushfire Prone Land Map 2009.](image)

Table 1 details the vegetation classification in each direction.
2.6.2 Slope Assessment

The effective slope under the classified vegetation located to the north, east and south of the subject site has been assessed as flat to upslope.

2.6.3 Distance to Classified Vegetation (Asset Protection Zones)

The assessment will determine the required minimum setbacks from dwelling construction to the vegetation hazard type.

The vegetation hazard are either upslope or on flat terrain from the proposed development areas. The minimum setbacks to achieve bushfire attack level (BAL) BAL29, as detailed in AS3959-2009 are:

- Forest: 25m - 35m
- Scrub: 13m - 19m

For the purpose of this BAL assessment it is assumed that all setbacks (APZ) are manage in perpetuity.

2.6.4 Determine Bushfire Attack Level (Construction Standards)

The BAL is derived using the vegetation classification, setback distance and effective slope. The BAL rating is equivalent to the AS3959-2009 requirements for the construction of various elements of a Class 1, 2 and 3 buildings.

With a minimum setback of 25 metres to upslope forest vegetation to the north and south and 13 metres to upslope scrub vegetation to the east, BAL 29 is achievable (refer to Figure 2).

Table 1 details the vegetation classification for each direction from the proposed development and the calculated BAL rating.
Table 1: APZ and BAL summary

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</table>

2.6.5 Water Supply

The subject site is connected to the town reticulated water supply. This water supply will be extended throughout the proposed subdivision via a ring main system.

The following water supply performance measures can be achieved in later, future design stages:

- All above ground water and gas service pipes external to the building will be metal, including and up to any taps.
- All fire hydrant spacing, sizing and pressures will comply with AS 2419.1 – 2005.
- Fire hydrants will not be located within any road carriageway and provisions for parking on public roads will be met.

2.6.6 Access and Egress

2.6.6.1 Public Road & Property Access

Residential development of the site would be accessible via Fullerton Street, which is a sealed two lane public through road, suitable for evacuation and simultaneous emergency management.

All public roads and property access roads will be designed in a manner that complies with the performance criteria’s outlined in Section 4.1.3 of PBP 2006.

Public roads will be a combination of perimeter road linking with an internal road system. Main thoroughfare roads will be 8m trafficable width kerb to kerb. Internal roads will be 6.5m trafficable width kerb to kerb.
The design allows for alternate access to Fullerton Street, and internal roads are through roads, thus avoiding any potential dead ends to residential areas.

All public and property access dimensions and capacity requirement can be achieved.

A fire trail access is recommended at the bushland interface between the cluster homes east and west, to provide some access for fire management purposes, and APZ maintenance.
### 3. COMPLIANCE SUMMARY


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<th>Intent</th>
<th>Complies with PBP (2006): YES</th>
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<td><strong>3.1 APZ</strong></td>
<td>This section is to provide for sufficient space for firefighting and other emergency services personnel, ensuring radiant heat levels permit operations under critical conditions of radiant heat, smoke and embers, while supporting or evacuating occupants.</td>
<td>The proposed development site has adequate space within the subject site, such that all required setbacks (APZ) can be established and maintained in perpetuity on site. The master plan shows that the APZ will provide adequate separation between the residential lots and the upslope forest vegetation to the north and south, and the upslope scrub vegetation to the east. All additional bushfire mitigation strategies will be managed entirely within the subject site.</td>
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| **3.2 Access** | This section is to provide for safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. | The existing public roads and all proposed public roads will comply the minimum performance requirements of PBP 2006 (Chapter 4.1.3(1) Public Roads). All property access roads will comply the minimum performance requirements of PBP 2006 (Chapter 4.1.3(2) Property Access). |

| **3.3 Services** | This section is to provide adequate water services for the protection of buildings during and after the passage of a bushfire, and to locate gas and electricity so as not to contribute to the risk of fire to buildings. | **Water:** Water supply to proposed development will comply with Chapter 4, of PBP (2006). The reticulated water supply will use a ring main system, and all above ground water and gas service pipes external to the building are metal, including and up to any taps. Fire hydrant spacing, sizing and pressure will comply with AS 2419.1 – 2005. Hydrants are not located within any road carriageway, and all provisions of parking on public roads are met. **Gas:** Gas services can conform to Chapter 4 of PBP (2006). Any reticulated or bottled gas must be installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. |
### 3.1 APZ

| Electricity:  
| Electrical services can conform to Chapter 4 of PBP (2006).  
| Location of electricity services will not lead to ignition of surrounding grassland or the fabric of buildings or risk life from damaged electrical infrastructure.  
| Where practical, new electrical transmission should be underground. |
4. CONCLUSION

The bushfire assessment indicate that the master plan and associated design principles located at (Lot 100, DP 1152115), 338 Fullerton Street, Stockton NSW can comply with all performance criteria’s outlined for integrated (residential subdivision) development in Chapter 4 of PBP (2006).

AS 3959-2009 sets out requirements for the construction of various elements of a building in order to reduce the likelihood of ignition of the building when subject to bushfire attack. The proposed development (residential subdivision) can achieve BAL 29 (minimum construction requirement).

The proposed design provides for suitable access and water provisions for emergency management.
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SITE AND IMMEDIATE CONTEXT

Stockton Centre

Source: Nearmap
The sites

The Fort Wallace Urban Design Report is to accompany the Fort Wallace Planning Proposal to Newcastle City Council.

This report has been prepared by Architectus for Defence Housing Australia, the owner of the Fort Wallace site at Stockton. The purpose of this report is to test the preferred urban design concepts to accompany the planning proposal to demonstrate typical street layouts, dwelling mix and development impact on the highly sensitive coastal site.

The objective of this study is to highlight key relevant issues to be addressed as part of the future master plan for the site. Key issues concerning the sites are:

- coastal dune location and coastal erosion
- ecology
- indigenous heritage
- heritage
- access

The Fort Wallace site is one of two sites on the Stockton Peninsula owned by Defence Housing Australia seeking amendments to their respective Local Environmental Plans (LEP) through a Planning Proposal. The other site being the Rifle Range site located 2 km north of Fort Wallace. The Fort Wallace and Rifle Range sites are located in separate local government areas, being Newcastle City and Port Stephens respectively. Accordingly, a separate Planning Proposal and accompanying master plan and Urban Design Report will be submitted to each Council concurrently in order to amend the different LEPs.

The vision

The vision is to create a new place for the public and future residents to enjoy without compromising the site’s unique history and coastal landscape character. The following planning and design principles underpin any future development of the site:

1. Touch lightly on the land
2. Embrace the coastal ecology
3. Celebrate history and cultural heritage
4. Open the gates to the public
5. Utilise interesting architectural forms

An indicative master plan has been developed (and included within this report) that embodies these best practice planning and design principles.
Master Plan Vision -
“Stockton Rifle Range and Fort Wallace will be unique coastal communities with strong links to Newcastle CBD and a growing Hunter region.

The communities will be a place where the natural coastal landscape prevails over the built environment and a rich layer of cultural heritage is celebrated and made accessible to the public.

New buildings will be contemporary in design and character, with references to traditional coastal forms and materiality. Development will ‘touch lightly’ on the ground and minimise impacts on the site.”
Executive summary

Indicative Master Plan

LEGEND

01/ Stockton Centre
02/ Cluster Homes
03/ Single Eco Home
04/ Townhouses
05/ Dune Apartments
06/ Courtyard Homes
07/ Firetrail walking path
08/ Community park
09/ Adaptive reuse community facility
10/ Heritage precinct
11/ Stairway
12/ Dune boardwalk
13/ Landscaped embankment
14/ Shared path to Stockton

Scale: 1:2000 @ A3
ARTIST’S IMPRESSION OF THE PROPOSED DEVELOPMENT
Proposed LEP Mapping

The proposed LEP controls are intended to strike the right balance between development and conservation of the site’s significant features. Sensitive ecological communities, heritage items and vulnerable coastal lands are proposed to be protected and enhanced, whilst the flatter, mostly featureless parts of the site are to be made available for housing and community amenities. Through new development, the historic site can be opened up to the public, new open space can be provided and degraded relics and vegetation communities can be restored.
The site is part of the Stockton Peninsula, with the town centre of Stockton sitting on the headland located approximately 3km to the south.
1. Introduction

1.1 The site

The Fort Wallace site is approximately 32 hectares in area and located on the Stockton peninsula north of the existing coastal village of Stockton on the northern side of the Hunter River and is 5km north of Newcastle CBD.

The Fort Wallace site is within Newcastle local government area.

The site is bound by the Stockton Centre (health care facility) to the north, a redundant water treatment works to the south, Fullerton Road and the Hunter River to the west and Stockton Beach to the east.

The site is currently accessed by a single entry off Fullerton Road. Although only 5 km from Newcastle CBD, being a peninsula the Fort Wallace site is a 20 minute drive from Newcastle CBD via the Stockton Bridge. The site is however, close to the ferry crossing between Stockton and Newcastle.

Key features of the site include:
- Significant European history with remnant defence buildings and gun emplacements with heritage significance.
- Potential for some cultural significance for local Aboriginal community.
- Undulating topography with a mix of areas of native regrowth vegetation, weed infested areas and highly modified landform due to previous defence uses.
- Elevated views west over the Hunter River and east to the coast.
- Coastal dune system to its eastern boundary (shelters the remaining site areas but restricts views east to the ocean).
- Close proximity to the beach and river.

1.2 Purpose of this report

This report has been prepared by Architectus on behalf of Defence Housing Australia (DHA) for land at 338 Fullerton Street, Stockton.

The site was formerly owned and utilised by Defence as a base and training site. The site is no longer required for Defence purposes and was purchased by DHA. The purpose of this report is to prepare concept options for the site that test the site’s development potential in line with its changing uses and vision for the future of the site. The site is currently vacant and secured.

The concept options developed are intended to inform a planning proposal to Newcastle Council by demonstrating the capacity of the site to accommodate development while responding to the site constraints.

1.3 Objectives of the master plan

Objectives of the Fort Wallace master plan are:
- facilitate housing for defence personnel;
- provide a scheme that is supported by stakeholders;
- maintain existing views to and from heritage items;
- establish public access to heritage items;
- create a heritage park;
- integration and conservation of heritage items;
- acknowledge coastal processes and develop within the year 2010 proposed hazard line;
- protect and improve the ecological condition of the site;
- create a master plan that provides public benefit eg. public parks, beach access, possible community uses and adaptable reuse of the heritage items;
- provide a mix of dwelling types that will meet a variety of housing needs;
- locate density on already scarred landscape (minimise building in bush);
- provide housing types that sit lightly within the landscape;
- connect with and extend the great coastal walks of Newcastle eg. Merewether Baths/Anzac Memorial Walk/ Fort Scratchley;
- maximise potential views from the site;
- manage visual impact to the site; and
- manage bushfire and APZs.

1.4 The team

This report was prepared in consultation with a team of technical specialist consultants in order to understand the site opportunities and constraints in detail.

The team included:
- Spackman Mossop Michaels, landscape architecture;
- Umwelt, ecological advice and indigenous heritage;
- Klienfelder, bushfire advice;
- Urbis, european heritage;
- BMT WBM, coast engineering advice;
- ADW Johnson, civil engineering;
- Better Transport Futures, traffic and transport; and
- Elton Consulting, community consultation.

Architectus worked collaboratively with specialists to ensure that the concept master plan was informed and
The site is in close proximity to the amenity and services of Stockton and the Newcastle CBD. The site is also well located to the Williamtown RAAF base.
2 Site context

2.1 Local context

The site includes two lots legally known as Lot 100 and 101, DP1152115, covering a land area of approximately 32 hectares. Fort Wallace is bound by the Stockton Centre to the north, a redundant water treatment works to the south, Fullerton Road to the west and Stockton Beach to the east. The site is approximately 3km north of the established area of Stockton and approximately 5km north of Newcastle.

The site is part of the Stockton Peninsula, with the town centre of Stockton sitting on the headland located approximately 3km to the south. Stockton town centre is a small community of low and medium density residential, with a mix of uses that serves the day to day needs of residents such as newsagents, hairdressers and grocers, as well as services such as hardware and real estate agents. The community enjoys amenity from green spaces around the water and the beach, which stretch north to the subject site and on to Port Stephens. Access to the Newcastle City Centre is available via ferry from Stockton, a trip of approximately ten minutes.

The Stockton town centre is served by a single road known as Fullerton Street that runs to the north, defining the western edge of the subject site. The Peninsula is at its narrowest point slightly to the south of the subject site, at what is currently a redundant water treatment plant owned by Hunter Water. The land begins to widen at the southern boundary of the subject site, and then gradually expands to the north. The land is bound to the east by the ocean, and to the west by the Hunter River North Channel, to which Fullerton Street runs parallel. The strip of land between Fullerton Street and the Hunter River North Channel, approximately 35m wide, is a grassed area with a shared pathway that runs to the ferry in the south and approximately to the Stockton Centre in the north.

Fullerton Street joins Nelson Bay Road to the north of the subject site, a major road that provides access to Newcastle through Kooragang and the RAAF Base Williamtown to the north.

The site is currently part of a special uses area located between the two residential communities of Stockton and Fern Bay. The special uses include a redundant water treatment plant adjoining the site to the south, a centre that accommodates those with severe disabilities known as the Stockton Centre adjoining the site to the north, a cemetery to the north of the Stockton Centre, and a former rifle range. Some small pockets of private residential uses are interspersed.

The vision for some of these special use sites is changing. The Stockton Centre in particular has been nominated for closure due to facilities not meeting modern requirements. The vision for Fort Wallace responds appropriately to any changing use by ensuring that potential connections are accommodated. A buffer is also maintained in the indicative Master Plan for the Fort Wallace site.

The Rifle Range site, to the north of the cemetery adjoining the Fern Bay community, is currently vacant and disused. The site is owned by DHA and is subject to a planning process with Port Stephens Council.

The site may be accessed from Fullerton Street and from the beach, although access is currently restricted.

2.2 Site analysis

A comprehensive analysis of the site, its context, constraints and opportunities has been undertaken to inform development potential and a framework from which the master plan was developed. The following analysis underpins the structure of the master plan and identifies more broadly the developable and undevlopable areas on this highly ecologically sensitive site. The detailed site analysis looks at:

- Topography
- Ecology
- Landscape
- Coastal erosion
- Heritage
- Access and circulation
- Views
- Built form

The key site analysis findings are condensed into a combined constraints and opportunities diagram. Further detail regarding site analysis is provided in separate consultant reports undertaken specifically for this planning and urban design process.
2.3 Existing built form

There is existing built form on the site that is present from the historical use of the site by Defence. Items include searchlights; exercise equipment; stores and compounds; common room; accommodation; car pit; Hoban commemorative tree; gymnasium and drill hall; shed; fire pump house; engine room; tunnels; casualty station; radio room; plotting room; watch tower; gun emplacements and a security office.

The location of each item has been surveyed as part of the Urbis...
Site photographs

1. Access road from Fullerton Street
2. Remnant gun emplacements
3. Steps down embankment (looking north)
4. Vacant defence buildings
5. The old watch tower
6. View south across open ground
7. View south towards Newcastle from the southern corner of the site
8. View north along Stockton Beach/dunes
9. View west over the Hunter River
10. View north along Stockton Beach/dunes
11. Access road to southern part of the site
2.4 Stockton Peninsula History

Aboriginal Heritage
The Stockton Peninsula was originally the land of the Worimi Tribe, who knew this place as "Burrinbingon". Evidence of Aboriginal occupation is available throughout the region, extending back several tens of thousands of years. A series of Aboriginal archaeological and cultural/historical sites are situated along the peninsula, and are now known as the "Fern Bay Complex". These sites indicate traditional Aboriginal hunting, fishing, and cultural activities occurring throughout this area.

European Heritage
Lieutenant John Shortland stumbled upon Newcastle Harbour and the Hunter River while searching for escaped convicts in 1797. He named the Stockton Peninsula "Point Kent".

From October 1800, Stockton became known as "Pirate Point", when convicts escaping from Broken Bay in the Norfolk were wrecked on the southern point of the peninsula.

Newcastle was settled in June 1801, closed in February 1802 and later resettled in March 1804. From this time onwards, parts of the peninsula were granted to settlers, with the southernmost end of the peninsula generally becoming known as the "Private Township of Stockton". Early industries in this area included saw milling, lime burning, salt works, an iron foundry, a tweed mill, a chemical plant, a tin smelter, coal mining, and ship building.

The Stockton residential suburb emerged from subdivisions made by the State Government in 1887. Vehicular and passenger ferries provided the only means of access across the harbour (aside from a long journey inland via Hexam) until the Stockton Bridge opened in 1971.

While the Stockton Peninsula may now be considered as the northern suburbs of Newcastle, it has its own distinctive seaside character.
2.5 Fort Wallace

Aboriginal Heritage
The Fort Wallace site was likely to have supported Aboriginal activities in the area, and while there is currently no evidence or record of indigenous heritage features on this site, the site may still have value for its proximity to important cultural sites nearby.

European Heritage
Constructed in 1912-13, Fort Wallace was the third of Newcastle’s three forts to be built. This elevated site was chosen to defend an area of sea outside Fort Scratchley’s coverage. The original ‘Fort Stockton’ name was changed to ‘Fort Wallace’ in November 1915 in memory of Colonel Robert Wallace, Chief of Ordnance and Commanding Officer, Royal Australian Garrison Artillery.

Fort Wallace had guns installed prior to WWI and upgrades made prior to WWII, but it was not called into action. The site had a skeleton staff until 1951, and was used for training purposes. The Army’s 130 Signal Squadron provided communications and support to RAAF Williamtown, and was accommodated in barracks from 1967 until the site was closed in 1993.

Heritage Listings
Commonwealth Heritage Listing
(Place ID 105335, registered 22 June 2004).

Department of Defence Heritage Register.

Register of the National Estate (non-statutory archive)
(Place ID 18957, registered 30 May 1995).

As a Commonwealth listed site, Fort Wallace is not listed with State or Local authorities, or with the National Trust of Australia.

Opportunities for Future Uses
The reasonably well preserved Fort Wallace site is considered to have national heritage significance, as it displays evidence of three distinct and consecutive phases in coastal defence.

It is proposed that heritage items on site are incorporated into future plans for the site through heritage interpretation, adaptive reuse, ecotourism, education, recreation, or other sensitive uses.
Strategic planning framework and controls
3.1 Hunter Regional Plan

Architectus on behalf of Defence Housing Australia (DHA) prepared a submission on 23 March 2016 to the NSW Draft Hunter Regional Plan (DHRP) and Draft Plan for Growing Hunter City (DPGHC) 2015.

The DHRP sets out a 20-year plan prioritising the growing and diversifying of the Hunter economy as NSW’s largest regional economy, and identifies subregional landscapes being the Western Hunter, Northern Tops, North East Coast and Hunter City (including Inner Newcastle) districts.

The DPGHC supplements the Regional Plan and follows the 20-year timeframe, reinforcing the City as the gateway to the region by capitalising on assets for greater growth via its identified districts, Inner Newcastle, Inner West, Maitland-New England Highway Corridor, Northern Gateways and Northern Lake Macquarie.

The Fort Wallace site (Newcastle LGA, currently zoned SP2 - Defence) is shown as an ‘Urban Area’ in the DHRP, but as ‘Non-Urban Area’ in the DPGHC. It was submitted that the site’s potential for renewal be recognised and shown as ‘Urban Area’ consistently in both documents.

The Stockton Rifle Range site (Port Stephens LGA, currently zoned E2 – Environmental Conservation) also has significant redevelopment potential. In both studies, the area is shown as ‘Non-Urban Area’ which may have the effect of precluding a future rezoning of the site. It was recommended that both plans show the site as ‘Urban Area’ or “Urban Area – For Investigation” to make way for the full assessment of the site’s redevelopment potential.

Additionally, it was recommended that the Department of Planning and Environment consider the inclusion of both DHA sites within the Inner Newcastle District to recognise their strategic and visual relationship with the city and their potential to contribute to the goals for Hunter City.

**Figure A - “Figure 3 – Inner Newcastle District” from the Draft Plan for Growing Hunter City, with Architectus amendments showing the recommended classifications for the two DHA sites in Stockton. We recommend that the same land use classifications be shown on all plans in the Draft Regional Hunter Plan and Plan for Growing Hunter City.**
3.2 Port Stephens Planning Strategy (PSPS) 2011

Areas identified as Fern Bay - Fullerton Cove, to the north and west of the Rifle Range, have been identified as future growth areas within the Strategy. This area, including the subject sites, comprise the Eastern Growth Corridor identified within strategic planning for Port Stephens. The area has been recommended to increase in density over the next 15-20 years since the Strategy’s release, with potential for:

- 42 infill residential dwellings; and
- 1,396 dwellings within green field residential zoned land.

The Strategy also recommends the opportunity to maximise access to existing infrastructure through density increases.

As the suburb (of Stockton or Fern Bay) is among the LGA’s small centres with no available commercial floor space, the need for commercial rezoning has also been identified.

The Strategy predicts a need for an indicative 14,441 additional dwellings throughout the LGA, including infill and within rural areas.

3.3 Port Stephens Commercial and Industrial Lands Study

Fern Bay has been highlighted as one of the small centres within Port Stephens that will experience greater residential growth. It has been recommended within the Study for rezoning from 2A Residential to B1 Neighbourhood Centre. In consideration of the Newcastle Centre across the peninsula to the south, this is to accommodate the day-to-day needs
4 Local planning context

4.1 Planning controls

The subject site was zoned 5(a) Special Uses (Defence) under the Newcastle LEP 2003. The objective of the zone was to accommodate major transport networks and facilities; accommodate large scale facilities and services, together with ancillary activities; accommodate large scale community establishments, together with ancillary activities; and require development to be integrated and reasonably consistent in scale and character with surrounding natural, rural or urban environments.

The site zoning reflects the Defence ownership at the time of making the LEP (2012) and the requirements of the LEP to respond to Defence uses, including no applicable FSR or minimum lot size control.

The land is currently zoned SP2 Infrastructure (Defence). The objectives of this zone are to provide for infrastructure and related uses and to prevent development that is not compatible with or that may detract from the provision of infrastructure.

The site is adjoined by land zoned SP2 Infrastructure (Sewage Systems) and Health Service Facility.

The dune and beach to the east of the site is zoned RE1 Public Recreation, while the lands to the west of the site are zoned E3 Environmental Conservation.

Nearby residential areas are zoned R2 Low Density Residential.

The subject site has no maximum height of buildings control, in line with the adjoining sites. The height of buildings control in the Stockton town centre to the south are 8.5m.
The land is subject to Acid Sulfate Soils Classes 4 and 5. Development consent for works more than 2m below the natural ground surface in Class 4 areas and works by which the water table is likely to be lowered must include an Acid Sulfate Soils Management Plan.

The subject site is not subject to a minimum lot size control. Adjoining lands to the east and west are zoned for a minimum lot size of 40ha.

Residential areas in the Stockton local centre are subject to a minimum lot size of 400sqm. LEP provisions allow smaller lot sizes (to 200sqm per lot) where development conditions are satisfied for residential uses.

The site adjoins a locally listed general heritage item, being the Stockton Centre to the north.

Land to the west of the site is listed as an archaeological item, identified as the Ballast Ground.
Site analysis
VIEW FROM THE SITE LOOKING SOUTH TOWARD NEWCASTLE
5.1 Purpose and scope

The project team has undertaken a thorough study of the physical site and its history in order to understand the site’s unique and special characteristics. This examination has included site walks, document research and desktop review, site mapping, future projections relating to climate change and other studies by a range of specialist consultants.

Properly understanding the site is a crucial step in ensuring the creation of a sensitive, site-responsive and sustainable master plan. By clearly identifying the site’s constraints and opportunities we are able to conserve areas of the site that are of special environmental and cultural value, and areas that could be suitable for new development, which could include public open space and amenities, streets, housing or other physical changes to the existing site.

The detailed site analysis includes:

- Topography
- Ecology
- Landscape
- Coastal erosion
- Heritage
- Access and circulation
- Views
- Built form

The detail of these analysis are presented in separate consultant reports. This section summarises technical inputs where relevant to the recommended master plan for the site.
5.2 Topography

1. Slope to Fullerton Street (approx. 4m height) requires consideration for access grades however offers elevated views west from the site.

2. Steep slope (approx. 8-9m height) splits the site and limits accessibility but offers panoramic views and protection from prevailing winds.

3. Flat (relatively) open areas represent the most feasible locations for development.

4. Undulating ridge line along dunes offers view points over Stockton Beach and potential north-south pedestrian link.
5.3 Heritage

Consider how the existing heritage items on the site can be linked together within the public domain.

Opportunity to capture the major heritage assets within a new public open space.

Potential to retain the gymnasium building as a community facility within a public open space.

Consider the retention of all the remnant defence buildings/structures for future public access and interpretation.

Refer to the Urbis heritage report.
5.4 Ecology

1. Existing river estuary Mangrove ecology provides contrast to western dune ecology.

2. Opportunity to retain and reinforce east-west ecological links.

3. Opportunity to reinforce north-south coastal dune ecology.

Refer to the Umwelt ecology report.
5.5 Access and circulation

1. Existing shared path to Stockton.
2. Potential connections to shared path network.
4. Existing vehicle access - opportunity to improve sense of arrival and address.
5. Potential secondary vehicle access.
6. Potential to regrade access road to achieve accessible grade.
7. Potential to re-organise the internal road network into 2 loops.
8. Vehicular access to heritage assets/park.
9. Potential future links north into Stockton Centre site.

Refer to the Better Transport Futures report.
5.6 Landscape

1. Landscape presentation/setback to Fullerton Road.

2. Opportunity for central public park/space associated with adapted heritage structure as community facility.

3. Opportunity for heritage themed parkland with adapted structures and interpretation.


5. Managed bushland edge to reinforce coastal character.
5.7 Views

1. Views west over Hunter River from elevated open ground
2. Steep excavated slope behind existing dunes blocks views est to the ocean
3. Panoramic views from existing gun emplacements
4. Views south-east over Stockton Beach towards Nobbys Head and Newcastle CBD.
5.8 Coastal Erosion

1. Develop westward of the ‘Best Estimate’ 2100 Erosion Hazard Line
2. Best Estimate 2100 Erosion Hazard Line (0.9m sea level rise)
3. ‘Likely’ 2100 Erosion Hazard Line (0.4m sea level rise)
4. Almost Certain 2100 Erosion Hazard Line (No sea level rise)

Refer to the BMT WBM coastal engineering report.
5.9 Built form

1. Minimise visual impact of buildings from Road.
2. 2-3 development parcels defined by ecological and topographical constraints.
3. Opportunity for taller buildings adjacent to higher dune areas.
4. Minimise visual impact of built form from dune areas and heritage assets.
CHARACTER IMAGE SHOWING A SENSITIVE BUILT FORM RESPONSE TO A NATURAL COASTAL SETTING
5.10 Consolidated constraints and opportunities

1. Existing vegetation communities retained and protected.
2. Existing degraded dune area suitable for replanting and regeneration.
3. ‘Best Estimate’ 2100 Erosion Hazard Line.
4. Heritage items suitable for conservation, interpretation and in some cases adaptive reuse.
5. Steep slopes limit development potential, provide a sense of containment and reinforce the site’s undulating coastal character.
6. Views from the site to surrounding water, coast and vegetation.
7. Potential development areas free from significant vegetation, heritage items, steep slopes and medium/high/extreme potential coastal erosion risks.
8. Opportunity for new public open space incorporating heritage items.
9. Potential public vehicle access and circulation utilising existing roads where possible.
10. Potential public pedestrian connections between public open space, heritage items, new development and the beach.
11. Opportunity to improve Fullerton Road frontage including new planting.
The proposal
6 The master plan

6.1 The vision

Stockton Rifle Range and Fort Wallace will be unique coastal communities with strong links to Newcastle CBD and a growing Hunter region.

The communities will be a place where the natural coastal landscape prevails over the built environment and a rich layer of cultural heritage is celebrated and made accessible to the public.

New buildings will be contemporary in design and character, with references to traditional coastal forms and materiality. Development will ‘touch lightly’ on the ground and minimise impacts on the site.
6.2 Master plan principles

**Touch lightly on the land**
- Buildings elevated (no slab on ground).
- Streets to be as informal as possible (no kerb and gutter or avenue trees, informal parking).
- Work with the existing natural topography to minimise earthworks (cut and fill).
- Minimise areas of hard standing.

**Embrace the coastal ecology**
- Regenerate natural vegetation. Endemic sp. only.
- Buildings sit within the natural landscape and vegetation.
- Minimise private open space and boundary fences.
- Maximise views to the ocean, dunes, river and the bush.
- Manage beach access to avoid further dune erosion.

**Celebrate history and cultural heritage**
- Retain heritage structures as site features where ever possible.
- Interpret the site history through its landscape.
- Explore opportunities to connect with the Wurimi reserve.

**Create a diverse community**
- A mix of building typologies that provide for defence, private and affordable housing needs.
- A range of open spaces that cater for a variety of resident requirements.
- New recreation opportunities that appeal to visitors from Stockton, Newcastle and wider Hunter region.

**Open the gates to the public**
- Provide public access via the local road, pedestrian and cycle networks.
- Explore opportunities for improved public transport links to Newcastle CBD.
- Establish new controlled pedestrian access to Stockton Beach and dune system.
- Connect to greater public domain and open space networks eg Anzac Memorial Walk.

**Utilise interesting architectural forms**
- Staggered building heights.
- Natural materials and finishes.
- Articulated façades.
- Vaulted and skillion roofs.
- Varied street setbacks.
Indicative Master Plan

LEGEND
01/ Stockton Centre
02/ Cluster Homes
03/ Single Eco Home
04/ Townhouses
05/ Dune Apartments
06/ Courtyard Homes
07/ Firetrail walking path
08/ Community park
09/ Adaptive reuse community facility
10/ Heritage precinct
11/ Stairway
12/ Dune boardwalk
13/ Landscaped embankment
14/ Shared path to Stockton

Scale: 1:2000 @ A3
0 50 100m
6.3 Indicative master plan

The indicative master plan for Fort Wallace demonstrates a best practice outcome within the proposed LEP controls. The master plan responds to the site’s natural and historic constraints, proposes a diverse mix of housing to accommodate a real community and includes high quality public parks and streets.

The master plan respects the site’s unique history and environmental character by reducing the development footprint to areas of the site with relatively few constraints. Rather than covering the site with low density development, the master plan proposes more energy efficient, environmentally-sensitive and higher density development with a smaller development footprint. Vegetation communities, historic elements and steeper slopes will be retained and opened up to the public for their use and enjoyment.

The development will feel distinctly public, with access for all to streets, parks and amenities, as opposed to a gated or themed community.

The development will be highly walkable and well vegetated throughout. Housing will generally recede into the landscape, allowing the natural environment to dominate.

The master plan envisages housing that not only nestles into the landscape but also responds to the site’s coastal landscape character. Buildings will vary in height and type but all will adopt a coastal architectural vernacular and use natural materials and finishes typically found in coastal settings, such as timber, corrugated iron and natural stone.

The new community at Fort Wallace will benefit from the unique and special qualities of the site but the wider public will benefit also through development of the site. Historic relics will be conserved, new public space provided and existing vegetation communities will be protected and enhanced. The public realm and housing will be attractive, responsive to the locale and robust in their design and construction.
Indicative Master Plan - development relationship to environmental areas and heritage
CREATING A WALKABLE AND PEOPLE FRIENDLY PUBLIC DOMAIN IS FUNDAMENTAL TO THE CREATION OF COMMUNITY
ARTIST'S IMPRESSION OF THE PROPOSAL
THE PUBLIC DOMAIN WILL INCLUDE GENEROUS PLANTING AND A SIMPLE, ROBUST MATERIALS PALETTE
Incorporate robust local materials
Use timber, concrete, gravel, brick, and other locally available materials that relate to the site’s coastal setting. Avoid use of stone and timber cladding which can crack over time.

Enhance habitat
Select indigenous plant species to encourage local fauna. Protect existing dune areas from walking and trampling through fencing and signage.

Create a public place
Design streets to feel public and accessible to all. Avoid use of estate-style landscape elements such as entry walls and domestic landscape materials.

Promote safety
Provide pedestrian and vehicle lighting. Maintain clear sightlines. Encourage the public to walk and cycle through the development by providing pathways and signage.

Maximise natural drainage
Maximise soft area and use of permeable materials with high infiltration rates. Use planted swales to collect and cleanse stormwater.

Create a green canopy
Reduce ambient air temperatures through generous planting of street trees and shade trees in public spaces. Use evergreen and deciduous trees within lots to ensure good solar access to living areas.

Ensure trees have sufficient area for root growth when planted next to streets and footpaths.

Minimise road area and consider use of permeable road materials.

Ensure trees have sufficient area for root growth when planted next to streets and footpaths.

Select non-slip materials and finishes.

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Minimise road area and consider use of permeable road materials.

Select non-slip materials and finishes.
Indicative Master plan

LEGEND

01/ Stockton Centre
02/ Cluster Homes
03/ Single Eco Home
04/ Townhouses
05/ Dune Apartments
06/ Courtyard Homes
07/ Firetrail walking path
08/ Community park
09/ Adaptive reuse community facility
10/ Heritage precinct
11/ Stairway
12/ Dune boardwalk
13/ Landscaped embankment
14/ Shared path to Stockton
7.1 Heritage Precinct

The Heritage Precinct sits atop the dunes at Fort Wallace and offers spectacular panoramic views in all directions. This area can be accessed via coastal boardwalk from Stockton Ferry Terminal, or by driving directly to the site. Heritage structures could be “made good” so as not to pose a safety risk, and offer visitors an opportunity to engage with the Fort Wallace’s military history through tactile, unscripted exploration.

Surrounding heritage structures will be adaptively reused to provide visitor amenities, such as a cafe space and outdoor classroom. The surrounding dune ecology will be protected by designated circulation paths and gathering spaces. Planting will reflect the surrounding coastal heath palette, and new hardscaping will use endemic materials such as sand, crushed oyster shells, and Australian hardwood timber.

This approach would be dependent on an agreed, strategic land ownership and management agreement with Council.

**KEY FEATURES**

01/ Refurbished heritage structure
02/ Public gathering and event space
03/ Adaptively-reused heritage structures (e.g. cafe, local museum, landcare facility)
04/ Dune Bushwalk and viewing platforms
05/ Dune Boardwalk to Stockton - Newcastle
06/ Dune revegetation and protection zone

An example of a public gathering space with views to the beach, connected to the boardwalk.
**Interpretive Heritage Park section**

- **01/** Firetrail bushwalk
- **02/** Back of dune
- **03/** Adaptively-reused structure
- **04/** Gathering and event space
- **05/** Carriageway
- **06/** Refurbished heritage structures
- **07/** Dune bushwalk
- **08/** Dune revegetation zone

**Indicative planting palette**
- Coastal Wattle: *Acacia sophorae*
- Coastal Banksia: *Banksia integrifolia*
- Old Man Banksia: *Banksia serrata*
- Pinkbeach: *Carpobrotus glaucescens*
- Pigface: *Lomandra longifolia*
- Coastal Banksia: *Banksia integrifolia*
- Old Man Banksia: *Banksia serrata*
- Pigface: *Carpobrotus glaucescens*
- Pigface: *Carpobrotus glaucescens*
- Pigface: *Carpobrotus glaucescens*

**Hardscape palette**
- Stabilized sand
- Timber boardwalk / decking
- Concrete with oyster shell aggregate
7.2 Community Park

The public parklands emphasize principles of "nature play" through the selection of play facilities, materials, and native planting palette. Structures will be constructed of natural materials and will be sited within the coastal heath landscape. Trees and shade structures will provide cover from the sun without obscuring views over the dunes. Robust, low-maintenance plantings will blend play areas into the surrounding heath.

Active sports lawn and children’s playground will be complemented by spaces for passive recreation. Picnic areas and shelters will be positioned behind the dune to minimize sun and strong winds from the ocean. The firebreak surrounding the community will double as a bushwalk trail, connecting the park to residential areas. Nearby heritage structures will be adaptively reused to provide public community amenity.

KEY FEATURES

01/ Sport lawn
02/ Picnic area
03/ ‘Nature play’ playground
04/ Public community space (e.g. cafe, restaurant, civic centre)
05/ Adaptively-reused heritage structures
06/ Firetrail bushwalk
07/ Stair access to Heritage Precinct
Community Park section

Indicative planting palette:

- Swamp Mahogany (Eucalyptus robusta)
- Tukeroo (Cupaniopsis anacardioides)
- Red Gum (Angophora costata)
- Coastal Wattle (Acacia xanthophloea)
- Coastal Banksia (Banksia integrifolia)
- Old Man Banksia (Banksia serrata)
- Coastal Tea Tree (Leptospermum laevigatum)
- Mat Rush (Lomandra longifolia)
- Pigface (Carpobrotus glaucescens)
- Mat Rush (Lomandra longifolia)
- Pigface (Carpobrotus glaucescens)
- Pigface (Carpobrotus glaucescens)

Scale: 1:300 @ A3

01/ Sports lawn
02/ Picnic area
03/ Firetrail bushwalk
04/ Back of dune
05/ Adaptively-reused structure
06/ Public gathering space
07/ Carriageway
7.3 Landscape Frontage

The sloping embankment along Fullerton Street represents the public face of the Fort Wallace community to all vehicles travelling to and from Stockton, as well as boaters on the Hunter River. The embankment will be landscaped with species native to the surrounding Coastal Sand Apple - Blackbutt Forest ecosystem. Existing feature trees will be preserved and new planting will be positioned to maintain views over the river. Together with the coastal mangroves along the opposing bank, Fullerton Street will become a green corridor along Stockton Peninsula.

The Fort Wallace community will also be served by the existing shared path that connect cyclists and pedestrians to the Stockton Ferry Terminal and Newcastle CBD.

KEY FEATURES

01/ Hunter River
02/ Mangroves
03/ Existing shared path to Stockton Ferry Terminal
04/ Fullerton Street
05/ Revegetated embankment
06/ Existing feature trees retained
07/ Vegetated swale to capture and purify stormwater
08/ Single Eco-Homes
09/ Access track
Fullerton Street Frontage Section

01/ Mangroves & Hunter River
02/ Shared path to Stockton
03/ Fullerton Street carriageway
04/ Detention basin
05/ Existing feature tree
06/ Revegetated embankment
07/ Vegetated roadside swale
08/ Single Eco-Home

Indicative planting palette:

- Swamp Mahogany
  Eucalyptus robusta
- Tukeroo
  Cupaniopsis anacardioides
- Red Gum
  Angophora costata
- Prickly Moses
  Acacia ulicifolia
- Old Man Banksia
  Banksia serrata
- Third Rush
  Juncus longifolius
- Kangaroo Grass
  Themeda australis
- Eggs and Bacon
  Dillwynia retorta
- Mat Rush
  Juncus effusus
- Flax Lily
  Dianella caerulea
- Bracken Fern
  Pteridium esculentum

Scale: 1:300 @ A3
7.4 Great Streets

Key to great urban environments and places are great streets. Streets connect our communities and our homes, provide us with essential services for living, and present everyday opportunities for exercise and socialising.

Designing streets for people

The Master Plan envisages several types of streets that respond to future access requirements and the existing street network on the site. All streets will be:

- Publicly accessible, with footpaths and wayfinding signage.
- Well vegetated with local plant and tree species.
- Low-key and informal in appearance.
- Designed to accommodate all modes of transport (cars, pedestrians and bicycles).
- Designed appropriately for emergency and council maintenance vehicles.

The following pages show indicative designs and locations for the four types of roads within the proposed development. The designs will be the subject of further review and adjustment as the project progresses and information becomes available.
Road hierarchy
Road type 1 section

01/ Landscaped Fullerton Street frontage
02/ Vegetated swale
03/ Flush kerbs
04/ Private yard (Single Eco Home)
Road type 2 section

01/ Communal open space (Dune apartment)
02/ Flush kerbs
03/ Vegetated swale
04/ Public open space
**Road type 3 section**

- **01/** Communal open space (Townhouse)
- **02/** Flush kerbs
- **03/** Central vegetated swale and street tree planting
Road type 4 section

01/ Garage or granny flat
02/ Flush kerbs
03/ Bidirectional laneway
The design principles set out in the previous section were used to develop a range of residential typologies that would respond to the unique nature of the site. While these typologies are used only to inform the structure of the master plan, it is intended that the key outcomes of the typologies will be established in a site specific to guide the future development of the site.

Five dwelling typologies have been developed to support the master planning of the site. The typologies demonstrate how the design principles can be achieved in a range of densities in order to deliver a diversity of housing on the site, including dwelling size, configuration and tenure.

The typologies include dune apartments, coastal cluster homes, single eco-homes, courtyard homes, and townhouses / row houses.

The key features of each dwelling type, including approximate heights, density, materials and sustainability mechanisms have been set out on the following pages. Indicative floor plans and lot plans have also been developed to show how the typologies could achieve the requirements of the market.

**Dune apartments**

Viridian Noosa Residences - by JMA Architects

**Single eco-homes**

Currawong - Pittwater, NSW - by Architectus

**Coastal cluster homes**

Bundeena masterplan - by Architectus

**Courtyard homes**

Little Bay, NSW

**Townhouses / row houses**

Lake Crackenback
Indicative Housing Typology Diagram
8.1 Dune apartments

Description: These apartment typologies are designed to minimise the overall building footprint and bulk and maximise visual connections with the surrounding landscape. Small footprints allow for up to 4 units per floor with the potential to allow for open undercroft spaces at ground floor and open stairwells and vertical circulation.

Building heights: 1-4 Storey
Approx density: 50-60 dw/ha

Construction: Steel frame concrete slab, skillion/vaulted roofs

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.

Typical layout

Private open space - Ground floor apartments will have a small area of defensible space / terrace to be accessible from a living area.

Communal open space - These areas are to be maintained as native bush gardens with contributions from each of the dwelling/unit owners.

Parking - Surface parking at the rear of the building. Some parking may also be provided in undercroft spaces at ground level.

Lot boundaries - Lot boundaries are to be defined with vegetation only. In general each lot will take on collective responsibility for the maintenance of the communal open space areas.
Indicative floor plan 1:250

Indicative exterior finishes

Indicative front elevation 1:250

Indicative dwelling sizes (exc balconies):

1 bed = 80m²
2 bed = 100m²
8.2 Coastal cluster homes

Description: This dwelling typology provides an alternative to traditional town houses or attached houses. By breaking down the layout into clusters of 2, 3 and 4 they provide views through the development to natural to the bush and increase the sense of a connection with the surrounding landscape.

Building heights: 2 Storey

Dwelling Size: 3 bed = 120m²

Approx density: 20-30 dw/ha

Construction: Steel or timber frame with suspended composite concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.
Indicative dwelling sizes (exc external space):

3 bed = 110m²
8.3 Single eco-homes

Description:

These homes are intended to be lightweight, climate responsive individual homes set within generous lots that are managed and maintained to contribute to the overall natural characteristics of the estate.

Building heights: 1-2 Storey

Approx density: 10-12 dw/ha

Construction: Steel or timber frame with suspended composite concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.

Indicative dwelling sizes (exc external space and garage): 3 bed = 160m²

Indicative exterior finishes
8.4 Courtyard homes

Description: This typology provides for a large family home including 4 bedrooms, 3 bathrooms, open plan living space, single garage and an ample rear garden. Dwellings are to be constructed on a zero lot line always on the same side with a 1.5m setback along the opposite boundary. This allows for a side pathway to access the rear garden and improves natural light and ventilation for the dwelling.

Building heights: 2 Storey
Lot Size: 380m²  Dwelling Size: 4 Bed 200m²
Approx density: 20 dw/ha

Construction: Steel or timber frame on concrete slab, skillion/vaulted roof.
External materials: Combination of corrugated metal sheet, timber panel cladding and rendered masonry.
Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant planting.

Example courtyard space

Little Bay, NSW

Indicative first floor plan 1:250

Indicative ground floor plan 1:250
8.5 Townhouses / row houses with ‘fonzie flat’ (rear lane access)

Description: These 3 bedroom homes provide a compact attached dwellings in locations where increased densities are appropriate. The rear lane access allows the front elevation of the house to be free from garage doors and parked cars which promotes good passive surveillance and an attractive street frontage. Above the rear double garage it is possible to have a secondary dwelling or “Fonzie Flat” that provides a self contained studio apartment that can provide additional family or guest accommodation, home occupation or rental return. The ‘fonzie flat’ also activates the laneway increasing safety and security through passive surveillance.

Building heights: 2 Storey
Lot Size: 240m² (varies)  Dwelling Size: 3 bed = 150m², 1 Bed Studio = 30m²
Approx density: 25 dwha
Construction: Steel or timber frame on concrete slab, skillion/vaulted roof.
External materials: Combination of corrugated metal sheet, timber panel cladding and rendered masonry.
Sustainability: Locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant planting.

Indicative first floor plan 1:250
Indicative ground floor plan 1:250
Assessment
9

Design assessment

Justification and supporting design detail for the master plan have been provided throughout this report, with technical specialist assessments attached under separate covers as part of the Planning Proposal package. This section summarises the key urban design assessment criteria and key elements of technical reports to demonstrate the likely impacts and benefits of the proposal.

9.1 Compliance

Local planning controls

The proposal facilitates housing for a mix of defence members and the public. While housing for defence meets the objectives of the existing SP2 (Defence) zone with respect to land use, it is considered that the proposal would be better facilitated under a R2 Low Density Residential and RE1 Public Recreation zoning to ensure that the future vision for the land is clear.

No height controls are currently applicable to the site.

Coastal Erosion

All dwellings shown in the master plan are west of the coastal hazard line in accordance with Council's policy position.

State Environmental Planning Policy 65 (SEPP 65)

The application of SEPP 65 has been considered in the development of the concept master plan, specifically for the dune apartment typology to which the SEPP would apply.

The dune apartment typology would be capable of complying with SEPP 65 criteria. At this stage of the concept master plan, adequate separation has been allowed between buildings and lot boundaries, and the depths and widths of building envelopes are sufficient to allow for solar access and cross ventilation.

The indicative layouts have demonstrated a compliance with standards for apartment sizes and configurations, which could be applied across the site.

Private and communal open spaces have been incorporated into the indicative layouts in accordance with SEPP 65 criteria.

The proposed 14m height limit on the parts of the site intended for development is important in ensuring SEPP 65 compliance and design excellence. The 14m height limit ensures that dwellings are not 'squashed' into the landscape, rather allowing flexibility for buildings to sit lightly on the ground, with a smaller floorplate that allows for better solar access and ventilation.

An overly restrictive height limit would be likely to encourage built form with an increased footprint, a poor outcome on such a sensitive site.

9.2 Access and movement

The proposal would increase the opportunity for the local community and visitors to move within and through the site, appreciating both the site's heritage values and filling in a 'missing link' from a coastal walk from Stockton Town Centre to Fern Bay. The landscape strategy proposes walkways that connect the key heritage items with a north-south link along the dunes.

The proposed road network is based on the existing road network in order to allow for staging, minimise disruption to the site and because the roads are important in the appreciation of the site's heritage significance.

A clear street hierarchy has been developed to encourage legibility, wayfinding and a sense of address for each building, as well as supporting the diversity of dwelling forms and characters by offering different characters themselves.

Importantly, no perimeter road is proposed. This enables the development area to softly transition into the areas of higher ecological value, with bushfire risk being managed by an appropriately designed APZ.

All streets have been designed to meet minimum road widths under Council's controls and relevant technical standards, and are intended to be dedicated to Council.

9.3 Character and context

The proposed 1 - 4 storey built form character is consistent with the scale of areas near the site such as the Stockton Town Centre.

Four key elements of the proposal ameliorate the potential impacts of heights up to 14m in the sensitive locations:

- The site topography, which allows for the built form to be nestled into level changes and for heritage items to be clearly visible from key spaces;
- The areas of vegetation, which provide a buffer between development and the adjoining sites, enabling the proposal to be read as a stand-alone development with a unique character that relates to its surroundings;
- Taller, efficient buildings allows for the site to feasibly developed in a smaller footprint, with a view to retaining as much vegetated area, and areas with high landscape or heritage value, as possible and
- The proposal facilitates an appropriate setback to key heritage items on the site, enabling views to and from the items from public spaces.

9.4 Issues to be resolved through detailed master planning

The final design and area of public open spaces for dedication should be determined through consultation with Council and the community.

A site-specific DCP Stage 1 DA or adopted master plan should be developed to lock in key objectives in the master plan for the development of the site. Appropriate flexibility should be allowed to enable new design approaches to be facilitated where they meet objectives.
10 View assessment

10.1 Stockton Bridge

View east from Stockton Bridge
The entry to Stockton from Kooragang is by the Nelson Bay Road Bridge, which lies to the northeast of the site. The view is from a public road and would generally be seen by those travelling in vehicles. The pedestrian pathway is to the centre of the bridge, minimising its potential for views.

The location is considered an important entrance to the Stockton area, but is not a location where the public might go to enjoy the view. It is noted that the view shown is taken from Google Streetview and, while it gives an indication of the potential impact, it sits higher than a normal viewer would.

The concept master plan that may be facilitated by the planning proposal forms part of the overall view without dominating it. The concept master plan would generally retain views from the bridge over the site to the ocean, although this is obstructed at some points by the change in topography and subsequent higher built form.

The concept master plan would retain views from the bridge to the observation tower.
10.2 Fort Wallace Gun Emplacement Number 1

The view is north east from the Gun Emplacement Number 1 in the centre of the site. The view is taken from standing on top of the gun emplacement itself.

The existing view encompasses the road in the foreground, a steep embankment with vegetation, a flat grassed area, taller trees and the Stockton Centre and the river in the background.

The view is currently inaccessible to the public. However, the proposed concept master plan and associated rezoning is intended to facilitate this area as a heritage park for public enjoyment. The view to and from heritage items on the site is a significant element of the heritage value of the site.

The concept master plan would obstruct the view of the flat grassed area and part of the vegetation surrounding Stockton Centre, but would maintain key views north to the river.
10.3 Fullerton Street North

View south along Fullerton Street
The approach to the site from the north by vehicle is available only through a single access road, known as Fullerton Street. The view is publicly accessible and likely to be viewed as vehicles and pedestrians approach the site from the north, travelling to Stockton Town Centre and ferry.

The existing view comprises Fullerton Street in the centre of the view, running from the foreground to the background. Large trees can be seen lining the road to the view right, set in a grassed area. The view takes in the northern parts of the site, including the existing fence and vegetation.

The concept master plan would result in a small amount of vegetation in the background of the view being obscured and some built form being visible from the road. The built form would not obscure significant heritage items from this view or substantially change the character of the view, with the development mostly screened by the vegetation on the site and set within the topography.
10.4 Fullerton Street South

The view is north along Fullerton Street adjacent to the southern-most point of the site. The view would be seen on approach to the site for vehicles and pedestrians travelling north to join Nelson Bay road from Stockton Town Centre.

The existing view comprises a flat grassed area alongside the street, running from the foreground to the background, and vegetation running from foreground to background in the image right. The background is primarily large trees. Some existing development can be seen on the site.

The concept master plan would result in some minor obstruction of vegetation in the background of the view. Dense vegetation and site topography existing on the site would obscure lower built form in the foreground of the view.
10.5 Fort Scratchley

View north from Fort Scratchley to the subject site

The view from Fort Scratchley is highly significant due to its heritage value and public nature, as well as its use as a lookout in the area. The view comprises open space, the beach and coastline, the ocean and the Stockton Peninsula in the background.

The subject site forms part of the far background of the view. The concept master plan would not be clearly visible from this location and there is no impact the character or the value of the view.
10.6 Newcastle Ferry Wharf

The Newcastle Ferry Wharf is a key view in the area, being a public and well frequented space with a pleasant view of the ocean and Stockton Town Centre to the north.

The subject site and concept master plan would not be visible from this location.
10.7 Stockton Beach

View west from Stockton Beach

The coastline is a valuable public asset. Due to the current security of the site, the view location is not frequently accessed, but is available to the public when walking along the beach or undertaking recreational activities such as fishing. The concept master plan would facilitate improved access to the beach and would be likely to increase the public use of this location.

The existing view comprises the dunal system with some low vegetation. A small part of the southern gun emplacement can be seen on top of the dunes in the background.

The concept master plan would not be visible from this location, due to the height of the dunes.

Fullerton Road North – Existing View
Focal Length: 35mm

Fullerton Road North – Proposed Development View (Development is not visible from this location)
Conclusion
Recommendations

The proposal is the result of engagement with a range of technical specialists, including coastal erosion, traffic, heritage, and archaeology, to develop a master plan that achieves the best practice planning and urban design principles in line with the changing vision for the future of the site.

Having investigated the site and its context in detail, Architectus and Spackman Mossop Michaels are confident that the master plan, further refined and tested in detail, represents the best design and public domain outcome for the site.

11.1 Planning controls

The proposed LEP controls are intended to strike the right balance between development and conservation of the site’s significant features. Sensitive ecological communities, heritage items and vulnerable coastal lands are proposed to be protected and enhanced, whilst the flatter, mostly featureless parts of the site are to be made available for housing and community amenities. Through new development, the historic site can be opened up to the public, new open space can be provided and degraded relics and vegetation communities can be restored.
Proposed Height of Buildings Map

Maximum Building Height (m)

- I: 8.5
- K: 10
- L: 11
- M: 12
- N: 14
- O: 15
- P1: 17
- P2: 18
- Q: 20
- R: 21
- S: 24
- T: 27
- U: 30
- V: 35
- X: 45
- AA: 60
- AB: 90
- RL1: 0 - 20
- RL2: 20 - 40
- RL3: 40 - 60

Projection: GDA 1994, MGA Zone 56

Newcastle Local Environmental Plan 2012

Cadastre

Base data 01/08/2007 copyright Land and Property Information, addendum data 17/10/2017 copyright Newcastle City Council

Scale: 1:5,000 @ A3

Map Identification Number: ECM 5324428, Date: 17/10/2017 10:10:20 AM
MAP 3 - Proposed Heritage Map
MAP 4 - Proposed Lot Size Map

Newcastle Local Environmental Plan 2012

Proposed Minimum Lot Size Map
Planning Proposal PP2017/00001

Base data 01/08/2007 copyright Land and Property Information Service by LPI, addendum data 17/10/2017 copyright Newcastle City Council

Projection: GDA 1994
MGA Zone 56

Subject Site
Minimum Lot size (sq m)

- C: 250
- F: 400
- G: 450
- M: 600
- S: 800
- U: 1700
- W: 4000
- X: 6000
- Z: 20000 (2ha)
- AB: 400000 (40ha)

Newcastle Local Environmental Plan 2012

Proposed Minimum Lot Size Map
Planning Proposal PP2017/00001

Base data 01/08/2007 copyright Land and Property Information Service by LPI, addendum data 17/10/2017 copyright Newcastle City Council

Projection: GDA 1994
MGA Zone 56

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- X: 6000
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- AB: 400000 (40ha)

Newcastle Local Environmental Plan 2012

Proposed Minimum Lot Size Map
Planning Proposal PP2017/00001

Base data 01/08/2007 copyright Land and Property Information Service by LPI, addendum data 17/10/2017 copyright Newcastle City Council

Projection: GDA 1994
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Newcastle Local Environmental Plan 2012

Proposed Minimum Lot Size Map
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Newcastle Local Environmental Plan 2012

Proposed Minimum Lot Size Map
Planning Proposal PP2017/00001

Base data 01/08/2007 copyright Land and Property Information Service by LPI, addendum data 17/10/2017 copyright Newcastle City Council

Projection: GDA 1994
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Subject Site
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- F: 400
- G: 450
- M: 600
- S: 800
- U: 1700
- W: 4000
- X: 6000
- Z: 20000 (2ha)
- AB: 400000 (40ha)
Appendix A

Master plan options
The final recommended master plan was the result of the development and testing of a range of options for the site development. These are included in the following pages to demonstrate the various benefits and constraints of each plan and highlight the reasoning for the final recommended master plan as set out in this report.

The master plans showed on the following pages are not recommended and are intended only to provide additional information on the urban design process undertaken.

**Option One - Working with existing constraints**

This layout utilises existing access arrangements as well as some of the existing road alignments.

Perimeter roads create a outward looking community and a clear delineation between development and ‘bush’ areas.

Development is restricted to the less ecologically sensitive or disturbed areas of the site.

---

**Approximate development mix/yield (indicative only subject to testing)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Area m²</th>
<th>Density dw/ha</th>
<th>Dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dune apartments/town houses</td>
<td>6,100</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Medium density coastal clusters</td>
<td>16,500</td>
<td>30</td>
<td>49</td>
</tr>
<tr>
<td>Single eco-homes</td>
<td>7,700</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>30,300</td>
<td></td>
<td>87</td>
</tr>
</tbody>
</table>
Maximising the southern development parcel

This layout is a variation on Option 1 that extends the developable area in two locations to further increase potential yield.

To the north of the site sensitive development of medium density coastal clusters could be located within existing areas of mapped ecological communities,

In the southern portion of the site additional development is shown on the an area of existing isolated vegetation as well as an existing remnant structure.

Approximate development mix/yield (indicative only subject to testing)

<table>
<thead>
<tr>
<th>Type</th>
<th>Area m²</th>
<th>Density dw/ha</th>
<th>Dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dune apartments/town houses</td>
<td>6,000</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Medium density coastal clusters</td>
<td>25,000</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Single eco-homes</td>
<td>6,500</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>37,500</td>
<td></td>
<td>118</td>
</tr>
</tbody>
</table>

Legend
- Dune apartments/town houses
- Medium density coastal clusters
- Single eco-homes
- Public open space
- Retained bush/vegetation
Master plan options

Breaking down the edges

This layout is a variation on Option 1 that restricts development to these areas outside the mapped ecological communities. It moves the perimeter road inward from the coastal dune boundaries and allows for groups of environmentally designed ‘medium density coastal clusters’ around the perimeter.

By removing the perimeter road and having dwellings set within the coastal vegetation this may help to reduce the sense of a traditional subdivision and create a better synergy with the coastal environment.

Approximate development mix/yield (indicative only subject to testing)

<table>
<thead>
<tr>
<th>Type</th>
<th>Area m²</th>
<th>Density dw/ha</th>
<th>Dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dune apartments/town houses</td>
<td>11,500</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>Medium density coastal clusters</td>
<td>7,500</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>Single eco-homes</td>
<td>9,500</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>27,500</td>
<td></td>
<td>88</td>
</tr>
</tbody>
</table>
Appendix B

Precedent studies
**Environment**

The Pacific Ocean coastline north of San Francisco features a windswept and rugged landscape. The Sea Ranch covers a section of this coastline approximately 16km in length, straddling Highway One as it winds along the hillside. This landscape is characterised by open meadows between hedgerows of cypress trees planted perpendicular to the coast as buffers to the wind. The vision was for a community of people to sensitively inhabit this place while preserving the quality and character of this environment.

**Dwellings**

This property was purchased in 1964 by Oceanic Properties for the development of a new town. Landscape architect Lawrence Halprin was hired to plan the site based on ecological considerations. Guidelines were established to promote design continuity in developments, beginning with the prototype Condominium One by Moore Lyndon Turnbull and Whitaker. Over time, houses with more suburban formats have become more prevalent, dissolving the strength of the original community clustering intent.

**Lessons Learned**

Architect and developer Al Boeke has stated that his idea was that “we would respect the land. We would build architecture... that seemed natural to this place.” This concept has been largely upheld by attracting environmentally inspired residents to build within site-specific controls; including a covenant, design principles, and design review process.
Murray’s Beach

Environment
The Wallarah Peninsula is a largely forested area of land between Lake Macquarie to the west and the Pacific Ocean to the east. The North Wallarah Peninsula Master Plan guides development of a series of small suburbs, including the lakeside village of Murray's Beach. This low density housing development features an environment and community oriented character that integrates it with the coastal landscape.

Dwellings
Streets and housing lots are designed to be woven into the landscape, with lots sold individually and developed in accordance with a set of design guidelines. A Design Essentials document encourages the sensitive siting, scale, expression, and environmental performance of individual houses in harmony with the bush context. For example, houses should be sited along contours to minimise ground works for cut and fill, and placed within designated development envelopes away from existing trees.

Lessons Learned
The houses at Murray’s Beach are successful in expressing a continuity of landscape. The positioning and openings of houses is generally well staggered, allowing space in between for trees. Construction is mostly lightweight, with a harmonious material and colour palette. Private divisions such as solid fences are discouraged, creating a sense of openness throughout the bushland setting.

Generally, earlier constructions in Murray’s Beach display a higher level of contextual harmony than more recent projects. Design regulations appear to have been relaxed, with increases in hard surface areas and more solid fencing materials. A system that relies upon design guidelines for quality control is dependent on the rigorousness of the application of development standards.
Environment

Little Bay, to the south-east of Sydney, has been home to the Prince Henry Hospital since 1881. The 1998 consolidation of the Prince Henry and Prince of Wales Hospitals made the Little Bay site available for redevelopment, with master planning by Landcom beginning in 2000. Several large precincts were developed separately, with design guidelines and design review processes to manage design outcomes, heritage conservation and adaptive reuse, housing diversity, and affordable housing provisions.

Dwellings

Little Bay has a high diversity of dwelling types, with apartments, terraces, townhouses, and houses. 1% of total dwellings are affordable housing. This variety facilitates community diversity in life stage and family type. There is also a Surf Life Saving Australia office, an Aboriginal Health College, community centres, and a retail precinct, providing local employment, education, and shopping. A variety of high quality public open spaces reinforce the coastal quality of the place and offer recreation opportunities in daily life.

Lessons Learned

Little Bay is a highly livable example of new development integrated with the existing place and context. Separate but coherent developments of a range of scales create an attractive aesthetic, while offering opportunities for a range of people to live, work, and play. This has been achieved while conserving the local heritage features and natural coastal character and amenity.

Precedent studies
Lake Crackenback

Environment
Lake Crackenback is a holiday resort near Bullocks Flat in the NSW Snowy Mountains. A strata plan structure applies to all apartments and chalet-style houses, allowing owners either exclusive use, letting agreements, or shared arrangements for their properties. Meanwhile, a private resort management company operates letting, housekeeping, maintenance, activities, food and beverage operations, and day spa facilities.

Dwellings
A row of apartment blocks face north along the edge of the lake, while houses are dispersed along streets and culs de sac. The land release for the 'Lakeside Chalets' includes a series of twin-key plans to combine architectural homogeneity with some variety. Two rows of houses are located between the lake and the street, with easements through the upper blocks providing access to those below.

Lessons Learned
Lake Crackenback displays some degree of environmental sensitivity. Existing groups of trees and rocks are often retained, but are built over in places. The lake edge is manipulated, with infills and some building footings extending into the water. This interrupts the waters edge in an ecological sense, while also restricting access around the lake. This relatively more environmentally intensive development unfortunately places a higher priority on private amenity than public access and enjoyment.


The James Grose-designed post-modern apartments at Lake Crackenback won the Sulman Award for public architecture in 1990.

Source: https://commons.wikimedia.org/wiki/File:Lake_Crackenback.jpg
Appendix E of Planning Proposal

Stormwater Management Plan

Fort Wallace
Planning Proposal

Property:
Fullerton Street, Stockton

Applicant:
Defence Housing Australia

Date:
October 2017
Limitations Statement

This report has been prepared in accordance with and for the purposes outlined in the scope of services agreed between ADW Johnson Pty Ltd and the Client. It has been prepared based on the information supplied by the Client, as well as investigation undertaken by ADW Johnson and the sub-consultants engaged by the Client for the project.

Unless otherwise specified in this report, information and advice received from external parties during the course of this project was not independently verified. However, any such information was, in our opinion, deemed to be current and relevant prior to its use. Whilst all reasonable skill, diligence and care have been taken to provide accurate information and appropriate recommendations, it is not warranted or guaranteed and no responsibility or liability for any information, opinion or commentary contained herein or for any consequences of its use will be accepted by ADW Johnson or by any person involved in the preparation of this assessment and report.

This document is solely for the use of the authorised recipient. It is not to be used or copied (either in whole or in part) for any other purpose other than that for which it has been prepared. ADW Johnson accepts no responsibility to any third party who may use or rely on this document or the information contained herein.

The Client should be aware that this report does not guarantee the approval of any application by any Council, Government agency or any other regulatory authority.
Executive Summary

ADW Johnson has been engaged by Defence Housing Australia (DHA) to prepare a Stormwater Management Plan to support the planning proposal for the proposed rezoning of the development known as Fort Wallace from SP2 to Part R2, Part E3 and Part RE2.

The Stormwater Management Plan specifically addresses stormwater quantity and quality. It has addressed the impacts of the development of the site on the existing drainage regime, determined the stormwater discharge constraints and identified proposed stormwater device measures to adequately treat the stormwater quality prior to discharging from the site.

Based on review of the existing site topography, it has been identified that stormwater discharging from the site will be conveyed to Fullerton Street and discharge across Fullerton Street and Council reserve to the Hunter River South Arm.

The stormwater discharge from the site has been assessed and details have been provided in Section 5.

A MUSIC model was used to simulate pollutant source elements for the proposed development to confirm that the stormwater can be adequately treated within the limits of the development. Further details on water quality modelling can be found in Section 6. The results from this study demonstrate that there is adequate capacity within the site to achieve the required performance objectives of the stormwater management.
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  2.2 PROPOSED DEVELOPMENT ................................................................................................... 2

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APPENDIX A – EROSION AND SEDIMENT CONTROL
  FIGURE A-1 – EROSION AND SEDIMENT CONTROL PLAN
  FIGURE A-2 – EROSION AND SEDIMENT CONTROL TYPICAL DETAILS

LIST OF FIGURES

Figure 1 - Site Locality (Google earth).
Figure 2 - Existing Site.
Figure 3 – Proposed Zoning.
1.0 Introduction

ADW Johnson has been engaged by Defence Housing Australia (DHA) to prepare a Stormwater Management Plan to support the planning proposal for the proposed rezoning of the development known as Fort Wallace from SP2 to Part R2, Part E3 and Part RE2.

The land subject to this application is located in Stockton adjacent to Fullerton Street to the west Stockton Bight to the east undeveloped land to the south and Stockton Centre to the north. The location of the site is shown in Figure 1.

This report covers the following:

- Existing site and proposed development within Section 2;
- Council’s requirements for a Stormwater Management Plan within Section 3;
- Overview of the proposed development within Section 4;
- Stormwater Discharge detailed in Section 5;
- Stormwater Quality detailed in Section 6; and
- Erosion and Sediment Control during construction outlined in Section 7.

Figure 1 - Site Locality (Google earth).
2.0 Site Description

2.1 EXISTING SITE

The subject site is located within The City of Newcastle LGA off Fullerton Street at Stockton. The site is located on a sand spit between the Pacific Ocean (Stockton Bight) and the Hunter River South Arm the site is shown in Figure 2. The site is previously developed with existing defence structures has a moderate fall from east to west. There is a large existing flat sports field located on the northern end of the site.

![Figure 2 - Existing Site.](image)

Based on review of the existing site topography, it has been identified that stormwater discharging from the site will be conveyed to Fullerton Street and discharge across Fullerton Street and Council reserve to the Hunter River South Arm.

2.2 PROPOSED DEVELOPMENT

The planning proposal proposes to rezone the site with a combination R2, E3 and RE2 zones.

The proposed rezoning will allow the redevelopment of the site with a mixture of low and medium density residential lots. The planning proposal allows for Local Parks, water quality treatment devices, public roads and environmental conservation lands.

The planning proposal plan of the site is shown in Figure 3.
Figure 3 – Proposed Zoning.
3.0 Council Requirements

The City of Newcastle provides objectives and controls for developments within "The City of Newcastle Development Control Plan 2012" (DCP). Section 7.06 "Stormwater" within the DCP outline relevant controls for subdivision development.

The objectives of Section 7.06 – Stormwater are:

1. Ensure stormwater is controlled in a way that minimises nuisance to adjoining properties.
2. Match post development runoff to the pre development or natural water runoff regime as closely as possible.
3. Minimise soil erosion and sedimentation from site disturbance.
4. Prevent pollutants such as litter, sediment, nutrients and oils from entering waterways.
5. Minimise the potential impacts of development and other associated activities on the aesthetics, recreational and ecological values of receiving waters.
6. Ensure appropriate easements are provided over drainage systems on private properties.
7. Ensure easements are unimpeded by development for maintenance purposes.
8. Protect natural watercourses and their associated ecosystems and ecological processes.
9. Incorporate water sensitive urban design elements into the landscape in a manner that provides multiple benefits including: water quality protection; stormwater retention and detention as well as ecological enhancement.
10. Provide objectives, targets and controls (where appropriate) for the management of waterfront lands, water use, stormwater and groundwater.
11. Ensure stormwater infrastructure is identified on site and can be appropriately maintained.

Table 1 - Water Quality Targets (The City of Newcastle DCP, 2012)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>85% of average annual load</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>65% of average annual load</td>
</tr>
<tr>
<td>Total Nitrogen (TN)</td>
<td>45% of average annual load</td>
</tr>
</tbody>
</table>
4.0 Overview

The proposed subdivision has been planned and designed to achieve water cycle management objectives. This process is known as Water Sensitive Urban Design (WSUD). As part of the WSUD approach for this development, the protection of the waterways and management of stormwater within the landscape were key principles. The objectives outlined in the DCP were incorporated into the development’s WSUD.

The proposed development incorporates measures to manage stormwater prior to discharging into the natural drainage system. A stormwater treatment train is proposed to provide appropriate treatment of pollutant prior to discharging to the natural environment, this is detailed in Section 6.

Construction activity has potential to impact on the adjacent environment and have a detrimental effect on the natural drainage regime. To maintain this area during construction, erosion and sediment controls will be implemented as outlined in Section 7.
5.0 Stormwater Discharge

The existing drainage within the subject site generally falls west towards Fullerton Street. From Fullerton Street the site stormwater discharges across Fullerton Street and Council reserve before entering the Hunter River South Arm.

The proposed rezoning of the site has potential to increase the impervious area within the site. This increase on impervious surfaces will increase the rate of stormwater discharging from the site. The requirements within the DCP “Match post development runoff to the pre development or natural water runoff regime as closely as possible” is in place to ensure the increase in discharge from the site does not impact on the downstream sites.

Due to the proximity of the receiving waters and the fact that there are no downstream properties which would be impacted by increased discharge it is considered unnecessary to detain post development discharge rates to pre developed levels.

The objective of the stormwater controls should be the collection and treatment for water quality.

Any development within the site will be required to address the collection, control and conveyance of stormwater to the receiving waters. This includes the assessment of existing Council stormwater infrastructure for adequate sizing to cater for the sites generated discharge. This assessment is expected to require the upgrade of existing or construction of new assets within the Council owned land to the west of the site adjacent to the Hunter River.

5.1 Sea Level Rise and Climate Change

The subject site ranges in elevation from RL 2.0m AHD to approximately 7.0m AHD within the proposed development zoned land, and to an elevation of 16m AHD within the dune system to the east of the site proposed for rezoning to E3.

The subject site is separated from the effect of the Hunter River flooding by elevated levels within existing development to RL 6.0m AHD to the west, and is separated from the sea by the dune system to the east.

The Lower Hunter River Flood Study (Greens Rocks to Newcastle) 1994 prepared by Lawson and Treloar on behalf of Port Stephens Council and The City of Newcastle was updated in 2008 by DHI Water and Environmental Pty Ltd on behalf of Newcastle City Council due to increased intensification of development within Hexham area and the use of up to date numerical modelling techniques. The DHI report identified that the 1% AEP flood level at Stockton Bridge with the adopted sea level rise is 1.34m AHD. A sensitivity assessment within the DHI report indicated that with a 20% increase in Hunter River discharge the 1% AEP flood level at Stockton Bridge is 1.51m AHD, this is considered an appropriate assessment of the Hunter River Flood level including sea level rise and Climate Change.

The subject site is above the predicted Hunter River 1% AEP flood level, therefore it is considered that the proposed rezoning of the development is not constrained due to sea level rise of climate change effects.
6.0 Stormwater Quality

The Stormwater management strategy for the site focuses on minimising impact of the development on the receiving waters adjacent to the site. The subject site discharges to the Hunter River South Arm located approximately 60m to the west of the site across Fullerton Street.

6.1 Oyster Aquaculture Water Quality

The ‘NSW Oyster Industry Sustainable Aquaculture Strategy’ published by the NSW Department of Primary Industries (2016) identifies the proposed discharge area as a ‘Priority Oyster Aquaculture Area’ within the Hunter River.

The strategy by the NSW Department of Primary Industries (dpi) outlines two main objectives in relation to the water quality of oyster aquaculture land:

- Consider the potential impact of the activity or plan on oyster aquaculture areas; and
- Include specific actions that will contribute to the protection and/or improvement of water quality for oyster aquaculture.

The proposed land rezoning to accommodate residential development as outlined within Section 2.2 will not directly impact the oyster aquaculture area, though stormwater runoff from the site has the potential to harm healthy oyster growth.

Accordingly, the actions required to be undertaken for the proposed land use as outlined with the strategy by dpi include:

- Identification of priority stormwater drains and installation of suitable treatment systems; and
- At source control of stormwater for new developments to reduce stormwater impacts.

It is noted that the existing developed site does not utilise appropriate treatment systems and therefore it is anticipated that suitable provision of treatment will enhance the stormwater quality discharged from the site irrespective of the proposed additional development within the site.

6.2 Stormwater Quality Methodology

To maintain stormwater quality to the prescribed levels in the DCP and apply the appropriate actions to protect and maintain water quality for oyster aquaculture, a stormwater quality treatment train approach is proposed, where a number of devices are used to cleanse the site discharge prior to discharging to receiving waters.

A MUSIC model was prepared to determine the required land take to facilitate appropriate stormwater treatment devices to achieve Council’s water quality targets which align with engineering best practice guidelines.

A typical 1Ha catchment was setup to represent the proposed residential usage.
6.2 MUSIC MODELLING

The MUSIC model included the following treatment train approach:

- Gross Pollutant Trap; and
- Bio filtration basin.

The use of BASIX compliant rainwater tanks is recommended in future modelling, however for the purpose of determining required land take rainwater tanks have been excluded.

It is noted that the above treatment train devices have been adopted for the purpose of determining the appropriate land take required to facilitate the appropriate treatment of stormwater. Alternate devices such as swales, buffer strips, constructed wetlands could be used.

Pollutant source inputs were obtained from the ‘Draft NSW MUSIC Modelling Guidelines’ (BMT WBM, 2010). The parameters adopted for the varying land uses were implemented in accordance with Table 3-2 of the above stated document. The rainfall-runoff parameters were updated where appropriate to meet The City of Newcastle’s adopted rainfall-runoff parameters within MUSIC-link.

The residential source node within MUSIC has been adopted, with an impervious percentage of 70%.

The parameters used within the MUSIC model are presented below.

**Gross Pollutant Traps**

GPTs are utilised as conveyance controls, though they can also be used as an end of line control. For the purposes of this model a High Flow EcoSol GPT has been adopted for the 1 Ha catchment. The treatment node was sourced from the EcoSol website. It is required that at detailed design stage, gross pollutant traps be positioned throughout the development to intercept the majority of stormwater discharging from the development while ensuring that the Gross Pollutant Traps are serviceable and remain efficient during smaller duration storm events.

The removal efficiency of the GPTs summarised in **Table 6.1**.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>% Removal Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids</td>
<td>55</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>40</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>40</td>
</tr>
<tr>
<td>Gross Pollutants(&gt;2000µm)</td>
<td>99</td>
</tr>
</tbody>
</table>

The high flow bypasses for the modelled GPTs have been set to 100L/s based on a conservatively sized EcoSol model.
Biofiltration Basins

Biofiltration basins are utilised as end of line controls treating the water prior to discharging from the site. An area equal to 4% of the developed area has been adopted for the purposes of informing the development outcomes.

Table 6.2 - Biofiltration Basin Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Catchment Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Area (m²)</td>
<td>500</td>
</tr>
<tr>
<td>Extended Detention Depth (m)</td>
<td>0.30</td>
</tr>
<tr>
<td>Exfiltration Rate (mm/hr)</td>
<td>0</td>
</tr>
<tr>
<td>Filter Area (m²)</td>
<td>400</td>
</tr>
<tr>
<td>Filter Depth (m)</td>
<td>0.40</td>
</tr>
<tr>
<td>Saturated Hydraulic Conductivity (sandy Loam)</td>
<td>180</td>
</tr>
<tr>
<td>Base Lined</td>
<td>no</td>
</tr>
<tr>
<td>Vegetated with Nutrient Removal Plants</td>
<td>yes</td>
</tr>
<tr>
<td>Underdrain Present</td>
<td>yes</td>
</tr>
<tr>
<td>Submerged Zone</td>
<td>no</td>
</tr>
</tbody>
</table>

6.3 WATER QUALITY RESULTS

The average annual pollutant loads from a generic 1Ha catchment are summarised in Table 6.3.

Table 6.3 - Treatment Train Effectiveness

<table>
<thead>
<tr>
<th>POLLUTANT</th>
<th>RESULT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS (kg/yr)</td>
<td>97.7</td>
</tr>
<tr>
<td>TP (kg/yr)</td>
<td>66.8</td>
</tr>
<tr>
<td>TN (kg/yr)</td>
<td>70.9</td>
</tr>
<tr>
<td>GP (kg/yr)</td>
<td>100</td>
</tr>
</tbody>
</table>

From Table 6.3 it can be seen that the treatment train successfully reduced the pollutant loads.

It is recommended that a whole of site detailed MUSIC model be prepared at future development stages throughout the site to confirm the bio retention basin areas required to treat the catchment based on the ultimate land use.

The results indicate that the inclusion of a GPT and a biofiltration basin of area 400m², adequately control the water quality objectives contained within the DCP, this area of basin equate to 4% of the developed site. Therefore there is sufficient available land within the site to cater for the proposed development of the land.
7.0 Erosion and Sediment Control

The City of Newcastle requires the use of erosion and sediment controls to manage and contain pollutant runoff, both during construction and as long term permanent treatments thus ensuring the minimisation of impact on the environment. All erosion and sediment controls and practices are to be in accordance with Council's DCP and ‘Managing Urban Stormwater’ by Landcom/NSW Department of Housing.

Long term permanent treatments are outlined as part of the treatment train within Section 6. The treatment train specified has been shown to sufficiently manage and control the pollutants leaving the development in accordance with Council’s pollutant reduction targets.

Erosion and Sediment control devices will be utilised to contain the generated pollutants from the site during construction. These include but are not limited to:

- Sediment Basins;
- Silt Fencing;
- Hay bale and Geotextile Fencing;
- Kerb Inlet Controls;
- Sandbag Kerb Inlet Sediment traps;
- Shaker Ramp; and
- Diversion Drains.

Any clean water entering the site from upstream catchments is to be diverted around the construction site where possible hence remaining clean. Runoff generated from within the site is to be treated and managed using a combination of the above stated treatment devices.

Due to the extents of disturbed areas, the use of sediment basins will be required (Landcom, 2004). During construction, the proposed Biofiltration basins will be utilised as temporary sediment basins. Refer to Appendix A for a typical Erosion and Sediment Control Plan.
8.0 Conclusion

ADW Johnson were engaged by Defence Housing Australia to prepare a report detailing Stormwater Management to support the rezoning of Lot 101 DP 1152115 Fullerton Street Stockton from SP2 to Part R2, E3 and Part RE2.

The impact on the existing drainage regime has been assessed in regard to Stormwater discharge, stormwater quality pollutant loads and erosion and sediments controls.

Appropriate erosion and sediment controls implemented to the requirements of The City of Newcastle are required for the construction period to protect downstream receiving waters.

The assessment determined the necessary mitigation measures required to be implemented are able to be readily provided within the subject land. The measures include the construction of stormwater quality devices which are able to adequately reduce pollutant loads to The City of Newcastle’s requirements, ensuring protection of existing environment and hydrology.
DHA Fort Wallace Stockton Beach Coastal Engineering Assessment
November 2017
DHA Fort Wallace Stockton Beach Coastal Engineering Assessment

Prepared for: Department of Housing Australia

Prepared by: BMT WBM Pty Ltd (Member of the BMT group of companies)

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This Coastal Hazard Assessment report outlines the potential for coastal erosion, wave overtopping, reduced foundation capacity of dunes, and sand drift to affect the Fort Wallace Planning Proposal by 2100. Measures to mitigate or manage the identified risks by 2100 are also provided.
Executive Summary

Defence Housing Australia (DHA) has recently purchased the former Fort Wallace site (Lots 100 & 101 DP1152115) covering 31.75 ha on Stockton Beach within the Newcastle local government area (LGA), (see Figure 1). DHA seeks to rezone this site and develop it for a mix of housing for Australian Defence Force (Defence) personnel and the private market. DHA’s planning proposal would seek a rezoning of the majority of the site to R2 Low Density Residential. The objectives of the zone are to provide housing within a low density environment and accommodate a diversity of housing forms. In accordance with the precedent set to the south and north of Fort Wallace, the beach portion of the lot would be zoned E3 Environmental Management.

This report provides an assessment of coastal hazards by 2100 that may impact upon the Fort Wallace site, proposed zoning and masterplan prepared by Architectus. Where impacts may occur, this report provides recommended mitigation measures to reduce the risks. Key outcomes of the coastal hazard and mitigation assessment are summarised below.

Risks from Erosion by 2100

Three scenarios for erosion by 2100 were investigated:

- an ‘almost certain’ erosion scenario including short and medium term erosion, ongoing recession (due to the Newcastle Harbour breakwaters), but excluding the impacts of sea level rise;
- a ‘likely’ erosion scenario including short and medium term erosion, ongoing recession, and future recession due to sea level rise of 0.4 m by 2100 (equivalent to the current rate of sea level rise); and
- an ‘unlikely’ erosion scenario including short and medium term erosion, ongoing recession, and future recession due to sea level rise of 0.9 m by 2100 (equivalent to highest emission scenario along which we are tracking). The ‘unlikely’ scenario is the typical conservative estimate used for planning purposes in NSW.

To better understand the risk associated with the erosion of land, the following consequence categories were applied to the proposed zones:

- Residential (all densities): major
- Roads, Open Space, Environmental Zones, existing heritage assets: minor

Based upon the combination of the above consequence levels with the erosion hazard scenarios, mapping of potential risk across the proposed zoning was possible, as shown in Figure 1.

As shown in Figure 1, all of land proposed for Low Density Residential is at low risk, located landward of the 2100 ‘unlikely’ erosion hazard. The eastern-most portion of proposed roadway servicing this residential area is also seaward of the ‘unlikely’ hazard, and found to be at low to medium risk. The existing historical sites, and associated access road and areas of proposed open space are found to be at low to medium risk, being located seaward of the ‘unlikely’ erosion hazard, although generally landward of the 2100 ‘almost certain’ erosion hazard.
LEGEN$$

- Fort Wallace Site Boundary
- Lot Boundary
- Road Boundary
- Historic Buildings
- Cluster Homes
- Single Eco Homes
- Townhouses
- Courtyard Homes
- Dune Apartments
- Stormwater Detention Basin

Figure 1: 2100 Erosion Risk Profile for the Fort Wallace Masterplan

Title: 2100 Erosion Risk Profile for the Fort Wallace Masterplan

Legend:
- Low Risk
- Medium Risk
- High Risk
- Extreme Risk

2100 Erosion Hazard (Likelihood Lines):
- UNLIKELY: Erosion (short + medium term) + existing recession + 0.9 m SLR recession
- LIKELY: Erosion (short + medium term) + existing recession + 0.4 m SLR recession
- ALMOST CERTAIN: Erosion (short + medium term) + existing recession + NO SLR

Filepath: K:\W20693 Stockton Coastal Engineering Assessment\MapInfo\Workspaces\DRG_006_RiskMatrix_FortWallace_002.wor

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.
It must be noted that the coastal erosion hazard estimates are subject to uncertainty, particularly regarding:

- the extent of ongoing recession;
- the response of the shoreline to sea level rise, and
- the potential for mitigation measures such as beach nourishment being implemented on Stockton Beach before 2100 (e.g. by State/Local government to manage the existing risks downdrift of Fort Wallace).

Given this uncertainty, it is possible that the extent of erosion by 2100 is overestimated, and so, the risk to the Fort Wallace proposed zoning is lower than identified through this report.

**Reduced Foundation Capacity Hazard**

Immediately following a storm erosion event, a near vertical erosion escarpment of substantial height can be left in the dunes or beach ridge. At some time after the erosion event, the escarpment may slump and the slope adjusts to a more stable angle. This slumping may occur suddenly and poses a risk to structures located immediately behind the dune escarpment within this zone of slope adjustment and reduced foundation capacity. The width of the reduced foundation capacity zone is directly dependent on the height of the dunes, with higher dunes resulting in a wider zone.

Caution is required in assessing and applying the dune instability hazard for 2100. The present day height of dunes/land in the region of the 2100 erosion hazard may not accurately represent the actual height of the dunes by that time. Activities including development for residential purposes, community uses, and even dune rehabilitation may lower or heighten the dunes over time. Furthermore, the erosion hazard estimates provide scenarios of potential erosion extents, but there remains uncertainty regarding the exact position of the erosion escarpment in the future, from which the dune instability hazard is calculated.

As the best proxy for the potential region of reduced foundation capacity that may affect the Fort Wallace development, the average, maximum and minimum dune heights along the erosion hazard scenario lines (i.e. ‘almost certain’, ‘likely’ and ‘unlikely’, see Figure 1) were used to calculate the potential region of reduced foundation capacity. Should the erosion escarpment reach a hazard scenario line and dune heights remain at their current level by 2100, the zone of slope adjustment and reduced foundation capacity:

- may average 25 m and range from 15 to 43 m width landward of the 2100 ‘almost certain’ erosion hazard scenario;
- may average 25 m and range from 15 to 41 m width landward of the 2100 ‘likely’ erosion hazard scenario; and
- may average 20 m and range from 11 to 35 m width landward of the ‘unlikely’ erosion hazard scenario.

If erosion were to reach the hazard scenario lines, structures present within these zone widths may be subject to reduced foundation capacity.

**Wave Overtopping Hazard**

Detailed analysis of wave run up and the subsequent potential for wave overtopping of dune barriers during an extreme storm by 2100 was undertaken. Assuming that existing dune heights along the 2100 erosion hazard scenario lines remain at the same height as at present, the potential for wave overtopping is extremely low, except for along a small section of low lying dune (4 m AHD minimum) on the 2100 ‘unlikely’ erosion hazard line. The risks from wave overtopping at this low lying area may include damage to buildings.
and footpaths, and engulfment of pedestrians and vehicles, but only in the case where they are located on or immediately adjacent to the dune crest. The site is predominantly composed of sand, therefore it is expected that any flow of water from wave overtopping at this small section of low lying dune will be quickly percolated into the sand, posing no threat to properties or people beyond 10 or 20 m from the dune crest.

**Sand Drift Hazard**

Dune vegetation on the Fort Wallace site is patchy and contains known weeds such as Bitou Bush. While dune vegetation is variable, sand drift causing ingress and accumulation on private property does not appear to be a significant issue at present.

Sand drift will be effectively managed by rehabilitation (i.e. weed removal and replanting) of the dunes on the site. Maintenance of rehabilitation works will need to be ongoing over time, including after beach erosion and recession events, to continue to provide mitigation of sand drift to adjacent properties. Indeed, proper dune maintenance is considered an important mitigation measure for storm erosion, as it will assist in retaining sand within the dunes to act as a buffer during erosion events.

**Risk Mitigation Measures**

**Dune Rehabilitation to Manage Sand Drift, Short Term Erosion and Wave Overtopping**

It is highly recommended that rehabilitation and ongoing maintenance of dunes on the Fort Wallace site be conducted. Properly functioning dune systems provide mitigation of a number of risks (to varying degrees) as follows.

Dune vegetation serves to capture windblown sand from the sub-aerial and aerial beach face. The capture of windblown sand effectively mitigates sand drift into adjacent properties and land.

Because dune vegetation captures and stores sand in the dunes, it is also a mitigation measure for short term storm erosion, by providing a sacrificial buffer of sand that is eroded during such storms. Dune maintenance programs need to accept the loss of dunes during storms from time to time, and support the rebuilding of dunes after such events.

Maintaining dune heights along the seaward boundary of the site of around 6 m AHD effectively nullifies the potential for wave overtopping during an extreme storm. Maintenance of dunes at this height will be largely self-sustaining via rehabilitation and maintenance of native dune vegetation, as dunes naturally tend to build to heights of around 5 m AHD. A dune barrier of 5 m AHD is expected to impede wave overtopping and overwash under most storm scenarios. No further mitigation of wave overtopping is required for the proposed rezoning of the Fort Wallace site.

**Coastal Erosion**

Residential zones have been kept landward of the ‘unlikely’ 2100 erosion hazard.

These negates the need for implementation of revetment structures to protect at risk properties in the future at Fort Wallace. This is particularly because Stockton Beach is known to be experiencing ongoing recession, and so, revetment structures will be exposed and denuded of sand, with no beach amenity in front or adjacent to the structures. This outcome is already evident at the seawall along Mitchell Street and Stockton Beach.

Potential erosion impacts by 2100 on other proposed land zones on the Fort Wallace site can be accepted, as follows.
Executive Summary

- The eastern most section of access road to residential properties found to be at low risk (see Figure 1) can be considered sacrificial, because access to the residential land is also possible via an alternate route.

- Open space areas shown to be at risk from erosion may also be considered sacrificial, as they typically remain functional even where reduced in size, and tend not to contain infrastructure of high financial value.

- A number of heritage assets that already exist on the site are likely to be affected by coastal hazards prior to 2100 (see Figure 1). Please refer to the hazard assessment undertaken by Urbis 2016 for further information on the intended use of and management of heritage items.

Reduced Foundation Capacity

In view of the long timeframes and the high level of uncertainty regarding the occurrence and width of the zone of reduced foundation capacity by 2100, it is recommended that the proposed rezoning proceed at the current time. As all structures are proposed to be sited landward of the ‘unlikely’ erosion hazard, they would not be expected to be subject to reduced foundation capacity risks over this lifespan, and so, foundation piles would not be required.
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Introduction

1.1 Purpose of the Planning Proposal

Defence Housing Australia (DHA) has recently purchased two surplus Defence sites at Stockton with the objective of obtaining the necessary planning approvals and developing them for a mix of housing for Australian Defence Force (Defence) personnel and the private market. DHA has an ongoing requirement for additional housing in Newcastle, to cater for Newcastle based Defence members and their families and to replace existing DHA dwellings that do not meet current standards.

One of these sites is the former Fort Wallace site (Lots 100 &101 DP1152115) on Stockton Beach within the Newcastle local government area (LGA). The site covers an area of 31.75 ha, and is currently zoned for SP2 Infrastructure under the Newcastle Local Environment Plan 2012.

DHA are seeking to rezone this site to allow for:

- Low density residential development;
- Potentially a neighbourhood shop and community facilities;
- New streets and open spaces;
- Protection and management of areas of high-value vegetation or environmentally sensitive areas;
- Protection and possible adaptive reuse of the heritage items.

The Planning Proposal will amend the land use / zoning controls, height controls, lot size controls and the local heritage provisions for the site.

This report provides an assessment of coastal hazards by 2100 that may impact upon the Fort Wallace site and proposed rezoning in particular. Where impacts may occur, this report provides recommended mitigation measures to reduce the risks from coastal hazards to the Fort Wallace rezoning proposal. The following coastal hazards are assessed in this report:

- Erosion, over the short and medium term, due to long term recession processes, and due to sea level rise in future;
- Dune Stability and Reduced Foundation Capacity for buildings in relation to erosion escarpments in dunes;
- Wave Overtopping, due to high tides, ocean water levels during storms, and in the future due to sea level rise; and
- Sand Drift, whereby natural windborne sand transport from active dunes engulfs nearby properties.

1.2 The Fort Wallace Site

The Fort Wallace site lies on Stockton Beach in NSW around 3.2 km north of Newcastle Harbour entrance, as shown in Figure 1-1. The site lies north of the existing residential development at
Stockton, and between Hunter Water Corporation’s (HWC) former Sewage Treatment Works (STW), and the Stockton Centre. The entire site extends to the shoreline of Stockton Beach, however the proposed development footprint, will not extend onto the foredunes or beach. The masterplan layout also retains the existing buildings and features of the former Fort Wallace, which are listed as heritage items (on the Commonwealth register).
Locality Plan for Fort Wallace
2 Coastal Setting

2.1 Stockton Beach

Stockton Beach is located at the southern end of the larger embayed section of sandy coast known as Stockton Bight. The northern breakwater of the Hunter River entrance forms the southern end of the beach unit. The southern end of Stockton Beach faces east-north-east. Towards the north, the shoreline curves in a long arc, facing progressively more southwards to culminate at Birubi Point, Anna Bay some 32 km to the north.

The southern 5km or so of Stockton Beach experiences lower waves averaging around 1 m (Short, 2007), as it lies in the wave shadow created by the Newcastle Harbour entrance breakwaters. The surf zone at this end generally displays a single attached sand bar cut by rips, with the sand bar becoming detached towards the north.

Particularly north of the Fort Wallace site, the beach becomes increasingly exposed to wave energy, as it extends beyond the wave shadow created by the Harbour breakwaters and arcs to face into the dominant southerly swell direction. The surf zone is described as high energy, with a well-developed double sand bar system, with both bars cut frequently by rips and separated by a deep wide trough (Short, 2007). In very big seas, the northern end of the beach (Birubi Point) will develop a third outer sand bar (Short, 2007).

In the nearshore zone off Stockton Bight, outcropping of rock reef is not evident in the surfzone, and the beach extends as a long, sandy embayment. The continental shelf is slightly wider through this region particularly out to the 40 m contour, which may have assisted in the onshore supply of sediment to the shoreline. Birubi Point forms a bedrock anchor that has repeatedly trapped northward littoral sediment transport to form Stockton Bight over previous interglacial periods.

2.1.1 Stockton Sand Dunes

The Stockton Sand Dunes are the largest and most active transverse dune system in NSW. The sand dunes extend some 25 km roughly from Fern Bay to Birubi Point in the north, and up to 3 km inland. Sands in some parts of the dune field are believed to pre-date the last two glacial periods (i.e. > 500,000 years old). A key aspect of these active dunes is that they are un-vegetated. This allows for sand to be blown into and northwards along the dunes, thus forming an important part of the coastal sediment transport system. That is, an important portion of the sediment transport occurring along Stockton Beach is actually above the water, on land via these active sand dunes.

2.1.2 The Fort Wallace Site

The Fort Wallace site includes beach frontage on Stockton Beach (Figure 2-1). The site’s coastal frontage in cross section includes a region of high, semi-vegetated and hummocky dunes, a low foredune crest, then a fairly wide beach and berm before entering the surf zone. The surf zone fronting the site typically displays a deep trough then single detached bar cut by rips. In the right conditions, the beach can provide decent surfing conditions.

Presently, the back beach and foredunes display a minor erosion escarpment that has slumped somewhat, especially where the dune is unvegetated (Figure 2-2). The erosion escarpment...
extends along the southern half or more of the site, before disappearing and being replaced by a stable to accreted dune and beach (Figure 2-3). It is possible the erosion escarpment was created during the June 2016 storms. That event arrived from a more north easterly direction, and so more heavily impacted the southern end of Stockton Beach. For this reason, the Fort Wallace site and adjacent beach to the north was barely (if at all) impacted by the June 2016 storms. In general, the site does not presently appear to be greatly affected by ongoing recession due to the harbour breakwaters, unlike the southern part of Stockton Beach (see Section 2.1.4).

The dunes at Fort Wallace range in height from around 5.5 m at the foredune crest, to 10-15 m (and higher) in the hind dunes. Dune vegetation is patchy with weeds such as Bitou Bush clearly evident (Figure 2-1). Bitou Bush will have assisted the creation of hummocks separated by sections of bare sand throughout the dunes.

It is considered likely that during its functioning as Fort Wallace, the site was cleared to allow for placement and clear site from the pillbox and other structures on the site. In this regard, it is difficult to discern if the lack of a well-developed foredune and hind dune system is due to site disturbance, ongoing recession due to the harbour breakwaters (see Section 2.1.4), or a combination of both.

Figure 2-1  View from Fort Wallace Site to North and South, with patchy and hummocked dune vegetation

Figure 2-2  Beach at Fort Wallace (to north and south) showing evidence of erosion and slumping
2.1.3 History of Newcastle Harbour Construction

The history of construction of the breakwaters and dredging activities that have formed the Port of Newcastle entrance are as follows (Umwelt, 2002; DHI, 2006):

- Between 1812 and 1846, the Macquarie Pier was constructed between Newcastle mainland and Nobbys Island (now Nobby's Head);
- Dredging of the Newcastle Harbour entrance commenced in 1859, as the entrance was still hazardous for ships;
- In 1875 the extension of the southern breakwater from Nobby's commenced, and following several storms, was completed in 1891;
- Between 1898 and 1912, the northern breakwater was constructed, measuring nearly 1140 m;
- In 1961, depths across the harbour entrance were around -8 m. To enable safer passage, the harbour entrance was deepened to -11 m between 1962 and 1967;
- A further channel deepening project commenced between 1967 to 1976, to increase depths through the channel to -12.8 m;
- Channel deepening continued between 1977 and 1983 to further deepen the entrance in line with Port expansion activities that continue to the present; and
- At the present time, the navigation channel is maintained at a depth of -18 m, with dredged material typically placed at an offshore disposal site.

2.1.4 History of Recession and Remediation on Stockton Beach

Stockton Beach is known to have experienced ongoing recession, overlain on the natural periods of erosion and accretion. A number of studies have been undertaken over time, confirming that Stockton Beach is experiencing ongoing recession as a result of the cessation of littoral drift past the Newcastle Harbour Breakwaters into the beach. Previous detailed investigations include:
Northerly littoral drift of up to 30,000 m$^3$/year has been impeded from passing the Hunter River entrance and supplying Stockton Beach by the construction of the southern then northern breakwaters. Littoral drift past the entrance breakwaters has not been able to re-establish because the Harbour channel is regularly dredged to a depth of 18 m, to allow for the passage of coal and other container ships. Fluvial sand supply from the Hunter River that may also have assisted to supply Stockton Beach has also ceased due to entrance dredging. The result has been ongoing recession of Stockton Beach, occurring as erosion and steepening of the surfzone, reduced beach width and progressive erosion into the back beach dunes and more recently, development.

Recession has previously threatened development in the central section of the beach along Mitchell Street as well as facilities such as the Stockton Beach Surf Life Saving Club (SLSC) house and pavilion, at the southern end of the beach (see Figure 2-4). Four treatment ponds were constructed in the late 1960's on HWC's Wastewater Treatment Works (adjacent to the Fort Wallace Site). One pond has been lost to erosion and the next most seaward pond is now under threat.

In 1989 in response to the erosion threat, a substantial rock seawall was constructed between Pembroke Street and Stone Street to protect the adjacent section of Mitchell Street and residential properties (see Figure 2-5). A sandbag wall with a design life of 5 years was also constructed in November 1996 to provide interim protection for the Stockton SLSC. The sandbag wall was implemented as a short term solution, however, it is still present and functional some 20 years later today. In June 2011, the sandbag wall was extended at the base of the SLSC towards the north. The sandbag structure was recently exposed during storms in June 2016.

A dune system was formed between the northern breakwater and Pembroke Street, and north of the rock seawall to Meredith Street during the period 1988 to 1991. Severe erosion in the mid-1990s effectively removed these dune reconstruction works. In the late 1990s, a new dune system was constructed south from the SLSC and seaward of the Stockton Caravan Park. Between the SLSC and Mitchell St seawall, a dune system is absent and the general ground level is as low as 4.0m AHD in places (see Figure 2-4). This area was further eroded during the June 2016 storms.

Approximately 130,000 m$^3$ of sand was dredged from the Harbour entrance in August 2009 and placed off Stockton Beach. The placement event was generally agreed to be a success and represents the first documented nourishment event for Stockton Beach. Over recent years, some small volumes of suitable dredged material (~5,000 m$^3$ per episode) have been placed at Stockton Beach by the Port’s maintenance dredger. While this is a valuable exercise, it has not fully replicated the lost regional sand supply of up to 30,000 m$^3$/year into Stockton Beach. As such, recession is expected to be ongoing.
Coastal Processes

The occurrence of coastal risks such as erosion and inundation occur due to the interaction of different coastal processes with the sediments and structure of a coastline, as described by its geology and geomorphology, outlined for Stockton Beach in Section 2.1.

Coastal drivers operating on coastlines such as Stockton Beach include:

- Waves
- Oceanic water levels
- Sea level rise

These drivers interact to generate:

- Cross-shore sediment transport,
- Longshore sediment transport, and
- Aeolian sediment transport within active dunes.
Depending on these interactions, coastal hazards such as erosion (short term, medium term, recession), wave overtopping and inundation, and sand drift may occur. A brief description of the coastal processes relevant to the hazard assessment of Stockton Beach is provided in Table 2-1.

**Table 2-1 **Summary of Coastal Processes Relevant to Stockton Beach

<table>
<thead>
<tr>
<th>Coastal Process</th>
<th>Description</th>
<th>Measured parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waves</td>
<td><strong>Significant Wave Height</strong>&lt;br&gt;Significant wave height ($H_s$) varies in response to the different wave generation sources that occur throughout the year, as well as larger scale climate cycles such as the El Nino Southern Oscillation. East coast low cyclones are known to generate the largest waves on the NSW coast.</td>
<td>Average $H_s$: 1.6 m&lt;br&gt;100 year Average Recurrence Interval (ARI) 6 hour duration $H_s = 8.7$ m&lt;br&gt;(based on measured wave data from Sydney)</td>
</tr>
<tr>
<td></td>
<td><strong>Wave Direction</strong>&lt;br&gt;Waves on the NSW coast are dominantly south east in origin. Wave direction occur in response to the different wave generation sources and their occurrence during the year, e.g. tropical cyclones occur to the north in summer; east coast low cyclones from May to July that can produce more northerly storms; and mid-latitude cyclones throughout the year that generate the predominant south easterly swell</td>
<td>Average Wave Direction: SE to S, with slight shift towards ESE in summer.</td>
</tr>
<tr>
<td>Water levels</td>
<td><strong>Astronomical Tide</strong>&lt;br&gt;NSW tides are micro-tidal (i.e. &lt;2.0 m range) and semi diurnal (high and low occurs twice a day) with significant diurnal inequalities (the two high and two low tide levels are different in any one day).</td>
<td>Port of Newcastle&lt;br&gt;Highest Astronomical Tide: 1.1 m AHD&lt;br&gt;Lowest Astronomical Tide: -0.9 m AHD</td>
</tr>
<tr>
<td></td>
<td><strong>Elevated water levels</strong>&lt;br&gt;Elevated ocean water levels during storms occur due to a combination of:&lt;br&gt;• Astronomical tide&lt;br&gt;• Barometric pressure set up&lt;br&gt;• Wind set up</td>
<td>100 year ARI ocean water level: 1.44 m AHD (DECCW, 2010)</td>
</tr>
<tr>
<td></td>
<td><strong>Wave Set Up</strong>&lt;br&gt;Wave set up adds to the elevated water levels at the beach. Wave set up is generated by the breaking of waves, and increases to a maximum at the beach face. A typical measure of wave set up for hazard estimation is 15% of the offshore wave height. A 6 hour duration $H_s$ is typically used, as this is likely to coincide with a high tide.</td>
<td>Wave set up: 1.3 m,&lt;br&gt;(calculated as 15% of the 100 year ARI 6 hr duration $H_s$ of 8.7 m)</td>
</tr>
</tbody>
</table>
Coastal Setting

### Sediment Transport

**Longshore Sediment Transport**
Longshore sediment transport occurs when waves arrive obliquely to the shoreline, generating a current along shore. Depending on the wave direction, transport may be directed upcoast or downcoast.
On the NSW coast, the net longshore sediment transport is northerly, due to the predominance of south-easterly waves. The volume of transport also tends to increase towards the north of NSW, as headlands are fewer (and so, there is less interruption of the sediment transport) and sand reserves greater.

Regional longshore sediment transport rate: up to 30,000 m³/year (based on investigations by various authors including: WBM, 2000; Umwelt, 2002; DHI, 2006)

### Cross-shore sediment transport
High waves during storms tend to generate offshore transport of sand eroded from the beach and nearshore. Rip currents are directed offshore, and contribute to beach erosion during storms.
During calm conditions, lower waves tend to generate transport of sand back onshore, to help rebuild the beach.

N/A

### Aeolian (Windborne) Sediment transport
Aeolian or windborne sediment transport originates from the dry sub-aerial upper beach face and berm and unvegetated incipient dunes and foredunes, supplying sediment to landward foredunes. Aeolian transport is the key builder of foredunes particularly where vegetation enables the windblown sediment to be captured and stabilised.

N/A

### Sea Level Rise

**Sea level rise**
Sea level rise is occurring at present, and the rate of rise is projected to increase in response to human-induced climate change.

Detailed discussion of sea level rise scenarios investigated for this report is given in Section 2.2.

### 2.3 Sea Level Rise

#### 2.3.1 Sea Level Rise Measurements to Date
Global mean sea level rose about 1.6 mm/year on average during the 20th Century (CSIRO, 2016a). Since 1992, high quality measurements of sea level rise have been made by satellite altimeters. From 1992 to present, Global Mean Sea Level (GMSL) has risen at a rate of around 3.2 ± 0.4 mm/year (CSIRO, 2016b). The rate of sea level rise over the past 20 years is therefore about double that of the previous century. If the rate of sea level rise were to remain at its present level of 3.2 mm/year, sea level can be expected to be nearly 0.3 m higher than at present by 2100.

Projections for sea level rise of about 0.9 m by 2100 (above 1990 sea level), as given by CSIRO (2015) and IPCC (2014), are based on the rate of sea level rise more than doubling from its present rate of 3.2 mm/year. This is not unreasonable given that the rate of sea level rise has already doubled over the last 20 years. The current rate of rise is also tracking along the rate expected under the highest carbon emission scenario modelled by CSIRO (2015) and IPCC (2014).
2.3.2 Sea Level Rise Projections used in this Assessment

The CSIRO released new regional projections for Australia in 2015, which are the most relevant to this coastal hazard assessment. The CSIRO (2015) suggest a 'likely' range for sea level rise of 0.45 to 0.88m by 2090 for the highest emission scenario (along which sea level rise is currently tracking, see Section 2.3.1).

The 2015 CSIRO projections are almost identical to the former NSW Sea Level Rise Policy Statement 2009 benchmarks of 0.4 m and 0.9 m rise above 1990 mean sea level by 2050 and 2100 respectively. These benchmarks were used by Newcastle City Council in deriving hazard estimates for Stockton Beach (as per the DHI (2011) study). The former benchmarks were based upon the latest reports by the IPCC (2007) and CSIRO (2007) available at that time. The recent IPCC report in 2014 also provides very similar projections to the 2007 IPCC report.

For this study three sea level rise scenarios were considered as shown in Table 2-2, representing:

- no further sea level rise occurs in the future;
- sea level rise remains at its current rate of ~ 3.2 mm/yr to the end of the century; and
- the rate of sea level rise increases as projected for the highest emission scenario by CSIRO (2015), and along which sea level rise has been tracking to date (i.e. the rate of rise doubles over the remainder of this century).

Because the projections from 2007 and 2014/2015 are so similar, the sea level rise scenarios applied are consistent with the projections used by DHI (2011) and Council.

It should be noted that small differences of 1 to 5 cm between exact projections are likely to make no appreciable difference in the position of a hazard line, or level of inundation, particularly at the scale of interest to this study.

**Table 2-2 Sea Level Rise Projections used for this assessment**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>SLR Value Adopted</th>
<th>Rational and Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>No SLR</td>
<td>0.0 m</td>
<td>A “no sea level rise” scenario provides a benchmark of coastal risk that is expected to occur regardless of the rate and impact of sea level rise.</td>
</tr>
<tr>
<td>SLR at current rate (~3.2 mm/year)</td>
<td>0.4 m (above 1990 levels)</td>
<td>This scenario represents current rate of sea level rise of 3.2 mm/year ± 0.4 mm (CSIRO 2016b) prevailing to the end of the century. However, this scenario also represents the lower value estimate given by CSIRO (2015) for the highest emission scenario, of 0.45m by 2090.</td>
</tr>
<tr>
<td>SLR at projected rate</td>
<td>0.9 m (above 1990 levels)</td>
<td>This scenario represents the upper value given by CSIRO (2015) for the highest emission scenario, of 0.88 m by 2090. As a demonstration of the similarities between previous and current scientific projections, this SLR value is also consistent with the benchmarks previously prescribed by the NSW Government for studies of this kind, including DHI (2011).</td>
</tr>
</tbody>
</table>
3 Coastal Hazard Assessment

3.1 General Provisions

Application of 2100 Timeframe for this Coastal Hazards Assessment

Given the proposed development at Fort Wallace represents a new subdivision, it is typical for local councils (including Newcastle City Council) to apply a 100 year design life to such developments. Therefore, the risk to the subdivision from coastal hazards by 2100 has been investigated. The application of the 2100 hazard extent is particularly important given that Stockton is experiencing ongoing recession (not related to sea level rise).

Use of Existing Hazard Calculations

The coastal hazard definition given in this assessment has relied on existing information in the DHI (2006, 2011) reports because this is the information currently approved and being used by Newcastle City Council for coastal planning purposes.

3.2 Beach Erosion Hazard

3.2.1 Definitions

The following modes of erosion have been included in the definition of the 2100 erosion hazard for the Fort Wallace site on Stockton Beach:

- **Short term erosion**, during a severe storm or storms in close succession (hours to days). Storms involve increased wave heights and ocean water levels (tide, barometric pressure set up, wind set up, wave set up) resulting in waves attacking the beach berm and dunes. The storm waves and water levels generate cross shore (offshore) and longshore sand transport simultaneously, resulting in erosion of the beach, berm and foredune. For example, storms on June 6, 2016 generated significant erosion of the beach and back beach area particularly at the southern end of Stockton Beach (see Figure 2-4).

- **Medium term erosion**, relating to 5-10 year cycles in the wave and water level climates, which are related to large scale climate cycles such as the El Nino Southern Oscillation. For example, there has recently been a shift from El Nino conditions (typically associated with lower storminess and a more dominant southerly wave direction) to La Nina conditions (typically associated with greater storminess and a slight shift in average wave direction towards the east/north). The direction of longshore sediment transport is directly related to the incoming wave direction, and so, slight shifts in wave direction over 5-10 year cycles can have a significant effect on longshore sediment transport direction and volume, and therefore, sand reserves within a beach system.

- **Long term recession**, being the long term, permanent loss of sediment from a beach system, resulting in an ongoing loss of beach and dune width. Stockton Beach has been experiencing recession over the last 100 years or so in relation to the construction of the Newcastle Harbour Breakwaters (commencing in the early 1800s to present, refer Section 3.2.2.2). Beaches such as Stockton that are experiencing long term recession are characterised by a prominent back
beach escarpment which moves landward over time after storm events, rather than recovering fully to the pre-storm position.

- **Future recession due to sea level rise**, where the beach and dune shift upward and landward in response to the rise in sea level. This is commonly represented by the Bruun Rule (Bruun, 1962), as in Figure 3-1 below. The coastline structure in terms of headlands, reefs and artificial structures such as breakwaters and seawalls will also control how recession due to sea level rise occurs, due to the structures’ control on longshore sediment transport. While newer modelling techniques are available to assess recession due to sea level rise (e.g. Patterson, 2013, Cowell et al 1992, 1995), it remains accepted industry practise to apply the Bruun Rule (1962) to determine the extent of recession due to sea level rise.

![Figure 3-1 Bruun (1962) Concept of Recession due to Sea Level Rise](image)

**3.2.2 Calculations**

**3.2.2.1 Short and Medium Term Erosion**

Potential short term erosion for Stockton Beach was analysed by DHI (2006) using a dune erosion model and application of storm conditions from May & June 1974, as well as June 1999 that arrived from the east to east-south-east and so more directly impacted the southern end of Stockton Beach. While the design storm approach can be problematic, Stockton Beach is experiencing long term recession and therefore it is difficult to separate short term events from the long term recession signal in beach survey and photogrammetric data. The maximum erosion estimates adopted by DHI (2006) ranged from 5 m at Stockton Tourist Park to 17 m at Meredith Street, 22 m at Fort Wallace and 24.5 m at the LGA Boundary, as in Table 3-1. The increase in the extent of storm erosion towards the north reflects the increased exposure of the beach to the pre-dominant south easterly waves experienced on the NSW coast.

Using the photogrammetric data, DHI (2006) also estimated erosion relating to medium term wave climate variability, such as enhanced storminess or more easterly wave direction over a sustained
period. DHI (2006) provided a best estimate for medium term erosion of 18 m north of the Mitchell St seawall, which is applicable to the study site, as given in Table 3-1.

**Table 3-1 Short and Medium Term Erosion Estimates (adapted from DHI, 2006)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Short term erosion</th>
<th>Medium term erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Wallace</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>Stockton Centre</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>LGA Boundary</td>
<td>25</td>
<td>18</td>
</tr>
</tbody>
</table>

*Erosion has been rounded to the nearest metre, to reflect the uncertainty in erosion estimates (refer Section 3.2.4 also).*

### 3.2.2.2 Long term Recession

It is well documented that Stockton Beach is experiencing ongoing recession due to the Newcastle Harbour entrance breakwaters (e.g. WBM, 2000, Umwelt 2002, DHI 2006). The breakwaters have cut off the supply of sediment from the southern beaches across the river mouth and into Stockton Beach. The erosion of beaches updrift of river entrance training walls is a well known phenomenon on the NSW coast (e.g. has occurred at Coffs Harbour, Richmond River, Tweed River and others).

Unlike most other places on the NSW coast, the Hunter River entrance and Stockton beach system has not been able to adjust to the construction of the Harbour Breakwaters. Bypassing of the southern breakwater is very likely to be occurring, however, the marine sand is removed by dredging to retain the entrance depth at 18 m to facilitate the passage of coal ships into the Port of Newcastle. Any sediment that is not dredged remains in water depths at or greater than 18 m, which is too deep for significant wave driven currents to form to transport the sediment back onto Stockton Beach (DHI, 2006). Therefore, the loss of up to 30,000 m$^3$/year of sand into Stockton Beach is, and will continue to be, ongoing.

The pattern of recession varies along Stockton Beach. The northern breakwater acts to shadow the southern end of Stockton Beach from south easterly swells, and a complex pattern of sediment transport is generated towards the south and then captured against the northern breakwater (DHI, 2006). Both the WBM (2000) and Umwelt (2002) studies also identified a slight accretionary trend at the southern end of Stockton Beach. North of this, the recession starts at low rates increasing to its peak of 1.3 m/year loss at the former Sewage Treatment Ponds, before reducing again to around 0.8 m/year loss at Fort Wallace and extending to the LGA Boundary (DHI, 2006).

DHI (2006, 2011) used model results to determine best estimates of shoreline retreat along Stockton Beach, which are reproduced for the study site in Table 3-2. These rates were found to be in good agreement with historical recession rates of 1 to 1.3 m/year along the beach (DHI, 2006).

Periodically, dredged marine sand from the Harbour entrance is placed on Stockton Beach (around 5,000 m$^3$ per episode, once or twice a year). However, this is insufficient to fully replace the yearly loss to the beach. As such, the recession rates provided by DHI (2006, 2011) have been applied for this assessment.
3.2.2.3 Future Recession due to Sea Level Rise

DHI (2011) calculated recession due to sea level rise using the standard Bruun Rule (1962). Long sandy shorelines such as the central portion of Stockton Beach, can reasonably be expected to respond in the uniform, two-dimensional manner described by Bruun (1962), because headlands and reefs are not present and so, sea level rise cannot reduce longshore sediment transport past these structures. However, the southern portion of Stockton Beach is also expected to behave in accordance with the Bruun Rule (1962). The longshore supply into the southern end of Stockton Beach has already been interrupted by the harbour breakwaters (and without recovery due to the ongoing dredging). Sea level rise cannot further reduce longshore transport past the harbour breakwaters. In this case, assessment of recession due to sea level rise with the Bruun Rule (1962) is suitable at Stockton Beach.

DHI (2011) estimated 28 m recession due to a sea level rise of 0.4 m (above 1990 levels) and 68 m for a sea level rise of 0.9 m, as given in Table 3-3 below.

Table 3-3 Future Recession Due to Sea Level Rise (from DHI, 2011)

<table>
<thead>
<tr>
<th>Sea level rise (above 1990 level)</th>
<th>Recession</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 m</td>
<td>28 m</td>
</tr>
<tr>
<td>0.9 m</td>
<td>68 m</td>
</tr>
</tbody>
</table>

3.2.3 Erosion Risk Profile for Fort Wallace

3.2.3.1 Coastal Erosion Risk Assessment

According to the Australian Standard Risk Management Principles and Guidelines (AS/NZS ISO 31000:2009) risk is defined as the combination of likelihood and consequence.

For this assessment of coastal erosion risk, the likelihood relates to the probable extent of coastal erosion by 2100, as described in Section 3.2.3.2. The consequence relates to the potential impact of erosion upon the permissible land uses within the proposed zones of the Fort Wallace planning proposal. The consequence considers the permanency of impact, the type of impact (social, economic, ecological), and the potential resilience of that land use type to erosion, as described in Section 3.2.3.3.

The level of risk is then the combination of likelihood and consequence via a risk matrix. The consequence and likelihood are combined (using GIS processing) to map the potential level of risk.
to proposed land zones on Fort Wallace from coastal erosion by 2100, as discussed and illustrated in Section 3.2.3.4.

### 3.2.3.2 Likelihood of Coastal Erosion

In order to support the development of risk profiles across the Fort Wallace / Rifle Range site, three scenarios for the erosion hazard by 2100 were investigated, as follows:

- **‘Almost certain’ erosion by 2100**, comprising the addition of short term erosion, medium term erosion, ongoing recession, but no recession due to sea level rise (i.e. a 0.0 m sea level rise was adopted, see Section 2.3.2);

- **‘Likely’ erosion by 2100**, being the addition of short term erosion, medium term erosion, ongoing recession, and recession due to sea level rise of 0.4 m (equivalent to the current rate of sea level rise, see Section 2.3.2); and

- **‘Unlikely’ erosion by 2100** being the addition of short and medium term erosion, ongoing recession, and future recession due to sea level rise of 0.9 m by 2100 (equivalent to highest emission scenario along which we are tracking, see Section 2.3.2).

The ‘unlikely’ scenario represents the conservative hazard estimate that is typically used for planning purposes in NSW. The combination of calculations into the probable erosion extents described above is provided in Table 3-4. The definition of the erosion hazard scenarios in terms of ‘likelihood’ or a descriptive probability has been used by BMT WBM in numerous other coastal hazard assessments (for example, see BMT WBM, 2015), and is provided in Table 3-5 below.

The erosion hazard scenarios for 2100 have been mapped for Fort Wallace planning proposal zoning (and indicative masterplan layout) in Figure 3-2.

### Table 3-4 2100 Erosion Hazard for the Fort Wallace Site

<table>
<thead>
<tr>
<th>Erosion Likelihood for 2100</th>
<th>Erosion modes included</th>
<th>Calculations for 2100</th>
<th>Total recession distance (fr. 4m AHD beach contour)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Almost Certain</strong></td>
<td>Short term erosion</td>
<td>22 m</td>
<td>112 m</td>
</tr>
<tr>
<td></td>
<td>Medium term erosion</td>
<td>18 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ongoing recession</td>
<td>0.8 m/yr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO recession due to sea level rise</td>
<td>0 m</td>
<td></td>
</tr>
<tr>
<td><strong>Likely</strong></td>
<td>Short term erosion</td>
<td>22 m</td>
<td>140 m</td>
</tr>
<tr>
<td></td>
<td>Medium term erosion</td>
<td>18 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ongoing recession</td>
<td>0.8 m/yr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recession due to 0.4 m sea level rise</td>
<td>28 m</td>
<td></td>
</tr>
<tr>
<td><strong>Unlikely</strong></td>
<td>Short term erosion</td>
<td>22 m</td>
<td>180 m</td>
</tr>
<tr>
<td></td>
<td>Medium term erosion</td>
<td>18 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ongoing recession</td>
<td>0.8 m/yr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recession due to 0.9 m sea level rise</td>
<td>68 m</td>
<td></td>
</tr>
</tbody>
</table>

1 All calculations sourced from DHI (2006), except recession due to sea level rise sourced from DHI (2011).
Figure 3-2

2100 Erosion Hazards for the Fort Wallace Masterplan
Table 3-5  Risk Likelihood for Coastal Hazards (100 year timeframe)

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain</td>
<td>There is a high possibility the event will occur as there is a history of frequent occurrence</td>
</tr>
<tr>
<td>Likely</td>
<td>It is likely the event will occur as there is a history of casual occurrence</td>
</tr>
<tr>
<td>Unlikely</td>
<td>There is a low possibility that the event will occur, however, there is a history of infrequent and isolated occurrence</td>
</tr>
</tbody>
</table>

3.2.3.3 Consequence of Erosion on Proposed Land Zones

In order to understand the profile of risk from erosion across the proposed land zones in the Fort Wallace Planning Proposal, the potential for erosion to cause adverse impacts within such zones was considered, and is detailed in Table 3-6.

The consequence scale used to derive these consequences is based on that used by BMT WBM for numerous other coastal hazard assessments (for example, see BMT WBM, 2015), as given in Table 3-7 below.

Table 3-6  Potential Consequence of Erosion within Proposed Land Zones

<table>
<thead>
<tr>
<th>Zone</th>
<th>Consequence of Erosion</th>
<th>Reasoning for Consequence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (low, medium or high)</td>
<td>Major</td>
<td>Loss of private residences would have a major social and financial impact on individual owners within the Stockton community.</td>
</tr>
<tr>
<td>In this case R2 Low Density Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads</td>
<td>Minor</td>
<td>Roads within the Planning proposal are of a local nature, and the use of ‘ring’ roads allows access to most properties to be maintained, even where erosion of a section of roadway may occur.</td>
</tr>
<tr>
<td>Open Space</td>
<td>Minor</td>
<td>Open spaces have limited infrastructure and therefore economic impact, and are generally still usable by the community even if reduced in size by erosion.</td>
</tr>
<tr>
<td>Existing Historical Assets</td>
<td>Minor</td>
<td>Historical assets have a high social value to the community, however, they are not habitable structures, nor vital infrastructure. Such structures can be relocated, or otherwise enjoyed until impacts are imminent.</td>
</tr>
<tr>
<td>Environmental zones</td>
<td>Minor</td>
<td>Generally, such areas should remain functional even if reduced in size by erosion. Rehabilitation will enhance the resilience of ecological communities, and assist their ability migrate in response to erosion impacts over time.</td>
</tr>
</tbody>
</table>
### Table 3-7 Consequence Scale for Coastal Hazards/Issues

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Society / Community</th>
<th>Environment</th>
<th>Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Major permanent or widespread medium term disruption to community’s services, wellbeing, or culture (e.g. 50% of community affected), or regional loss, or Few, if any, suitable alternative sites exist</td>
<td>Widespread permanent or semi-permanent impact, or widespread pest / weed species proliferation, or semi-permanent loss of entire regionally important habitat. Recovery may take many years, if at all.</td>
<td>Damage to property, infrastructure, or local economy &gt;$2 million</td>
</tr>
<tr>
<td>Moderate</td>
<td>Minor long term or major short term (mostly reversible) disruption to services, wellbeing, or culture of the community (e.g., up to 25% of community affected), or sub-regional loss, or Some suitable alternative sites exist</td>
<td>Significant environmental changes isolated to a localised area, or loss of regionally important habitat in one localised area. Recovery may take several years.</td>
<td>Damage to property, infrastructure, or local economy &gt;$250,000 - $2 million</td>
</tr>
<tr>
<td>Minor</td>
<td>Small to medium short term (reversible) disruption to services, wellbeing, finances, or culture of the community (e.g., up to 10% of community affected), or local loss, or many alternative sites exist</td>
<td>Environmental damage of a magnitude consistent with seasonal variability. Recovery may take one year.</td>
<td>Damage to property, infrastructure, or local economy &gt;$50,000 - $250,000</td>
</tr>
</tbody>
</table>

### 3.2.3.4 Potential Erosion Risk to Fort Wallace Planning Proposal

The level of risk is the combination of likelihood and consequence via a risk matrix, as derived for this assessment in Table 3-8. The consequence and likelihood were combined using GIS processing to map the potential level of risk to proposed land zones on Fort Wallace from coastal erosion by 2100, as shown in Figure 3-3.

### Table 3-8 Risk Matrix for Coastal Erosion Assessment

<table>
<thead>
<tr>
<th>LIKELIHOOD</th>
<th>CONSEQUENCE</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain</td>
<td>Medium</td>
<td>High</td>
<td>Extreme</td>
<td></td>
</tr>
<tr>
<td>Likely</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Unlikely</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3.2 2100 Erosion Risk Profile for the Fort Wallace Masterplan

LEGEND

- Fort Wallace Site Boundary
- Lot Boundary
- Road Boundary
- Historic Buildings
- Cluster Homes
- Single Eco Homes
- Townhouses
- Courtyard Homes
- Dune Apartments
- Stormwater Detention Basin

2100 Erosion Hazard (Likelihood Lines)
- **UNLIKELY**: Erosion (short + medium term) + existing recession + 0.9 m SLR recession
- **LIKELY**: Erosion (short + medium term) + existing recession + 0.4 m SLR recession
- **ALMOST CERTAIN**: Erosion (short + medium term) + existing recession + NO SLR

Title:
2100 Erosion Risk Profile for the Fort Wallace Masterplan

Figure:
3-3

Rev:
C

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.
From Figure 3-3, it is evident that:

- The majority of the new proposed residential zones are landward of the 2100 ‘unlikely’ erosion hazard scenario, and therefore considered to be at very low risk.

- A small portion of proposed residential land, and associated roads and open space at the southern end of the site lies seaward of the 2100 ‘unlikely’ erosion scenario, but landward of the ‘likely’ erosion hazard scenario, and is therefore classified to be at medium and low risk by 2100 respectively.

- Existing historical assets and associated access roads and open space associated are generally located seaward of the 2100 ‘unlikely’ hazard scenario, and therefore variously at low to medium risk from erosion by 2100.

3.2.4 Uncertainties in Erosion Hazard estimates

Uncertainty in defining coastal erosion hazards particularly over long timeframes (50 years+) is an inherent feature of all coastal assessments. Uncertainty in coastal hazard estimation arises due to:

- the complexity of the coastal system, and limitations of our understanding of the interactions within this complex system;

- due to this complexity, the requirement for assumptions when replicating the coastal system via modelling or other techniques,

- the uncertainties associated with climate change, particularly the rate and extent of sea level rise over long timeframes; and

- the uncertainties of how the coastal system will respond to sea level rise, particularly as this will be combined with existing recession at Stockton Beach.

With such uncertainties in mind, three scenarios for the occurrence of coastal erosion to the 2100 timeframe were investigated (being ‘almost certain’, ‘likely’ and ‘unlikely’, as noted above), to provide more transparency regarding how erosion estimates are derived and combined. The key areas of uncertainty in the erosion hazard estimate relating to Stockton Beach are listed then explained below:

- the extent of ongoing recession;

- the response of the shoreline to sea level rise, and

- the potential for mitigation measures such as beach nourishment being implemented on Stockton Beach before 2100 (e.g. by State/Local government to manage the existing risks downdrift of Fort Wallace).

It could be argued that the rate of ongoing recession occurring at the Fort Wallace site is overestimated. The current state of the beach and dunes at the Fort Wallace site are slightly eroded (due to the 2016 storms) to accreted, with a wide beach and berm (see Figure 2-2 and Figure 2-3). The beach state is not typical for a receding beach, but rather is more typical of a stable beach. By comparison, the southern end of Stockton Beach did experience a period of relative accretion as shown in Figure 2-4, however the dunes and beach were not as accreted as is
currently evident at Fort Wallace. Fort Wallace does not demonstrate a well-developed foredune and hind dune complex, and this is typical of receding beaches. However, this is equally likely to be due to the use of the site by the Australian Defence Force in the past (and which may have involved clearing for views from the “pillboxes” and other training activities), and then weed infestation, which has destabilised the natural dune hierarchy.

The height and width of the sand dunes on the Fort Wallace site actually represent a substantial store of sand. When the beach recedes into these dunes, the sand will be liberated and can supply the coastal system. The existing substantial stores of sand in the dunes at Fort Wallace in front of the proposed subdivision may assist to reduce the rate of future recession, but have not been taken into account when deriving the erosion hazard estimates. Modelling techniques available to determine future recession either due to historical influences (as in DHI, 2006); or due to sea level rise with the Bruun Rule (as calculated by DHI, 2011), are not currently able to include such sand reserves in their calculation. Indeed, a key argument for avoiding the construction of seawalls on Fort Wallace is because such structures actually lock away the sand reserves, and restrict the mobilisation of this sand into the coastal system, exacerbating erosion updrift.

The Bruun Rule (1962) that was used to estimate recession due to sea level rise is known to have significant limitations (for example, refer Ranasinghe et al, 2007). Any one of these limitations may present an error in the sea level rise recession extent used in this coastal hazard assessment. For example, recession calculated with the Bruun Rule (1962) is entirely dependent upon the offshore slope applied. If the bathymetric data is of poor quality or is analysed differently, then a difference in the calculated extent of recession could occur. While the NSW Government has supplied guidance on this matter, selecting the distance/depth offshore from which to measure this slope (called the depth of closure), is an ongoing source of argument and discussion within the coastal science community.

Lastly, Stockton Beach has been subject to many and ongoing investigations by the state and local government regarding methods to ameliorate the existing recession issue. The most recent such study was the Stockton Beach Sand Scoping and Funding Feasibility Study (WorleyParsons, 2011). The WorleyParsons (2011) report identified suitable sediment sources for use as beach nourishment on Stockton Beach. The report recommended: episodic trucking of sand from further north on Stockton Beach to the southern areas affected by recession; continued episodic use of dredged marine sand from Newcastle Harbour on the beach; lobbying of developments within the Port of Newcastle to access marine sand reserves that are liberated during site works; and, while it is currently not politically viable, the dredging and use of sand from offshore (i.e. > 30-40 m water depth) remains a technically and financially viable option.

Given the feasibility of beach nourishment activities described above, it is very possible that both small and large scale nourishment programs may commence on Stockton Beach well before the 2100 timeframe for coastal risks for which this development has been designed for. Such programs will invariably reduce the potential for erosion impacts to the Fort Wallace site.
3.3 Dune Stability and Reduced Foundation Capacity Hazard

3.3.1 Definition

Immediately following a storm erosion event, a near vertical erosion escarpment of substantial height can be left in the dune or beach ridge. At some time after the erosion event, the escarpment may slump, and the slope adjust to a more stable angle. This slumping may occur suddenly, and poses a risk to structures located immediately behind the dune escarpment.

The schema of Nielsen et al. (1992) is the accepted method for determining the zone behind a dune escarpment that remains unstable, as follows (see Figure 3-4):

- **Zone of Slope Adjustment**: the area landward of the vertical erosion escarpment crest that may be expected to collapse after the storm event; and

- **Zone of Reduced Foundation Capacity**: the area landward of the zone of slope adjustment that is unstable being in proximity to the storm erosion and dune slumping.

As shown in Figure 3-4, these zones are shaped as a wedge, and so, stable foundation can be reached below the zones. Developments in the immediate vicinity of beaches with the potential to be affected by the zone of reduced foundation capacity may require foundation piles that penetrate to the stable foundation zone (see Figure 3-5).

![Figure 3-4 Zones of instability after Storm Erosion (From Nielsen et al., 1992)](image_url)

![Figure 3-5 Using Foundation Piles to access the Stable Foundation Zone](image_url)
3.3.2 Calculation

For the purpose of applying the Nielsen et al. (1992) schema to beach-scale assessments, it is accepted to assume that the entire dunal system comprises homogeneous sand, which allows an angle of repose of 35° to be applied in the calculation. This is very likely to be a suitable assumption for Stockton Beach given the long geologic history of sand accumulation in Stockton Bight. However, expert geotechnical engineering assessment is required to properly establish the zone and foundation requirements on an individual development basis.

The width of the zone of reduced foundation capacity is also directly dependent upon the height of the dunes. This is problematic where calculations must be made for the presumed position of the erosion escarpment in 2100. The present day height of dunes/land in the region of the 2100 erosion hazard may not accurately represent the actual height of the dunes by that time. Activities including development for residential purposes, community uses, and even dune rehabilitation may lower or heighten the dunes over time.

To provide an indication of the potential zone of reduced foundation capacity behind the 2100 erosion hazard zones, the existing topographic information for dune height has had to be used. Table 3-9 provides the average, maximum and minimum height of dunes along each of the erosion hazard lines fronting the masterplan lot boundary. These dune values have been used to calculate the average and range for the zone of slope adjustment plus zone of reduced foundation capacity that may exist landward of the erosion hazard lines.

<table>
<thead>
<tr>
<th>Erosion Scenario</th>
<th>Dune Height</th>
<th>Dune Height (m AHD)</th>
<th>Zone of Slope Adjustment (m)</th>
<th>Zone of Reduced Foundation Capacity (m)</th>
<th>Total zone of instability (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Almost certain’ erosion hazard</td>
<td>Average</td>
<td>10.5</td>
<td>6.1</td>
<td>18.6</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>19</td>
<td>12.1</td>
<td>30.7</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>6</td>
<td>2.9</td>
<td>12.1</td>
<td>15</td>
</tr>
<tr>
<td>‘Likely’ erosion hazard</td>
<td>Average</td>
<td>10.5</td>
<td>6.1</td>
<td>18.6</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>18</td>
<td>11.4</td>
<td>29.3</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>6</td>
<td>2.9</td>
<td>12.1</td>
<td>15</td>
</tr>
<tr>
<td>‘Unlikely’ erosion hazard</td>
<td>Average</td>
<td>8.5</td>
<td>4.6</td>
<td>15.7</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>15.5</td>
<td>9.6</td>
<td>25.7</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>4</td>
<td>1.4</td>
<td>9.3</td>
<td>11</td>
</tr>
</tbody>
</table>

1 Dune Heights were calculated along the erosion hazard line fronting the Masterplan Lot Boundary footprint (unless otherwise stated), to best represent conditions at the proposed developments.
2 Calculated as per Nielsen et al 1992, in Figure 3-4.
3 Values rounded to nearest m, to reflect uncertainty and assumptions that affect accuracy of calculation.
4 Average dune height fronting the 7 cluster homes only at southern end is also 10 m
The zone of reduced foundation capacity has not been mapped, because, in addition to these zones being based on present day, not future dune heights, the dunes themselves vary considerably in height.

The assessment of risk has considered the distance of proposed buildings in the masterplan layout from the erosion hazard lines, to determine where properties may potentially be at risk of dune instability, should erosion progress to the estimated level by 2100.

### 3.3.3 Potential Impacts

The zone of reduced foundation capacity that may be present by 2100 has not been mapped, to avoid presenting a false certainty to these calculations that are derived for a somewhat unknown future scenario.

Should the erosion escarpment reach a hazard scenario line and dune heights remain at their current level by 2100, the zone of slope adjustment and reduced foundation capacity:

- may average 25 m and range from 15 to 43 m width landward of the 2100 ‘almost certain’ erosion hazard scenario;
- may average 25 m and range from 15 to 41 m width landward of the 2100 ‘likely’ erosion hazard scenario; and
- may average 20 m and range from 11 to 35 m width landward of the ‘unlikely’ erosion hazard scenario.

If erosion were to reach the hazard scenario lines, structures present within these zone widths may be subject to reduced foundation capacity and structural instability.

### 3.4 Wave Overtopping

#### 3.4.1 Definition

The coastal inundation hazard comprises:

- Elevated ocean water levels, comprising the addition of astronomical tide, barometric pressure set up, wind set up, and wave set up at the shoreline, which may inundate rivers, creeks, lagoons etc. hydraulically connected to the ocean; and
- Wave run up and overtopping of the shoreline, where waves overwash coastal barriers such as dunes and seawalls.

Wave overtopping is the inundation hazard of interest to this assessment, to determine the potential for the overtopping of frontal dunes during storms. The actual height of wave run up does not present a hazard unless the run-up is overtopping coastal barriers at a rate or volume that would cause a significant impact to pedestrians or land and assets behind.

There are no hydraulic connections to the ocean whereby oceanic waters may penetrate to inundate low lying areas on the Fort Wallace site, and so coastal inundation from elevated ocean water levels alone (and which are lower than the wave run up level) were not considered further.
Sea level rise will contribute to elevated ocean water levels and wave run up in the future, and is therefore included in the wave overtopping assessment for 2100.

### 3.4.2 Calculations

For a coastal protection structure, including a natural dune barrier, wave run-up and subsequent overtopping depends, amongst other things, on:

- hydraulic parameters such as: ocean water level, wave height, wave period, wave direction, water depth; and
- structural parameters such as: the seawall roughness and porosity (random rock armour or smooth concrete surface); slope (sloping, composite, vertical, stepped); and crest levels. Dune sand barriers are considered equivalent to smooth concrete surfaces.

#### Run-up on a Sandy Beach

The 2% run-up level ($R_{2\%}$) has been derived based on the findings of Nielsen and Hanslow (1991), who indicate:

$$R_{2\%} = 0.58 \times \tan \beta \times \sqrt{H_{0\text{RMS}}} \times L_{0\text{TX}} \times \sqrt{\ln(50)}$$

Where:
- $\beta$ = slope of the beach face (assumed to be 0.10);
- $H_{0\text{RMS}}$ = deepwater RMS wave height $\approx H_s/\sqrt{2}$;
- $L_{0\text{TX}}$ = deepwater wavelength corresponding to zero crossing wave period;
- $x$ = exceedence level

The run-up level derived from the above equation is added to the still water level (i.e. the addition of tide, water level anomaly caused by barometric pressure set up and wind set up, plus wave set up), plus sea level rise for 2100 of 0.0 m (almost certain); 0.4 m (likely); and 0.9 m (unlikely).

Wave run up levels for the 2100 are listed in Table 3-10.

<table>
<thead>
<tr>
<th>Stockton Beach</th>
<th>2100 Wave Run Up Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain (no SLR)</td>
<td>5.4 m</td>
</tr>
<tr>
<td>Likely (0.4 m SLR)</td>
<td>5.8 m</td>
</tr>
<tr>
<td>Unlikely (0.9 m)</td>
<td>6.3 m</td>
</tr>
</tbody>
</table>

#### Overtopping Rate for a Rock Armoured or Stepped Slope

The present standard for engineering calculation of wave overtopping of various structures is provided by *EurOtop Wave Overtopping of Sea Defences and Related Structures: Assessment Manual* (Pullen et al., 2007) (*the Eurotop Manual*).
The mean overtopping discharge is calculated from the relationship provided in Chapter 6 of the Eurotop manual (Pullen et al., 2007).

\[ q = 0.2 \times e^{2.3 \times \frac{R_c}{H_m^0 \times f_f \times f_\beta}} \times \sqrt{g \times H_m^0} \]

Where 
\( q \) = mean overtopping discharge rate (l/s); 
\( H_m^0 \) = Depth limited spectral significant wave height (m) 
\( R_c \) = distance of freeboard crest above still water level (m) 
\( f_f \) = factor for effect of roughness elements (set to 0.60); 
\( f_\beta \) = factor for effect of roughness elements (set to 1.00, assuming orthogonal wave approach).

The following values were applied in these equations:
- 100 year ARI 6 hour duration wave height (Hs) of 8.7 m;
- 100 year ARI elevated ocean water level of 1.44 m AHD;
- Dune crest height, as measured along the position of the 2100 erosion hazard scenarios (as per Section 3.3.2 also);
- Wave set up calculated from spectral wave modelling (SWAN) at Stockton Beach (using model results from other studies completed by BMT WBM in the Newcastle region, i.e. BMT WBM 2014); and
- Sea level rise of 0.0 m (almost certain); 0.4 m (likely); and 0.9 m (unlikely);
- A nearshore slope out to the 20 m depth contour calculated as -0.008, used in the transformation of waves from offshore to shore.
- The depth limited spectral significant wave height (\( H_m^0 \)), which describes the transformation of waves through the breaker zone, was calculated using a graphical method utilising charts derived from the findings of Van der Meer (1990), as recommended in the Eurotop manual; and
- Roughness elements of 1, as natural dune barriers are assumed to behave like smooth concrete for the purpose of the wave overtopping calculation.

<table>
<thead>
<tr>
<th>Erosion Scenario</th>
<th>Dune Height (m AHD)</th>
<th>Wave Run Up</th>
<th>Overtopping Rate (l/m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>’Almost certain’ erosion hazard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>10.5</td>
<td>5.4 m</td>
<td>0.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>19</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>6</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>’Likely’ erosion hazard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>10.5</td>
<td>5.8 m</td>
<td>0.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>18</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>6</td>
<td></td>
<td>18.5</td>
</tr>
</tbody>
</table>
## 3.4.3 Potential Impacts

The average dune heights currently present along each of the 2100 erosion hazard lines are of sufficient height to protect the proposed development from wave overtopping. For the minimum dune height measured along the ‘likely’ and ‘unlikely’ hazard lines, there is potential for wave overtopping, should the dunes be eroded to these hazard lines in the future.

Wave overtopping rates in Table 3-11 have been compared to the guideline overtopping rates given in the Eurotop Manual in Table 3-12. For the minimum dune heights, wave overtopping rates may potentially damage structures and pose a risk to pedestrians or vehicles, should they be located on or immediately adjacent to the dune crest at the time that such overtopping occurs. Given the site is dominantly composed of sand, it can be expected that wave overtopping will be quickly absorbed into the porous sand, rather than continue to flow further landward to create an inundation issue on the site.

Based on the above, and the limited extent of low-lying dunes, the potential for overtopping to cause adverse impact to the proposed development is considered very low. Furthermore, continued maintenance of dune heights at or above 6 m AHD over time, which can generally be achieved through maintenance of appropriate vegetation, will adequately mitigate the potential for overtopping during extreme storm conditions in future.
3.5 **Sand Drift**

Windborne or Aeolian sediment transport allows the transfer of sand from the sub-aerial beach into the dunes behind. This sand drift is a natural phenomenon, however it can pose a hazard where coastal developments are being overwhelmed by windborne sediment, or significant volumes of sediment are being lost from the active beach system. For example, windblown sand can bury roads, stormwater drains and property located immediately behind an active or poorly vegetated dune system. Sand drift posing a hazard can be initiated by the degeneration or destruction of dune vegetation.

Dune vegetation plays an important role in minimising the detrimental effects of sand drift by acting to trap windblown sand, helping to build up the dune and keep the sand within the active beach system. In fact, the adequate maintenance of dune vegetation also assists to ameliorate other coastal hazards. Dune systems act as reservoirs to supply sand to the active beach during periods of erosion. If sand is lost inland through windborne transport, the volume of sand available to supply the erosion demand is less and therefore the erosion extent will be greater. Similarly, properly functioning dunal vegetation complexes also assist to ameliorate coastal inundation, as the capture of windblown sand helps to build dunes to greater heights, reducing the potential for wave overtopping.

Windborne transport of sand can be an important component of the coastal sediment transport system. This is particularly the case on Stockton Beach north of the Fort Wallace site. The Stockton Bight beach system extends some 32 kilometres to the north east. Aeolian processes are significant within this highly active and vast transgressive dune system. The lack of dune vegetation within this dunal system is highly important for allowing the transgression of sand along Stockton Beach towards Birubi Point and beyond. In this case, a significant portion of the natural northerly sand transport is via the land-based portion of the coastal system. As such, it is vital that this vast active system is and should remain naturally unvegetated.

As noted in Section 2.1.2 (see Figure 2-1), dune vegetation at the Fort Wallace site is present but is patchy and infested with weeds such as Bitou Bush. The patches of bare sand between hummocks created by Bitou Bush would allow for nuisance sand drift into areas behind the beach.

The persistence of dune vegetation here in spite of known pressures such as erosion and weeds suggests that the Fort Wallace site would naturally have good dune vegetation coverage. In this case, the remediation and then ongoing maintenance of adequate native dune vegetation on the Fort Wallace site seaward of the proposed development is recommended. Ongoing maintenance of dune vegetation will also assist to manage other coastal hazards such as erosion and wave overtopping also.
4 Risk Mitigation

4.1 Summary of Potential Coastal Risks by 2100

Based upon the coastal hazard assessment detailed in Chapter 3, the following potential coastal impacts to the Fort Wallace Planning Proposal by 2100 are identified.

- Coastal erosion poses a risk to residential zones proposed seaward of the 2100 ‘unlikely’ coastal erosion hazard scenario, as shown in Figure 3-2.
- Should erosion reach the coastal erosion hazard scenarios by 2100, there may be a zone of reduced foundation capacity immediately landward of the erosion escarpment that will affect structures at that time.
- Should erosion reach the coastal erosion hazard scenarios by 2100, wave overtopping of the coastal dune barrier is not expected to pose a hazard, except at a small portion of low lying dune.
- If dune vegetation is not adequate or maintained seaward of the proposed development, sand drift may pose a hazard.

4.2 Risk Mitigation Measures

4.2.1 Dune Rehabilitation and Maintenance

A program of dune rehabilitation and ongoing maintenance on the Fort Wallace site is highly recommended. All of the identified potential coastal risks to the Fort Wallace site may be ameliorated (to a lesser or greater degree) by the rehabilitation and ongoing maintenance of the dunes on the site. This should include weed removal, replanting with appropriate endemic native species, re-contouring and dune fencing, and ongoing maintenance of the dunes into the future.

The maintenance of dune vegetation at the site reduces the following risks.

- Dune vegetation can capture and retain sand, which acts as a buffer to short term erosion events. It needs to be accepted, however, that dune vegetation will be eroded by storm events from time to time. Ongoing maintenance will assist the dunes to recover and naturally regenerate after storms.
- By capturing sand, dune vegetation aids the growth in height of dunes, which in turn reduces the potential for wave overtopping and overwash into areas behind. Ideally, the foredune height should be maintained at or above 6 m AHD, however properly functioning dunes tend to reach 5 m above the adjacent beach alone. A height of 5 m AHD will protect from wave overtopping during the majority of storm incidences.
- The capturing of sand within dune vegetation also reduces the potential for sand to drift into developed areas behind the beach.
4.2.2 Coastal Erosion

4.2.2.1 Residential Zones

Coastal erosion risk was assessed for the Fort Wallace Planning Proposal for the 2100 timeframe. The conservative (i.e. ‘unlikely’) erosion hazard scenario by 2100 is applied to subdivision proposals in NSW, because the change in land use is expected to remain for more than 100 years (and probably in perpetuity).

At the subdivision stage, the best approach to managing potential erosion is to avoid the risk by siting proposed developments landward of the conservative 2100 ‘unlikely’ erosion hazard. This is the approach that has been used for the majority of the proposed residential zones in the Fort Wallace Planning Proposal. Roads and services associated with residential development should also be avoided within erosion risk areas, unless alternative access can be provided in the future.

It is recommended that all remaining residential zoned land be kept landward of the ‘likely’ erosion hazard zone. Residential land within this zone was assessed to be at medium risk of erosion by 2100 (see Section 3.2.3.4). Generally a medium risk can be tolerated, however, it is recommended that at the development stage, further development controls be undertaken to reduce the risk to residential structures to a low and acceptable level. Such controls are recommended to be included in a development control plan (DCP) or similar for the subdivision.

A review of controls that may be implemented via a DCP for individual developments within the medium risk residential zone is provided in Table 4-1. Based upon this review, the following controls are recommended, for example as “acceptable solutions” in a DCP or similar.

- Siting of buildings landward of the 2100 ‘unlikely’ erosion hazard, in the first instance;
- Where this is not possible, siting of buildings landward of the 2100 ‘likely’ erosion hazard, plus development approval on the condition that if and when an erosion trigger is reached (e.g. when the width of sand seaward of the property ≤ 20 m), the structural stability of the property will be assessed. If found to be unstable, then either:
  - the property is removed or relocated landward into the stable foundation zone;
  - Beach nourishment is undertaken to restore sand reserves fronting the property; and / or
  - Piles are installed below the property into the stable foundation zone.

Implementation of revetment structures to protect at risk properties in the future is strongly discouraged at Fort Wallace. This is particularly because Stockton Beach is known to be experiencing ongoing recession, and so, revetment structures will be exposed and denuded of sand, with no beach amenity in front or adjacent to the structures. This outcome is already evident at the seawall along Mitchell Street and Stockton Beach (see Figure 2-5).
### Table 4-1  Risk Mitigation Options for Residential Development within Erosion Risk Areas

<table>
<thead>
<tr>
<th>Option, Ball-park cost</th>
<th>Positives</th>
<th>Negatives</th>
<th>Recommendation for use at Fort Wallace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building footprint sited landward of erosion risk area</td>
<td>Avoids the erosion risk. Allows development to proceed without further controls.</td>
<td>May reduce the property yield sought by the developer.</td>
<td>Yes, recommended, wherever possible for residential zones</td>
</tr>
<tr>
<td>Event-based (conditional) Development Approval.</td>
<td>Allows land to be developed and used prior to the occurrence of the erosion risk some 50-100 years in the future. Local councils are also able to issue removal orders for properties found to be at imminent risk, without the prior need for a conditional approval.</td>
<td>May be difficult to sell properties with a conditional approval.</td>
<td>Yes, recommended, for the buildings that cannot be sited landward of the 2100 'unlikely' hazard zone.</td>
</tr>
<tr>
<td>Beach nourishment</td>
<td>Retains the shoreline in its current position, to maintain the buildings and assets behind the shoreline. Retains a sandy beach for the community. In the case of Fort Wallace, beach nourishment would not be recommended to occur now, but be required to be implemented in the future when a specific erosion trigger is reached, or an assessment of the property(s) identifies that nourishment is required to restore structural stability.</td>
<td>Very expensive, due to costs from onshore sand mines plus transport and site costs. Suitable sand sources at Stockton were identified by WorleyParsons (2011), and may include trucking of sand from further north down to beach sections under threat. At present, the NSW government does not permit mining of sand from offshore sources, however suitable sand does exist offshore of Stockton Beach.</td>
<td>Yes, recommended, for the buildings that cannot be sited landward of the 2100 'unlikely' hazard zone.</td>
</tr>
</tbody>
</table>

Note: The use of dredged marine sand from Newcastle Harbour on Stockton Beach is not technically "nourishment", but re-use of sand from the existing coastal system.
### Risk Mitigation

<table>
<thead>
<tr>
<th>Option, Ball-park cost</th>
<th>Positives</th>
<th>Negatives</th>
<th>Recommendation for use at Fort Wallace</th>
</tr>
</thead>
</table>
| **Foundation piles to stable ground.**  
Installation of deep foundation piles into the ‘stable foundation zone’.  
Cost: ~ $300/m³ concrete piles, unknown depth or quantity per structure | Provides stability to the property during an erosion event that reaches or exceeds the building footprint.  
Provides stability to a property located behind an erosion escarpment within the zone of slope adjustment or reduced foundation capacity. | Very expensive outlay, particularly given the long timeframes for the expected erosion impact at Stockton. | **Yes, recommended** for development types expected to have a design life of 80 years or greater (i.e. beyond 2100); and as a future option for buildings that cannot be sited landward of the 2100 ‘unlikely’ hazard zone. |

![Diagram showing zones of slope adjustment, reduced foundation capacity, and stable foundation zone.](image-url)
## Risk Mitigation

<table>
<thead>
<tr>
<th>Option, Ball-park cost</th>
<th>Positives</th>
<th>Negatives</th>
<th>Recommendation for use at Fort Wallace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock revetment (seawall)</td>
<td>Retains the shoreline in its current position, to maintain the buildings and assets behind the shoreline. <em>In the case of Fort Wallace, the seawall would not be constructed now, but be required to be implemented in the future when a specific erosion trigger is reached, or an assessment of the property(s) identifies that a revetment is required to restore structural stability.</em></td>
<td>On receding beaches such as Stockton, the seawall results in a loss of beach and beach amenity in front of the structure (see picture below of Mitchell St seawall). Erosion at the ends of the structure also occurs. Revetments can &quot;lock away&quot; sand reserves that would otherwise be eroded and supply the coastal system. This is particularly so at Fort Wallace given the volume of sand within the existing dunes. Under existing coastal legislation, amelioration of offsite impacts such as erosion in front and at the ends of the structure is required. This typically means ongoing beach nourishment, additional to the cost and maintenance of the seawall structure alone. Given that property owners at Fort Wallace would be the sole beneficiary of the revetment, existing coastal legislation allows the entire cost burden (construction, maintenance and remediation works) to be placed upon these property owners.</td>
<td><strong>No, not recommended</strong>, due to the existing recession hazard at Stockton Beach, that would place an unreasonable financial burden on future property owners to build and maintain the structure, including beach nourishment</td>
</tr>
</tbody>
</table>
4.2.2 Other Land Zones

Potential erosion impacts on other proposed land zones by 2100 can be accepted, as follows.

- The eastern most section of access road to residential properties found to be at low risk (see Figure 1) can be considered sacrificial, because access to the residential land is also possible via an alternate route.
- Open space areas shown to be at risk from erosion may also be considered sacrificial, as they typically remain functional even where reduced in size, and tend not to contain infrastructure of high financial value.

4.2.2.3 Heritage Assets

A number of heritage assets that already exist on the site are likely to be affected by coastal hazards prior to 2100 (see Figure 3-2). The historical structures are not intended for use as habitable dwellings. It is recommended that the heritage assets on site be utilised and enjoyed until such time as impacts are imminent, which is likely to be many years away. As and when coastal erosion risks threaten the structures, appropriate measures to manage the risks can be investigated and implemented, for example, as follows in order of preference:

1. **Relocation:** whereby the structure(s) is physically relocated seaward to avoid the erosion risks. This is the preferred option as it enables the heritage asset to be retained, and the beach amenity to be retained because the beach and dune are able naturally progress landward over time.

2. **Sacrifice:** whereby the structure(s) are removed prior to them becoming a public safety hazard in respect of erosion impacts. This option is recommended second, as it will allow for the beach and dune to migrate landward, maintaining the beach environment, but the heritage item is lost.

3. **Beach nourishment:** whereby sand is placed along the beach in front of the structure. This option is the third preferred option. Beach nourishment does allow for both the heritage assets and beach amenity to be retained. However it is very costly (at present), and must be continually repeated for the beach and structure to be retained.

Protection works to defend the existing heritage structures are strongly discouraged. Protection structures have significant negative impacts on the beach environment, and also require substantial funds to build and maintain (see Table 4-1).

4.2.3 Reduced Foundation Capacity

In view of the long timeframes and the high level of uncertainty regarding the occurrence and width of the zone of reduced foundation capacity by 2100, it is recommended that the proposed rezoning proceed at the current time. Future development applications for structures should to consider the expected lifespan of the structure, and require foundation piles to mitigate the foundation capacity risk as appropriate. For example, structures with an expected lifespan of 40-50 years sited landward of the ‘unlikely’ erosion hazard would not be expected to be subject to reduced foundation capacity risks over this lifespan, and so, foundation piles would not be required.
5 References


PWD (1985), *Stockton Beach Coastal Engineering Advice*, prepared by the NSW Public Works Department, December 1985.


References


Executive Summary (General Publication)

Defence Housing Australia (DHA) purchased from the Department of Defence the Fort Wallace and Stockton Rifle Range sites to facilitate the development of the properties for residential use by Australian Defence Force personnel and private individuals. It is proposed to rezone the project area (comprising Lots 100 and 101 DP1152115) from the current Infrastructure (SP2 Defence) to Low Density Residential and E3 Environmental Management under the Newcastle Local Environmental Plan (LEP) 2012 to allow for the residential subdivision. Should the rezoning be approved, subsequent residential development of the project area will be subject to approval in accordance with the provisions of the Environmental Protection and Assessment Act 1979 (EP&A Act).

DHA has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle-based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. The proposed Master Plan is prepared to demonstrate how the site could appropriately facilitate a residential development and includes a mix of residential typologies primarily placed within the former Fort Wallace clearance footprint. The Master Plan has sought to retain the Fort Wallace landscape and focus development within the previously disturbed areas of the site.

Umwelt (Australia) Pty Limited (Umwelt) has been commissioned by DHA to prepare an Aboriginal Cultural Heritage and Archaeological Assessment to inform the rezoning application and any subsequent proposals under the EP&A Act. In accordance with the wishes of the registered Aboriginal parties, the full assessment report is not provided to the general public but the outcomes are summarised in this document to ensure important cultural information is managed appropriately.

Aboriginal party consultation was conducted in accordance with the Office of Environment and Heritage’s Aboriginal Cultural Heritage Consultation Requirements for Proponents (Office of Environment and Heritage 2010). Five Aboriginal organisations registered for consultation for the Project. These parties have been consulted regarding the assessment strategy and draft assessment report and four groups who registered early in the process were invited to participate in a field survey for the Project.

The proposed development area is located within the Fern Bay Site complex (38-4-0895) and a further ten sites (Aboriginal Resource and Gathering, artefact scatters and burials) are located within the Fort Wallace property boundary outside of areas of proposed impact. The Fern Bay Complex site consists of middens, artefact scatters and isolated finds. The site card noted traditional knowledge records the presence of ceremonial sites and traditional burials within the site area. On this basis, it was predicted that further artefacts and shell are likely to be present within the project area. The extent of historical disturbance associated with the establishment and ongoing use of the Fort has impacted much of the project area and is likely to have also impacted any sub-surface deposits that may be present within the disturbed areas. However, outside the disturbance footprint (that is, where sub-surface disturbance does not extend to the depth of deposits), it is possible that intact or partially intact deposits may be present.

A field survey was conducted on the 21 September 2016 of the areas of pedestrian accessibility. In the southern portion of the site many of the previously recorded sites were inaccessible due to dense vegetation. Five new sites were recorded. Areas of archaeological potential were identified within the less disturbed areas of the site adjoining the parade ground and the western dune parallel to Fullerton Street. These areas of archaeological potential were identified due to the presence of the newly identified sites and the archaeological pattern for the areas which indicates the potential for archaeological deposits within the dune profiles in areas of low previous disturbance. The central portion of the site has been subject to substantial disturbance as a result of the construction of the Fort and as a result lacks archaeological potential.
Registered Aboriginal parties also identified a burial site (referred to as the Burial Hill) as an area of cultural sensitivity and specified that no impacts should occur in this area.

The recommendations presented below were provided by registered Aboriginal party representatives participating in the survey.

- Undertake inspection of areas where buildings currently stand after their removal and salvage any artefacts found.
- The Burial Hill should be well marked and demarcated as a no go zone so there is no access (machinery or foot traffic) during any works.
- Excavation of test pits across entire impact footprint with focus on the western dune which has been identified as a midden.

The following recommendations have been developed in light of the archaeological context of the region, the findings of the survey, the archaeological assessment of the project area, the cultural assessment of the area by Aboriginal parties; the potential impacts of the project and current cultural heritage legislation.

- DHA should ensure that its employees and contractors are aware that it is an offence under Section 86 of the NPW Act to harm or desecrate an Aboriginal object unless that harm or desecration is the subject of an Aboriginal Heritage Impact Permit (AHIP).
- The project area is suitable for rezoning for an Aboriginal cultural heritage and archaeological perspective, provided that any subsequent proposal for redevelopment of the project area is undertaken in accordance with the recommendations of the Aboriginal cultural heritage assessment.
- DHA should apply to the Director-General of OEH for an AHIP in accordance with Section 90 of the NPW Act, with this AHIP to cover the entirety of the impact area on the finalised master plan. The need to cover the entirety of the impact area is in recognition that archaeological material has been identified and/or predicted throughout the project area as a result of the movement and redistribution of the former dunes throughout the site. The AHIP should include provision for surface collection across the entirety of the project area (where Aboriginal objects are identified) and for the completion of sub-surface investigations where the project will involve impacts within the areas of low to moderate and moderate archaeological potential. All salvage works should be conducted in accordance with the methodology specified in the assessment and will be subject to ongoing consultation with the registered Aboriginal parties as part of the AHIP application process.
- Should the proposed impacts change such that it is proposed to impact in the immediate vicinity of the areas of previously recorded sites to the south of the current proposed impacts or the active seaward dune further survey and the provision of additional recommendations would be required.
- The AHIP should specifically exclude impacts to recorded burial sites. In the event that suspected human skeletal material is identified within the other portions of the project area, all works should cease immediately and the NSW Police Department, OEH and the registered Aboriginal parties should be contacted so that appropriate management strategies can be identified.
URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:


1 – Draft report issued 07.10.2016

Report Number                5 – Amended report issued 31.10.2017
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EXECUTIVE SUMMARY

Urbis has been engaged by Defence Housing Australia (hereafter DHA) to prepare the following Heritage Impact Statement to assess the heritage impact of a planning proposal for Fort Wallace, Stockton.

Fort Wallace is listed on the Commonwealth Heritage List (ID 105335), the Department of Defence Heritage Register and the non-statutory Register of the National Estate (ID 18957).

This heritage assessment is part of a suite of specialist assessments of the site that have informed consideration of the site’s potential for redevelopment. Separate indigenous heritage and archaeology reports have been prepared for the site, provided as part of the planning proposal package. These assessments have been used as the basis of master plan options and the development of a recommended master plan, which has subsequently informed proposed revised planning controls for the site with respect to land use and height of buildings.

It is intended that a planning proposal will be lodged with Newcastle City Council, seeking support of the strategic merit of the proposal to proceed to a Gateway Determination by the Department of Planning and Environment (DPE). It is intended that the planning proposal, if supported by both Council and DPE, would then proceed to public exhibition and finalisation through an amendment to the LEP. Key outcomes of the master plan are intended to be established in a Stage 1 DA or adopted master plan. Where relevant to heritage impact, development principles for the DCP have been set out in this report. Appropriate approvals will then be sought for the subdivision and development of the site under the amended planning controls.

The master plan has been used as a demonstration of how the site could appropriately accommodate residential uses in response to best practice urban design and planning principles. Where appropriate, this report has considered the likely impacts of the master plan on the heritage of the site to enable as detailed an assessment as possible. However, it is acknowledged that further detailed work will be undertaken and consideration given to potential heritage impacts at subdivision and detailed design stage.

A set of planning proposal aims and principles have been set down by Architectus which will be submitted with the planning proposal. The principles would ensure the retention of the heritage values of the place in terms of views and setting. Specifically, the principles stipulate that a development buffer should be retained around the significant heritage items not located within the ‘heritage park’ and that key views from significant areas should be identified and conserved (refer section 1.3.1 for full principles).

In summary, the planning proposal is supported as it would facilitate the ongoing use and maintenance of the site, including its significant heritage features. The following key observations have been summarised from the full assessment set out in Section 5 of this report in relation to the planning proposal:

- **It is proposed to conserve the coastal ridge top, the highly significant items on the coastal ridge top and the beach in the eastern portion of the site as these areas will be zoned for Environmental Management. The planning proposal facilitates minimal development in a highly significant area and would conserve the seaward outlook from significant heritage items including the gun emplacements.**

- **The Environmental Management zone would encompass the heritage items atop the escarpment as well as the Plotting Room and the Administration Building. Any future residential development on the site which is confined to the areas proposed for low density residential would therefore maintain an appropriate setback from the significant items and facilitate ongoing understanding of the original setting of the items and the relationship between them.**

- **The principles of the site specific DCP stipulate implementation of development buffers around the highly significant heritage items which are located within the residential zoned area. These include the Admin Building and the Plotting Room. This would ensure that the curtilage of these items is appropriately respected and appreciation of them is facilitated. It is intended that development buffers would be mapped in a site specific DCP to ensure an appropriate separation between development and heritage item.**

- **The DCP will also formally identify key views and provide guidance on retention of these views. As such, the planning proposal would ensure that identified significant views including those east to the ocean and that west from the observation tower to the river would be formally recognised and maintained.**
• The residential development of part of the site would generate pedestrian traffic around the heritage items in the vicinity which would encourage appreciation and continued maintenance of the items. It would also facilitate casual surveillance of the items which are currently subject to repeated vandalism despite measures taken by the owners to prevent this.

• The 1994 CMP generally recommends that appropriate height on the site is 2-3 storeys which is lower than that facilitated by the planning proposal. However, the following should be considered in regards to the type of development that could be facilitated by the planning proposal:
  o Larger buildings are not unprecedented on the site. The 1974 barracks building which has since been removed in the southern portion of the site was of three storeys and had an additional pitched roof form (refer Figure 6). This building was distinctive as part of a later phase of development, as the development facilitated by the planning proposal would be;
  o The CMP document was prepared when there was no clear view as to what kind of development would characterise the future of the site. It is appreciated that to achieve a meaningful development on the site that a degree of density on the site is required;
  o The larger allowable height facilitates some higher density elements which are required as the site has a number of environmental constraints, lessening the amount of developable land. They would also allow a greater curtilage around the heritage items on the ground plane;
  o The CMP references maintaining key views as a key objective of the stated appropriate height and notes that increase in the height may be appropriate. As an outcome of detailed site testing, it is considered that the stated objective can be achieved without limiting the height to 2-3 storeys; and
  o Development to 14m on the entrance knoll would be subject to the principles of a site specific DCP which would stipulate the maintenance of key views from the site.

It is recognised that there is an opportunity to formally recognise the significance of the site through listing as a local item on the LEP despite the existing Commonwealth listing of the place. After consultation with council it is proposed to apply a local heritage listing to four items on the site (item 696 – item 699). It is also proposed to define the Gunnar Hoban Memorial Tree as a landscape item (100) and the entire site as an Archaeological item (A21). This will ensure that the protection of the place is facilitated if parts of the place are divested in the future.

A preliminary assessment of the indicative master plan has been set out in Section 5.2.3. This assessment serves to demonstrate how the application of development facilitated by the planning proposal could be sympathetic to the heritage significance of the place. It is considered that the indicative master plan conserves the heritage significance of the site, maintaining the highly significant elements in terms of their fabric and setting. Future development of the indicative master plan is supported from a heritage perspective.

The following recommendations have been set down to guide the design development of the proposed master plan as part of a future stage of works:

• Further consideration must be given to the options for adaptive reuse of the Admin Building, Observation Tower and Plotting Room. There is an option to retain the buildings as landscape items only with no internal access; however genuine adaptive reuse of appropriate elements will ensure that the structures are maintained to the highest level;
• If any items are proposed to be maintained as remnant evidence only, with no assigned adaptive reuse, they should be properly managed to ensure that public safety requirements are met; and
• It is recommended that as part of any future application for development on the site, a Base Heritage Interpretation Strategy and full Heritage Interpretation Plan including fabrication and execution should be prepared. These documents should be prepared in consultation with Council and local historical societies.
1. INTRODUCTION

1.1. BACKGROUND

Urbis has been engaged by Defence Housing Australia (hereafter DHA) to prepare the following Heritage Impact Statement to accompany a planning proposal for Fort Wallace, Stockton.

As part of a consultant team appointed to develop a master plan for the subject site, Urbis has provided ongoing heritage advice to DHA including an initial Opportunities and Constraints Analysis, and a summary working report assessing the developing concept master plan design.

The site subject comprises a number of significant built heritage items and is listed on the Commonwealth Heritage List (ID 105335), the Department of Defence Heritage Register and the non-statutory Register of the National Estate (ID 18957). As such, this report considers the impact of the planning proposal on the heritage significance of the site. It also generally considers the heritage impact of the concept master plan as an example of the development that could be facilitated by the planning proposal.

1.2. SITE LOCATION

The entire site which is located at 338 Fullerton Street, Stockton (Figure 1) borders Stockton Beach to the east. The heritage listed curtilage comprises the entire site. Fort Wallace and Stockton Rifle Range located to the north in Port Stephens LGA were transferred to DHA ownership in 2015 as the sites were no longer required for defence purposes. The planning proposal for Stockton Rifle Range is not assessed in this report.

Figure 1 – Map indicating the location of the subject site (Fort Wallace) and Stockton Rifle Range to the north.

1.3. METHODOLOGY

This Heritage Impact Statement has been prepared in accordance with the NSW Heritage Branch guideline ‘Assessing Heritage Significance’ (2001). The philosophy and process adopted is that guided by the Australia ICOMOS Burra Charter 1999 (revised 2013).
Stockton Rifle Range is located to the north of Fort Wallace and is also planned for redevelopment. The heritage impact of the redevelopment of the Rifle Range will be addressed in a separate assessment. For the purposes of this report the “subject site” refers only to Fort Wallace.

The history of the Fort Wallace site has been previously addressed in detail in the Fort Wallace Heritage Management Strategy prepared by Godden Mackay Logan May 2008. As such, the historical overview set out in Section 3 of this report has been sourced from that document. A full review of any newly available historic information will be undertaken as part of the future required updates of the Heritage Management Strategy and the Conservation Management Plan.

All constraints related to Aboriginal Archaeological are addressed under separate in document prepared by Umwelt.

1.3.1. The Proposal
Planning Proposal

This report provides an assessment of the heritage impact of the planning proposal for the land known as Fort Wallace, located at 338 Fullerton Street, Stockton.

The application proposes to amend the land use zoning and height of buildings control that relates to the site. It proposes that the whole site be listed as an item – Archaeological (A21), the Gunnar Hoban Memorial Tree be listed as an item – Landscape (I100) and that the following items are individually listed as heritage items:

- I696
- I697
- I698
- I699

Sections of the western portion of the site are proposed to be zoned R2-Low Density Residential. A small section is proposed to be zoned RE2 – Private Recreation and the remainder of the site including the highly significant items surmounting the escarpment would be zoned E3 – Environmental Management.

The proposed maximum building height across the majority of the site is 8.5m. However two small areas near the centre of the site are proposed to be zoned 11m and 14m.

The planning proposal has been assessed herein against the relevant policies in the Heritage Management Strategy (HMS) for the site prepared by GML in 2008 and the existing CMP for the subject site prepared in 1994 by Suters Architects Snell.

This report has been written in reference to the proposed LEP Height of Buildings Map and the proposed LEP Land Zoning Map prepared by Architectus and received by Urbis in October 2017.

Intended DCP Aims and Principles

In addition to the planning proposal maps, Architectus has set out the intended aims and principles of the site specific DCP which will accompany the planning proposal. The intended aim pertinent to this report is number 3. Ensure that development of the site is sensitive to the heritage and ecological significance of the site.

The intended principles of the DCP which are pertinent to this report are set out below. Refer to the document prepared by Architectus for a full list of the intended aims and principles of the site specific DCP.

- Key views, including those from the observation tower to the west towards the river and to the east to the ocean; views between the observation tower and the gun emplacements; and views from within public spaces on the site to the observation tower. These views would be mapped and a key objective of the control would be to maintain these views with no obstruction from development.

- The relationship of development and heritage items. An appropriate development curtilage would be defined to ensure that new development respects the heritage significance of the site. A map of key heritage and archaeological items will be included in the DCP and development locations as defined in the concept masterplan.

The above principles have been addressed in Section 5 of this report.
Concept Master Plan

The concept master plan received by Urbis October 2017 has also been addressed briefly herein. Although there are no works proposed under this application, this master plan constitutes an illustration of one way that the site could be redeveloped for residential and community use incorporating the heritage items. The preliminary assessment is included only to demonstrate how the application of development facilitated by the planning proposal could be sympathetic to the heritage significance of the place.

The concept Master Plan has been assessed herein with reference to the obligations arising from heritage significance set down by Urbis in June 2016.

1.4. LIMITATIONS

This report is limited to a consideration of the built heritage and cultural landscape at Fort Wallace and does not address impacts to archaeological resources, or natural landscape or vegetation.

1.5. AUTHOR IDENTIFICATION

The following report has been prepared by Alexandria Barnier (Senior Heritage Consultant).

Unless otherwise stated, all drawings, illustrations and photographs are the work of Urbis.

The authors of the previous HMS and CMP (listed below) are acknowledged with thanks.

The following documents have been referenced in the preparation of this document:

- Fort Wallace Heritage Management Strategy prepared by Godden Mackay Logan in May 2008;
- Fort Wallace Conservation Management Plan prepared by Suters Architects Snell in 1994;
- Fort Wallace, Stockton NSW. Department of Defence Disposal Study. Non-Indigenous Heritage Assessment prepared by South East Archaeology for GHD services in 2004; and
- Fort Wallace Infrastructure Report prepared for Department of Defence 2007 (SKM - Sinclair Knight Merz).
2. SITE DESCRIPTION

Fort Wallace is located on the Stockton Peninsula, 5 kilometres northeast of the Newcastle CBD. The fort is 31.78 hectares in area and is bounded by Fullerton Street to the west and Stockton Bight to the east. The site is generally flat but is higher to the east with a knoll in the southern which connects to an escarpment running north up the beach. The sand dunes to the east of the site vary in stability in accordance with the level of ground cover. The only structures on the eastern sand dunes constitute four searchlight positions which are badly dilapidated.

![Picture 1 – View south east across outer fort towards the escarpment.](image)

Despite the recent removal of some items (including the 1974 barracks building) which have been previously deemed to be of low significance there is still a substantial amount of remaining infrastructure which demonstrates the key phases of development on the site. The remaining buildings on the site largely relate to the WWII use of the site with some remnant guns and searchlights from WWI.

The most notable and intact structures on the site constitute the partly sub surface Plotting Room towards the south west corner of the site, the three gun emplacements which are located along the western boundary of the dunes and the Observation Tower and tunnel system which are located to the west of the gun emplacements. There are also a number of support structures located to the west of these. The emplacements and the Observation Tower are located within the inner fort precinct on an escarpment which runs along the eastern boundary of the developed land on the site.

Until it was overgrown, the Plotting Room (building 23) was the centre of a number of support structures. It now remains as one of the most significant structures on the site however it is largely obscured by unkempt vegetation.

The entrance area from Fullerton Street to the west of the site now comprises only the WWI engine room and the Guard House after the removal of the Married Quarters and the Tuckeroo Tree.

The outer part of the fort is located on the flat land to the west of the primary structures. The buildings in this area are generally more contemporary than those above and were used primarily during WWII and after. The drill hall, transport naval stores and Junior Sailors Accommodation are still extant. The transport naval stores and the drill hall are the most visible from Fullerton Street.

Four searchlights, two each for the 6 inch and 9.2 inch guns are located down the eastern boundary of the site along the boundary of the developed land and the beach. These are in very poor condition and are currently surrounded by temporary security fences.
2.1. **LANDSCAPE, VIEWS AND VISTAS**

The views analysis below has been largely sourced from the existing HMS.

The landscape of Fort Wallace is based on coastal dune formations. Remnant natural vegetation survives on the site which is heavily overgrown with invasive bitou bush. The site is divided by a distinct change in elevation between Fullerton Street to the west and the high ground where the gun emplacements and observation tower were constructed to take advantage of the panoramic, 360 degree views of the surrounding ocean and land, provided by the high natural dunes.

Today these views include the dramatic Stockton Bridge, Kooragang Island, Stockton Bight and Nobbys Head reflecting the earlier strategic importance of the location of the fort. The dunal landscape and panoramic views therefore constitute an important aspect of the cultural significance of the site, contributing to both its historical and aesthetic heritage values.

There are limited views towards the inner fort structures from Fullerton Street due to the topography of the land and the later structures in between.
2.2. **VISUAL SURVEY OF THE SIGNIFICANT STRUCTURES**

General images of the significant structures and their setting have been reproduced below. For a detailed record of the extant state of the site, refer to the Photographic Archival Recording prepared by Urbis in 2015 which Defence Housing Australia (DHA) have a copy of (contact Gulliver Coote). These photos can be cross referenced to the plan at Figure 2 which shows the location of the elements.

![Picture 5 – View west from the gun emplacement towards the Observation Tower (item A0036) and Stockton Bridge behind.](image1)

![Picture 6 – General view south across the subject site towards the Casualty Station (item 13) at the base of the escarpment.](image2)

![Picture 7 – View towards the entrance to the tunnels and the Observation Tower (items A0036 and A0037) above.](image3)

![Picture 8 – View north west towards the Observation Tower (item A0036).](image4)
Picture 9 – View through tunnels which run through the escarpment (item A0037).

Picture 10 – View south east towards escarpment with Observation Tower on top. Junior Sailors accommodation (item A0017) in the foreground.

Picture 11 – View towards the badly dilapidated Northern Searchlight – 9.2 inch guns (item 102).

Picture 12 – No. 2 Gun Emplacement 6 inch Guns (item 16).

Picture 13 – No. 2 Gun Emplacement 6 inch Guns (item 16).

Picture 14 – No. 1 Gun Emplacement 9.2 inch Guns (item 18).
Picture 15 – No. 2 Gun Emplacement 9.2 inch Guns (item 27).

Picture 16 – No. 2 Gun Emplacement 9.2 inch Guns (item 27).

Picture 17 – Western façade of the Casualty Station (item 13).

Picture 18 – Western façade of the Admin Building (item A0007).

Picture 19 – Northern façade of the radio wireless room (item A0035).

Picture 20 – View towards the engine room – northern searchlight (item 15).
2.3. VISUAL SURVEY OF THE LATE 20TH CENTURY BUILDINGS

Below is a record of the late 20th century buildings in the outer fort which are proposed to be removed to facilitate the development of the site (except for the Drill Hall) in the indicative master plan option assessed in Section 5.
Picture 27 – View south west towards the Transport Naval Stores (item A0030).

Picture 28 – View south towards the Junior Sailors Accommodation (items A0013-A0017).

Picture 29 – Detail of the Junior Sailors Accommodation.

Picture 30 – Junior Sailors Accommodation (A0015).

Picture 31 – Junior Sailors Accommodation.

Picture 32 – Junior Sailors Accommodation.
Condition

This condition description was prepared subsequent to the site inspection in November 2015.

The physical condition of the buildings is generally poor to fair. Generally, the most significant buildings are among those in the poorest condition including the Observation Tower and the four searchlights. These are dilapidated to such an extent that they are not watertight and security of the structures is not possible without independent surrounding fences.

Later 20th century buildings of little significance including the Jnr Sailor’s Accommodation and the Transport Naval Stores are in fair condition, and stabilisation works require only ensuring that the structures are secure from vandals.

Various structures are so overgrown that it is not possible at present to determine the extent of their condition. These structures include the Northern and Southern Searchlights 6-inch guns and the Engine Room – Southern Searchlight.

In response to the above described condition of the site Urbis prepared a Heritage Maintenance Schedule in 2015 which scheduled maintenance and urgent stabilisation works to prevent further deterioration of the heritage fabric; provisions for future urgent works that may arise; and ongoing maintenance works to ensure the continued stability of the site. A schedule of conservation works is required to ensure the ongoing integrity of the significant structures on the site.
Picture 36 – Overgrown Engine Room – Southern Searchlight (item 101).

Picture 37 – Ruined BBQ and Shed (items A0009 and A0010).
2.4. LOCATION OF ELEMENTS ON THE SITE

Figure 2 – Key map indicating the location of the remnant elements on the site.

Table 1 – Reference numbers for items on the site.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Northern Searchlight 9.2-inch guns</td>
</tr>
<tr>
<td>20</td>
<td>Northern Searchlight 6-inch guns</td>
</tr>
<tr>
<td></td>
<td>Southern Searchlight 6-inch guns</td>
</tr>
<tr>
<td>103</td>
<td>Southern Searchlight 9.2-inch guns</td>
</tr>
<tr>
<td>A0023</td>
<td>Practice Cricket Nets</td>
</tr>
<tr>
<td>A0024</td>
<td>Cricket Pitch</td>
</tr>
<tr>
<td>Reference</td>
<td>Item</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>A0022</td>
<td>Pump House No.1</td>
</tr>
<tr>
<td>A0030</td>
<td>Transport Naval Stores, Transport Compound</td>
</tr>
<tr>
<td>A0016</td>
<td>Common Room</td>
</tr>
<tr>
<td>A0013</td>
<td>Jnr Sailor’s Accommodation, Lecture Room</td>
</tr>
<tr>
<td>A0015</td>
<td>Jnr Sailor’s Accommodation, Tech Maintenance</td>
</tr>
<tr>
<td>A0017</td>
<td>Jnr Sailor’s Accommodation, Q store</td>
</tr>
<tr>
<td>A0019</td>
<td>Car Pit</td>
</tr>
<tr>
<td>56</td>
<td>Hoban Commemorative tree</td>
</tr>
<tr>
<td>A0008</td>
<td>Gymnasium, Drill Hall</td>
</tr>
<tr>
<td>A0014</td>
<td>Jnr Sailor’s Accommodation, Admin Office</td>
</tr>
<tr>
<td>A0009</td>
<td>BBQ</td>
</tr>
<tr>
<td>A0010</td>
<td>Shed</td>
</tr>
<tr>
<td>A0033</td>
<td>Fire Pump House No. 2 Pump House</td>
</tr>
<tr>
<td>15</td>
<td>Engine Room, Northern Searchlight – 9.2 inch guns</td>
</tr>
<tr>
<td>A0037</td>
<td>Tunnels</td>
</tr>
<tr>
<td>13</td>
<td>Casualty Station</td>
</tr>
<tr>
<td>A0035</td>
<td>Radio Room, Wireless Room</td>
</tr>
<tr>
<td>A0036</td>
<td>Watch Tower, Observation Tower</td>
</tr>
<tr>
<td>27</td>
<td>No. 2 Gun Emplacement – 9.2 inch guns</td>
</tr>
<tr>
<td>16</td>
<td>No. 2 Gun emplacement – 6 inch guns</td>
</tr>
<tr>
<td>18</td>
<td>No. 1 Gun emplacement – 9.2 inch guns</td>
</tr>
<tr>
<td>A0007</td>
<td>Admin Building, Engine House 6 inch guns</td>
</tr>
<tr>
<td>A0006</td>
<td>Security Office, Guard House</td>
</tr>
<tr>
<td>A0004</td>
<td>Bus Shelter</td>
</tr>
<tr>
<td>101</td>
<td>Engine Room, Southern Searchlight – 9.2 inch guns</td>
</tr>
<tr>
<td>A0012</td>
<td>Tennis Court</td>
</tr>
<tr>
<td>23</td>
<td>Plotting Room</td>
</tr>
</tbody>
</table>

3. HISTORICAL OVERVIEW

The below history of Fort Wallace has been sourced from the Fort Wallace Heritage Management Strategy prepared by Godden Mackay Logan May 2008. Where relevant to the proposed master plan this history has been variously augmented.

3.1. SITE HISTORY

By the late 1870s, when NSW was re-examining its coastal defences, Newcastle's port was handling more than a million tons of coal a year, supplying Sydney and Melbourne and exporting to Asia and North and South America. As coal was also the fuel for steamships and naval vessels in this period, the possibility that enemy warships would target Newcastle, if Great Britain became involved in a major conflict, was regarded as high.

Fort Wallace was the third fort constructed for the defence of Newcastle. Fort Scratchley was constructed in the early 1880s and the Shephard's Hill Battery was installed in 1896. In 1910, Britain's most famous soldier, Lord Kitchener, was in Australia to advise the new nation on defence issues. Kitchener inspected several sites at Stockton before finally approving the current site of Fort Wallace.

Prior Use of the Site

In the 1870s, before the selection of the Fort Wallace site for military purposes, the area was the location of the No.2 Rocket Brigades storage shed. The shed contained the heavy rocket propulsion gear and cables used to carry life lines to ships in distress. The Stockton Rocket Brigade was involved in several notable rescues. The station was subsequently demolished to make way for the new fort.

Original Construction

Constructed in 1912-13, the main objective of Fort Wallace was the cover the 'blind spot' of Fort Scratchley created by Nobby's Head, primarily the dead sea area in front of Stockton. It replaced the gun emplacement located on Shepard's Hill to the south of the site, which was deemed unsafe due to earth subsidence.

The fort was originally equipped with two Mark VII 6-inch guns on pivotal mountings in gun pits. The site infrastructure included a magazine, barracks and quarters for non-commissioned officers. Originally name Fort Stockton, the name was changed to Fort Wallace in November 1915, in memory of Colonel Robert Wallace, Chief of Ordinance and Commanding Officer, Royal Australian Garrison Artillery. There were many similar 6-inch gun installations around Australia. Similar guns are now in place at Fort Scratchley, having been relocated there from King Edward Park Battery.

World War I

Although functional once its guns were proved, the course of World War I made the fort redundant as the German Navy was restricted to home waters in the latter stages of the war. During World War I, Fort Wallace was fully manned for only one month, from April to May 1918. It then reverted to minimum maintenance status. A section of the 13th Heavy Battery of the Royal Australian Artillery, based at Fort Scratchley, was trained to man the 6-inch guns at Fort Wallace. These militia-men were part time citizen soldiers. The command post for the battery and associated light defence controls were installed in 1919, however neither the engines for the lights were installed at this time.

World War II

In the 1930s, the Australian Government looked to upgrade its coastal defences in response to rising tension in the Europe and Pacific regions. Fort Wallace was redesigned to play a counter bombardment role against any attack by ship from the sea. The 6-inch guns were removed and replaced before the end of 1940 with 9.2 inch guns, with a range of 17 miles (the old 6-inch guns were relocated to Rabaul, in Papua New Guinea). Fort Wallace was the only one of the 9.2 inch batteries constructed in this period to re-use a 6-inch gun emplacement, reinforcing the ongoing strategic importance of the Fort Wallace site.

New gun pits were required for these weapons. Extensive site changes included new gun sites, plotting room, magazine, engine rooms, new drill hall, officers' quarters, mess and casualty rooms. Some demolition was required including the original command post and expansion of the No.1 gun pit. The new guns could also traverse 360 degrees to allow inland firing in case of sea-borne invasion. Anti-aircraft defences, blast
walls and a three pounder quick-firing battery were also installed in and around the fort for close defence in case of attack.

Newcastle Fortress

In World War II batteries from Wollongong through to Sydney and Newcastle defended NSW’s major ports and coastline. While the strategic importance of coal had lessened, due to changes in technology since World War I, the steelworks at Waratah and the State Dockyard at Walsh Island meant that Newcastle remained an important potential target in wartime.

Fort Wallace was an integrated aspect of the broader Newcastle defensive system in this period. The fort was the primary counter bombardment facility within the Newcastle Fortress Area. The operation of the fort required the transmittal of target information from the installations at Shephards Hill, Wipers Flats and Port Stephens (however coastal radar was only available from 1943, so visual information must have been used initially). This information was transmitted from these installations to Shephards Hill, which in turn transmitted to the plotting room at Fort Wallace.

During WWI Fort Wallace has been a subsidiary installation to Fort Scratchley and Shepherds Hill. While overall command remained at Fort Scratchley and Shepherds Hill in WWII, the local importance of Fort Wallace, as the principal counter bombardment installation, was much increased in the later period.

Post War Uses

After WWII Fort Wallace was scaled back again. However, a skeleton staff was maintained at the fort and anti-aircraft battery until 1951. The 9.2inch guns were removed in 1963 for scrap but some oral sources claim the barrels were buried intact on site. In 1949 Gunner Hoban was killed when crushed by a rotating 9.2inch gun. A tree planted in his memory, near the drill hall, remains on the site today.

The fort was used as a training site until 1967 when it reopened to house the Army’s 130 Signal Squadron, the Tactical Air Support Signal Squadron. The unit was to provide communication facilities to support air offensive support and co-ordinate air transport. The Fort Wallace site was chosen for its proximity to RAAF Williamtown, the ground attack aircraft base. A new barracks for 69 men was erected in 1972-74. In 1980 the fort was chosen as Flag Station for the district. This choice reflects the earlier closure of Fort Scratchley, the site of the previous Flag Station. 130 Squadron remained at Fort Wallace until 1993 when the site was closed.
Figure 3 – 1987. Fort Wallace: Generator and Engine Room for 9.2 guns.

![Image of 1987 Generator and Engine Room for 9.2 guns.](image)

Source – Newcastle City Council (Reg. number 037 000024).

**Restoration Works**

In 1986 the restoration of the fort was initiated by a group of enthusiasts, mostly ex-artillerymen, led by Colonel Mort. In 1994 the group was known as the Fort Wallace Restoration Association. Although small in number the group received considerable support from a range of local industries and community groups.

Figure 4 – 2003. View of the Plotting Room from Fullerton Street. The three storey barracks (1974) behind have since been demolished.

![Image of 2003 Plotting Room from Fullerton Street.](image)

3.2. PHASES OF DEVELOPMENT

The Fort Wallace site demonstrates three key phases of development which are represented by the physical evidence on the site and suggested through the historical and documentary analysis. These phases are described below. The description below refers to the Defence Estate Management System (DEMS) asset numbers and the reference number given to each item in the comprehensive 1995 Conservation Management Plan by Suters Architects.

Phase 1 – The 6-inch guns 1912-1919

As set out above, The Fort Stockton site was selected in 1910 and construction began in 1912. The fort was original equipped with two Mark VII 6 inch guns on pivotal mountings in gun pits. The site infrastructure also included a magazine, barracks and quarters for non-commissioned officers. Key site infrastructure surviving from this period includes:

- The no. 2 6 inch gun emplacement (SKM/DEMS 16, Suters 51) – while the No. 1 6 inch gun emplacement was demolished in order to construct the No. 1 9.2 inch gun emplacement, the No.2 6 inch gun emplacement was left intact;
- The magazines and casualty rooms attached to the 6-inch guns (SKM/DEMS 16, Suters 51) - the magazines and casualty rooms attached to the 6-inch guns were reused for the 9.2 inch guns as gun floor shelters. The outer chamber of the No 2 6-inch gun magazine has been left intact and re used as a Gun Relief Station for the No 2 9.2 inch gun emplacement. The ‘Cartridge Issue Hatch’ sign remains visible;
- The engine house for the 6 inch guns (SKM/DEMS 7, Suters 7) – survives, although heavily modified by its later re-use;
- The 6 inch gun searchlights (SKM/DEMS 20, Suters 18 and 19) – survive in poor condition on the sand dunes to the east of the gun emplacements.

Phase 2 – The 9.2 – inch guns 1930-1963

Extensive evidence of this phase survives on the site. The need to upgrade Fort Wallace’s guns was identified as early as 1930, while the emplacements and associated infrastructure (plotting room, tunnels, observation tower and power houses) were under construction by 1938/9. Also constructed were new searchlight positions and their associated engine rooms. These replaced the World War I infrastructure. Support structures, including the residences and the drill hall were also built at this time. While Wallace reverted to a minimum maintenance facility in 1945 the guns were not scrapped until 1963. Importantly, these structures retain some remnants of World War II equipment including the ammunition hoists found in the gun emplacements and the de gassing plant located next to the plotting room. Key site infrastructure surviving from this period includes:

- No. 1 Gun emplacement – 9.2 inch (SKM/DEMS 18, Suters 41);
- N. 2 Gun emplacement – 9.2 inch (SKM/DEMS 27, Suters 45);
- Observation Tower (SKM/DEMS 36, Suters 28);
- Tunnels (SKM/DEMS 37, Suters 40);
- Northern and Southern Searchlights (SKM/DEMS 102, 103 Suters 16,21);
- Plotting Room and De – gassing Plant Chamber (SKM/DEMS 13, Suters 13);
- Casualty Station (SKM/DEMS 13, Suters 13);
- Northern and Southern Searchlight Engine Rooms (SKM/DEMS 15, 101, Suters 15,21);
- Drill Hall (SKM/DEMS 8, Suters 8);
- Tree (Norfolk Island pine planted to commemorate the death of Gunner Mervyn Hoban on 30 March 1949 during operation of one of the 9.2 inch guns. (Suters 56)

Fort Wallace was chosen as the site for a new facility in 1967. By this time fixed guns for coastal defences were well and truly obsolete. However, unlike many forts, Wallace continued in use as the base for 130 Signal Squadron, the Tactical Air Support Signal Squadron, which was located at Wallace due to the site’s proximity to RAAF Williamtown. In this period of use a barracks for 69 men was constructed (1972-74) and an administration compound was constructed in 1985. Key site infrastructure from this period includes:

- Transport Compound (SKM/DEMS 30, Suters 30);
- Lecture Room, Junior Sailors (SKM/DEMS 13, Suters 35);
- Administration Building, Junior Sailors (SKM/DEMS 14, Suters 36);
- Technical Maintenance, Junior Sailors (SKM/DEMS 15, Suters 37);
- Q Store, Junior Sailors (SKM/DEMS 17, Suters 38);
- Barracks, 1974
- Guard House, Security Office (SKM/DEMS 6, Suters 39).
3.3. DEVELOPMENT CHRONOLOGY

Where available, the date of construction of the major buildings on the site is set in the table below. The information for this table has been sourced from Fort Wallace Heritage Management Plan prepared by GML in 2008.

Table 2 – Construction dates for remnant buildings within Fort Wallace.

<table>
<thead>
<tr>
<th>Key Ref no.</th>
<th>Item</th>
<th>Date of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 – The 6-inch guns 1912-1919</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A0007</td>
<td>Admin Building, Engine House 6&quot; Guns</td>
<td>1917</td>
</tr>
<tr>
<td>20</td>
<td>Northern Searchlight 6&quot; Guns</td>
<td>1917</td>
</tr>
<tr>
<td></td>
<td>Southern Searchlight 6&quot; Guns</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>No. 2 Gun Emplacement 6&quot; Guns</td>
<td>WWI (dated unknown)</td>
</tr>
<tr>
<td>Phase 2 – The 9.2 – inch guns 1930-1963</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Casualty Station</td>
<td>1937</td>
</tr>
<tr>
<td>15</td>
<td>Engine Room Northern Searchlight 9.2&quot; Guns</td>
<td>1937</td>
</tr>
<tr>
<td>23</td>
<td>Plotting Room</td>
<td>1937</td>
</tr>
<tr>
<td>A0035</td>
<td>Radio Wireless Room</td>
<td>1937</td>
</tr>
<tr>
<td>18</td>
<td>No.1 Gun Emplacement 9.2&quot; Guns</td>
<td>1939</td>
</tr>
<tr>
<td>A0008</td>
<td>Drill Hall</td>
<td>1939</td>
</tr>
</tbody>
</table>

Figure 6 – ND. Aerial view south west showing 1974 barracks building (red arrow).

Source: environment.gov.au
<table>
<thead>
<tr>
<th>Key Ref no.</th>
<th>Item</th>
<th>Date of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0037</td>
<td>Tunnel Complex</td>
<td>1939</td>
</tr>
<tr>
<td>27</td>
<td>No. 2 Gun Emplacement 9.2” Guns</td>
<td>c1939</td>
</tr>
<tr>
<td>102</td>
<td>Northern Searchlight 9.2” Guns</td>
<td>c1939</td>
</tr>
<tr>
<td>103</td>
<td>Southern Searchlight 9.2” Guns</td>
<td>c1939</td>
</tr>
<tr>
<td>101</td>
<td>Engine Room Southern Searchlight 9.2” Guns</td>
<td>c1939</td>
</tr>
<tr>
<td>A0036</td>
<td>Battery Observation Post</td>
<td>c1939</td>
</tr>
<tr>
<td>56</td>
<td>Tree in memory of Gunner Hoban</td>
<td>1949</td>
</tr>
</tbody>
</table>
4. HERITAGE SIGNIFICANCE

4.1. WHAT IS HERITAGE SIGNIFICANCE?

Before making decisions to change a heritage item, an item within a heritage conservation area, or an item located in proximity to a heritage listed item, it is important to understand its values and the values of its context. This leads to decisions that will retain these values in the future. Statements of heritage significance summarise a place’s heritage values – why it is important, why a statutory listing was made to protect these values.

4.2. COMMONWEALTH AND NSW HERITAGE CRITERIA

The Commonwealth Heritage Criteria of the EPBC Regulations and their correlating NSW criteria have been set out below. The following assessments of heritage significance set out below in this section have been prepared with reference to the Commonwealth Heritage Criteria or the Heritage Brand Criteria where relevant.

<table>
<thead>
<tr>
<th>Commonwealth Heritage Criteria</th>
<th>Equivalent NSW Heritage Branch Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A:</strong> The place has significant heritage value because of the place’s importance in the</td>
<td><strong>A – Historical Significance</strong></td>
</tr>
<tr>
<td>course, or pattern, of Australia’s natural or cultural history</td>
<td><strong>An item is important in the course or pattern of the local area’s cultural or natural history.</strong></td>
</tr>
<tr>
<td><strong>B:</strong> The place has significant heritage value because of the place’s possession of</td>
<td><strong>F – Rarity</strong></td>
</tr>
<tr>
<td>uncommon, rare or endangered aspects of Australia’s natural or cultural history</td>
<td><strong>An item possesses uncommon, rare or endangered aspects of the local area’s cultural or natural history.</strong></td>
</tr>
<tr>
<td><strong>C:</strong> The place has significant heritage value because of the place’s potential to yield</td>
<td><strong>E – Research Potential</strong></td>
</tr>
<tr>
<td>information that will contribute to an understanding of Australia’s natural or cultural</td>
<td><strong>An item has potential to yield information that will contribute to an understanding of the local area’s cultural or natural history.</strong></td>
</tr>
<tr>
<td>history</td>
<td></td>
</tr>
<tr>
<td><strong>D:</strong> The place has significant heritage value because of the place’s importance in</td>
<td><strong>G – Representative</strong></td>
</tr>
<tr>
<td>demonstrating the principal characteristics of:</td>
<td><strong>An item is important in demonstrating the principal characteristics of a class of NSWs (or the local area’s):</strong></td>
</tr>
<tr>
<td>-a class of Australia's natural or cultural places;</td>
<td><strong>cultural or natural places; or</strong></td>
</tr>
<tr>
<td>or</td>
<td><strong>cultural or natural environments.</strong></td>
</tr>
<tr>
<td>-a class of Australia's natural or cultural environments;</td>
<td></td>
</tr>
<tr>
<td><strong>E:</strong> The place has significant heritage value because of the place’s importance in</td>
<td><strong>C – Aesthetic Significance</strong></td>
</tr>
<tr>
<td>exhibiting particular aesthetic characteristics valued by a community or cultural group</td>
<td><strong>An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or</strong></td>
</tr>
<tr>
<td></td>
<td><strong>technical achievement in the local area.</strong></td>
</tr>
</tbody>
</table>
### Commonwealth Heritage Criteria

**F:** The place has significant heritage value because of the place’s importance in demonstrating a high degree of creative or technical achievement at a particular period

**G:** The place has significant heritage value because of the place’s strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

**H:** The place has significant heritage value because of the place’s special association with the life or works of a person, or group of persons, of importance in Australia’s natural or cultural history

**I:** The place has significant heritage value because of the place’s importance as part of Indigenous tradition

### Equivalent NSW Heritage Branch Criteria

**C – Aesthetic Significance**

*An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.*

**D – Social Significance**

*An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.*

**B – Associative Significance**

*An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area’s cultural or natural history.*

**Covered by the NPW Act.**

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#### 4.3. ASSESSMENT OF HERITAGE SIGNIFICANCE – COMMONWEALTH VALUES

The below assessment of significance has been sourced from the Australian Heritage Database (Place ID 105335).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Significant Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A – Processes</strong></td>
<td>Fort Wallace is nationally significant as a major component of the integrated system of defence for the Newcastle Fortress Area. Its prime purpose was protection of Newcastle Harbour and its industries. During World War One Newcastle was an important coal export centre, not only for Australia, but for the Allied Nations generally, and during World War Two it was also a major steel producing centre. The importance of the Fort increased during World War Two with the installation of the 9.2 inch guns, when it became the primary counter bombardment facility within the Newcastle Fortress Area. In terms of the fort's operational equipment and function, it represents three distinct and consecutive phases in the development of coastal defence tactics and military technology: Phase One. The 6 inch guns remnant defence technology from the late nineteenth/early twentieth centuries. This relies on the use of a separate explosive charge to fire the projectile, operated and directed by purely manual resources. Phase Two. The 9.2 inch guns. While the firing of the projectile remained basically unchanged, the operation and direction of the gun had made use</td>
</tr>
</tbody>
</table>
### Criteria

**Significant Assessment**

of advanced technology in the form of hydraulic and electrical power, radar, aeroplanes and computers to plot target positions, and radio and direct landline to relay target information to the guns. Phase Three. Tactical Air Support Land based fixed guns for coastal defence were recognised as obsolescent as early as the 1950s, particularly with the development of airborne defences. Aircraft could be used to attack both ground and sea positions, and to transport troops and equipment to required locations. This relied on the relay of information between Army and Air Force through a variety of sources.

Attributes: All of the fabric associated with the operation use of the site as a defence and military facility from 1907 until its closure in 1993.

**B – Rarity**

Fort Wallace is a relatively rare example of three consecutive defence phases on the one site. In respect of the first two phases, it is the only defence installation in Australia to have been the site of both 6 inch and 9.2 inch guns, as well as the range of associated items, such as plotting rooms and observation towers. In respect of the third phase, it is one of only a few military installations to have remained as an active defence site post World War Two, most either closing completely or being used for training or administration purposes only. The Inner Fort Precinct and the Plotting Room Precinct within the Fort are of particular importance, and within these precincts are specific items of significance.

Attributes
All of the fabric associated with the operational use of the site from 1907 until its closure in 1993.

**C – Research**

Many of the precincts and items are significant for the way they contribute to an understanding of the general operation of the fort during the three phases of its operation.

Attributes
All of the fabric associated with the operational use of the site from 1907 until its closure in 1993.

### 4.4. FORT WALLACE (SITE GENERALLY) SUMMARY STATEMENT OF SIGNIFICANCE

The following statement of heritage significance has been sourced from the Australian Heritage Database (Place ID 105335).

*Fort Wallace is nationally significant as a major component of the integrated system of defence for the Newcastle Fortress Area. Its prime purpose was protection of Newcastle Harbour and its industries. During*
World War One Newcastle was an important coal export centre, not only for Australia, but for the Allied Nations generally, and during World War Two it was also a major steel producing centre. The importance of the Fort increased during World War Two with the installation of the 9.2 inch guns, when it became the primary counter bombardment facility within the Newcastle Fortress Area. In terms of the fort’s operational equipment and function, it represents three distinct and consecutive phases in the development of coastal defence tactics and military technology: Phase One. The 6 inch guns remnant defence technology from the late nineteenth/early twentieth centuries. This relies on the use of a separate explosive charge to fire the projectile, operated and directed by purely manual resources. Phase Two. The 9.2 inch guns. While the firing of the projectile remained basically unchanged, the operation and direction of the gun had made use of advanced technology in the form of hydraulic and electrical power, radar, aeroplanes and computers to plot target positions, and radio and direct landline to relay target information to the guns. Phase Three. Tactical Air Support Land based fixed guns for coastal defence were recognised as obsolescent as early as the 1950s, particularly with the development of airborne defences. Aircraft could be used to attack both ground and sea positions, and to transport troops and equipment to required locations. This relied on the relay of information between Army and Air Force through a variety of sources. Fort Wallace is a relatively rare example of three such consecutive phases on the one site. In respect of the first two phases, it is the only defence installation in Australia to have been the site of both 6 inch and 9.2 inch guns, as well as the range of associated items, such as plotting rooms and observation towers. In respect of the third phase, it is one of only a few military installations to have remained as an active defence site post World War Two, most either closing completely or being used for training or administration purposes only. The Inner Fort Precinct and the Plotting Room Precinct within the Fort are of particular importance, and within these precincts are specific items of significance. Many of the other precincts and items are also significant for the way they contribute to an understanding of the general operation of the fort during the three phases of its operation (Criteria A.4, B.2 and C.2).

4.5. SCHEDULE OF SIGNIFICANT ELEMENTS

All remnant elements have been assigned a grading of significance in Table 4 below. The thresholds for significance have been set out in Table 3.

Table 3 – Thresholds for levels of significance.

<table>
<thead>
<tr>
<th>Level of Significance</th>
<th>Definition</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Element of high significance or heritage value that embodies Commonwealth values and State heritage significance in its own right and make an irreplaceable contribution to the significance/heritage value of the place as a whole.</td>
<td>Meets the threshold for entry in the Commonwealth Heritage List. Fulfils criteria for state or local listing.</td>
</tr>
<tr>
<td>B</td>
<td>Element of significance or heritage value that embodies Commonwealth values and State or local heritage significance in its own right and makes a significant contribution to the overall significance of the place.</td>
<td>Meets the threshold for entry in the Commonwealth Heritage List. Fulfils criteria for state or local listing.</td>
</tr>
<tr>
<td>C</td>
<td>Element that demonstrates some heritage values and makes a contribution to the overall significance of the place.</td>
<td>Makes a contribution to the Commonwealth Heritage values of the place as a whole/ Fulfils criteria for local</td>
</tr>
<tr>
<td>Level of Significance</td>
<td>Definition</td>
<td>Threshold</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td>D</td>
<td>Element that has low level of significance and makes some contribution to the overall heritage values of the place.</td>
<td>May have some significance within the context of the site, but individually does not fulfil criteria for State or Local listing.</td>
</tr>
<tr>
<td>E</td>
<td>Element with little or no heritage value.</td>
<td>Does not meet the threshold for entry in the Commonwealth Heritage List or for State or local listing.</td>
</tr>
<tr>
<td>F</td>
<td>Intrusive element which detracts from the significance of the place.</td>
<td>Detracts from the heritage values of the place and does not meet the threshold for entry in the Commonwealth Heritage List or for State or local listing.</td>
</tr>
</tbody>
</table>

Table 4 – Level of significance for each element.

<table>
<thead>
<tr>
<th>Item</th>
<th>Assessed Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0037 – Tunnels</td>
<td>A</td>
</tr>
<tr>
<td>23 – Plotting Room</td>
<td>A</td>
</tr>
<tr>
<td>A0036 – Watch Tower, Observation Tower</td>
<td>A</td>
</tr>
<tr>
<td>27 – No. 2 Gun Emplacement – 9.2 inch guns</td>
<td>A</td>
</tr>
<tr>
<td>16 – No.2 Gun emplacement – 6 inch guns</td>
<td>A</td>
</tr>
<tr>
<td>18 – No. 1 Gun emplacement – 9.2 inch guns</td>
<td>A</td>
</tr>
<tr>
<td>15 – Engine Room, Northern Searchlight – 9.2 inch guns</td>
<td>B</td>
</tr>
<tr>
<td>13 – Casualty Station</td>
<td>B</td>
</tr>
<tr>
<td>A0035 – Radio Room, Wireless Room</td>
<td>B</td>
</tr>
<tr>
<td>A0007 – Admin Building, Engine House 6 inch guns</td>
<td>B</td>
</tr>
<tr>
<td>102 – Northern Searchlight 9.2- inch guns</td>
<td>B</td>
</tr>
<tr>
<td>20 – Northern Searchlight 6- inch guns</td>
<td>B</td>
</tr>
<tr>
<td>Southern Searchlight 6- inch guns</td>
<td>B</td>
</tr>
<tr>
<td>Item</td>
<td>Assessed Level of Significance</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>103 – Southern Searchlight 9.2-inch guns</td>
<td>B</td>
</tr>
<tr>
<td>56 – Hoban Commemorative tree</td>
<td>B</td>
</tr>
<tr>
<td>101 – Engine Room, Southern Searchlight – 9.2 inch guns</td>
<td>B</td>
</tr>
<tr>
<td>A0008 - Gymnasium, Drill Hall</td>
<td>C</td>
</tr>
<tr>
<td>A0023 – Practice Cricket Nets (any remnants)</td>
<td>E</td>
</tr>
<tr>
<td>A0024 – Cricket Pitch (any remnants)</td>
<td>E</td>
</tr>
<tr>
<td>A0022 – Pump House No.1</td>
<td>E</td>
</tr>
<tr>
<td>A0030 – Transport Naval Stores, Transport Compound</td>
<td>E</td>
</tr>
<tr>
<td>A0016 – Common Room</td>
<td>E</td>
</tr>
<tr>
<td>A0013 – Jnr Sailor’s Accommodation, Lecture Room</td>
<td>E</td>
</tr>
<tr>
<td>A0015 – Jnr Sailor’s Accommodation, Tech Maintenance</td>
<td>E</td>
</tr>
<tr>
<td>A0017 – Jnr Sailor’s Accommodation, Q store</td>
<td>E</td>
</tr>
<tr>
<td>A0019 – Car Pit (any remnants)</td>
<td>E</td>
</tr>
<tr>
<td>A0014 - Jnr Sailor’s Accommodation, Admin Office</td>
<td>E</td>
</tr>
<tr>
<td>A0033 – Fire Pump House No. 2 Pump House</td>
<td>E</td>
</tr>
<tr>
<td>A0006 – Security Office, Guard House</td>
<td>E</td>
</tr>
<tr>
<td>A0004 – Bus Shelter</td>
<td>E</td>
</tr>
<tr>
<td>A0012 – Tennis Court (any remnants)</td>
<td>E</td>
</tr>
<tr>
<td>A0009 - BBQ (Ruinous)</td>
<td>F</td>
</tr>
<tr>
<td>A0010 – Shed (Ruinous)</td>
<td>F</td>
</tr>
</tbody>
</table>
Figure 7 – Graphic representation of the grading of heritage significance attributed to each item.

Gradings of Heritage Significance

Source: Urbis 2016
5. IMPACT ASSESSMENT

5.1. HERITAGE LISTING

Fort Wallace is listed on the Commonwealth Heritage List and on the Department of Defence Section 170 Heritage Register and the elements comprised therein are variously identified as being of State or National significance.

None of the heritage registers associated with the Heritage Act are applicable to the subject site. As the Act is NSW state legislation, none of the heritage registers apply to the property which is owned by a Commonwealth Government Agency.

The subject site is also listed on the Register of the National Estate (ID18957) which has ceased to be a statutory list.

5.2. NON-STATUTORY CONTROLS

5.2.1. Heritage Management Strategy 2008

The planning proposal is assessed in the table below in relation to the relevant principles which are set out in the Heritage Management Strategy prepared by GML in 2008.

Table 5 – Assessment against policies set down in the Heritage Management Strategy 2008.

<table>
<thead>
<tr>
<th>CLAUSE</th>
<th>DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conserve, manage and interpret the heritage values of the significance historic built fabric, Aboriginal cultural and archaeological significance.</td>
<td>The planning proposal would encourage the ongoing use and maintenance of not only the developable parts of the site, but the existing heritage items. It is proposed to conserve the coastal ridge top, the highly significant items atop on the coastal ridge top and the beach in the eastern portion of the site as these areas will be zoned for public recreation. The planning proposal therefore facilitates minimal development in a highly significant area and would conserve the seaward outlook from significant heritage items including the gun emplacements. The Environmental Management zoning would encompass the heritage items atop the escarpment as well as the Plotting Room and Administration Building. Any future residential development on the site would therefore maintain a setback from the significant items and facilitate ongoing understanding of the original setting of the items and the relationship between them. Adaptive reuse of some items may be appropriate. Key criteria in a merit assessment of proposed adaptive reuse in later stages should consider the heritage value of the item, its physical state, financial feasibility, relationships between items and the value</td>
</tr>
</tbody>
</table>

to the community of a potential reuse.

The principles of the site specific DCP stipulate implementation of development buffers around the highly significant heritage items which are located within the residential zoned area. These include the Admin Building and the Plotting Room. This would ensure that the curtilage of these items is appropriately respected and appreciation of them is facilitated.

It is recognised that there is an opportunity to formally recognise the significance of the site through listing as a local item on the LEP despite the existing Commonwealth listing of the place. After consultation with council it is proposed to apply a local heritage listing to four items on the site (item 696 – item 699). It is also proposed to define the Gunnar Hoban Memorial Tree as a landscape item (100) and the entire site as an Archaeological item (A21). This will ensure that the protection of the place is facilitated if parts of the place are divested in the future.

<table>
<thead>
<tr>
<th>Consider the provision of information, interpretation, visitor and picnic facilities, parking and other appropriate infill development within the curtilage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is recommended that as part of any future application for development on the site, a Base Heritage Interpretation Strategy and full Heritage Interpretation Plan including fabrication and execution should be prepared. These documents should be prepared in consultation with Council and local historical societies.</td>
</tr>
</tbody>
</table>

No further development should occur along the coastal ridge top where the gun emplacements are located and the 360 degree views from the ridge top should be protected.

<table>
<thead>
<tr>
<th>It is proposed that the coastal ridge top be zoned E3 - Environmental Management. This zoning would ensure that development in this area would be minimal and it would facilitate of all views eastward from the ridge top. This is considered to be sympathetic to the highly significant site and is supported from a heritage perspective.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The proposed zoning includes an 11m and 14m allowable height in the vicinity of two significant items. However, cognisant of the significance of these items the DCP principles stipulate that a development curtilage would be defined around these items and mapped in the DCP such that the intention to maintain a sympathetic setback from the items, as demonstrated in the concept master plan, is formalised.</td>
</tr>
<tr>
<td>The DCP provides guidance on retention of key external and internal view corridors through formal recognition of significant views (refer images</td>
</tr>
</tbody>
</table>
Any new development should be set well back from the battery complex so that the relationship between structures can be understood.

The application of Environmental Management zoning around the battery complex would ensure a setback of residential development from the complex.

It is appreciated that the indicative master plan demonstrates a development setback from the complex.

Areas on the site with good potential for redevelopment include the sites of the Junior Sailors Accommodation and the parade ground.

The planning proposal primarily facilitates development in this area through the concentration of low density zoning.

Further, note that the indicative master plan shows that development is concentrated in this area.

Compatible uses for the site may include hostel accommodation, convention centre, educational facility, tourism/heritage interpretation and community facilities. A mix of uses may be appropriate; so that hospitality and retail uses

It is considered that the proposed residential use of the western section of the site would not be incompatible with its heritage significance subject to sympathetic design of future development and given the DCP principles which stipulate that a

| below). As such, the planning proposal would ensure that identified significant views including those east to the ocean and that west from the observation tower to the river would be formally recognised and maintained. |

Figure 8 – External view corridors

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Source: Architectus
```

Figure 9 – Internal view corridors

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Source: Architectus
```
could be combined with the previously mentioned uses.

development buffer would be established around the highly significant items.

It is appreciated that the residential development of part of the site would generate pedestrian traffic around the heritage items in the vicinity which would encourage appreciation and continued maintenance of the items. It would also facilitate casual surveillance of the items which are currently subject to vandalism despite measures taken by the owners to prevent this.

While in Commonwealth ownership, manage Fort Wallace in accordance with the Commonwealth heritage management principles *Schedule 7B EPBC Regulations 2000).

The site Fort Wallace is subject to the Fort Wallace Heritage Management Strategy prepared for the Department of Defence by Godden Mackay Logan in May 2008. The 2008 Heritage Management Strategy primarily defines significance of the entire site and provides recommendations and policy to assist in conserving and managing that identified significance.

Under Section 341X of the EPBC Act the existing HMS requires review. Further, a Heritage Management Plan or Conservation Management Plan is required to be prepared for the site which sets out more specific guidelines for the management of the place. The timing for the update of these document is being determined in consultation with the Department of the Environment and Newcastle City Council.

The future owner of Fort Wallace site shall provide access to the Indigenous and non-Indigenous heritage values of the site by:

- Providing public access to the heritage curtilage; and
- Providing access to the heritage values of the place through appropriate interpretation.

A large portion of the site is proposed to be zoned for Environmental Management. This zoning would ensure that the highly significant items on the coastal ridge are accessible to the public. Provisions should be made to ensure that public access to the items from Fullerton Street is maintained.

It is recommended that as part of any future application for development on the site, a Base Heritage Interpretation Strategy and full Heritage Interpretation Plan including fabrication and execution should be prepared. These documents should be prepared in consultation with Council and local historical societies.
5.2.2. Conservation Management Plan 1994

The planning proposal is assessed in the table below in relation to the relevant principles which are set out in the Heritage Management Strategy prepared by GML in 2008.

Table 6 – Assessment against obligations arising from heritage significance.

<table>
<thead>
<tr>
<th>PROVISION</th>
<th>DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.1.1</strong></td>
<td>There are no works proposed to the most significant heritage features as part of this application. However, the application of Environmental Management zoning on the site and the identification of four new locally listed items would ensure that there would be no residential development within the definable curtilage of the highly significant items on the coastal ridge top. The DCP principles further aim to ensure that there are no works in the curtilage of the Admin Building and Plotting Room through the application of a development buffer around these items.</td>
</tr>
<tr>
<td>Any future development should not diminish the significance of the site as a whole. This particularly implies that work on the most significant heritage features, such as the gun emplacement and the plotting room, or works within their definable curtilage should be restricted to preservation, restoration or reconstruction.</td>
<td></td>
</tr>
<tr>
<td>Any future development, including landscaping works should respect the existing landforms and vegetation on the site, and maintain available views from the site. The chief purpose here is to limit the height of any new developments.</td>
<td>The CMP references maintaining key views as a key objective of the stated appropriate height and notes that increase in the height may be appropriate. As an outcome of detailed site testing, it is considered that the stated objective can be achieved without limiting the height to 2-3 storeys. Views westward from the coastal ridge top as defined in the DCP would not be obstructed by development facilitated by the planning proposal in the outer fort area as it is understood that the top of a 14m building in the area would be essentially in line with the ground of the ridge top. The DCP principles would provide guidance on retention of key views from the site. As such, the planning proposal would ensure that identified significant views including those east to the ocean and that west from the observation tower to the river would be formally recognised and maintained.</td>
</tr>
<tr>
<td>No new development should be in the area of the inner fort.</td>
<td>The planning proposal does not facilitate development in the area of the inner fort.</td>
</tr>
<tr>
<td><strong>6.1.2</strong></td>
<td>The planning proposal ensures that the buildings on the outer fort would be restricted to a maximum of 14m. This maximum height is restricted to a</td>
</tr>
</tbody>
</table>
Existing structures and roadways should be retained where feasible. Small area, most of the site would be subject to a 8.5m height, so to be at the same, or lower height than the coastal ridge top. The application of Environmental Management zoning would further ensure that residential development maintains a setback from the significant ridge top. Therefore, it is appreciated that the planning proposal facilitates the ongoing use of the site while restricting development to areas of lesser significance and conserving fully the inner fort.

It is appreciated that the indicative master plan shows a concentration of development in the outer fort area and that the existing layout of the road network is largely retained.

There are no works proposed as part of this application however it is appreciated that the only buildings marked for removal in the concept master plan are those identified as having a significance grading of E or less. Refer to Section 2.3 for a visual record of these buildings. The Drill Hall is intended to be retained, conserved and adaptively reused.

No new development should be permitted within the sand dunes precinct. It is understood that development in this area would not be facilitated by the planning proposal.

The design of any new development in the entrance area should be controlled so as to be sympathetic to the significance of the site overall. As above, the planning proposal does facilitate development on the knoll. It is considered that development in this area could be sympathetic to the significance of the place subject to the retention of key views from the inner fort as defined in the DCP. The retention of key views including those west from the observation tower to the river is stipulated in the DCP principles.

7.1

The following recommendations arise from the assessed significance of the site, and refer to site specific tasks:

<table>
<thead>
<tr>
<th>The site should be retained as a single entity</th>
<th>There is no proposed subdivision or disposal of the site planned at this stage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No work other than restoration/interpretation work should be permitted within the inner fort and the plotting room precincts which have been assessed as the most significant areas on the site.</td>
<td>As discussed above, it is appreciated that the planning proposal would not facilitate development in the inner fort precinct. The DCP principles stipulate the maintenance of a development buffer around the admin building and the plotting room despite the residential zoning in their vicinity. It is considered that development in the general vicinity of these items would maintain</td>
</tr>
<tr>
<td>Significant buildings within the remaining precincts should be considered for retention in any development and removed only where it is shown to be unfeasible to retain them.</td>
<td>There is no demolition proposed at this stage. However, the indicative master plan demonstrates an intention to keep all remnant significant buildings on the site (significance gradings of C and above).</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
| 7.3.1 Inner Fort Precinct  
No new development should be permitted, with the exception of works that aid in interpretation at the place. | As above, the planning proposal does not facilitate development in the inner fort precinct. |
| 7.3.2 Plotting Room Precinct  
No new development should be permitted with the exception of works that aid in interpretation at the place. | The planning proposal does facilitate development in this area. However, the DCP principles would ensure that an appropriate development buffer is established around the plotting room such that its setting is retained. |
| 7.3.3.1 Height Limitations  
The height of any new development should be restricted so as to avoid any obstruction to the panoramic views available from the site, particularly from the Observation Tower. While no specific dimension is considered an appropriate height limit for the whole site, in terms of actual built structures 2 storeys rising to 3 storeys in part would seem generally acceptable. Some isolated structures could even be taller than this, such as masts or lookout towers, particularly the further away from the existing observation tower they are located and hence the less the obstruction to the view. | Although the corresponding provision generally recommends that appropriate heights on the site are 2-3 storeys, the following should be considered in regards to the type of development that could be facilitated by the planning proposal:  
- Larger buildings are not unprecedented on the site. The 1974 barracks building which has since been removed in the southern portion of the site was of three storeys and had an additional pitched roof form (refer Figure 6). This building was distinctive as part of a later phase of development, as the development facilitated by the planning proposal would be;  
- The CMP document was prepared when there was no clear view as to what kind of development would characterise the future of the site. It is appreciated that to achieve a meaningful development on the site that a degree of density on the site is required;  
- The larger allowable height facilitates some higher density elements which are required as the site has a number of environmental constraints, lessening the amount of developable land. They would also allow a greater curtilage around the heritage items on the ground plane;  
- The CMP references maintaining key views as a key objective of the stated appropriate height and notes that increase in the height may be appropriate. As an outcome of detailed site testing, it is considered that the stated objective can be achieved without limiting the height to 2-3 |
storeys;

- Development to 14m on the entrance knoll would be subject to the principles of the site specific DCP which stipulates the maintenance of key views from the site; and
- The planning proposal facilitates development of up to 4 storeys. However, it is acknowledged that the indicative masterplan proposes building typologies which are largely less than 3 storeys.

7.3.3.3 Design Style

The design style of any future development will of course be largely dependent on the nature of that development. However, in general terms the buildings should be subservient in their visual prominence to the significant features of the site, and should be obviously “new” buildings to avoid confusion with the significant features of the site and the phases of development they represent. Design mimicking historic style such as the current “Federation” trend would not be appropriate, nor would overly ornamental features. See discussion under 7.3.3.1 above. Design development with regard for this control will be undertaken at master planning stage.

7.5.5 Views

The unimpeded panoramic views available from the site, particularly from the Observation Tower should be retained and maintained.

Views corridors within the site should also be retained and maintained. This particularly includes the line-of-sight contact between the gun emplacements and searchlight positions with the Observation Tower. See discussion under 7.3.3.1 above.

7.7.7 Inappropriate Uses

There are various uses which could be accommodated on the site in practical terms, however would be inappropriate for other reasons:

- The development of isolated houses, that is single residences within separate allotments of land, would not utilise the significant features of the site to advantage and would provide no basis for funding their continued maintenance. It would also create management problems in terms of controlling development within each separate

The application of an Environmental zoning across most of the site including the ‘heritage park’ is considered to be appropriate in that it facilitates uses which would not detract from the significance of the place. The zoning would ensure public access and appreciation of the elements.

It is acknowledged that the development of isolated houses and the application of a residential zoning across the entire site would not be an appropriate use given the high significance of the inner fort and the importance of retaining its public accessibility. However, it is considered that the application of a residential zoning across the remainder of the site as proposed is appropriate (pending detail design) given the DCP principles which stipulates
5.2.3. Obligations arising from Heritage Significance

The indicative master plan has been assessed briefly below with reference to the obligations arising from heritage significance set down by Urbis in June 2016. This is a preliminary assessment only to demonstrate how the application of development facilitated by the planning proposal could be sympathetic to the heritage significance of the place. There are no works proposed at this stage.

Table 7 – Assessment against obligations arising from heritage significance.

<table>
<thead>
<tr>
<th>PROVISION</th>
<th>DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structures with the significance grading of ‘E’ are those which have little or no heritage value and are generally those which are not associated with the significant WWI or WWII history of the site. Although the significance of the site is party vested in its rare evocation of three phases of development on the site, the removal of these structures would be supported from a heritage perspective given their individual identified significance.</td>
<td>The indicative master plan removes a number of items with a grading of “E”. This is considered acceptable from a heritage perspective however the phases from which they are a product should be represented in future interpretation for the site as a whole. Refer to the images at Section 2.3 for a visual survey of the fabric to be removed.</td>
</tr>
<tr>
<td>All buildings with a heritage significance grading of C and above have been identified as those, which should be retained, conserved and incorporated thoughtfully into the master plan.</td>
<td>The indicative master plan retains all structures with a significance grading of C and above.</td>
</tr>
<tr>
<td>The treatment of the elements (Significance Grading D and above) should be considered as they are features of overall site which has Commonwealth Heritage significance</td>
<td>Further consideration will be given to the options for adaptive reuse of the significant elements on the site as part of the development of the master plan. This may include retaining in situ as interpretive landscape elements.</td>
</tr>
<tr>
<td>The new residential development should aim to enhance and not diminish the historic and aesthetic character of the precinct. The master plan presents an opportunity to intensify development in a manner which considers the site holistically as well as the setting of the</td>
<td>As discussed above, the restriction of the residential zoning to the western part of the site would confine development to areas of lesser significance and ensure an appropriate curtilage around the items on the coastal ridge top.</td>
</tr>
<tr>
<td>Heritage items.</td>
<td>Further, it is considered that the concept master plan acknowledges the significance of the site holistically as development is confined to the outer fort precinct.</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>It is recognised that development may be achieved in the western half of the site.</td>
<td>Cognisant of the significance of the military items surmounting the escarpment, all new development in the indicative master plan option is confined to the western portion of the site.</td>
</tr>
<tr>
<td>Views to and from significant items and elements should be considered in the master plan for the site, including the opportunity to retain views towards the Heritage Park from around the Outer Fort Precinct. This should be achieved through the appropriate application of massing and height.</td>
<td>See discussion under 7.3.3.1 above.</td>
</tr>
<tr>
<td>The development in the Outer Fort area should be set back from the escarpment to east. This would distinguish the Heritage Park and ensure the visual prominence of the significant fabric comprised within it from around the site and from Fullerton Street.</td>
<td>The application of the Environmental Management across the coastal ridge top would ensure a setback of residential development from it.</td>
</tr>
<tr>
<td>The interface between the two sections of the Heritage Park (i.e. atop the escarpment and at the western base of the escarpment) should be thoughtfully resolved such that the relationship between the significant elements comprised therein is legible.</td>
<td>The indicative master plan shows development setback from the escarpment which ensures the retention of the relationship between the items atop the escarpment and those at the base. This is supported in principle pending further design development.</td>
</tr>
<tr>
<td>Significant views from inside the Observation Tower eastward to sea currently comprise only the landscape with the historic items comprised within the Heritage Park in the foreground. No new residential developments should obscure or dominate these views.</td>
<td>There is no new residential development to the east of the Tower in the indicative master plan in line with the planning proposal.</td>
</tr>
<tr>
<td>The Admin Building is one of few on the site, which is visible from Fullerton Street. The element constitutes a key identifier of the site and is highly visible at the entrance to the fort. Further, it is associated with a key period of development in the history of the site (constructed in 1917) and has a functional relationship with the searchlights on the beach. It is advised that it should be retained in situ.</td>
<td>The indicative master plan retains the significant Admin Building. Further consideration of its adaptive reuse will be given at master planning stage.</td>
</tr>
<tr>
<td>Any buildings built on the escarpment behind (east and north east of) the Admin Building should be set back from it and of an appropriate</td>
<td>Buildings on the escarpment behind the Admin Building as shown in the indicative master plan are set back from the Admin Building. Development of</td>
</tr>
</tbody>
</table>
| Scale such that the new development is not visually dominant when the Admin Building is viewed from Fullerton Street. | Buildings in this area would be subject to the site specific DCP which would specify retention of key views and as such would be supported in principle subject to further design development.

As discussed above, the DCP identifies key views in the vicinity of the escarpment to ensure that they are maintained with no obstruction by development. |
<table>
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<tr>
<td>The high attributed significance of the Gun Emplacements and Plotting Room places an obligation for owners, occupiers and users of the heritage item and any other stakeholders responsible for or involved in the maintenance and management of the place, to conserve the items and their associated significant elements.</td>
<td>These highly significant elements are intended to be retained in the indicative master plan.</td>
</tr>
<tr>
<td>There should be no works within the definable curtilage of any of the Gun Emplacements or Plotting Room.</td>
<td>The indicative master plan maintains the definable curtilage of all three gun emplacements in line with the planning proposal. Specifically, there are no new zones of development between the gun emplacements and the additional military structures atop the escarpment. It is considered that the open setting of the Plotting Room to the south is important in an appreciation of the item which is largely sub surface. The indicative typology and setback of the homes indicated in the vicinity of the Plotting Room are supported in principle pending further design development. It is appreciated that the DCP principles stipulate the retention of a development buffer around this item and it is proposed to identify this item as an item of environmental heritage in the LEP.</td>
</tr>
</tbody>
</table>
6. CONCLUSION AND RECOMMENDATIONS

The planning proposal is supported as it would facilitate the ongoing use and maintenance of the site, including its significant heritage features.

The planning proposal conserves the coastal ridge top and the beach for Environmental Management. It therefore facilitates minimal development in a highly significant area and would conserve the seaward outlook from significant heritage items including the gun emplacements. The application of land use zoning on the site DCP also ensures that there is a setback of residential development from this coastal ridge top which would facilitate the ongoing legibility of the relationship between the highly significant heritage items.

A site specific DCP is being developed by Architectus. The DCP will ensure the retention of the heritage values of the place in terms of views and setting. Specifically, the principles stipulate that a development buffer should be retained around the significant items not within the ‘heritage park’ and formally identifies significant views which should be identified and conserved.

It is recognised that there is an opportunity to formally recognise the significance of the site through listing as a local item on the LEP despite the existing Commonwealth listing of the place. After consultation with council it is proposed to apply a local heritage listing to four items on the site (item 696 – item 699). It is also proposed to define the Gunnar Hoban Memorial Tree as a landscape item (100) and the entire site as an Archaeological item (A21). This will ensure that the protection of the place is facilitated if parts of the place are divested in the future.

The indicative master plan addressed herein has been developed to illustrate a potential product of the planning proposal. In summary, it is considered that the indicative master plan conserves the heritage significance of the site, maintaining the highly significant elements in terms of their fabric and setting. Future development of the indicative master plan is supported from a heritage perspective.

The following recommendations have been set down to guide the design development of a proposed master plan as part of a future stage of works:

- Further consideration should be given to the options for adaptive reuse of the Admin Building, Observation Tower and Plotting Room. There is an option to retain the buildings as landscape items only with no internal access; however genuine adaptive reuse of appropriate elements will ensure that the structures are maintained to the highest level;
- If any items are proposed to be maintained as remnant evidence only, with no assigned adaptive reuse, they should be properly managed to ensure that public safety requirements are met; and
- It is recommended that as part of any future application for development on the site, a Base Heritage Interpretation Strategy and full Heritage Interpretation Plan including fabrication and execution should be prepared. These documents should be prepared in consultation with Council and local historical societies.

7. **BIBLIOGRAPHY AND REFERENCES**

7.1. **BIBLIOGRAPHY**


7.2. **REFERENCES**


SKM - Sinclair Knight Merz, Fort Wallace Infrastructure Report prepared for Department of Defence 2007.


*Note: Some government departments have changed their names over time and the above publications state the name at the time of publication.*
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1 Executive Summary

1.1 Background

DHA has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. DHA has recently purchased two surplus Defence sites at Stockton with the objective of obtaining the necessary planning approvals and developing them for a mix of housing for ADF personnel and the private market. These two sites (Fort Wallace and the Stockton Rifle Range) are located just a few kilometres north of the Newcastle CBD across the Hunter River on the Stockton Peninsula. As such the sites are comparatively close to Williamtown RAAF Base (approx. 11 to 12 km by road).

This report present the transport investigations into the Fort Wallace Range site in support of the rezoning proposal.

Site details are:

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A number of earlier assessments of the site have been prepared over a number of years. As part of this work, notional development yields were prepared indicating around 100 development lots may be achievable on the Fort Wallace site. This yield is being tested as part of the current investigations and is noted here for the purpose of forming a notional understanding of what the impacts may be and what development levels may be possible.

1.2 Summary

The following observations have been made in relation to the assessment of the transport system in the vicinity of the Rifle Range sites at Fern Bay:

a. **Location** – Stockton is a suburb of Newcastle located on the north side of the Hunter River, and adjacent to the Pacific Ocean. It is a narrow peninsula with road access available from the north. Fern Bay is a small village at the northern end of the Stockton peninsula, between the Hunter River north arm, and the Pacific Ocean.

b. **Transport Network** –
   
   a. **Road Network** – Access to Fern Bay is provided by road from the north and south, via Nelson Bay Road (B63 Route). The Fern Bay road network is a series of local streets on the eastern side of Nelson Bay Road. Access to the wider Newcastle area is provided via the Stockton Bridge to Kooragang Island and on to Tourle Street and Industrial Drive. Access north to Williamtown Airport is via the B63 Nelson Bay Road.
   
   b. **Ferry Service** – The Newcastle to Stockton Ferry connects Stockton at its southern end, on the Hunter River, to Queens Wharf in the Newcastle CDB
   
   c. **Bus Services** – Newcastle Buses Bus operates Route 118 serving Fern Bay and Stockton, although the route is quite circuitous. Buses to Williamtown are also available, operated by Port Stephens Coaches.
   
   d. **Cycle ways** – The Stockton Cycle way was opened in 2013, connecting the peninsula from Stockton Bridge in the north to the Stockton Ferry terminal in the south.

c. **Road Network performance**
   
   a. **Peak Periods** – Traffic Movement surveys were conducted on 8 June 2016 at the following locations:
      
      i. Nelson Bay Road and Fullerton Street roundabout
      
      ii. Nelson Bay Road and Taylor Road (priority control)
   
   b. AADT flow data is also available for traffic crossing the Stockton Bridge.
c. Observed flows were well within the technical mid-block capacity of the various roads under review.
d. The offset roundabout at the junction of Nelson Bay Road and Fullerton Street has been tested as operating at a very good level of service.
e. The priority junctions of Nelson Bay Road with Taylor Road and Vardon Road operate with minimal levels of delay on the main road, but with some delay for right turn movements.
d. **Land Use Proposals** – The notional development yield of 100 lots on the Fort Wallace site has been used for initial testing of traffic generation levels form the subject site.
e. **Traffic Generation** – Forecast traffic flows would be in the order of 156 trips AM and 172 trips PM for the Fort Wallace site. The external road network is more than capable of absorbing these levels of additional trips, while remaining at a very good operational level of service.
f. **Initial Site Access Considerations** –
   a. **Fort Wallace** – The existing flow levels on Fullerton Street coupled with the initial predictions of site traffic flows suggest the site will need an intersection configuration with an Auxiliary Left (AUL) turn lane, and a Channelised Right (CHR[S]) short turn slot to cater for predicted site movements onto and from Fullerton Street.
   b. Two site access points are shown on the Fort Wallace Draft Indicative Master Plan. While one access is technically acceptable from a traffic capacity perspective, the second access is of benefit in terms of redundancy, allowing emergency vehicle access or evacuation should one access point be blocked.
g. **Road Capacity** – Existing traffic flow levels suggest the mid-block two lane two way capacity of the surrounding road network is very satisfactory and has ample spare capacity to cater for the subject development proposals.
h. **Access Strategy** – Single site entrance on Fullerton Street developed with a southbound Auxiliary Left lane (AUL), and a Channelised Right Short turn slot (CHR[S])
i. **Other Considerations** –
   j. Internal road design – to meet Council road design standards. Carriageways at Local Street, Access Street, Access Place standard.
k. North extension of Stockton cycleway, or possible cycle connection between the two sites lining to the exiting cycleway.

### 1.3 Conclusion and Next Steps

This report presents the findings of the traffic and transport investigations for the Fort Wallace development site as additional housing in the Newcastle area to cater for Newcastle based Defence members and their families and to replace existing DHA dwellings that do not meet current standards.

The investigations have found that subject to road and intersection improvements as outlined in these investigations the site is able to be accommodated on the surrounding transport (road) network. The potential works of significance are:

1. Provision of one site access intersection with Fullerton Street (second access is optional) to provide turning facilities for the subject site.
2. A second site access is proposed which will provide a level of redundancy that is of benefit for emergency vehicle and evacuation access.

The overall conclusion is that given the potential level of future development proposed for the Fort Wallace site at Stockton, the strategy focussing on one site access to Fullerton Street would be technically sufficient to meet Austroads Guidelines, and a two access strategy would provide superior access within minimal impact on the external road system.

The next steps recommended are to seek more detailed engineering advice from The City of Newcastle as to the most appropriate form of road and intersection improvements to service the site.
2 Introduction and Background

2.1 Background

DHA has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. DHA has recently purchased two surplus Defence sites at Stockton with the objective of obtaining the necessary planning approvals and developing them for a mix of housing for ADF personnel and the private market. The subject site (Stockton Fort Wallace) is located just a few kilometres north of the Newcastle CBD across the Hunter River on the Stockton Peninsula. The site is comparatively close to Williamtown RAAF Base (approx. 11 to 12 Km by road).

The details of the two sites are:

<table>
<thead>
<tr>
<th>Title</th>
<th>Fort Wallace</th>
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<tbody>
<tr>
<td>Area</td>
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<td>Existing Land use Zoning</td>
<td>SP2 Infrastructure</td>
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</tbody>
</table>

A series of earlier assessments of the site has been prepared over a number of years. As part of this work, notional yields were prepared indicating around 100 development lots may be achievable on the Fort Wallace site. This yield has been tested as part of the current investigations and are noted here for the purpose of forming a notional understanding of what the impacts may be and what development levels may be possible. An Illustrative Masterplan for the Fort Wallace site is included at Appendix A of this report.

2.2 Site Context

The subject site under consideration by DHA for housing for Newcastle based defence members and their families is located at Fern Bay just north of Newcastle. The close proximity to the RAAF Williamstown base which is about 12 kms to the north of the sites, and the closeness to the regional centre of Newcastle make these sites attractively located for the purposes of housing defence families. The sites are shown in Figure 1 – Regional Context below.

![Figure 1 – Regional Context](Image)

Source: architectus” 2016

The local context of the site is shown in Figure 2 – Local Context below.

![Figure 2 – Local Context](Image)
2.3 Objectives of Traffic Investigation

The Traffic/Transport investigations have assessed the constraints and opportunities of the subject site, as a contribution to the design development of the preferred scheme for inclusion in the sites Planning Proposal. Specific work tasks have included:

- Site visits the two sites,
- Review existing information on the sites and surrounding transport network,
- Review any Council Plans, Policies or Strategies relevant to the sites and local area,
- Undertake assessments (traffic, transport, pedestrian, cycleways) to develop a sufficient understanding of the sites and their constraints and opportunities to inform the subsequent Planning Proposal and Development Application(s),
- Liaise with the urban design team on matters relating to the traffic/transport constraints and opportunities of the two sites,
- Contribute to the options development for the two sites,
- Prepare the following reports covering the traffic/transport constraints, opportunities and proposals to support the development and planning proposals:

  1. Initial review of the development options (Summary Working Report),
  2. Supporting summary report for the preferred development option,
  3. Supporting report for the Planning Proposal,
  4. Supporting report for the Development Application,

This report forms the supporting report for the Fort Wallace Planning Proposal.

It should be noted that a comparable report has been prepared for the second site under consideration, and that both pieces of work have taken into account the traffic generation and impacts of the other proposal.
3 Existing Conditions

3.1 Road Network

External Roads

The Fort Wallace site is accessed directly from Fullerton Street to the south of the roundabout controlled intersection with Nelson Bay Road.

Nelson Bay Road (B63)

Nelson Bay Road (B63) is the main road connection from Newcastle via Kooragang Island to the Port Stephens area, including the nearby airport and Defence base at RAAF Williamtown. It is built to a 4 lane dual carriageway arterial standard with sealed shoulders in the vicinity if the subject sites. At its southern end it connects to Fullerton Street via an offset roundabout junction. The western leg of this roundabout connects Nelson Bay Road to Kooragang Island via the Stockton Bridge.

Nelson Bay Road is used as a bus route for regular and for school services. (A copy of the Newcastle Buses bus network map is included in Appendix B for reference). Buses serve Stockton and Fern Bay, and complete a loop via Vardon Road Popplewell Road and Rankin Rod to access Nelson Bay Road for the return journey to Newcastle.

Photo Plate 1 – Nelson Bay Road (B63) looking south from near Vardon Road (on the left of photo)
Photo Plate 2 – Nelson Bay Road (B63) looking north from Taylor Road

Photo Plate 3 – Nelson Bay Road (B63) looking south from Taylor Road (on the left of photo)
Fullerton Street

Fullerton Street is the main north south sub-arterial route that connects the Stockton Peninsula to Nelson Bay Road. It is the only road connection for the locality. It is built to a two lane two way ‘rural’ standard in the vicinity of the Fort Wallace site, with sealed shoulders and no kerb and gutter. It is approximately 11 metres width on its approach to the Nelson Bay Road intersection, and narrows to around 9 metres adjacent to the Fort Wallace Gate.
Photo Plate 6 – Fullerton Street – Looking south from the Nelson Bay Road (B63) roundabout

Photo Plate 7 – Existing Fort Wallace Gate – viewed from Fullerton Street
Photo Plate 8 – Fullerton Street– Looking north toward Nelson Bay Road from near Fort Wallace existing entrance

Photo Plate 9 – Fullerton Street– Looking south from near Fort Wallace existing entrance
3.2 Traffic Surveys and Site Observations

Traffic Surveys

In considering the appropriate times for analysis of the impacts of future site activities it is important to ensure all periods of significant on road activity are captured.

Monitoring of traffic movements was conducted over an AM and PM peak for a typical weekday. The traffic surveys were conducted on Wednesday 8 June 2016. The surveys utilise video and automated data capture techniques with the ability to monitor both pedestrian and vehicle movements and accumulations at the nominated locations.

Traffic Survey data was collected at two locations on Nelson Bay Road, at Fullerton Street and Taylor Road. The survey data is included in Appendix C – Traffic Survey Data.

General Site Observations

The most significant observations from a traffic movement efficiency and road safety perspective that were observed from the data monitoring and site observations Wednesday 8th June 2016 were:

1. Traffic flows along Nelson Bay Road are well within the technical capacity of this 4 lane dual carriageway arterial road.
2. Traffic flows along Fullerton Street were also observed as being well within the technical capacity of this 2 way 2 lane sub arterial (truck collector/) road.
3. Operation of the Nelson Bay Road / Fullerton Road Roundabout is very good, with SIDRA intersection modelling indicating an very high Level of Service (Los) of ‘A’ on the Austroads scale of ‘A’ to ‘F’.
4. Parking is minimal on the main traffic routes approaching the subject site.
5. Bus movements along the local street network were observed, on Fullerton Street, and on Nelson Bay Road, Vardon Road and Rankin Road to the north of the subject site.

The above observations have been taken into account when considering the development proposals.

3.3 Cycling Facilities
The road network in the vicinity of the subject site includes generous sealed shoulders along Nelson Bay Road, and Fullerton Street. These are available for use by cyclists.

The Stockton Cycle way, which runs parallel to Fullerton Street from near the Stockton Bridge, was opened by Council in 2013, connecting the peninsula from Stockton Bridge in the north to the Stockton Ferry terminal in the south. It is constructed as high standard concrete pavement dual use path.

The City of Newcastle Council has actively promoted cycling as a mode of transport as well as a recreational activity for many years. This is not without its challenges, including some topography challenges, but with much of the local Stockton area quite flat, it lends itself to the promotion of cycling in the local area.

Appendix B - Newcastle Cycling Map illustrates the existing and planned network of cycleways being development by Council.

3.4 Public Transport Services

The locality is well service by bus public transport, and is also linked to the Newcastle CBD by the Newcastle to Stockton Ferry Service. Scheduled bus and ferry services are operated By Newcastle Buses and Ferries, a State Government owned corporation. Bus services operated by Port Stephens Coaches also serve to area, linking to locations in the north such as Newcastle Airport at Williamtown. The networks, bus and ferry, are illustrated in Appendix C.

3.5 Road Authority Liaison

Liaison has been undertaken with officers of both the City of Newcastle and NSW Roads and Maritime. No specific issues were raised from a traffic and transport perspective by either authority although it is noted here that NSW RMS are currently conducting a route development strategy for Nelson Bay Road. It is understood that RMS has a requirement to deliver 20 year strategies on all roads under its jurisdiction. Date of completion was not known at the time of publishing this report.

3.6 Crash History

Data has been sourced for review for the NSW RMS Crash Database. Summary information is provided in Appendix D to this report.

The data covers the period from 1st July 2010 to 30th June 2015, and is focussed on the Stockton Bridge, Nelson Bay Road, and Fullerton Street Fern Bay location. Over the period of review there were 20 recorded crashes with 9 casualties. NO fatalities were recorded in this vicinity. Of the casualties 4 incidents involved serious injuries. 75% of the incidents occurred on non-intersection locations, with a third involving hitting objects when leaving the (straight) carriageway. 45% of recorded incidents involved single vehicles. Contributing factors were noted as speed (15% and fatigue (10%)

Further to the north and approaching the Newcastle (Williamtown) Airport precinct there were 10 recorded incidents with 13 casualties, in the vicinity of Cabbage Tree Rod and Williamtown Drive. In this area speed was noted as a significant contributing factor (40%) and fatigue also but to a lesser extent (20%).

At the key intersections on approaches to the subject site, there have been 2 incidents, one involving a moderate injury in 2011, at the Nelson Bay Road / Fullerton Street intersection. The roundabout control at this junction was upgrade some years ago, with the northbound lanes able to bypass the offset roundabout layout that controls southbound movements and the Fullerton Street approach to the junction. It is understood these changes have had a positive impact on the number type and severity of incidents since that time.

Of note from the crash data is that there were no recorded incidents involving traffic pulling out of local roads onto Nelson Bay Road.

This information has been taken into consideration in developing the access strategy for the subject site.
4 Development Proposals

A number of earlier assessments of the subject site have been prepared over several years. As part of this work, a notional development yield was prepared indicating some 220 development lots may be achievable on the Rifle Range site. This yield is being tested as part of the current investigations and are noted here for the purpose of forming a notional understanding of what the impacts may be and what development levels may be possible. The Stockton Fort Wallace Indicative Master Plan is illustrated in Appendix A.

Key access features include road connections to both Vardon Road and Taylor Road.

4.1 Fort Wallace

The details of the Fort Wallace Site are:

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<td>Existing Land Use Zoning</td>
</tr>
<tr>
<td>Potential Residential Dwellings</td>
</tr>
<tr>
<td>Proposed Site Access</td>
</tr>
</tbody>
</table>

A series of earlier assessments of the site were prepared over a number of years. As part of this work, notional yields were prepared indicating around 100 lots may be achievable on the Fort Wallace. This yield is being tested as part of the current investigations and are noted here for the purpose of forming a notional understanding of what the impacts may be and what development levels may be possible. It should be noted also that a comparable report has been prepared for the second site under consideration, and that both pieces of work have taken into account the traffic generation and impacts of the other proposal.

4.2 Access, Trip Distribution and Assignment Assumptions

It is proposed to access the Fort Wallace site point using the existing site access location on Fullerton Street, and with a second access point to Fullerton Street to the north between the existing site entrance and the Nelson Bay Road Roundabout. The fundamental assignment and distribution of trips irrespective of the local road assignments has been assumed as follows:

**Fort Wallace**

**Assignment of Trips**

- a. AM – 10% IN, 90% OUT
- b. PM – 90% IN, 10% OUT

**Directional Distribution**

- a. 80% northbound via Fullerton Road
  - a. 50% northbound via Nelson Bay Road
  - b. 50% westbound via Stockton Bridge
- b. 20% southbound via Fullerton Street

4.3 Traffic Generation

Table 4-3 – Applied Traffic Generation Rates presents the traffic generation characteristics of the two sites under consideration.

<table>
<thead>
<tr>
<th>Table 4-3 – Future Traffic Generation Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Masterplan Component</strong></td>
</tr>
<tr>
<td>Fort Wallace</td>
</tr>
</tbody>
</table>

Notes: All peak trip rates are expressed in vehicles per hour (vph)
5 Existing Network Performance

5.1 Road Network

Traffic volume data for the project has been collected during a 1 day survey of intersection traffic volumes as outlined in Section 3.2 of this report. These surveys were completed on a typical weekday. The surveys were completed using video monitoring and data capture techniques, and allow post survey viewing of video footage for review of characteristics such as queuing, driver behaviour and so on. Data reduction has been completed that focusses on the typical peak periods for commuters (and school based activity) at the start and end of the business day, i.e. 7.00 AM to 9.30 AM, and 2.00PM to 4.30PM. The results of this monitoring are provided in Appendix E of this report.

AM Operations

The results from the traffic survey indicate that during the surveyed morning AM peak commute period (7.00 to 8.00 AM) the two-way traffic flow along Nelson Bay Road north of Fullerton Street was in the order of 1900 vph (864 NB +1060 SB). These flows are well within the technical capacity of a dual carriageway 4 lane urban arterial road at Level of Service (LoS) ‘A’ northbound, and ‘B’ southbound.

PM Operations

The corresponding results from the PM survey at Nelson Bay Road north of Fullerton Street between 3.30 PM and 4.30 PM (peak PM activity) show flows of a similar magnitude to the AM peak period. The PM data set indicates that during the surveyed afternoon peak period the two-way traffic flow along Nelson Bay Road was in the order of 2000 vph (1284 NB +720 SB), slightly more than the morning peak observed. These flows are again well within the technical capacity of urban traffic lanes at LoS ‘B’ northbound and LoS ‘B’ southbound.

A summary of the Wednesday 8th June 2016 traffic data is presented in Table 5.1 – Existing Traffic Volumes below.

Table 5.1 – Existing Traffic Volumes

<table>
<thead>
<tr>
<th>Road</th>
<th>Location</th>
<th>Peak Period</th>
<th>Peak flow(1)</th>
<th>Mid-Block Road Capacity</th>
<th>Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nelson Bay</td>
<td>North of Taylor Road</td>
<td>AM peak</td>
<td>861 N/B</td>
<td>900 (one-way)</td>
<td>A</td>
</tr>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td>1055 S/B</td>
<td>1400 (one-way)</td>
<td></td>
</tr>
<tr>
<td>Nelson Bay</td>
<td>North of Fullerton Street</td>
<td>AM peak</td>
<td>864 N/B</td>
<td>900 (one-way)</td>
<td>A</td>
</tr>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td>1060 S/B</td>
<td>1400 (one-way)</td>
<td></td>
</tr>
<tr>
<td>Nelson Bay</td>
<td>West of Fullerton Street</td>
<td>AM peak</td>
<td>761 E/B</td>
<td>900 (one-way)</td>
<td>A</td>
</tr>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td>1388 W/B</td>
<td>1400 (one-way)</td>
<td></td>
</tr>
<tr>
<td>Fullerton</td>
<td>South of Nelson Bay Rd</td>
<td>AM peak</td>
<td>299 N/B</td>
<td>380 (one-way)</td>
<td>B</td>
</tr>
<tr>
<td>Street</td>
<td></td>
<td></td>
<td>268 S/B</td>
<td>600 (one-way)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM peak</td>
<td>324 N/B</td>
<td>380 (one-way)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>445 S/B</td>
<td>600 (one-way)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: 1. Peak flow from 8th June 2016 traffic survey results by Mark Waugh Pty Ltd
2. RTA 2002, Urban Road Conditions, One Lane, Level of Service (Refer Table 5.2 below)
3. RTA 2002, Urban Road Conditions, Two Lanes, Level of Service (Refer Table 5.2 below)
Table 5.1 demonstrates that the roads serving as the main access routes for the subject site will operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines.

The results above are drawn from the urban flow conditions Levels of Service definitions as presented in the Guide to Traffic Generating Developments ((NSW ART October 2002) Theses are reproduced here as Table 2.2 – Urban Road peak hour flows per direction, overleaf. It can be seen that the ultimate capacity for Taylor Road for example in this location is 900 vph at the limit of acceptable flow conditions under urban conditions Level of Service ‘D’, and possibly up to 1400 vehicles per hour in one direction for LoS ‘E’. For the current observed traffic flows along Fullerton Street it can be seen that the level of service for road users is ‘A’.

Table 5.2 – Urban Road peak hour flows per direction

<table>
<thead>
<tr>
<th>Level of service</th>
<th>One Lane (vph)</th>
<th>Two Lanes (vph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>B</td>
<td>380</td>
<td>1400</td>
</tr>
<tr>
<td>C</td>
<td>600</td>
<td>1800</td>
</tr>
<tr>
<td>D</td>
<td>900</td>
<td>2200</td>
</tr>
<tr>
<td>E</td>
<td>1400</td>
<td>2800</td>
</tr>
</tbody>
</table>


The conclusion drawn from this data is that the technical lane capacity of the road system adjacent to the subject sites is high and the performance is very good.

5.2 Intersection Performance

Local Intersections

As discussed above the Fort Wallace site is proposed to maintain its existing access onto Fullerton Street, and possibly a second access also to Fullerton Street to the north and closer to the roundabout controlled intersection with Nelson Bay Road.

For the assessment of intersection performance it is useful to firstly consider the Austroads threshold levels for intersection capacity under uninterrupted flow conditions. Table 5.3 Intersection Capacity – Uninterrupted Flow Conditions below presents these thresholds. Where traffic flows fall within these limits intersection performance is essentially operating with little or no delay for approaching drivers other than to obey the requisite road rules.

Table 5.3 Intersection Capacity – Uninterrupted Flow Conditions

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Light Crossing or turning volumes</th>
<th>Maximum Design Hour Volumes, Two-way (vph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Lane through Roadway</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td>Cross Road</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Four Lane through roadway</td>
<td>1000</td>
<td>1500</td>
</tr>
<tr>
<td>Cross road</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Austroads Guide to Traffic Engineering Practice - Part 5, 1988

For both the morning and afternoon peak periods, the survey results indicate that these limits are not met on the site access priority junction. Essentially, traffic would be required to slow down to negotiate turns with little if any delay for the through traffic movements.
Operation of Nelson Bay Road Roundabout

The higher order interactions that are part of the road network providing access to the subject site are the Nelson Bay Road intersection with the roundabout controlled junction with Fullerton Street. For the Nelson Bay Road / Fullerton Road roundabout, SIDRA\textsuperscript{7} Intersection modelling indicates a good level of service of "A" on all approaches. Liaison with the road authorities has been sought, but has not been completed at this time. This liaison should be completed before finalising the traffic investigations. It is an important step in the approval process to confirm the requirements of Council as the local road authority with regard to its current access strategy for the Stockton peninsula.

Further details of the intersection analyses are provided in Appendix F to this report.
6 Future Network Performance

6.1 Road Network

The forecast traffic generation form the subject site presented in Table 4-3 have been added to the existing flows to arrive at the ‘with development’ scenario. A summary of the changes in peak traffic flows taking the additional site movements into accounts is presented in Table 6.1 – Forecast Mid-Block Traffic Volumes below.

Table 6.1 – Forecast Mid-Block Traffic Volumes

<table>
<thead>
<tr>
<th>Road</th>
<th>Location</th>
<th>Peak Period</th>
<th>Peak flow(1)</th>
<th>Mid-Block Road Capacity</th>
<th>Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nelson Bay Road</td>
<td>North of Taylor Road</td>
<td>AM peak</td>
<td>887 N/B 1058 S/B</td>
<td>900 (one-way) (4)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM peak</td>
<td>1263 N/B 742 S/B</td>
<td>900 (one-way) (4)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1400 (one-way) (4)</td>
<td></td>
</tr>
<tr>
<td>Nelson Bay Road</td>
<td>North of Fullerton Street</td>
<td>AM peak</td>
<td>890 N/B 1063 S/B</td>
<td>900 (one-way) (4)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM peak</td>
<td>1287 N/B 748 S/B</td>
<td>900 (one-way) (4)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1400 (one-way) (4)</td>
<td></td>
</tr>
<tr>
<td>Nelson Bay Road</td>
<td>West of Fullerton Street</td>
<td>AM peak</td>
<td>764 E/B 1414 W/B</td>
<td>900 (one-way) (4)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM peak</td>
<td>1530 E/B 811 W/B</td>
<td>900 (one-way) (4)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1800 (one-way) (4)</td>
<td></td>
</tr>
<tr>
<td>Fullerton Street</td>
<td>South of Nelson Bay Rd</td>
<td>AM peak</td>
<td>351 N/B 274 S/B</td>
<td>380 (one-way) (4)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM peak</td>
<td>331 N/B 501 S/B</td>
<td>380 (one-way) (4)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>600 (one-way) (4)</td>
<td>B</td>
</tr>
</tbody>
</table>
| Notes: 1. Peak flow from 8th June 2016 traffic survey results by Mark Waugh Pty Ltd
2. RTA 2002, Urban Road Conditions, One Lane, Level of Service (Refer Table 5.2 below)
3. RTA 2002, Urban Road Conditions, Two Lanes, Level of Service (Refer Table 5.2 below) |

Table 6.1 demonstrates that the roads serving as the main access routes for the subject site will continue to operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines. The only change indicated is on Nelson Bay Road where the AM level of Service is predicted to be LoS ‘C’ which is still within acceptable urban flow conditions.

The results above are drawn from the urban flow conditions Levels of Service definitions as presented in the Guide to Traffic Generating Developments (NSW ART October 2002). These are reproduced here as Table 2.2 - Urban Road peak hour flows per direction, overleaf. It can be seen that the ultimate capacity for Taylor Road for example in this location is 900 vph at the limit of acceptable flow conditions under urban conditions Level of Service ‘D’, and possibly up to 1400 vehicles per hour in one direction for LoS ‘E’.

On Fullerton Street the mid-block flow conditions are forecast to exhibit no discernible change in Level of Service.

Table 6.1 demonstrates that the roads surrounding the subject site will continue to operate well within their technical and functional lane capacity levels as described by Austroads and NSW RMS guidelines.

6.2 Intersection Performance
Intersection performance have been re-tested here as part of the future site access considerations. The operation of Nelson Bay Road / Fullerton Street roundabout has been tested to demonstrate the potential future intersection performance. The results of the SIDRA analysis indicate the Nelson Bay Road / Fullerton Street roundabout intersection will continue to operate at satisfactory service levels with no discernible change in operational performance.

It should be noted that a comparable report has been prepared for the second site under consideration, and that both pieces of work have taken into account the traffic generation and impacts of the other proposal. Level of Service summaries for the junction analyses are included in Appendix F to this report.

6.3 Intersection Design

The traffic flow analysis outlined previously demonstrates that there are no technical capacity grounds for requiring intersection control beyond the most basis of priority controlled junctions. The Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads 2009) provides guidance on the warrants for various auxiliary lane treatments at intersections. Figure 6.1 below illustrates the principles for a design speed of less than 100 kph. The posted speed limit on Boomerang Drive in the vicinity of the subject site is 60 kph. The warrants relate turn treatments to a combination of major road traffic volume and turning volumes.

For the existing traffic flows on Fullerton Street an Auxiliary Left turn treatment (AUL) and a short CHannelised Right Turn Treatment (CHR(S)) is the required treatment, assuming a nominal exiting flow (10 vph) from the subject site.

Figure 6.1 Warrants for turn treatments on major roads at unsignalised intersections

(Design Speed < 100kph)

Source: Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads 2009)

If the existing + development traffic flows on Fullerton Drive are applied at the rates calculated above, and with one site access only, then the form of the intersection required is a short CHannelised Right Turn Treatment (CHR(S)) coupled with a CHannelised Left Turn Treatment (CHL). If the alternative access strategy include the 2 proposed access junctions planned for the subject site, the combination of intersection controls recommended would be as follows:
a) North Access – Short Channelised Right Turn Treatment (CHR(S)) coupled with a Channelised Left Turn Treatment (CHL)

b) South Access – Short Channelised Right Turn Treatment (CHR(S)) coupled with an Auxiliary Left turn treatment (AUL)

The need for short channelised right turn treatment is driven largely by the Fullerton Street flows, even though the level of site traffic turning right into the site is anticipated to be quite small. The difference in the left turn treatments is based on the assumption that most (if not all) left turn traffic entering the subject site would do so at the first opportunity, the north access point.

The conclusion drawn here is that one site access point is sufficient to deal with traffic capacity issues. The form and function of the second access point should be reviewed and discussed with the road authorities to determine its role, as either an unrestricted public access point, or possibly as a gated emergency site access for evacuation and emergency service uses.

Figures 6.2, 6.3 and Figure 6.4 illustrate the basic concepts for right and left turn treatments. Given the adjacent off road cycle facilities on the west side of Fullerton Street it is not expected that on road facilities would be required.
Figure 6.3 Basic Auxiliary Left-turn treatment (BAL)
Source: Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads 2009)

Figure 6.4 Channelised Urban Auxiliary Left-turn treatment (AUL/CHL) – (Cycle Lane optional)
Source: Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (Austroads 2009)
6.4 Recommended Access Strategy

The functional class of a road will determine the balance that needs to be struck between the traffic function and the access function of the abutting land.

The local access requirements of the subject site connecting to Popplewell Road will be satisfied by priority junction control, and road cross sections consistent with the engineering standards of the City of Newcastle for local street design. Nelson Bay Road is an arterial road, and so its important function is primarily to favour traffic movement over access considerations. Direct access is generally discouraged and in this instance can be avoided by using local road connections.

**TRAFFIC ENGINEERING RECOMMENDATIONS: FORT WALLACCE SITE**

Having regard for the anticipated road authority issues based on the results of analysis conducted to the Austroads and RMS Guidelines, consideration has been given to the range of possible access arrangements for the subject sites.

a) Upgrade site access / Fullerton Road intersection to short turn slot CHR (S) and Auxiliary left lane priority junctions to suit the adopted access strategy.

b) Should a two access strategy be preferred then the combination of junctions could be:
   - North Access – Short CHannelised Right Turn Treatment (CHR(S)) coupled with a CHannelised Left Turn Treatment (CHL)
   - South Access – Short CHannelised Right Turn Treatment (CHR(S)) coupled with an Auxiliary Left turn treatment (AUL)

The form and function of a second access point should be reviewed and discussed with the road authorities to determine its role, as either an unrestricted public access point, or possibly as a gated emergency site access for evacuation and emergency service uses.
7 Summary and Conclusions

7.1 Summary

The Defence Housing Australia proposes to cater for Newcastle based Defence members and their families and to replace existing DHA dwellings that do not meet current standards. DHA has recently purchased two surplus Defence sites at Stockton with the objective of obtaining the necessary planning approvals and developing them for a mix of housing for ADF personnel and the private market. This traffic study has investigated the existing conditions and potential development of Defence Housing Australia housing facilities on the Rifle Range site at Fern Bay near Newcastle NSW, arriving at the following outcomes:

Existing Conditions

a. Existing traffic flows on Nelson Bay Rd & Fullerton St are well within capacity limits of road of their function and construction standard.
b. Intersections have been assessed as operating at satisfactory service levels, the Fullerton Street / Nelson Bay Road roundabout is built to a high urban arterial road standard.
c. A cycle path is provided along the Hunter River foreshore from Stockton Bridge to Stockton Ferry terminal.
d. Existing Ferry services link Stockton to the Newcastle CBD with regular scheduled services.
e. Existing bus services also connect Stockton and Fern Bay to Newcastle, and north to Newcastle Airport.

Proposed Development

f. Additional traffic generation associated with the Fort Wallace site is 100 dwellings
g. The Rifle Range site development has been taken into consideration in this assessment.
h. Access is proposed from Fullerton Street via priority controlled intersections

Future Performance

i. Future flow conditions on Nelson Bay Road and Fullerton Street are forecast to remain well within technical capacity limits for the function and standard of construction of the road. There is no discernible difference in existing and forecast “with development flows.
j. The Fullerton Street / Nelson Bay Road roundabout has been assessed under future flow conditions as maintaining operation at satisfactory service levels.

ACCESS RECOMMENDATIONS:

In view of the conditions of the local roads and performance of the intersection of Nelson Bay Road / Fullerton Street the following recommendations are made for improvements to support the development proposal:

a) A single site access is sufficient, incorporating a Short CHannelised Right Turn Treatment (CHR(S)) coupled with a CHannelised Left Turn Treatment (CHL)

For the alternative access strategy which includes two (2) proposed access junctions for the subject site, the combination of intersection controls recommended would be as follows:

b) North Access - (CHR(S)) treatment coupled with a (CHL) Treatment
c) South Access - (CHR(S)) Treatment (CHR(S)) coupled with an Auxiliary Left turn treatment (AUL)

The need for short channelised right turn treatment is driven largely by the Fullerton Street flows, even though the level of site traffic turning right into the site is anticipated to be quite small. The difference in the left turn treatments is based on the assumption that most (if not all) left turn traffic entering the subject site would do so at the first opportunity, the north access point.

The conclusion drawn here is that one site access point is sufficient to deal with traffic capacity issues. The form and function of the second access point should be reviewed and discussed with the road authorities to determine its role, as either an unrestricted public access point, or possibly as a gated emergency site access for evacuation and emergency service uses.

7.2 Conclusion

The conclusion drawn here is that the proposed site access arrangements for the Fort Wallace site will provide a very high quality of access for the subject site. One site access point is sufficient to deal with traffic capacity issues. It is recommended that the form and function of a second access point should this be pursued be reviewed and discussed with the road authorities to determine its role, as either an unrestricted public access point, or possibly as a gated emergency site access for evacuation and emergency service uses.

The overall conclusion is that the proposed access arrangements for the Fort Wallace site redevelopment are satisfactory and the planning proposal is therefore recommended on traffic and transport grounds.
Appendix A. Fort Wallace Illustrative Master Plan

Source: Architectus 2017
Appendix B. Newcastle Cycling Map
Appendix C: Public Transport Maps
Appendix D. Crash History
Stockton Bridge, Nelson Bay Road and Fullerton Street, Fern Bay
Crash period 01/07/2010 to 30/06/2015

Map data copyright (C) 2007 Roads and Traffic Authority, NSW. Some spatial data courtesy of NSW Department of Lands.
<table>
<thead>
<tr>
<th>Crash No.</th>
<th>Data Source</th>
<th>Date</th>
<th>Time</th>
<th>Distance</th>
<th>ID Feature</th>
<th>Loc Type</th>
<th>Alignment</th>
<th>Weather</th>
<th>Surface Condition</th>
<th>Speed Limit</th>
<th>No. of Tuss</th>
<th>Tu Type/Obj</th>
<th>Age/Sex</th>
<th>Street &amp; Travelling</th>
<th>Speed Travelling</th>
<th>Manoeuvre</th>
<th>Degree of Crash</th>
<th>Killed</th>
<th>Injured</th>
<th>Injury Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter Region</td>
<td>Newcastle LGA</td>
<td>717007 P</td>
<td>03/07/2010</td>
<td>14:25</td>
<td>at FULLERTON ST</td>
<td>RDB</td>
<td>CRV</td>
<td>Fine</td>
<td>Dry</td>
<td>80</td>
<td>2</td>
<td>CAR</td>
<td>F81</td>
<td>W in FULLERTON ST</td>
<td>10 Proceeding in lane</td>
<td>N 0 0</td>
<td>Fullerton St</td>
<td>10 Proceeding in lane</td>
<td>N 0 0</td>
<td>S F</td>
</tr>
<tr>
<td>Hunter Region</td>
<td>Newcastle LGA</td>
<td>717500 P</td>
<td>12/07/2010</td>
<td>10 m</td>
<td>S FULLERTON ST</td>
<td>RDB</td>
<td>CRV</td>
<td>Fine</td>
<td>Dry</td>
<td>80</td>
<td>2</td>
<td>LOR</td>
<td>M67</td>
<td>S in NELSON BAY RD</td>
<td>40 Proceeding in lane</td>
<td>N 0 0</td>
<td>Fullerton St</td>
<td>40 Proceeding in lane</td>
<td>N 0 0</td>
<td>S F</td>
</tr>
<tr>
<td>Hunter Region</td>
<td>Port Stephens LGA</td>
<td>723113 P</td>
<td>12/08/2010</td>
<td>Thu 07:50</td>
<td>100 m</td>
<td>N FULLERTON COVE RD</td>
<td>DIV</td>
<td>STR</td>
<td>Fine</td>
<td>Dry</td>
<td>100</td>
<td>2</td>
<td>CAR</td>
<td>M21</td>
<td>S in NELSON BAY RD</td>
<td>Unk Proceeding in lane</td>
<td>N 0 0</td>
<td>Fullerton St</td>
<td>Unk Proceeding in lane</td>
<td>N 0 0</td>
</tr>
<tr>
<td>Hunter Region</td>
<td>Newcastle LGA</td>
<td>740774 P</td>
<td>01/02/2011</td>
<td>Tue 08:50</td>
<td>555 m</td>
<td>S NELSON BAY RD</td>
<td>2WY</td>
<td>CRV</td>
<td>Fine</td>
<td>Dry</td>
<td>70</td>
<td>1</td>
<td>WAG</td>
<td>M40</td>
<td>S in FULLERTON ST</td>
<td>55 Proceeding in lane</td>
<td>N 0 0</td>
<td>Fullerton St</td>
<td>55 Proceeding in lane</td>
<td>N 0 0</td>
</tr>
<tr>
<td>Hunter Region</td>
<td>Newcastle LGA</td>
<td>750199 P</td>
<td>10/04/2011</td>
<td>Sun 01:14</td>
<td>600 m</td>
<td>N SAND/PIPER CL</td>
<td>DIV</td>
<td>STR</td>
<td>Fine</td>
<td>Dry</td>
<td>80</td>
<td>1</td>
<td>WAG</td>
<td>M53</td>
<td>W in TEAL ST</td>
<td>80 Proceeding in lane</td>
<td>N 0 0</td>
<td>Fullerton St</td>
<td>80 Proceeding in lane</td>
<td>N 0 0</td>
</tr>
<tr>
<td>Hunter Region</td>
<td>Newcastle LGA</td>
<td>757281 P</td>
<td>05/05/2011</td>
<td>Thu 14:55</td>
<td>at FULLERTON ST</td>
<td>RDB</td>
<td>STR</td>
<td>Fine</td>
<td>Dry</td>
<td>70</td>
<td>2</td>
<td>CAR</td>
<td>M17</td>
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<td>Fullerton St</td>
<td>20 Turning right</td>
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<td>2WY</td>
<td>CRV</td>
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<td>Dry</td>
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<td>M/C</td>
<td>F43</td>
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Rep ID: DCR02 Office: Hunter User ID: hampson
## Detailed Crash Report - sorted

### Natural Lighting

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<th>Street Travelling</th>
<th>Manoeuvre</th>
<th>Degree of Crash</th>
<th>Killed</th>
<th>Injured</th>
<th>Factors</th>
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## Detailed Crash Report - sorted

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<th>Alignment</th>
<th>Weather</th>
<th>Surface Condition</th>
<th>Speed Limit</th>
<th>No. of Tus</th>
<th>Tu Type/Obj</th>
<th>Age/Sex</th>
<th>Street Travelling</th>
<th>Speed Travelling</th>
<th>Manoeuvre</th>
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<th>Injured</th>
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<td>Darkness</td>
<td>RUM</td>
<td>Rear end</td>
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<tr>
<td>E56227779</td>
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<td>10/01/2014</td>
<td>Sun</td>
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<td>Darkness</td>
<td>RUM</td>
<td>Off rd left =&gt; obj</td>
<td>UTE U U S in NELSON BAY RD</td>
<td>70 Proceeding in lane</td>
<td>2</td>
<td>UTE U U S in NELSON BAY RD</td>
<td>0 Parked footpath</td>
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<td>0</td>
<td></td>
<td>0</td>
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### Natural Lighting

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<th>Time</th>
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<th>No. of Tus</th>
<th>Tu Type/Obj</th>
<th>Age/Sex</th>
<th>Street Travelling</th>
<th>Manoeuvre</th>
<th>Degree of Crash</th>
<th>Killed</th>
<th>Injured</th>
<th>Factors</th>
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<tbody>
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<td>Thu</td>
<td>21:00</td>
<td>40</td>
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<tr>
<td>Port Stephens LGA</td>
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<td>Sun</td>
<td>04:30</td>
<td>70</td>
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<td>0</td>
<td>F</td>
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<td></td>
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</table>

### Crash Totals:

- Total Crashes: 20
- Fatal Crashes: 0
- Injury Crashes: 7
- Killed: 0
- Injured: 9

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. For further information refer to Data Manual or report provider.
**Summary Crash Report**

### Crash Type
- **Car Crash**: 19 (95.0%)
- **Light Truck Crash**: 1 (5.0%)
- **Rigid Truck Crash**: 1 (5.0%)
- **Articulated Truck Crash**: 0 (0.0%)
- **Heavy Truck Crash**: 1 (5.0%)
- **Bus Crash**: 0 (0.0%)
- **Heavy Vehicle Crash**: 1 (5.0%)
- **Emergency Vehicle Crash**: 0 (0.0%)
- **Motorcycle Crash**: 1 (5.0%)
- **Pedal Cycle Crash**: 0 (0.0%)
- **Pedestrian Crash**: 1 (5.0%)

* Rigid or Artic. Truck * Heavy Truck or Heavy Bus
* # These categories are NOT mutually exclusive

### Location Type
- **Intersection**: 5 (25.0%)
- **Non intersection**: 15 (75.0%)

* Up to 10 metres from an intersection

### Collision Type
- **Single Vehicle**: 9 (45.0%)
- **Multi Vehicle**: 11 (55.0%)

### Road Classification
- **Freeway/Motorway**: 0 (0.0%)
- **State Highway**: 0 (0.0%)
- **Other Classified Road**: 16 (80.0%)
- **Unclassified Road**: 4 (20.0%)

### Speed Limit
- **40 km/h or less**: 0 (0.0%)
- **80 km/h zone**: 9 (45.0%)
- **90 km/h zone**: 0 (0.0%)
- **100 km/h zone**: 1 (5.0%)
- **110 km/h zone**: 0 (0.0%)

### Contributing Factors
- **Speeding**: 3 (15.0%)
- **Fatigue**: 2 (10.0%)
- **Other**: 0 (0.0%)

### Crash Movement
- **Intersection, adjacent approaches**: 2 (10.0%)
- **Head-on (not overtaking)**: 0 (0.0%)
- **Opposing vehicles; turning**: 1 (5.0%)
- **U-turn**: 0 (0.0%)
- **Non-casualty**: 13 (65.0%)

### Weather
- **Fine**: 15 (75.0%)
- **Other**: 0 (0.0%)

### Road Surface Condition
- **Wet**: 5 (25.0%)
- **Snow or ice**: 0 (0.0%)

### Natural Lighting
- **Dawn**: 1 (5.0%)
- **Daylight**: 12 (60.0%)
- **Dusk**: 0 (0.0%)
- **Darkness**: 7 (35.0%)

### Time Group % of Day
- **00:01 - 02:59**: 1 (5.0%)
- **03:00 - 04:59**: 2 (10.0%)
- **05:00 - 05:59**: 2 (10.0%)
- **06:00 - 06:59**: 0 (0.0%)
- **07:00 - 07:59**: 2 (10.0%)
- **08:00 - 08:59**: 1 (5.0%)
- **09:00 - 09:59**: 0 (0.0%)
- **10:00 - 10:59**: 1 (5.0%)
- **11:00 - 11:59**: 0 (0.0%)
- **12:00 - 12:59**: 3 (15.0%)
- **13:00 - 13:59**: 0 (0.0%)
- **14:00 - 14:59**: 3 (15.0%)
- **15:00 - 15:59**: 0 (0.0%)
- **16:00 - 16:59**: 1 (5.0%)
- **17:00 - 17:59**: 0 (0.0%)
- **18:00 - 18:59**: 1 (5.0%)
- **19:00 - 19:59**: 0 (0.0%)
- **20:00 - 20:59**: 3 (15.0%)
- **21:00 - 21:59**: 0 (0.0%)
- **22:00 - 23:59**: 0 (0.0%)

### Self Reported Crash
- **0%**

### Reporting yrs 1996-2004 and 2014 onwards contain uncategorised inj crashes.

### Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data.

### Holidays
- **New Year**: 0 (0.0%)
- **Easter**: 1 (5.0%)
- **Queen’s BD**: 0 (0.0%)
- **Labour Day**: 0 (0.0%)
- **Christmas**: 0 (0.0%)
- **Easter SH**: 2 (10.0%)
- **Sept./Oct. SH**: 1 (5.0%)
- **Anzac Day**: 1 (5.0%)
- **May Day**: 0 (0.0%)
- **January SH**: 1 (5.0%)
- **June/July SH**: 2 (10.0%)
- **December SH**: 0 (0.0%)
- **Aust. Day**: 1 (5.0%)
- **Easter**: 0 (0.0%)
- **Christmas**: 0 (0.0%)
- **Easter SH**: 2 (10.0%)
- **July/Aug. SH**: 1 (5.0%)
- **Dec. SH**: 0 (0.0%)

### Casualties
- **Killed**: 0 (0.0%)
- **Seriously inj.**: 4 (20.0%)
- **Moderate inj.**: 3 (15.0%)
- **Minor/Other inj.**: 1 (5.0%)
- **Uncategorised inj.**: 3 (15.0%)
- **Fatally Injured**: 0 (0.0%)
Appendix E. Traffic Movement Survey Results
## TURNING MOVEMENT SURVEY
Nelson Bay Rd and Fullerton St, Nelson Bay
Wednesday, June 8, 2016

**Weather:** Overcast  
**Suburban:** Nelson Bay  
**Customer:** Better Transport

### All Vehicles

<table>
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<tr>
<th>Time</th>
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<th>East Approach Fullerton St</th>
<th>South Approach Nelson Bay Rd</th>
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<td>SB</td>
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Appendix F. Traffic Modelling Summary
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Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

SIDRA INTERSECTION 7.0 | Copyright © 2000-2016 Akcelik and Associates Pty Ltd | sidrasolutions.com
Project: C:\Users\mark.waugh\Documents\WORK\PROJECTS ACTIVE\ACTIVE\BTF201693 DHA Stockton\SIDRA\DHA Stockton.sip7
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Nelson Bay Rd & Fullerton St - PM+RR+FW+BG1.5]

DHA Stockton
Roundabout

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Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
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SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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Appendix K of Planning Proposal

DHA
Fort Wallace
Social Impact Assessment

July 2017
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Appendices

Appendix A - Demographic summary
Appendix B - Local Social Infrastructure
Appendix C - Age Structure Profile
1. Introduction

1.1 Project overview

Defence Housing Australia (DHA) purchased the Fort Wallace site in 2015 from the Department of Defence. The development of the site is concurrent with the Fern Bay Rifle Range site, which was also purchased by DHA. The Fort Wallace site was considered to be surplus to Defence’s operational needs. DHA purchased the site in order to provide high quality, modern accommodation (one to four bedroom dwellings) for Defence personnel and their families, and to the wider community. DHA is seeking amendments to the Local Environment Plan (LEP) through a Planning Proposal to rezone the land for residential and public recreational uses.

1.2 Purpose of this report

GHD has been engaged by DHA to prepare a Social Impact Assessment (SIA) in support of the Planning Proposal for the Fort Wallace site in Stockton. The SIA has been prepared in accordance with Newcastle City Social Impact Assessment Policy (1999). The method and approach adopted for assessment is discussed in section 1.4.

1.3 The proposed development

1.3.1 Site location

The Fort Wallace site is located on the Stockton peninsula north of the existing coastal village of Stockton, 5km north of Newcastle CBD on the northern side of the Hunter River within Newcastle LGA. Fort Wallace is approximately 32 hectares in area. The site is bound by the Stockton Centre (health care facility) to the north, a disused water treatment works to the south, Fullerton Road and the Hunter River to the west and Stockton Beach to the east.

The Fort Wallace site is currently accessed by a single entry from Fullerton Road. It is a 20 minute drive from Newcastle CBD via the Stockton Bridge, or alternatively 3.5 km from the 10 minute ferry service between Stockton and Newcastle.

The planning proposal indicates key features of the site including:

- Significant European history with remnant defence buildings and gun emplacements with heritage significance
- Cultural and archaeological significance for the local Aboriginal community
- Elevated views west over the Hunter River and east to the coast
- Coastal dune system to its eastern boundary
- Close proximity to the beach and river

The site location and surrounding features are illustrated in Figure 1.
1.3.2 The Planning Proposal

The site is currently part of a special uses area that sits between the two residential communities of Stockton and Fern Bay. The RAAF Base Williamtown is located approximately 30 km north of the site, which would be the place of employment for many of the Defence residents of the subject site. Fort Wallace is also proximal to the employment areas of Kooragang Island and accessible to the Newcastle CBD.

DHA purchased the land in 2015 and seeks to provide high quality, modern accommodation (1 to 4 bedroom dwellings) for Defence personnel and their families, and to the wider community. In order to develop the site for residential uses, the land will need to be rezoned.

The Planning Proposal for this site addresses the request for rezoning of the land to residential development as R2 Low Density Residential and the remaining land to RE1 Public Recreation uses. All proposed dwellings and developable area is landward of the 2100 Coastal Hazard line, in accordance with Council’s policy. The part of the site to the east, adjoining the existing RE1 Public Recreation area, is proposed to be zoned RE1, accommodating the coast, dune and important heritage items for public enjoyment. This zone retains the potential to accommodate a small retail offering, such as a café or kiosk, in the context of the heritage items to activate the precinct for visitors to the site and provide amenity for the local community in Stockton and Fern Bay-Fullerton Cove.
1.3.3 Concept Master Plan

To support the planning proposal, DHA has developed a Concept Master Plan for the site to illustrate its ability to accommodate residential development, and the nature of planning changes required. The concept master plan is outlined in the Fort Wallace Planning Proposal (Architectus, 2017). The master plan responds to the site’s natural and historic constraints, and through these considerations proposes a diverse mix of housing to accommodate a residential community, including public parks and streets and retained heritage values. The master plan proposes an energy efficient, environmentally sensitive and higher density development with a smaller development footprint. The master plan would facilitate the delivery of a residential development including:

- 103 dwellings (a mix of one to four bedrooms)
- Heritage items, including bunkers and tunnels and three buildings for potential adaptive reuse
- Community parks and recreational facilities

The concept master plan envisages the 103 dwellings would comprise:

- 42 Dune apartments (4 units per floor, 1-4 storey; 1-3 bedrooms)
- 25 Coastal cluster homes (clusters of 2, 3 and 4 ‘apartments’, 2 storey, 3 bedroom)
- 14 Single eco-homes (larger lot sizes 1-2 storeys, 3 bedroom)
- 3 Courtyard homes (2 storey, 4 bedrooms)
- 19 Townhouses/row houses with rear lane access (2 storey; 3 bedroom homes plus potential 1 bedroom studio)

The sites heritage would offer residents and visitors the opportunity to engage with Fort Wallace’s military history. The heritage precinct would comprise:

- Refurbished heritage structures
- A public event space
- Adaptively-reused heritage structures (e.g. cafe, local museum, Landcare facility)

Paths and public spaces would permit access to the beach and dune ecology whilst protecting the ecology through:

- Dune bushwalk and viewing platforms
- Dune Boardwalk to Stockton - Newcastle
- Dune revegetation and protection zone

The public parklands proposed within the master plan would emphasize principles of “nature play” through the selection of play facilities and materials. An active sports lawn and playgrounds would be included in these communal spaces.

1.4 Methodology

This SIA has been prepared in accordance with Newcastle City Council’s Social Impact Assessment Policy for Development Applications (1999). The aim of this policy is to facilitate the preparation and assessment of development applications with respect to social considerations in the interests of the developer, the broader community and the future of Newcastle.

It also reflects the Planning Institute of Australia’s Social Impact Assessment Position Statement (2010) which recommends that the SIA process involves analysing, monitoring, and managing
these social consequences, both positive and negative, and any social change processes invoked by them.

In undertaking the SIA, GHD has undertaken a staged methodology based on the International Association for Impact Assessment *Social Impact Assessment International Principles* (2015)\(^1\). This process is consistent with Newcastle City Council’s requirements for a SIA. The process involves five stages as identified in Figure 2.

**Figure 2 GHD’s five stages for preparing the SIA**

1. Scoping and profiling
2. Consultation
3. Impact identification
4. Impact evaluation and analysis
5. Recommendations and final report

**Figure 3 Concept Master Plan**
Stage 1: Scoping and profiling

Scoping was undertaken to identify the primary issues and associated stakeholders potentially impacted by the project, and the spatial extent of these issues in assessing the project area. The scoping was refined and adjusted throughout the profiling process. A visit to the site and surrounding areas was undertaken on 7 - 8 June 2017

A profile of the existing community that has the potential to be affected by the proposed rezoning was prepared based on 2011 census data and information provided by Newcastle Council and Port Stephens Council in regard to development approvals. A demographic profile of the potential future residents of the Fort Wallace site and the local area was also prepared. In addition a review was conducted of the available local social infrastructure.

A review of the planning proposal (Architectus 2017) and supporting documents was undertaken, including the Aboriginal Cultural Heritage and Archaeological Assessment Report (Umwelt 2017), Urban Design and Landscape Report Final Draft, Fort Wallace, Stockton (Spackman, Mossop and Michaels, and Architectus, 2016) and, the Stakeholder and Community Engagement Outcomes Report (Elton Consulting 2016).

Stage 2: Identification of impacts

An assessment was undertaken to identify the possible risks and social impacts that may arise as a result of the proposed rezoning. The assessment considered the timing, duration, likelihood and significance of the identified risks.

Stage 3: Consultation

Considerable consultation was undertaken in the development of the Fort Wallace Planning Proposal. GHD has drawn on these outcomes and consulted with key stakeholders as outlined in Section 5. This consultation has informed the SIA in both profiling, identifying impacts and developing mitigation measures.

Stage 4: Impact evaluation and analysis

GHD collated and further analysed the information obtained in Stages 1, 2 and 3. Key questions that were considered include:

- What is the likelihood that the impact will occur?
- Are the impacts likely to be experienced by all persons or will the impact be specific to certain demographic cohorts, stakeholders or special interest groups?
- Is the impact positive or negative? What weight or level of importance should be attached to each impact?
- What measures can be implemented that will mitigate the negative impacts or enhance the positive impacts?

The analysis included a community needs assessment that aimed to determine any gaps in existing community need, and the needs of the likely future population should the site be developed according to its potential under the rezoning proposal. The community needs assessment was informed by leading practice frameworks in social infrastructure, as outlined in section 4.

Stage 5: Recommendations and final report

The final report has been developed with recommendations that outline the options and procedures that could be pursued should the proposed rezoning be adopted and residential development pursued. These recommendations would seek to identify strategies to maximise positive social outcomes whilst also minimise social risk and avoid or ameliorate potential negative social impacts.
1.4.1 Study areas

The local study area determined for the Fort Wallace site includes the suburbs of Stockton, Fern Bay and Fullerton Cove. Although these suburbs are different from each other, they share a number of common characteristics including:

- a relatively isolated position in relation to the district and regional areas
- shared access to local infrastructure and conveniences
- bordering two local government areas.

The geography of the suburbs (being on a peninsular spanning two LGAs) also results in these residents accessing district and regional infrastructure within the local government areas of both Newcastle and Port Stephens. The regional study area for the assessment was therefore assessed to include both Newcastle and Port Stephens LGAs.

1.5 Scope and limitations

1.5.1 Consideration of 2016 Census data

This social impact assessment was prepared in June 2017, drawing on demographic data from the 2011 census and informed by consultation with key stakeholders about change in the area and information about the number residential development approvals in the local area, as provided by Councils. At the conclusion of the study much of the 2016 census data became available.

The estimated current (2017) population of 8,141 people used in this assessment is in the order of 645 people higher than that reported in the 2016 census (7,496 people). This variation is likely due to a number of factors including:

- Additional development and occupation of residential dwellings since the 2016 census (resulting in a larger number for 2017 during the period of consideration)
- The estimate assuming occupation of all approved development applications that may not yet have been built or occupied
- Errors in the estimate matching the actual situation

The key population number used in this report is the likely future population, estimated at 9,341 people. This estimates the 2011 population in addition to residential occupation of all currently approved residential developments and is thus considered to remain a relevant estimation for the purposes of the assessment, although it may be somewhat high.

A preliminary review of the 2016 census data for the local area indicates the significant changes since 2011 that were identified during consultation and are reflected and discussed in this social impact assessment (primarily a large overall population growth with the greatest growth in 0-4 years olds and seniors over 60 years of age).

The age structure estimated made for the assessment have varied from that indicated in the 2016 census, but again these can not be expected to be identical as further development in both Seaside and seniors living will continue to modify this structure.

Compared with the 2016 census data, the likely age structure of the future population expects a higher proportion of 0 – 4 year olds and a lower proportion of over 60 year olds. The ageing population may be under represented in this estimate.

In summary these differences in numbers are not considered to significantly alter the key outcomes of the assessment, as the likely future population estimates are considered suitable
for the purposes of the assessment and qualitative consideration of these issues has been undertaken in the assessment and need and impact.

1.5.2 Limitations

This report has been prepared by GHD for Defence Housing Australia (DHA) and may only be used and relied on by DHA for the purpose agreed between GHD and the DHA as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other or entity other than DHA arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by DHA and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report, which were caused by errors, or omissions in that information.
2. Policy context

This section provides information about the social policy context of the proposed site and identifies specific plans that align with the proposal and strategies, which inform this assessment. These include NSW Government and Newcastle City and Port Stephens Council documents.

2.1 State government

2.1.1 Hunter Regional Plan 2036

The Plan has been developed to guide the NSW Government’s land use planning priorities and decisions over the next 20 years.

The Hunter Regional Plan 2036 is the NSW Government’s strategy guiding land use planning priorities and decisions over the next 20 years. The vision for the region is for a leading regional economy in Australia with a vibrant new metropolitan city of Newcastle at its heart. To achieve the vision, the plan identifies that the growing region would need to support thriving communities and greater housing choice and jobs. Greater Newcastle and revitalising Newcastle City Centre are identified as key components to the region’s success. It is intended as a framework to guide subsequent and more detailed land use plans, development proposals and infrastructure funding decisions. The Plan also identifies priorities for each council to guide further investigations and implementation.

Overall the growth strategy in the Plan supports the renewal of the site to deliver a diversity of housing to serve the housing needs of the local and defence force community, whilst making the most efficient use of existing social and physical infrastructure.

Although the Plan includes some conflicting mapping of the land use and development expectations for the site, it does indicate the site for residential and employment use in some figures. The Plan, representing a high level framework provides direction to local planning for specific sites. The Department of Planning and Environment has recommended to Council that assessment of specific planning proposals have consideration for:

- Direction 20 – Revitalise existing communities
- Direction 21 – Create a compact settlement
- Direction 22 – Promote housing diversity
- Direction 23 – Grow centres and renewal corridors
- Direction 24 – Protect the economic functions for employment land

The planning proposal responds to each of these directions;

- increasing demand and viability of existing social infrastructure in the Stockton-Fern Bay area;
- renewal of an area for residential use in close proximity to the city centre;
- seeking rezoning which supports a concept master plan that delivers diverse housing options which would support a diverse community;
- contributing to the development of the locally significant Fern Bay growth centre,
- supporting the nearby Williamstown RAAF base and Defence force personnel in the region by providing housing.
2.1.2 Draft Plan for Growing Hunter City 2015

The Draft Plan for Growing Hunter City accompanies the Hunter Regional Plan 2036. Hunter City is defined as the metropolitan area extending from Toronto and Swansea in the south to Raymond Terrace in the north and from Newcastle harbour in the east to Lochinvar in the west. The Newcastle City Centre falls under the Inner Newcastle district identified in the plan. It will be a major contributor to achieving the Regional Plan’s goals to grow and diversity the Hunter economy. In order to support robust communities, communities will have access to a range of housing opportunities and jobs. Access to jobs, services, shops, recreation opportunities, entertainment and the arts will deliver quality living.

The plan identifies goals, directions and actions to guide land use planning across the Hunter Region including the metropolitan area.

Direction 7.2 in the Plan aims to manage growth to protect the strategic Northern Gateways District (which includes Stockton). The Plan identified Stockton as a future housing growth area and notes the NSW Government committing to encouraging urban renewal in areas including Stockton. This planning proposal is therefore consistent with the intentions of this direction.

2.2 Local Government

2.2.1 Newcastle 2030: Newcastle Community Strategic Plan

Newcastle 2030 is a strategic community vision developed by Newcastle City Council to inform policies and actions to become a “smart, liveable and sustainable City by 2030” (page 10). It focuses on seven strategic directions for Newcastle to become:

- A connected City;
- A protected and enhanced environment;
- Vibrant and activated public spaces;
- Caring and inclusive community;
- Liveable and distinctive built environment;
- A smart and innovative City; and
- Open and collaborative leadership.

The strategy outlines the key challenges facing Newcastle communities, including meeting the needs of a growing and ageing population. The development directly responds to key opportunities identified in the Plan, including creating public spaces, enhancing the environment and connecting the peninsula.

2.2.2 Newcastle Local Planning Strategy 2015

The Newcastle Local Planning Strategy (2015) presents a comprehensive land use strategy for Newcastle. It includes neighbourhood visions and population forecasts up on which planning is based.

Key local visions and objectives for Stockton include;

- Protection and enhancement of the existing beach and harbour side character and existing historic identify

Encouragement of development that is sympathetic to the existing character of Stockton

- Facilitate development of the commercial centre to improve local services and attract visitors
Promote Stockton for tourism without compromising its residential appeal
Protection and enhancement of public harbour side reserves

The Plan also includes population estimates for Stockton which indicate an increase in population by 2036 of only 72 people, and only 32 people by 2026, noting that, the largest increase over the period is likely to be in lone person households. It is apparent that this forecast has not included potential development of the Fort Wallace or Stockton Centre sites.

The Plan notes the Stockton commercial area as a local centre, meeting the daily needs of the local community, but recognises that its desired pedestrian catchment (ped shed) does not include norther Stockton and that a new commercial centre may be justified there and to meet the needs of new urban release areas.

### 2.2.3 Draft Newcastle Social Strategy 2016-2019

The Draft City of Newcastle Social Strategy (2016-2019) is a four-year framework outlining the key priorities and actions to be delivered by Council in its commitment to investing in, promoting and delivering community development outcomes in Newcastle. The strategy, together with six others aims to deliver outcomes on the strategic directions outlined in the Newcastle 2030 Community Strategic Plan. The Draft Social Strategy identifies five focus areas for each action, including:

- Community wellbeing
- Innovation and creativity
- Healthy lifestyles
- Community infrastructure
- Community safety

### 2.2.4 Community Assets and Open Space Policy 2012

The purpose of the *Community Assets and Open Space Policy* is to provide Council with a framework and set of guiding principles for the consistent and integrated planning, acquisition, delivery management and disposal of community assets and open space across the Newcastle local government area.

This policy seeks to provide the community of Newcastle with the following community asset and open space outcomes:

- Encourage social connections, community participation, promote health and wellbeing;
- Multi-purpose, functional, safe and innovative places and spaces that are equitably distributed across the local government area;
- Management of community assets and open space from a quadruple bottom line perspective;
- Diverse places and spaces that accommodate a range of uses that are responsive to changing trends, aspirations and community needs;
- Timely delivery of community assets and open space that is integrated with other assets provided by Council and partner agencies;
- Co-location of community assets and open space to maximise the opportunity for ing community connections and economies of scale; and
- Open and transparent governance and management of community assets and open space that provides the community with clear accountability of Council’s actions.
2.2.5 **Newcastle Safe City Plan 2017-2020**

The City of Newcastle Council’s *Safe City Plan* includes actions that contribute to safety and social inclusion within the community. This plan supports the objectives of Council’s *Social Strategy 2016-2019* to improve community perceptions of safety. Key safety issues identified include drug and alcohol related crime, disengaged youth, fear of crime, discrimination, malicious damage to the built environment and anti-social behaviour.

In order to address safety issues, Council’s priority areas include:

- Improving safety through public domain design and the built environment, such as increasing natural surveillance and perceptions of safety.
- Facilitating community inclusion, such as providing Council facilities that are safe, welcoming and inclusive, and providing open space and community assets that facilitate positive social interaction and wellbeing.

2.2.6 **Newcastle Cultural Strategy 2016 – 2019**

The Newcastle City Council’s *Cultural Strategy 2016-2019* aims to support and develop a thriving creative culture within the city. It prioritises actions and resources to assist the local arts communities and increase opportunities for the community to participate in cultural activity. Priorities include creating:

- Vibrant and activated public places that provide diverse activity, safety and strengthen social connections, where cultural, heritage and place are valued.
- Liveable and distinctive built environments that maintain and enhance the city’s sense of identity.
- Smart and innovative city with a thriving community that attracts people to live, work, invest and visit the city.

2.2.7 **Newcastle Cycling Strategy and Action Plan 2012**

The *Newcastle Cycling Strategy and Action Plan* builds on previous bike plans and expands on cycling-related strategies and initiatives from a range of Council documents.

The overall objective of the strategy is to make cycling a safe and attractive travel option to encourage more peoples to cycle. Strategies and actions to cover the broad areas to do this are:

- Bicycle network and infrastructure
- Promotion and education
- Leadership and advocacy
- Planning for active transport
- Monitoring and review

The plan identifies the need for proposed development to tie in with existing and planned cycling networks, and to cater for cyclists through the provision of infrastructure such as bike storage or hoops in both planned residential and commercial areas.

The plan, relevant to this proposal identifies the need for connected pathways in Stockton through the addition of a local bike route (L20 – Stockton). This route was proposed as an on road connector from the ferry terminal to R1 (Adamstown Heights to Fern Bay) at the northern end of Fullerton St, on Mitchell St, Barrie Cr, Griffith Ave Eames Ave and Meredith St. It is to be considered in conjunction with work on the Coastal Revitalisation project, in which an off road path from S2 to connect to R1 near Fullerton St north has been mooted.
2.2.8 Stockton Public Domain and Traffic Plan 2017

Newcastle City Council developed this public domain improvement program in consultation with the local community. Key elements of the plan which support improved community accessibility and social amenity, which is planned to commence in 2017/2018 includes;

- Footpath widening outside Stockton Library, including seating, a table and bike racks and the provision on 1 hour timed parking
- Exploring the provision of public toilets in the commercial centre
- Moving pedestrian crossings to improve safe access and increase parking
- Creating disabled parking spaces outside the seniors centre and surgery
- Potential for occasional road closures to support markets and community events

2.2.9 Port Stephens Integrated Plans 2013-2023


The Community Strategic Plan sets out which other areas of government are responsible for contributing to achieving the Strategic Directions and how these Integrated Plans align with the NSW State Plan NSW 2021 and the Hunter Regional Action Plan.

The key objectives of the Plans relevant to the planning proposal relate to:
• Enhancing public safety.
• Responding to future needs of an ageing population.
• Delivering facilities, services and opportunities for children.
• Providing recreational facilities for residents and visitors.
• Providing Strategic land use planning services.
• Promoting sustainable and improved, accessible and flexible transport modes.
• Support education and training in Port Stephens

The Plans seek to provide the community with assets to improve the liveability of the Port Stephens area, which have been considered in this assessment.

### 2.2.10 Port Stephens Pathways Plan 2016

The Port Stephens Pathways Plan is a Councillor adopted plan by the Port Stephens Council, which indicates existing footpaths and shared paths throughout the Local Government Area, as well as identifies locations for future pathways through a series of maps, rather than a report. The identification of future pathway locations will allow Council to prioritise construction and to apply for grant funding to assist Council in the provision of pathway connections and missing links.

### 2.3 Current Council planning

Several strategies and plans are under preparation or planned by both Newcastle City and Port Stephens Councils of relevance to the Fort Wallace planning proposal. Of particular note are:

- Both Councils advise they are working collaboratively in reviewing Section 94 development contributions plans. As the proposal area is within a cross LGA border area, a contribution sharing arrangement has been agreed in the past and will also occur for future developments, recognising that the suburbs use local services primarily in Stockton.
- A Fern Bay Strategy is also in the early stages of development by Port Stephens Council. The strategy will address needs and demands for residential, commercial and recreational development in the area to guide sustainable future development in the area.

### 2.4 Implications for the SIA

Table 1 below summarises the implications of these policies for this report.

<table>
<thead>
<tr>
<th>Policy</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter Regional Plan</td>
<td>• Identifies housing diversity, compact settlements and community revitalisation as directions for planning.</td>
</tr>
<tr>
<td>Draft Plan for Growing Hunter City 2015</td>
<td>• Identifies the need for residential renewal in Stockton as part of the Northern Gateway.</td>
</tr>
<tr>
<td>Newcastle Local Planning Strategy</td>
<td>• Recognises the potential future need for a commercial centre in the north of Stockton to serve existing and renewal populations.</td>
</tr>
<tr>
<td>Policy</td>
<td>Implications</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Newcastle 2030 Community Strategic Plan 2013</td>
<td>• Identifies strategies to deal with issues such as growing and aging population, and identifies opportunities including urban renewal, economic strengths and a revitalised town centre.</td>
</tr>
<tr>
<td>Newcastle Draft Social Strategy 2016-2019</td>
<td>• Identifies priorities and actions addressing public space activation, use of recreation area, activities and events to build connectedness and inclusion, creating local identity and, supporting urban renewal.</td>
</tr>
<tr>
<td>Newcastle Cycling Strategy and Action Plan 2012</td>
<td>• Identifies that new development should tie into existing or proposed cycle infrastructure and networks, and cater for cyclists.</td>
</tr>
<tr>
<td>Port Stephens Integrated Plans 2013-2023</td>
<td>• Identifies priorities, needs and actions for addressing a growing and aging population, demand for schooling and facilities for children, and the use and availability of public transport.</td>
</tr>
<tr>
<td>Port Stephens Pathways Plan 2016</td>
<td>• Identifies the locations of future pathway locations that will allow Council to prioritise construction in the provision of pathway connections and missing links.</td>
</tr>
</tbody>
</table>
3. Community profile

The sections below provide a summary of the key demographic indicators available from the 2011 census for the local study area as whole and with some notes as to variances between the suburbs. A comparison with the regional area is also included. The section also discusses likely changes in each indicator since the 2011, census based on the results of consultation and estimates of development since 2011.

3.1 Population and age profile

Consultation indicates that in recent years, there has been a significant amount of development within the local area, particularly in areas north of the site in Fern Bay and Fullerton Cove. This development has predominantly been seniors living and residential. These include the new seniors living developments of Palm Lake Resort in Fern Bay and The Cove in Fullerton Cove. Expansion of the existing Bayway, a manufactured homes village has also occurred and is also marketed to seniors. The master-planned residential community of Seaside also continues to expand, attracting a younger demographic. South of the site in Stockton, some gentrification of housing has occurred, but the area is largely underdeveloped with older style one and two storey dwellings and key facilities located in the centre of town.

These developments are expected to have resulted in an increase in population, and changes in demographic structure since the 2011 census. To capture a more up to date profile the study has attempted to estimate a population profile based on the development information sourced from the respective councils.

In 2011 the local area had a total population of 6,130. The population of Stockton showed a slight decrease to 4,195 from 2006, whilst Fern Bay increased more than 40 percent to 1,625. A decrease in population for Fullerton Cove was the result of boundary changes reducing the area counted, but in 2011 the suburb recorded a population of 300.

Drawing on information provided by Port Stephens Council, an indicative estimate of the current resident population of the local area in 2017 is 8,141 people (see Appendix C). This estimate is based on information from Port Stephens Council with regard to approved dwellings and estimates of those currently developed for each of the residential developments noted above. Development on the peninsula has occurred in discreet pockets, with seniors living growing in Fern Bay and Fullerton Cove and new residential development in Fern Bay.

Table 2 Indicative local area current population

<table>
<thead>
<tr>
<th>Suburb</th>
<th>2011 population*</th>
<th>Estimated 2017 population#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fullerton Cove</td>
<td>300</td>
<td>546</td>
</tr>
<tr>
<td>Fern Bay</td>
<td>1626</td>
<td>3,400</td>
</tr>
<tr>
<td>Stockton</td>
<td>4,195</td>
<td>4,195</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,121</strong></td>
<td><strong>8,141</strong></td>
</tr>
</tbody>
</table>

* ABS Census Data 2011, # GHD estimate based on dwelling numbers provided by Port Stephens Council and census averages
This represents a more than 80 percent increase in the population in Fullerton Cove. Fullerton Cove has historically been a rural residential locality with development of The Cove seniors living significantly increasing population in the suburb.

The population of Fern Bay is also expected to have more than doubled since the 2011 census with the expansion of the residential estate, Seaside, and new seniors living developments, Palm Lakes Resort and seniors relocatable home village, Bayway Village. The Stockton population is expected to have remained relatively stable, with little development and an ageing population.

This represents an estimated 498 new seniors living dwellings accommodating around 797 people aged exclusively over 50 years of age. There are also estimated to be 601 new residential dwellings accommodating an estimated 1,642 people in predominantly young families.

In 2011 the local area was considerably older than the regional area, with average ages ranging between the suburbs from 47 and 54 years, compared with the regional average of 40.

An estimate of the likely age structure of the local population in 2017 has also been prepared to inform the assessment of community infrastructure and is presented in section 3.8. Although the estimates are indicative, the comprising indicates that the overall structure of the local area population has not altered dramatically with variations in proportions representation of each age cohort not more the 1.5 percent. By contrast, the older demographics of the local area, compared with the regional area is dramatic.
Table 3 – Estimated current population and changes

<table>
<thead>
<tr>
<th>Local Area</th>
<th>2011</th>
<th>2017</th>
<th>Change</th>
<th>Regional Area</th>
<th>Local vs Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>No. of dwellings</td>
<td>2,588</td>
<td></td>
<td>3,542</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Persons</td>
<td>6,121</td>
<td></td>
<td>8,141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age groups: 0 to 4 years</td>
<td>289</td>
<td>4.7%</td>
<td>495</td>
<td>6.1%</td>
<td>206</td>
</tr>
<tr>
<td>5 to 11 years</td>
<td>400</td>
<td>6.5%</td>
<td>536</td>
<td>6.6%</td>
<td>136</td>
</tr>
<tr>
<td>12 to 17 years</td>
<td>328</td>
<td>5.4%</td>
<td>366</td>
<td>4.5%</td>
<td>38</td>
</tr>
<tr>
<td>18 to 24 years</td>
<td>423</td>
<td>6.9%</td>
<td>486</td>
<td>6.0%</td>
<td>63</td>
</tr>
<tr>
<td>25 to 34 years</td>
<td>563</td>
<td>9.2%</td>
<td>871</td>
<td>10.7%</td>
<td>308</td>
</tr>
<tr>
<td>35 to 49 years</td>
<td>1,197</td>
<td>19.6%</td>
<td>1,554</td>
<td>19.1%</td>
<td>357</td>
</tr>
<tr>
<td>50 to 59 years</td>
<td>1,033</td>
<td>16.9%</td>
<td>1,325</td>
<td>16.3%</td>
<td>292</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>930</td>
<td>15.2%</td>
<td>1,259</td>
<td>15.5%</td>
<td>329</td>
</tr>
<tr>
<td>70 to 84 years</td>
<td>776</td>
<td>12.7%</td>
<td>1,095</td>
<td>13.5%</td>
<td>319</td>
</tr>
<tr>
<td>85 and over years</td>
<td>181</td>
<td>3.0%</td>
<td>205</td>
<td>2.5%</td>
<td>24</td>
</tr>
<tr>
<td>Aver household size</td>
<td>2.4</td>
<td></td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* assumes a HH size of 1.6 and an age distribution of 20 percent 50-59 years, 40 percent 60-69 years, 37 percent 70-84 years, 3 percent 85 years and over
Reviewing the three suburbs in the local area, age profiles were characterised by:

- Fern Bay has slightly fewer high school aged children from 12 to 17 years (3.6 percent compared to 6.2 percent in Stockton and 5.7 percent in Fullerton Cove).
- Stockton had the youngest median age at 47 years in Stockton, compared with 50 years in Fullerton Cove and 54 years in Fern Bay. Fern Bay had the highest proportion of residents over 60 years of age. However Fern Bay also had a relatively larger young population with the greater proportions (12.3 percent) of children from 0 to 11 years percent compared to Fullerton Cove (8.7 percent) and Stockton (10.9 percent).
- Although Stockton had the highest proportions of primary and high school aged children, Fern Bay had the greatest proportion of 0 to 4 year olds (most likely reflecting the younger Seaside demographic).

![Age Profile Diagram]

### 3.2 Cultural diversity

The population has low levels of cultural diversity. The percentage of Indigenous residents in the local area ranged from 2.5 percent in Fern Bay to 3.7 percent in Fullerton Cove with a 3.2 percent average. However, school data indicates that the Indigenous population is young, with 12 percent of students at Fern Bay Public School and 10 percent of Stockton Public School students identifying as Indigenous.

In 2011 no residents of the local area were born in non-main English speaking countries with most residents speaking only English at home (91.1 percent) compared with the regional average of 89.7 percent.

### 3.3 Dwellings and tenure

In Stockton, Fern Bay and Fullerton, the number of dwellings that were separate houses were 75.1 percent, 95.8 percent and 69.3 percent respectively, which was higher compared to the regional average (67.6 percent).

This is a reflection that to date, most housing developments in the local areas have been low and medium density.
Suburbs in the local area and regional area have similar patterns in bedroom numbers. One-bedroom dwellings were the least prominent for all suburbs and the regional area ranging from 5 percent in Stockton and the regional area to the highest one bedroom percentage in Fullerton Cove (8 percent); three bedroom dwellings were the most common for all suburbs and the regional area. The average number of bedrooms for dwellings was highest in Fullerton Cove (3.1 bedrooms) compared to the regional area (3.0 bedrooms), Stockton (2.8 bedrooms), and Fern Bay (2.7 bedrooms).

### Table 4 - Average number of bedrooms per dwelling in the Local Area and the Regional Area (2011).

<table>
<thead>
<tr>
<th></th>
<th>Stockton</th>
<th>Fern Bay</th>
<th>Fullerton Cove</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Bedroom</td>
<td>5%</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Two Bedrooms</td>
<td>27%</td>
<td>35%</td>
<td>14%</td>
<td>34%</td>
</tr>
<tr>
<td>Three Bedrooms</td>
<td>47.7%</td>
<td>37%</td>
<td>42%</td>
<td>45%</td>
</tr>
<tr>
<td>Four + BEDROOMS</td>
<td>17.7%</td>
<td>19%</td>
<td>36%</td>
<td>24%</td>
</tr>
<tr>
<td>Average number of bedrooms</td>
<td>2.8 bedrooms</td>
<td>2.7 bedrooms</td>
<td>3.1 bedrooms</td>
<td>3.0 bedrooms</td>
</tr>
</tbody>
</table>

Tenure types indicated that home ownership (outright or with a mortgage) was more common in the local area than the regional area. Much higher proportions of home ownership was noted in Fern Bay and Fullerton Cove (87.4 percent and 92.9 percent respectively) and Stockton (66.0 percent) than in in Newcastle LGA (64.9 percent) and Port Stephens LGA (71.4 percent) in and 66.0 percent in Stockton.

### 3.4 Households and families

The proportion of family households in the local area varies between suburbs, but is largely within the range of the regional LGAs (63.8 percent in Newcastle LGA, 73.2 percent in Port Stephens LGA). However, Fullerton Cove showed a higher proportion with 82.2 percent family households.

The average household size also varies across the local area with the smallest average households in Fern Bay (2.1 people), then Stockton at 2.3 persons and the largest households in Fullerton Cove at 2.8 persons. These compare to 2.4 persons in Newcastle LGA and 2.5 persons in Port Stephens LGA.

Family composition was fairly consistent across all areas. Couple families with children were consistent amongst Newcastle LGA, Port Stephens LGA, Stockton and Fullerton Cove (38.1 percent on average) while Fern Bay local area smaller representation at 28.5 percent. Fullerton Cove and Stockton had higher proportions of single parent families (58.3 percent and 23.2 percent respectively) compared to the other areas (14.0 percent in Fern Bay, 18.5 percent in Newcastle LGA and 16.6 percent in Port Stephens LGA).

### 3.5 Employment, education and household income

The local areas had a slightly lower labour force participation rate (48.7 percent in Stockton, 39.7 percent in Fern Bay, 53.2 percent in Fullerton Cove) compared to Newcastle LGA (60.5 percent) and Port Stephens LGA (54.4 percent). The unemployment rate in Fern Bay and Fullerton Cove local areas (both 7.0 percent) was slightly higher than that of Newcastle LGA (5.7 percent), Port Stephens LGA (6.2 percent) and Stockton local area (5.7 percent).

In 2011, there was a higher percentage of people who did not have post-school qualifications in Stockton (49.1 percent), Fern Bay (50.0 percent), and Fullerton Cove (43.4 percent), compared to the percentage of people who completed year 12 (23.4 percent, 27.3 percent and 22.5...
percent respectively). Of those who finish secondary education only a low percentage of students attended university (2.7 percent in Stockton, 2.2 percent in Fern Bay and 3.4 percent in Fullerton Cove) which is consistent with Port Stephens LGA (2.7 percent) and much lower than Newcastle LGA (8.8 percent).

Across all local areas there was a significantly higher percentage of students attending both government primary (76.6 percent in Stockton, 62.7 percent in Fern Bay, 72.2 percent in Fullerton Cove) and government secondary schools (60.8 percent in Stockton, 55.8 percent in Fern Bay, 64.7 percent in Fullerton Cove). The same trend can be seen with Newcastle LGA (71.7 percent primary students, 65.8 percent secondary students) and Port Stephens LGA (74.8 percent primary students, 70.2 percent secondary students).

Fullerton Cove had a higher percentage of primary students attending a Catholic school (27.8 percent) in comparison to the other local areas (17.1 percent in Stockton, 20.5 percent in Fern Bay) and LGA’s (19.2 percent in Newcastle LGA, 13.9 percent Port Stephens LGA). When looking at the statistics for secondary students however, all local areas showed a higher percentage of students attending Catholic school (35.0 percent in Stockton, 30.2 percent in Fern Bay, 35.3 percent in Fullerton Cove) compared to the LGA’s (20.2 percent in Newcastle LGA, 13.6 percent in Port Stephens LGA).

The weekly median household income in Fern Bay was significantly lower ($690) than other local areas ($1,072 in Stockton, $1,062 in Fullerton Cove) and LGA’s ($1,165 in Newcastle LGA and $999 in Port Stephens LGA).

Department of Defence was the most common employer of Fern Bay residents stated in the 2011 Census at ten percent of respondents (Elton, 2016).

3.6 Vehicle ownership and travel

In the Fullerton Cove local area, all households owned at least one vehicle (100.0 percent) compared to the Newcastle LGA (88.1 percent) and the Port Stephens LGA (94.2 percent). Stockton and Fern Bay households showed similar statistics to the LGA’s (84.9 percent and 91.2 percent respectively).

The primary mode of transport across all areas was by car as the driver with an average of 76.4 percent. A highest proportion of residents who worked at home was in Fullerton Cove (10.7 percent) compared to other local areas and LGA’s.

The Ferry is a major link in the local area, with strong commuter use in Stockton (6.6 percent compared to bus use of 2.9 percent), but considerably lower with distance from the wharf (2.3 percent in Fern Bay compared to 2.7 percent for bus use). In Fullerton Cove, no commuter reported using trains or ferries to travel to work, with 2.5 percent using the train.

3.7 Crime and safety

For many common crimes, Newcastle LGA has higher rates than for neighbouring Port Stephens LGA, and the local area generally has rates between the two LGAs, with the exception of domestic and sexual assault which are higher than both LGA averages. Recent statistics indicate that the common crimes (listed in Table 5) have remained stable or have been in decline over the last 5 years.


Table 5 Local and Regional Crime Statistics January 2016 to December 2016

<table>
<thead>
<tr>
<th>Offence</th>
<th>5 year trend</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local Area</td>
<td>Newcastle LGA</td>
</tr>
<tr>
<td>Assault - domestic</td>
<td>Stable</td>
<td>557.1</td>
</tr>
<tr>
<td>Assault - non-domestic</td>
<td>Down 2.5% /year</td>
<td>685.7</td>
</tr>
<tr>
<td>Robbery</td>
<td>Down 15.8% /year</td>
<td>21.4</td>
</tr>
<tr>
<td>Theft</td>
<td>Down 2.5% /year</td>
<td>3428.3</td>
</tr>
<tr>
<td>Sexual offences</td>
<td>Stable</td>
<td>214.3</td>
</tr>
<tr>
<td>Malicious damage to property</td>
<td>Stable</td>
<td>1234.1</td>
</tr>
</tbody>
</table>


3.8 Expected future community

In assessing the social impact of the proposed Fort Wallace development, it is necessary to consider the magnitude and nature of the future residents of the site and also that of the likely local community. This section aims to estimate the possible magnitude and indicative structure of the local area population. This estimate is indicative only for the purposes of assessing the magnitude of future demand for social infrastructure.

Fort Wallace site

Defence families likely to be accommodated at the Fort Wallace site would primarily be working with the Air Force. The age of Defence personnel eligible to live at this site ranges between 24 and 60 years, with an average age of 40 years. About one-third are expected to have no dependants other than their spouse, with the remainder being households with children. An estimated 52 dwellings would be occupied by Defence households with an estimated population of 171 people. Their likely age structure illustrated in Table 8.

The other 51 dwellings would likely to be sold in the real estate market, and accommodate a population of around 117 people as they are expected to have smaller households. AS a result, the Fort Wallace site is expected to accommodate in the order of 288 people.

Table 6 Estimated future Fort Wallace population

<table>
<thead>
<tr>
<th></th>
<th>DHA Residents</th>
<th>Non DHA residents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Number</td>
<td>% Number</td>
<td></td>
</tr>
<tr>
<td>0-4 years</td>
<td>8% 14</td>
<td>7% 8</td>
<td>22</td>
</tr>
<tr>
<td>5-11 years</td>
<td>15% 26</td>
<td>6% 7</td>
<td>33</td>
</tr>
<tr>
<td>12-17 years</td>
<td>13% 22</td>
<td>4% 5</td>
<td>27</td>
</tr>
<tr>
<td>18-49 years</td>
<td>60% 103</td>
<td>45% 53</td>
<td>156</td>
</tr>
</tbody>
</table>

1 DHA data on eligible Defence households has been adjusted to reflect the service age groups required to assess community needs. Data provided for 5 to 12 years olds has been spilt assuming an average across all ages within the group. Data provided for dependents 13 years or older has been assumed to be 70 percent dependents aged 13 to 17.
<table>
<thead>
<tr>
<th></th>
<th>DHA Residents</th>
<th>Non DHA residents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 + years</td>
<td>4%</td>
<td>38%</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>171</td>
<td>117</td>
<td>288</td>
</tr>
<tr>
<td>Average household size</td>
<td>3.3</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

**Expansion of existing developments**

The likely future population will also include residents of approved development applications, which have not yet been developed. Population estimates have included new or expanded development, including:

- Existing approvals for further development of seniors, or predominantly seniors living in Bayway Village, The Cove and Palm Lakes
- Further approved development of Seaside residential development

Information provided by Port Stephens Council indicates there are in the order of 262 approved seniors dwellings and 229 approved residential dwellings yet to be developed. The estimate assumes an otherwise low population growth in the existing Stockton community, and has not allowed for other potential new developments in the Stockton – Fern Bay area.

**Table 7 Indicative future local area population**

<table>
<thead>
<tr>
<th>Suburb</th>
<th>Likely future population</th>
<th>Fort Wallace</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimated 2017 population*</td>
<td>Approved DAs#</td>
<td>Future population</td>
</tr>
<tr>
<td>Fullerton Cove</td>
<td>546</td>
<td>176</td>
<td>722</td>
</tr>
<tr>
<td>Fern Bay</td>
<td>3,400</td>
<td>1,024</td>
<td>4,424</td>
</tr>
<tr>
<td>Stockton</td>
<td>4,195</td>
<td>-</td>
<td>4,195</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,141</strong></td>
<td><strong>1,200</strong></td>
<td><strong>9,341</strong></td>
</tr>
</tbody>
</table>

*GHD estimate based on dwelling approval and development numbers provided by Port Stephens Council and using relevant average household sizes from 2011 ABS Census SA1 areas.

If rezoning and consequent development of the DHA Rifle Range site is achieved it is likely that this would generate in the order of a further 698 people in Fern Bay in the future. Whilst not included in the assessment of social infrastructure, the potential for both this, and the nearby development of the Stockton Centre are noted. To facilitate assessment of the community needs of this population, an indicative age structure has been considered, as noted in Table 8.
### Table 8 Indicative age profile for future local area population

<table>
<thead>
<tr>
<th>Age group</th>
<th>Future local area population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 4 years</td>
<td>7% 653</td>
</tr>
<tr>
<td>5 to 11 years</td>
<td>6% 561</td>
</tr>
<tr>
<td>12 to 17 years</td>
<td>4% 374</td>
</tr>
<tr>
<td>18 to 60 years</td>
<td>53% 4,951</td>
</tr>
<tr>
<td>60 years and over</td>
<td>30% 2,802</td>
</tr>
<tr>
<td><strong>Total population</strong></td>
<td><strong>9,341</strong></td>
</tr>
</tbody>
</table>

Source: GHD estimates based on Forecast id data provided by Newcastle City Council and modified to breakdown percentages for under 18 year olds. These are also comparable with GHD 2017 population age structure estimates in Table 3.
4. Social infrastructure

Development of the Fort Wallace site will increase demand for social facilities and services. This review of social infrastructure focuses on the capacity of facilities and services currently used at the local level to support the likely future population (as outlined in Table 3 which includes realisation of all currently approved developments in the local area). Local level infrastructure has been defined as that which is required to meet the daily needs of people living in a population catchment of up to 10,000 people.

This review identifies current gaps in key local social infrastructure facilities based on:

- **demographic** needs – how the size of the population influences need
- **identified** needs – what the community and managers identify as needed
- **best practice** needs - based on rates of provision detailed on unpublished *Draft Social Infrastructure Guidelines* developed by GHD for NSW Department of Planning.

Social infrastructure discussed in this section is illustrated in Figure 7.
4.1.1 Community centres and libraries

The Fern Bay Community Centre is the only Council owned community centre in the local area. A development application is currently being considered by Council to redevelop this centre. The redevelopment would replace the existing hall and adjacent tennis club building and separate toilets. The site is adjacent to a recently upgraded playground and the Fern Bay Public School. The proposed centre will include a multi-function hall (approximately 160m²), tennis club office/storage, a kitchen facility, reception desk and publicly accessible amenities.

The Stockton Beach Surf Club, Stockton Bowling Club and Stockton RSL and Citizens Club each have meeting rooms/ and or event halls that are used by residents of the local area. The RSL and Citizens Club has the largest facilities with meetings rooms and an auditorium which fits up to 250 people.

A Defence Communities Organisation funded community centre operates for defence families at the Williamstown Base. It organises activities including playgroups and social gatherings.

Best practice rates of provision suggest that one multipurpose centre or two community spaces be available to communities of less than 20,000 people, with multipurpose centres having a minimum of 500 m². Public, affordable and accessible meeting and activity spaces are important for all communities, and especially so for this local area which is isolated from its district and regional area. The local area also presents specific challenges in regard to the spatial and consequently social dislocation between residential communities or areas, with some of this being related to it's peninsular geography, and some by the nature of the development that has occurred (gated seniors living and pocket residential developments). These factors, as indicated in consultation, reinforce the need for indoor public activity spaces in the local area to support social cohesion and equitable access.

It is likely that a need for a community space in Stockton will remain even after the redevelopment of the Fern Bay community hall. Any such community space would need to be multipurpose and to respond to diverse community needs.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fern Bay Community Centre ~200m²</td>
<td>Population growth of around 33 percent expected since 2011 and up to in the near future</td>
<td>Need for multipurpose centre to centralise services and facilities that are fit for use Need for community facility in Seaside</td>
<td>1 centre or 2 space: less than 20,000 people</td>
<td>The new Fern Bay Hall may service the needs of the Fern Bay community. It could be revised to be a larger multipurpose centre, or a new space or multipurpose centre developed in Stockton</td>
</tr>
<tr>
<td>No public facilities in Stockton</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.1.2 Other community and cultural spaces

There are Men’s sheds in some of the seniors living developments that are for the exclusive use of their residents, however it was noted during consultation that the shed at Palm Lakes Resort has limited use due to restrictions relating to noise. The Newcastle Men’s Shed is also without a venue, having been unable to afford their previous site in the Steelworks. Consultation has indicated a demand in the local and regional area for a Men’s shed. With an ageing population in the local area, and a need for social inclusion between seniors, a Men’s shed would meet this need, and also provide an opportunity for intergeneration inclusion.
There are no public cultural or indoor youth spaces in the local area. The nearest cultural facilities are located in Newcastle CBD. Whilst regional level facilities are available in Newcastle, a local space is justified given the relative isolation of the peninsular.

### 4.1.3 Libraries

The Stockton Library operates two full days and two half days per week. The small library (approximately 200 m²) reports strong usage by both preschool and school ages children and the elderly. Newcastle City Library indicates that use of the library has increased over recent years with services such as story time reading for pre-schoolers and young school aged children increasing from once a month to once a week. Council also notes that they have recorded increasing library registrations from residents of seniors living developments of Fern Bay and Fullerton Cove. Port Stephens operates a mobile library, which visits the Fern Bay Reserve fortnightly for public access and use by Fern Bay Public School. The mobile library does not visit Seaside due to the difficulties in navigability of the roads. Residents in both LGAs have free access to library services in both LGAs.

Each of the seniors living developments and the Bayway relocatable home development have some provision of libraries, community activity and meeting facilities for the exclusive use of their residents which reduces somewhat their demand for external or publically provided facilities.

Consultation indicates the existing library operations in Stockton are inadequate to meet the growing needs of the existing and future population and the changing nature of library services and roles in the community.

The limited capacity and flexibility of the Port Stephens mobile library service is not currently meeting the demands of the local population. Being unable to provide services in Fern Bay as planned, increasing frequency of visits and duration to Fern Bay Hall, and greater integration of services to the site (e.g book return) would improve access. Potential collocation or integration of library and community space on Department of Education land could be beneficial to both the Fern Bay Public School and the local Fern Bay community.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockton Library</td>
<td>Existing unmet needs from local area, especially Seaside residents. Likely growing need from Fern Bay PS</td>
<td>Existing Stockton library requires extended hours until replacement (as no room to expand) Increase in frequency of mobile services to Fern Bay</td>
<td>People Places population based benchmark : 646m²</td>
<td>Extend existing hours of operation of Stockton Library Increase frequency of Port Stephens mobile library Consider collocation of library in school grounds Consider collocation of library services with any potential future public community space in Stockton town centre</td>
</tr>
<tr>
<td>Port Stephens mobile library</td>
<td>~ 200 m²</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1.4 Childcare

Long day care

In Stockton there is one long day care centre (49 places). Two OOSH providers service the area. There are four family day care services, two in Seaside and one each in Stockton and Fullerton Cove providing approximately 16 places and some OOSH places (around 6).

A 94 place long day care service has been approved for a development in Seaside.

Consultation indicates many residents are using services at or enroute to their place of work, and that lack of access to long day care is also likely limiting the ability of many parents to return to work. It is estimated that the future community will have a need for 130 long day care places, whereas only 65 are currently available locally. However development of the recently approved 94 place centre at Seaside would meet this demand.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 places, plus around 16 in family day care</td>
<td>Future population of 653 children</td>
<td>No current spare capacity, many families use facilities enroute to and at work</td>
<td>1 place: 5 children ages 0-4 years Suggests need for 130 places.</td>
<td>Newly approved facility should meet this need</td>
</tr>
</tbody>
</table>

Preschool

Stockton Preschool is operated by the Department of Education as part of Stockton Public School, with 40 places. Fern Bay and Fullerton Cove residents are outside the catchment for the Stockton Preschool so they are not prioritised for places in the preschool and as a result have limited access to the preschool. A Defence preschool was formerly located at Williamstown base but was relocated, and is expected that it will relocate to Medowie in 2018 where it would likely be used by Defence families from Fort Wallace.

There is clear demand for preschool services in the local area with only 40 places available, and estimated future preschool population of 210, requiring 105 places. 2011 data indicates lower than regional attendance of preschool in the local area. Further, consultation suggests that levels have declined with increasing population yet no expansion of services. Whilst the proposed new long day care centre may meet some of this need (as it will likely offer a preschool program), there is a clear current and future need for a new service, with a gap in the order of 65 places.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>Estimated future population of 210</td>
<td>Strong demand especially from Seaside community with a very young population</td>
<td>1 place: 2 children ages 4-5 years Suggests need for 105 places</td>
<td>Clear need for an additional service, particularly catering to Fern Bay. Some need will be met</td>
</tr>
</tbody>
</table>
The Fern Bay Progress Association suggests that a service (potentially mobile) be provided out of the new Fern Bay Hall. Colocation of a Department of Education preschool at Fern Bay Public School could also address this demand.

**Out of School Hour (OOSH) Care**

The Stockton Kids Fun Club provides OOSH services from Stockton Public School with 30 places servicing both the school and St Peters Primary School students (who travel between the schools on the school bus). WeMOOSH, an OOSH business, operates an umbrella service for Fern Bay Public School students from West Mayfield. The service aims to negotiate use of the new Fern Bay Hall once completed for a 30 place service. As noted above, around 6 OOSH places are provided through family day care in Fern Bay and Fullerton Cove.

There is clear demand for OOSH services in the local area with only 33 places locally available, and most of these prioritising children from Stockton. With a likely future need for in the order of 110 places, there is clear need for more OOSH services. WeMOOSH expect to provide 30 places in the new Fern Bay Hall when it is completed, going some way to meeting this demand.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>OOSH</td>
<td>Estimated future population of 552</td>
<td>1 place: 5 children ages 5-11 years Suggests need for 110 places</td>
<td>Strong demand for an additional service. New service may largely meet current demand</td>
<td></td>
</tr>
</tbody>
</table>

Further, as young families in the local area mature, the demand for long day care and OOSH services is expected to increase.

### 4.1.5 Public open space and recreational facilities

The local areas are well resourced with passive outdoor recreation areas, with proximity and access to beach, river, bushland and parkland areas. Upgrades to facilities such as skate parks and playgrounds are ongoing, and together with the Stockton Swimming Centre are valuable resources for the community and visitors alike. The bulk of this recreational infrastructure however is located in Stockton, with only one park with a playground and two tennis courts in Fern Bay. Parks, sporting and recreation facilities in the local area include:

- Pitt Street Reserve and the nearby skate park
- Stockton Swimming Centre
- Griffith Park (concept design for district playground and street skate park)
- Ballast Ground (dog off-leash park)
- Hunter Street Reserve
- Breen Park
- Rawson Park
- Corroba Park
Consultation indicates that there is a need for sporting facilities in Fern Bay – Fullerton Cove. Currently there are only two tennis courts in this area. Residents use sports facilities in Stockton and consultations indicate that the quality and facilities of the netball courts, the tennis courts and some other utilities need to be improved. The Fern Bay Fullerton Cove Progress Association proposed that two dual marked netball and basketball courts be developed at the Fern Bay Reserve.

<table>
<thead>
<tr>
<th>Existing Provision</th>
<th>Demographic need</th>
<th>Identified need</th>
<th>Rates of provision</th>
<th>Facility/service required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 netball/basketball court and 2 netball courts</td>
<td>Future population expected to be 9,341</td>
<td>Two multipurpose netball/basketball courts at Fern Bay Reserve, Existing Stockton courts have no shelter or toilets</td>
<td>2 multipurpose courts per 10,000 people</td>
<td>One to two full sized multipurpose courts at Fern Bay.</td>
</tr>
<tr>
<td>4 tennis courts (2 in Stockton, 2 in Fern Bay)</td>
<td>Current supply adequate</td>
<td>2 tennis courts per 10,000 people</td>
<td>No requirement</td>
<td></td>
</tr>
<tr>
<td>4 playing fields in Stockton</td>
<td>No provision in Fern Bay, but no land available to support more fields there</td>
<td>1 sports ground (comprising two playing fields per 5,000 people)</td>
<td>Adequate overall provision in the local area. Opportunities for provision of playing fields in Fern Bay could be explored in the future.</td>
<td></td>
</tr>
</tbody>
</table>

It is of note that seniors living developments in Fern Bay and Fullerton Cove include significant open space and social and recreational infrastructure to varying degrees including pools, tennis courts, activity centres and meeting rooms that are available for the exclusive use of residents. As result, there is a much lower demand for these services from these residents.

4.1.6 Education

There are three primary schools in the local area. Both Stockton and Fern Bay each have a public primary school. St Peters Primary School is located adjacent to the commercial centre in Stockton.
Stockton Public School currently has 267 enrolments which it considers close to capacity, with relatively stable enrolments in recent years. It has some out of area students from Fern Bay. Consultation with the school indicates that it is close to capacity, however, Department of Education long range plans consider that school classrooms are running at only 60% utilisation (indicating significant potential for absorbing growth). The plans also anticipate further growth in enrolments of 12 students by 2021.

Fern Bay Public School is small with only 34 enrolments in 2016, although this has increased significantly to 60 in 2017. The school has one permanent and one demountable classroom and generous open space and recreation areas. It also uses the adjacent Fern Bay Reserve which has two tennis courts, a basketball half court, new playground and fortnightly visits from the Port Stephens mobile library. Consultation indicates that several factors have contributed to formerly attendance by Seaside residents: by indicating an intention to attend Stockton Public School residents are eligible to go to Stockton Preschool, the only one in the local area, a historically poorer reputation of Fern Bay Public School compared to Stockton Public School, and the need to travel (by bus or car) to either facility eliminating this as a factor in choosing a local school. Although Department of Education long range plans appear to underrepresent current enrolments, it is still considered to be operating at 200% utilisation, indicating no capacity. With an area of 1.01 ha, the site has considerable space for expansion for accommodate a growing population.

St Peters Primary School currently has 136 enrolments and expects 150 in 2018. St Peters notes its enrolments have expanded significantly since 2015 largely through gain in students from Seaside who represent approximately one third of the school population. It is expected though, that the current capacity and future expansion would be sufficient to accommodate students from a growing population in the near future. The 2011 census indicates 18.4 percent of primary students attend Catholic schools and 73.2 percent attend government schools. 2011 census data also indicates that the proportion of students attending Catholic schools increases in high school, with 34.3 percent of students in the local area at Catholic schools and 60.3 percent at government schools. With the planned development of a new Catholic high school in Medowie, it is likely this school will attract some students from the local area.

Most high school students in Stockton attend Newcastle High School, however consultation indicates Fern Bay residents are more likely to attend catholic schools. The nearest and most common Catholic high school is San Clemente in Mayfield. A new Catholic high school is also planned for Medowie in the near future.

4.1.7 Health

Stockton has two GP surgeries, both of which indicate they have capacity for new patients. One has only started taking new patients in recent years due to increased demand. Together the services provide one full time and three part time doctors and two part time nurses, with one bulk billing and the other with some potential to bulk bill. A pharmacy is located in the Stockton commercial centre.

The Fern Bay Medical Centre is located in Palm Lake Resort but is open to the broader community. This centre has one full time doctor and a part time nurse and generally does not bulk bill. A commercial development approved for development in Seaside includes health consulting rooms.

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2 NSW Department of Education, Stockton Public School Land Range Forecast
3 2016 Fern Bay Public School Annual Report
4 NSW Department of Education – Long Range Schools Report
Residents of seniors living community residents have indicated during consultations that a pharmacy is needed in the Fern Bay area.

An early childhood health service operates home visit services out of Stockton (in the same building as Meals on Wheels). Consultation with Newcastle City Council indicates that the service is experiencing a high demand from the new growth area of Seaside, and that the current building is not meeting the needs of the service, due it its age, cost and facilities.

Overall, current general medical services are considered adequate in the local area, with likely future expansion through an approved health services space in Seaside.

4.1.8 **Aged services**

Meals on Wheels operates from Stockton delivering meals to around 52 clients in the local area, three days a week. They have indicated that they have capacity for further growth in demand.

Westcott Aged Care facility provides 20 home care packages within the community and also has a respite care facility. Community transport is also available within the local area from Newcastle and Port Stephens Community Transport providers.

Each of the seniors living developments and the Westcott aged care facility have services to their residents which meet many of their daily needs. Community transport is also available for seniors in the local area from Newcastle or Port Stephens Community Transport. The Senior Citizens Association of Stockton has a facility in the Stockton commercial centre, next to Meals on Wheels where it is understood they hold social gatherings and activities and offer the centre for hire, though it was not possible to contact them for input to the SIA.

Current services appear to be meeting demand, however as the local area is ageing, and this is intensified by the ageing of the seniors communities, demand is expected to grow significantly. A greater diversity of outreach and locally available aged services will be needed in the future.

4.1.9 **Public and active transport**

Public transport in the local area is provided by bus and ferry services. A 10 minute ferry service operates between Queen Street Wharf in Newcastle and the Stockton peninsular. The service operates three times an hour in peak hours and one to two times an hour at other times.

The Department of Transport NSW buses service the Stockton area, with bus routes averaging 40 to 50 minutes to get to and from Newcastle CBD as the bus route is through the peninsula along Fullerton Street and across Nelson Bay Road Bridge. Bus times are varied, but generally area available every 30 minutes to an hour.

A school bus services Fullerton Cove, Seaside (with a bus stop inside the development), Fern Bay Public School, St Peters’ Primary School and Stockton Public School. This bus is also used for students from St Peters to travel to and from OOSH care at Stockton Public School. The nearest bus stops at the entrance to Fort Wallace and the entrance to the adjacent Stockton Centre.

It is also understood that regional coaches operating between Newcastle and Port Stephens regularly stop on Nelson Bay Road opposite Vardon Road for passengers to use the public toilets there. Passengers also regularly cross to the take away food shop on the other side of the road.

A shared pathway connects the southern end of the Stockton peninsular to the southern end of Fern Bay. The path runs along the western side of Fullerton Street, crossing at the roundabout intersection with Nelson Bay Road and continuing north on the eastern side of Nelson Bay Road past the Stockton Centre, through the cemetery and terminating in Fullerton Street, Fern Bay. Further north, a footpath of variable width and quality continues to the bus stop at Bayway
Village. A short section of footpath lines the houses on the western side of Nelson Bay Road at Fern Bay, but does not extend to the seniors living developments further north. There is currently only one pedestrian crossing (outside Stockton Centre) along this north-south road that connects the three suburbs. One pedestrian island is located in the southern sections of Fullerton Road in Stockton and one where the shared pathway crosses Fullerton Road. As a result, access to both western bus stops and much of the shared pathway involves crossing busy roads. In recent years a student was fatality injured crossing Nelson Bay Road.

4.1.10 Emergency Services

The Stockton Fire and Rescue is a retained station that is usually staffed during business hours and is otherwise supported by retained crew in the community. No obvious changes in the number of fire or rescue calls have been observed in recent years and it is likely that it will be adequate to meet the needs of the growing community.

Stockton Ambulance is staffed 24 hours, 7 days a week, with one day time and one night time shift each day. There has been increases in demand state wide with an ageing population, and this is also true of the Stockton-Fern Bay area.

The Stockton Police Station is staffed for up to four shifts per week, with service outside these times provided by the Waratah station. Local staff indicate that incidences in the area have increased in keeping with trends in other areas (but not really a reflection on the growing population) and do not note any specific concerns or hot spots, although incidents are more common in Stockton, than in the northern areas.

4.1.11 Internet and technology

NBN fibre to the node is currently being installed in the local area with connection imminent. Availability of quality broadband will enhance the ability of local service providers and businesses to operate efficiently and enhance connectivity for residents.

Consultation indicates that there are several areas, primarily in Fern Bay and Fullerton Cove where there is no, or very patchy mobile reception, including areas of the Rifle Range.

4.1.12 Fresh food and retail

A small commercial centre is located along Mitchell Street in Stockton. The centre includes a small format grocery store, bakery, butcher, pharmacy, two banks (credit unions), newsagent and a number of other specialist shops and services. However, the main shopping outlets close to the area include the Newcastle CBD or the Mayfield shopping centre. A number of local residents also shop at Medowie. A take away shop in Fern Bay on Nelson Bay Road is the only public commercial facility in Fern Bay. Consultation has also indicated that it is common for elderly residents on restricted drivers licenses to shop at Kooragang (3.5 km from Stockton bridge) where a supermarket is adjacent to a petrol station which defines the spatial limit of their restricted licenses. Consultation has indicated that many residents of Fern Bay and Fullerton Cove consider a supermarket is needed in the area. Stockton residents have also indicated the need for a larger format supermarket that is more cost competitive.

A commercial development approved for development in Seaside includes a neighbourhood shop which is likely to serve the basic daily needs of local residents. It also understood that there is commercial interest in rezoning some land along Nelson Bay Road for a supermarket and commercial area, although no such zoning has been approved to date.
5. Consultation

5.1 Approach

Consultations to inform the SIA were through face-to-face meetings and phone calls with key stakeholders. Consultation has focussed on the overall provision and capacity of existing social infrastructure, and existing or expected social issues relevant to the proposal and the future population.

GHD has consulted with:

- Newcastle City Council and Port Stephens Council
- Defence Families Association
- NSW Department of Education
- Stockton Public School and St Peters Primary School
- Fern Bay Fullerton Cove Progress Association
- Stockton Library
- Facility managers of seniors developments (Palm Lakes Resort, The Cove, Bayway Village, Westcott Aged Care)
- Stockton Police, Fire and Ambulances services
- Local service providers, including medical centres, childcare, preschool and OOSH providers in Stockton and Fern Bay

5.2 Consultation outcomes

The outcomes of all discussions were recorded by GHD and have been reviewed to identify key themes and issues outlined below.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Issue</th>
</tr>
</thead>
</table>
| Population change and development | A diverse community with varied access to services and varied socio-economic status  
extensive new development in seniors living in the local area, with potential expansions in the future  
Seaside, a new development aimed towards a younger demographic is resulting in new families or couples re-locating to the area |
| Social infrastructure          | demand for childcare facilities and sportsgrounds/community centres to facilitate the needs of new families with younger children  
baby boom in the regional area of primary school aged children, highlighting the need for both pre-schools, primary schools and high schools  
The Port Stephens mobile library van goes to the Fern Bay community hall, but cannot go to Seaside development due to the size of the van and the narrow roads  
The Fern Bay Community Hall is planned to be rebuilt and there are no other public buildings for community use. |
<p>| Access and mobility            | Nelson Bay Road acts as a barrier to community cohesion as it is not safe to cross, and there are not adequate paths to connect the developments                                                                 |</p>
<table>
<thead>
<tr>
<th>Themes</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>community would like a shared cycle-way and footpath (to also support motorised scooters) to extend along Fern Bay and to the Ferry, to improve access to amenities and alleviate parking pressures, which could promote social engagement</td>
</tr>
<tr>
<td>Social issues</td>
<td>trend of social exclusion/isolation created through the developments; with both a larger child aged and elderly demographic, an inadequate number of facilities to service both age groups and physical urban forms (i.e. roads) creating a barrier between these populations</td>
</tr>
</tbody>
</table>

The outcomes of the consultation have been considered in the assessment of potential social impacts and the recommended mitigation measures (section 6).
6. Social impact assessment

This section considers the potential social impacts and opportunities that may result from residential development (as informed by the concept master plan) of the Fort Wallace, should the site planning proposal be approved. The assessment addresses the potential for residential development rather than the master plan itself in the context of the potential of the site to support a socially sustainable community. As such, it does not consider in detail any elements of the master plan, but rather the vision and nature of development it would facilitate.

6.1 Accommodation and housing

Rezoning of the Fort Wallace site would facilitate increased housing supply in Stockton, contributing to the Hunter Regional Plan 2036. Residential development of the site would also respond to the directions for revitalising existing communities, creating compact settlements, promoting housing diversity, and conserving buildings, structures and relationships of heritage significance applicable in the *Hunter Regional Plan 2016* and the *Draft Plan for Growing Hunter City*.

The development, whilst not providing affordable housing as such, will provide 52 dwellings for Defence families within an accessible distance of their place of work. The delivery of housing for Defence personnel would support social diversity, housing diversity and affordability for these key workers in the region.

The concept master plan supports diverse housing options with dwellings sizes ranging from one to four bedrooms and including typologies that integrate potential fonzie or granny flats. This is particularly relevant for Fullerton Cove and Stockton with higher proportions of single parent families and seniors within their community. As indicated in Table 8 the master plan envisages a higher proportion of dwellings with fewer bedrooms that would suit these varied household types. This is especially important for local housing diversity given that consultation indicates the Seaside development includes predominantly large dwellings (4 bedrooms and larger) and that many of the smaller dwellings currently in the local area are within private seniors communities.

### Table 9 Dwelling size

<table>
<thead>
<tr>
<th></th>
<th>Stockton</th>
<th>Fern Bay</th>
<th>Fullerton Cover</th>
<th>Regional Area</th>
<th>Concept master plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Bedroom</td>
<td>5%</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Two Bedrooms</td>
<td>27%</td>
<td>35%</td>
<td>14%</td>
<td>24%</td>
<td>10%</td>
</tr>
<tr>
<td>Three Bedrooms</td>
<td>48%</td>
<td>37%</td>
<td>42%</td>
<td>45%</td>
<td>67%</td>
</tr>
<tr>
<td>Four + Bedrooms</td>
<td>18%</td>
<td>19%</td>
<td>36%</td>
<td>24%</td>
<td>3%</td>
</tr>
<tr>
<td>Average number of bedrooms</td>
<td>2.8</td>
<td>2.7</td>
<td>3.1</td>
<td>3.0</td>
<td></td>
</tr>
</tbody>
</table>

6.2 Population change and impacts on social infrastructure

Rezoning of the Fort Wallace site would facilitate it's residential development bringing in a new population to the peninsula. As outlined in section 3.8, development of the order demonstrated in the concept master plan is likely to yield of 103 dwellings and a population of 288. It is likely that around half of new residences will be occupied by Defence households and the other half will be private owners and renters, likely attracting both younger couples and families and empty
nesters, due to the diverse housing typologies envisaged. The demographic structure of such a population is expected to vary somewhat in from the 2011 population, as illustrated in section 3.1.

6.2.1 Community centres and spaces

Community centres

As indicated in section 4.1.1 there are no public community centres in Stockton, with privately held halls and clubs providing spaces for community gatherings. The Fern Bay Hall is an old facility and a development application for its replacement and amalgamation with the tennis club is in progress.

There is an existing need for an additional public community centre or space in the local area. As there are no existing public cultural, youth or seniors spaces in the local area, new community spaces should be multipurpose with the capacity to provide spaces for these user groups and the services and programs they require. This need for community space would be further reinforced with the additional population of around 288 people in Fort Wallace. The magnitude of increase in population for Fort Wallace is not expected to significantly alter the demand already identified.

6.2.2 Libraries

Whilst the potential new population of Fort Wallace would add to the demand for currently under met services, this is not a significant increase, with minor impact on the determination of need for this infrastructure. Using the People Places (State Library of NSW, 2012) population benchmark, the additional Fort Wallace population would increase the proposed needs for space only marginally, by 19m².

6.2.3 Child care

Residential development of the Fort Wallace site would likely generate in the order of 4 long day care places, 4 preschool places and 5 OOSH care places for new residents. The potential relocation of the Defence preschool to Medowie may result in some DHA families using this facility. This number of places is very small in the context of overall demand in the local area, as discussed in section 4.1.4. To support a socially sustainable community at Fort Wallace, there will be a need for existing service gaps to be addressed and have capacity for further population growth. Much of this future provision is expected to be delivered by the private or not for profit sector.

6.2.4 Recreation facilities

There is existing need for further sports courts in the Fern Bay area, which, if built, would likely be used by Fort Wallace residents.

Rezoning of the Fort Wallace site for residential development would create access to additional passive recreation space and an informal sport lawn in the community park precinct. The creation of a heritage precinct and connection of the site via dune boardwalks to the north and south will also provide a local and regional recreational attraction.

As noted above, the growing local area has an existing shortage of sports courts, and the moderate population growth facilitated by the proposed rezoning would add to this demand.

6.2.5 Education

Residential development of the Fort Wallace site would likely generate in the order of 33 primary school aged and 27 secondary school aged students. Fort Wallace would fall within the
catchment of Stockton Public School (270 students on a 1.85 ha site). As noted in section 4.1.6, capacity of the school is unclear although the school administration considered it to be currently operating close to capacity. By comparison, the nearby Fern Bay Public School has only 60 students on a 1.01 ha site with one permanent classroom. The school has significant potential for growth and if school catchment boundaries were modified, Fort Wallace students could be accommodated there (with expansion of classrooms and staff). It is around 2km from Fort Wallace to Fern Bay Public School and 3km to Stockton Public School. Consultation with the Fern Bay Fullerton Cove Progress Association suggests that a majority of residents of Fort Wallace would preferentially send their children to Fern Bay Public School due to the convenience (especially for DHA residents) or being located along parental travel routes (predominantly travelling norther rather than south to the ferry).

Capacity at St Peters Primary School is being rapidly taken up by students of the expanding Seaside development. It is expected though, that the current capacity and future expansion would be sufficient to accommodate students of a development at Fort Wallace. The 2011 census indicates 18.4 percent of primary students attend Catholic schools and 73.2 percent attend government schools. 2011 census data also indicates that the proportion of students attending Catholic schools increases in high school, with 34.3 percent of students in the local area at Catholic schools and 60.3 percent at government schools. With the planned development of a new Catholic high school in Medowie, it is likely this school will attract some students from the local area.

Overall, it is considered that local primary schools have the capacity (potentially with some expansion) to accommodate new residents at Fort Wallace, and that schools planning should consider the relative catchments for this new population and the best use of Department of Education facilities.

Should rezoning of the site be approved, it is recommended that Council advise the Department of Education of this change to consider in their planning, with the expectation that Fern Bay Public School be expanded and catchments reviewed.

6.2.6 Youth services

There are no youth services or facilities based in the local area. There is a need for a public indoor facility that can host services and activities for young people and also provide a venue to gather and socialise informally. This could be a new multipurpose community centre, as a specific youth centre is not justified at the local level, nor recommended. A multipurpose space would need to be located in close proximity to other services and attractions and easily accessible by public transport.

Adaptive reuse of heritage buildings in Fort Wallace could provide a venue for such a facility, within the core of the community and recreation precinct in the concept master plan.

6.2.7 Aged services

Many of the facilities and programs available to seniors in the local area are provided in the seniors developments, exclusively for their residents. The implications of this inequality in access to services affects social cohesion and connectedness between older residents in different parts of the local area. Older residents of the Fort Wallace site would have access to limited aged services in the local area.

6 NSW Department of Education, Stockton Public School Land Range Forecast
6.3 Access and mobility

Proximity of residential areas to local infrastructure and services and other destinations of interest are key to their viability. Access and connectivity is a key issue in the local area with spatial separation between Stockton and Fern Bay/Fullerton Cove, and many of the seniors and residential developments in Fern Bay and Fullerton Cove in discreet, independent and often private pockets that discourage or prevent connectivity between communities and limit access. Fort Wallace is located between but distinct from the two residential centres, so the quality of connections linking it to these other areas will be key to overcoming this spatial separation.

Residents in the local area indicate a strong reliance on private vehicles, (as does the regional area). The Stockton ferry service was used by 6.6 percent of commuters in 2011 and enhancing access to the ferry service, and consequently the bus services from the site to the wharf, could be pursued, in terms of increasing bus services and improving access to active travel routes for the site. There is an existing bus stop at the Fort Wallace entrance which would facilitate access for most future residents within a 400m walking catchment of the stop, with services to Stockton in the south and Newcastle and Port Stephens destinations heading north. Another bus stop with pedestrian crossing is located at the Stockton Centre and would provide the safest access. Any future planning for the site should explore options for pedestrian access from the site directly to the Stockton Centre bus stop.

The concept master plan also suggests that the site could provide for some local destinations with the potential adaptive reuse of the three heritage buildings. Walkable streets with footpaths and active travel networks within the site would facilitate this local mobility and attract and facilitate public access into and within the site, especially the heritage areas, community park and to the boardwalks, which could potentially be part of a longer coastal walk connecting to Stockton and Fern Bay.

Improving active travel connectivity will be integral for the site, with the need for a means for safer crossing of Fullerton Road (for access to the shared path and bus stop) and for a footpath or shared path on the eastern side of Fullerton Road. A further key consideration is the potential redevelopment of the Stockton Centre. The concept master plan includes the potential for future connections between the sites, ensuring not to sterilize such opportunities, and hence permit accessibility between the sites internally and avoid creating two isolated residential pockets.

The concept master plan envisages a community that is inviting and open, attracting the local community and visitors to it’s preserved and restored heritage features, providing public access to the beach and the potential destinations mentioned above, such as a café or community use building.

Consultation indicates that mobile phone connectivity is unreliable on the peninsular. Future site planning would need to ensure reliable mobile phone reception is available across the site.

Residential development of Fort Wallace, as per the concept master plan will also facilitate public access to a formerly restricted area, creating a local attraction and celebrating existing local heritage, both Defence and Indigenous.

6.4 Community cohesion and connectedness

A sense of connectedness is an important contributory factor to achieving significant positive impacts on health, well-being, and mental health for both individuals and groups of people. Communities with strong social capital and sense of identity have improved levels of passive surveillance, stronger informal assets that can be relied upon by members and more inclusive social networks, which celebrate diversity.

A challenge facing potential development of the Fort Wallace site is the development of a sense of community and belonging, both internally for residents within the development and for those
residents within the broader community. For new residents, this sense of community and belonging can be developed in many ways including:

- Getting to know neighbours.
- Being aware of and using local services.
- Being aware of and involved in local sports or common interest groups.
- Creating new social networks.
- Connecting with people with similar backgrounds.
- Being involved in the decision making process in the local area.

This challenge is exacerbated in the local area by the existing social and spatial separation between Stockton and Fern Bay and between the various discreet developments within Fern Bay and Fullerton Cove. Geographically, residential development of the site would stem some of the spatial divide, located between the two main residential areas. Proposed as an open and inclusive developed, the concept master plan envisages a heritage precinct and community park to become both local and visitor attractions.

For Defence families social connections and community cohesion is of great importance. As a frequently mobile population, they are often remote from friends and family, and rely on each other for social and support networks. The community centre at Williamstown RAAF base will be an important facility for Defence families to meet and develop social networks within the Defence community and also learn about the local and regional area. The community park and heritage precinct proposed in the concept master plan will also provide important social congregation points in the community for people from both within and outside the development to meet and socialise. However, as noted in section 6.2.1 there is an existing need for a local public community centre or space to provide an accessible and affordable place for people to come together. Such a space could also support the delivery of varied programs and services.

The adaptive reuse of heritage buildings at Fort Wallace could provide for use of this sort, however ownership and administration of the buildings would need to be determined with local Councils or community groups. To date there is no indication of an organisation that would be interested in managing these buildings. It is likely that the redeveloped Fern Bay Community Hall could meet some of this need, however it is not a multipurpose centre and is thus limited somewhat in its potential uses.

Ensuring development of a welcoming and inclusive community delivers sustainable social outcomes for both individuals and the community. Effective and efficient activation of the communal spaces within the site and use of facilities outside site for activities that are inclusive of the surrounding community would contribute to positive social outcomes and are recommended to be delivered for residents upon development of the site.

It is recommended that a Community Development and Welcome Program be prepared and resourced for the site by any developer of the site. The program would assist new residents with a particular focus on making new residents feel welcome and part of the community, on activating community spaces within the development, and more inclusive activities that engage the broader local community. The program would enhance and complement existing programs and natural social connections such as through schools, sports clubs, seniors groups and playgroups. The program could potentially be delivered in partnership with a non-profit/community-based organisation. Such a partnership has the benefit of supporting community/non-profit groups; connecting to community networks; utilising grant funding/sponsorship where available and potentially long-term sustainability of the program.
6.5 Health and wellbeing

Access to social and economic resources is essential to support healthy lifestyles through all stages of life. Access to health services, education, child and older peoples care, efficient public transport, to passive and active recreation areas and programs, to fresh food and daily needs, and to public and social spaces is needed to make places liveable and socially sustainable.

Fort Wallace, whilst located outside a desirable walking catchment to most services and facilities, will have many of the daily needs of its community available within 3km. With existing and proposed active travel infrastructure, these would be accessible by bike, bus or car. In addition to the social infrastructure needs identified in section 6.2, promoting the use of active travel modes to new residents for these local trips would enhance their uptake and set in place new travel habits. A community development and welcome program (as discussed in section 6.4) should include an objective as promoting this mode uptake. It should also promote the accessibility of Newcastle by ferry for both commuting and recreational access. Further, the social connections that the program would seek to develop under the plan would deliver social and health benefits across diverse age groups in the new and existing community.

Current access to fresh food is limited in the local area (a small format supermarket and local butcher), with consultation indicating that many people shop outside the local area at major supermarkets. With significant commercial interest in the development of a major supermarket in Fern Bay, it is likely that this will result in coming years and would adequately service the local area.

The Health Foundation is a key driver in Australia of planning for healthy communities. Their 2016 Master Checklist for Healthy Active Living by Design, identifies a number of considerations of relevance to planning for healthy populations at the level of rezoning for residential development. These considerations have been used to consider the health impact of the rezoning of Fort Wallace. The checklist is a tool to help development encourage and support physical activity and health outcomes including healthy eating. The key considerations with regard to the development are considered in Table 10. In general, at this stage of site planning, the concept master plan supports or enables future development in compliance with many of the principles of Healthy Active Design. Those aspects not consistent with the principles have also been identified in other sections of this SIA.

**Table 10 – Healthy Active by Design Review**

<table>
<thead>
<tr>
<th>Principle Consideration</th>
<th>Assessment</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Destinations</strong>: Access – are they within a safe and easy 400m-800m catchment</td>
<td>Facilities internal to the site are accessible, however other local services and destinations are more than 3km from the site</td>
<td>Ensure safe access to active travel links to Fern Bay and Stockton (section 6.3)</td>
</tr>
<tr>
<td><strong>Access</strong> – do paths and cycleways connect surrounding communities</td>
<td>Dune boardwalk will create a safe linkage.</td>
<td>Safer crossing of Fullerton Road or access to Stockton centre bus stop, or additional shared path (section 6.3)</td>
</tr>
<tr>
<td><strong>Open space</strong>: Access: at least one space within 400m-800m walk</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
### Principle Consideration

| Sense of place: Have heritage and cultural features been acknowledged, integrated and protected? | Yes | Interpretation and information about the Indigenous history and significance of the area is included in master planning. |
| Community facilities: Are they located for passive surveillance | Yes. Main heritage reuse building is adjacent to community park |

### 6.6 Cultural values and beliefs

Cultural values provide significant meanings and reference points for individuals and groups. The celebration and protection of cultural values is a key element in building strong and resilient communities. The Newcastle 2030 Community Strategic Plan highlighted the strong cultural life evident in Newcastle and surrounding areas. It recognises Newcastle’s role as a regional city and identifies the need to revitalise the area through strengthened retail, public transport, education and public precincts, while maintaining heritage values.

The concept master plan supports retaining vegetation and maintaining the dunes, envisages public access to the beach and supporting Aboriginal heritage values, as well as protecting the historical significance of the site’s military past.

Consultation with local Aboriginal groups concluded that the Stockton Peninsula, including the site, is considered to have very high Aboriginal cultural value to the Worimi people due to a nearby burial site. Fort Wallace has heritage and historic significance due to its former defence use and the structures remaining on the site associated with those uses.

It is recommended, if the Fort Wallace rezoning is approved, that further development of the master plan should be undertaken in consultation with the Worimi Local Aboriginal Land Council and other Aboriginal elders within the area.

### 6.7 Local economy and employment

Renewal of currently unused areas through residential expansion will generate increased demand for services and businesses in the local area, further supporting the demand for a growth in retail and social services in the local community. Development of the Fort Wallace site to accommodate Defence families is also important for the ongoing sustainable operation of the Williamstown RAAF base, being able to provide quality accommodation close to their personnel’s place of work. As identified in the Draft Plan for Growing Hunter City, Stockton, as part of the Northern Gateway is an important residential area proximal to employment areas in the city, the port and airport. The planning proposal would therefore complement existing employment lands.

The heritage precinct proposed in the concept master plan also supports the Newcastle Local Planning Strategy by creating a potential new tourist attraction within a sympathetically designed new residential area.

### 6.8 Crime and safety

Consideration for crime and public safety relate to:

- The safety of new residents in the existing environment.
• How the development will alter the built environment and create or reduce public safety.
• How new residents themselves alter community safety in the area.

Crime in the local area is largely comparable to that in Newcastle, however there are higher levels of domestic and sexual assault. The rezoning of Fort Wallace is not expected to impact the incidence of such crimes, however any future residential development on the site should include awareness raising programs for issues associated with this violence and of support services for victims of it as part of a developer led community development and welcome program.

The concept master plan would create a community with high levels of passive surveillance and aim to create accessible and visible shared open spaces. Should rezoning be approved for the sites, further planning for the site would incorporate Crime Prevention Through Environmental Design (CPTED) principles to maximise community safety. This will be an important consideration in the planning and activation of the heritage precinct.

A Community Development Program could also activate public spaces within the development, create a sense of safety and security for community members (both within and surrounding the proposed development) and as a result enhance passive surveillance. The importance of vibrant, active, inclusive and safe communities is reinforced in the Newcastle Community Strategic Plan, Safe City Plan and Social Strategy.

6.9 Summary of social impacts

Table 11 below provides a summary of the social impacts, benefits and needs relevant to the potential development of the Fort Wallace sites in a manner suggested by the concept master plan, and recommendations in response to these identified issues.

<table>
<thead>
<tr>
<th>Potential impact/risk/opportunity</th>
<th>Impact type</th>
<th>Social Considerations for future development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accommodation and housing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased housing supply and diversity in Northern Gateway, including smaller format dwellings and varied numbers of bedrooms</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Delivery of affordable and accessible housing for Defence personnel</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td><strong>Population change</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development will attract households at more diverse life stages and household types</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td><strong>Social infrastructure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing unmet need for community space and library services will be increased slightly by a population at Fort Wallace</td>
<td>Need</td>
<td>Short term increases to Stockton Library hours and increased frequency of Port Stephens mobile library service</td>
</tr>
<tr>
<td>Potential impact/risk/opportunity</td>
<td>Impact type</td>
<td>Social Considerations for future development</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Absence of <strong>cultural or youth spaces</strong> in the local area which is spatially isolated</td>
<td>Need</td>
<td>New multipurpose facility to meet diverse community needs (community/youth/cultural/seniors, library)</td>
</tr>
<tr>
<td>Existing unmet need for <strong>preschool and OOSH services</strong>, especially in Fern Bay</td>
<td>Need</td>
<td>Port Stephens Council to facilitate private sector delivery of preschool and OOSH services in the local area, and explore options for sports courts and fields in Fern Bay</td>
</tr>
<tr>
<td>Existing need for <strong>sports courts and playing fields</strong> in Fern Bay</td>
<td>Need</td>
<td>Regional Councils liaise with Department of Education to determine appropriate school catchments for Fort Wallace</td>
</tr>
<tr>
<td>Existing unmet need for preschool and OOSH services, especially in Fern Bay</td>
<td>Need</td>
<td>Port Stephens Council to facilitate private sector delivery of preschool and OOSH services in the local area, and explore options for sports courts and fields in Fern Bay</td>
</tr>
<tr>
<td>Limited capacity of Stockton primary schools to accommodate population growth, but significant room for growth/expansion in Fern Bay Public School.</td>
<td>Need</td>
<td>Regional Councils liaise with Department of Education to determine appropriate school catchments for Fort Wallace</td>
</tr>
<tr>
<td>Fort Wallace would deliver a local public playground, open space, dune boardwalks and heritage precinct – both a local and tourist attraction</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td><strong>Access and mobility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoning would support public recreational access to the site heritage and natural areas, including a coastal dune boardwalk to run along the peninsular</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Access from Fort Wallace to external active travel networks (bus stops and shared pathway) are not convenient and would discourage use by residents and visitors</td>
<td>Positive</td>
<td>Future site planning include pedestrian access to the Stockton Centre us stop and pedestrian crossing</td>
</tr>
<tr>
<td>Regional Councils consider pedestrian and cycle crossing options for Fullerton Road and/or shared pathway east of Fullerton Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited mobile phone coverage in the area</td>
<td>Negative</td>
<td>Any site developer ensure adequate mobile phone reception throughout the site</td>
</tr>
<tr>
<td><strong>Community cohesion and connectedness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing communities of the local area are socially fragmented and lack public spaces to connect making inclusion of new residents difficult. This is particularly relevant for teenagers in Defence families and seniors</td>
<td>Negative</td>
<td>Regional Councils consider a multipurpose community centre</td>
</tr>
<tr>
<td>A community development and welcome program be pursued by any site developer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential impact/risk/opportunity</td>
<td>Impact type</td>
<td>Social Considerations for future development</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>who do not have access to facilities in the private communities</td>
<td></td>
<td>DHA explore options for heritage reuse buildings to operate as Mens Sheds</td>
</tr>
<tr>
<td><strong>Health and wellbeing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance uptake of active travel for local journeys, especially with the site being located between two existing centres</td>
<td>Opportunity</td>
<td>Active travel promotion be a component of a Community Development and Welcome program for any new development at Fort Wallace</td>
</tr>
<tr>
<td><strong>Local economy and employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential development in an area that supports existing employment lands, especially for Defence staff at Williamstown Base</td>
<td>Benefit</td>
<td></td>
</tr>
<tr>
<td>Growing population to increase demand for services in the area which may assist in prompting private sector delivery</td>
<td>Benefit</td>
<td></td>
</tr>
<tr>
<td><strong>Crime and safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site design should minimise crime risks and maximise resident and visitor safety</td>
<td>Risk</td>
<td>Undertake a CPTED assessment for any future master plan, Implement Community Development and Welcome Plan to address existing crime issues and increase passive surveillance</td>
</tr>
</tbody>
</table>


7. **Conclusion and recommendations**

The social impact assessment has not identified any social considerations that would preclude the development of the site for residential development.

The proposed rezoning of Fort Wallace would facilitate the delivery of increased housing and housing diversity for people at a range of life stages. The concept master plan envisages the delivery of 103 dwellings, with around half of these occupied by Defence households. The site would likely accommodate in the order of 263 residents, would effect renewal of currently unutilised land within a designated future housing growth area and facilitate access to local heritage areas and items and public access to natural areas. It would also support the ongoing needs for quality, proximal housing for Defence families working in the region and particularly at the Williamstown RAAF base.

The site is within a local area undergoing considerable development and recent population growth and with existing unmet needs for social infrastructure. Additional social infrastructure (in terms of facilities, services and programs) would be required to support the development of a sustainable, healthy and inclusive community. The recommendations within this SIA and summarised below have been developed to inform future planning that would be required to support socially sustainable residential development under the proposed planning changes.

<table>
<thead>
<tr>
<th>Area of Change</th>
<th>Proposed mitigation or enhancement measure</th>
</tr>
</thead>
</table>
| **Social infrastructure**      | • Short term increases to Stockton Library hours and increased frequency of Port Stephens mobile library service  
                                | • New multipurpose facility to meet diverse community needs (community/youth/cultural/ seniors, library)  
                                | • Port Stephens Council to facilitate private sector delivery of preschool and OOSH services in the local area, and explore options for sports courts and fields in Fern Bay  
                                | • Regional Councils liaise with Department of Education to determine appropriate school catchments for Fort Wallace                                                                                                                                  |
| **Access and mobility**         | Future site planning include pedestrian access to the Stockton Centre bus stop and pedestrian crossing  
                                | • Regional Councils consider pedestrian and cycle crossing options for Fullerton Road and/or shared pathway east of Fullerton Road  
                                | • Any site developer ensure adequate mobile phone reception throughout the site                                                                                                                                                                    |
| **Community cohesion and connectedness** | Regional Councils consider a multipurpose community centre  
                                | A community development and welcome program be pursued by any site developer  
<pre><code>                            | • DHA explore options for heritage reuse buildings to operate as Mens Sheds                                                                                                                                                                      |
</code></pre>
<p>| <strong>Health and wellbeing</strong>        | Active travel promotion be a component of a Community Development and Welcome program for any new development at Fort Wallace                                                                                                                      |</p>
<table>
<thead>
<tr>
<th>Area of Change</th>
<th>Proposed mitigation or enhancement measure</th>
</tr>
</thead>
</table>
| Crime and safety | Undertake a CPTED assessment for any future master plan  
|                 | Implement Community Development and Welcome Plan to address existing crime issues and increase passive surveillance |
8. References


GHD, 2014. Draft Social Infrastructure Guidelines for NSW Department of Planning


The Health Foundation, March 2016, Healthy Active by Design - Master Checklist


## Appendix A - Demographic summary

### Region Demographics

<table>
<thead>
<tr>
<th></th>
<th>Fortitude N</th>
<th>Stockton N</th>
<th>Puttancourt N</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>% Within File</td>
<td>% Of Precinct</td>
<td>No</td>
<td>% Within File</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Persons</td>
<td>1425</td>
<td>70.0%</td>
<td>7.7%</td>
<td>4125</td>
</tr>
<tr>
<td>Average</td>
<td>82.2</td>
<td>2.0%</td>
<td>10.6%</td>
<td>834</td>
</tr>
<tr>
<td>0-4 years</td>
<td>201</td>
<td>5.9%</td>
<td>1.5%</td>
<td>141</td>
</tr>
<tr>
<td>5-11 years</td>
<td>217</td>
<td>5.1%</td>
<td>0.5%</td>
<td>927</td>
</tr>
<tr>
<td>12-17 years</td>
<td>261</td>
<td>10.4%</td>
<td>1.2%</td>
<td>873</td>
</tr>
<tr>
<td>18-29 years</td>
<td>257</td>
<td>35.9%</td>
<td>2.2%</td>
<td>972</td>
</tr>
<tr>
<td>30-44 years</td>
<td>235</td>
<td>35.9%</td>
<td>2.7%</td>
<td>663</td>
</tr>
<tr>
<td>45-64 years</td>
<td>215</td>
<td>0.0%</td>
<td>0.0%</td>
<td>577</td>
</tr>
<tr>
<td>65+ years</td>
<td>210</td>
<td>41.0%</td>
<td>1.2%</td>
<td>452</td>
</tr>
<tr>
<td>No. of age years</td>
<td>54</td>
<td>54</td>
<td>54</td>
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</tr>
<tr>
<td><strong>Median Age (years)</strong></td>
<td>47</td>
<td>56</td>
<td>40</td>
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<tr>
<td><strong>Gender Distribution</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Indigenous person</td>
<td>49</td>
<td>49</td>
<td>49</td>
<td></td>
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<tr>
<td>Persons born in New Zealand English-speaking countries</td>
<td>146</td>
<td>146</td>
<td>146</td>
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</tr>
<tr>
<td>Persons born in non-English-speaking countries</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Language spoken at home other than English</td>
<td>11</td>
<td>11</td>
<td>11</td>
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</tr>
<tr>
<td><strong>Spoken English very well or well</strong></td>
<td>30</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Household Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family household</td>
<td>472</td>
<td>54.5%</td>
<td>5.8%</td>
<td>994</td>
</tr>
<tr>
<td>Lone person household</td>
<td>232</td>
<td>4.6%</td>
<td>1.0%</td>
<td>382</td>
</tr>
<tr>
<td>Group household</td>
<td>37</td>
<td>1.4%</td>
<td>2.0%</td>
<td>37</td>
</tr>
<tr>
<td>Average household size (number of persons)</td>
<td>3.1</td>
<td>3.1</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td><strong>Sex Distribution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total families</td>
<td>475</td>
<td>475</td>
<td>475</td>
<td></td>
</tr>
<tr>
<td>Couple family with children</td>
<td>130</td>
<td>28.0%</td>
<td>0.6%</td>
<td>382</td>
</tr>
<tr>
<td>Couple with children under 15 years</td>
<td>252</td>
<td>35.7%</td>
<td>1.3%</td>
<td>223</td>
</tr>
<tr>
<td>Couple with children over 15 years</td>
<td>150</td>
<td>14.8%</td>
<td>0.0%</td>
<td>137</td>
</tr>
<tr>
<td>Couple family without children</td>
<td>67</td>
<td>14.0%</td>
<td>1.2%</td>
<td>233</td>
</tr>
<tr>
<td>One parent family</td>
<td>67</td>
<td>14.0%</td>
<td>1.2%</td>
<td>253</td>
</tr>
<tr>
<td>One parent with children under 15 years</td>
<td>24</td>
<td>78.6%</td>
<td>0.0%</td>
<td>113</td>
</tr>
<tr>
<td>One parent with children over 15 years</td>
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<td>114.0%</td>
<td>0.0%</td>
<td>125</td>
</tr>
<tr>
<td>Other family</td>
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<td>0.0%</td>
<td>18</td>
</tr>
<tr>
<td>Characteristic</td>
<td>Ferndale.xls</td>
<td>Stockton.xls</td>
<td>Fullerton Cove.xls</td>
<td>Regional Area</td>
</tr>
<tr>
<td>----------------------------------------</td>
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<td>---------------</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Within Ferndale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Of Precinct</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Within Stockton</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Of Precinct</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Within Fullerton Cove</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Of Precinct</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Within Regional Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>% Of Precinct</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other characteristics:**

- **Need for assistance:** 154, 0.8%, 2.2%, 171, 17.0%, 5.4%, 31, 5.0%, 0.1%, 1270, 5.8%, 48.3%
- **Dwelling:**
  - Semi-detached, terrace houses, townhouses: 0, 0.0%, 3.0%, 90, 5.5%, 1.0%, 7, 5.0%, 0.1%, 9655, 10.4%, 49.7%
  - Flat, unit or apartment: 0, 0.0%, 0.0%, 186, 5.2%, 1.1%, 0, 9.0%, 0.0%, 801, 13.6%, 49.7%
  - Other dwellings: 0, 0.0%, 3.0%, 0, 4.4%, 0.8%, 7, 5.5%, 1.5%, 9655, 10.4%, 49.7%
  - Net total: 0, 0.0%, 3.0%, 1, 0.0%, 0.0%, 0, 9.0%, 0.0%, 9655, 10.4%, 49.7%
- **Total occupied private dwellings:** 732, 95.6%, 1460, 97.5%, 107, 98.9%, 8242, 97.6%
- **Unoccupied private dwellings:** 32, 4.2%, 3.3%, 211, 12.4%, 2.6%, 28, 19.7%, 0.2%, 10672, 11.0%, 99.3%

**Tertiary Type:**

- **Fully owned:** 476, 67.0%, 1.1%, 537, 37.2%, 1.6%, 45, 59.0%, 0.2%, 2574, 34.0%, 49.2%
- **Owner with a mortgage:** 185, 23.0%, 0.5%, 418, 28.8%, 1.9%, 63, 43.0%, 0.5%, 2608, 34.6%, 49.4%
- **Rented (OSS):** 109, 12.9%, 0.3%, 300, 24.0%, 1.8%, 7, 7.1%, 0.1%, 2944, 38.1%, 49.5%
- **State or territory housing authority:** 27, 30.3%, 0.2%, 251, 51.2%, 1.7%, 0, 0.0%, 0.0%, 14285, 54.6%, 49.3%
- **Person not in same household:** 12, 13.6%, 0.0%, 97, 17.0%, 0.8%, 0, 0.0%, 0.0%, 4354, 15.5%, 49.2%
- **Sharing co-operatives/communal churches:** 0, 0.0%, 0.0%, 0, 0.0%, 0.0%, 0, 0.0%, 0.0%, 800, 2.5%
- **Other classified:** 12, 48.9%, 0.0%, 50, 7.0%, 0.0%, 0, 0.0%, 0.0%, 1151, 4.5%
- **Landlord type/Net rental:** 7, 7.8%, 0.0%, 3, 0.0%, 0.0%, 3, 42.9%, 1.5%, 420, 1.6%, 49.3%
- **Other tenure type:** 3, 2.4%, 0.5%, 16, 3.3%, 2.4%, 0, 0.0%, 0.0%, 547, 2.4%, 49.3%
- **Net total:** 18, 20.2%, 0.6%, 31, 6.3%, 1.4%, 3, 42.9%, 0.1%, 4295, 8.3%, 49.4%

**Median Income:**

- **Weekly Median:** 598, 4.3%, 969, 4.4%, 442, 4.3%, 531, 5.8%, 10263, 5.3%
- **Annual Median:** 58, 4.3%, 96, 4.4%, 14, 5.3%, 10263, 5.3%
- **Quartiles:**
  - 1st: 14, 6.1%, 25, 6.1%, 10, 6.1%, 20, 6.1%
  - 2nd: 21, 6.1%, 25, 6.1%, 10, 6.1%, 20, 6.1%
  - 3rd: 14, 6.1%, 25, 6.1%, 10, 6.1%, 20, 6.1%
  - 4th: 21, 6.1%, 25, 6.1%, 10, 6.1%, 20, 6.1%

**Individual income status:**

- **Individual income not stated:** 105, 7.6%, 230, 6.4%, 20, 11.1%, 12771, 7.3%
## Basic Community Profile

### File Name (incl File Extension) : .xls or .xlsx

<table>
<thead>
<tr>
<th>Region</th>
<th>Ferndale.xls</th>
<th>Stockton.xls</th>
<th>Fullerton Cove.xls</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>% Within File</td>
<td>% Of Precinct</td>
<td>No</td>
<td>% Within File</td>
</tr>
</tbody>
</table>

### Household Income

<table>
<thead>
<tr>
<th>Median Household Income (S/weeks)</th>
<th>Ferndale.xls</th>
<th>Stockton.xls</th>
<th>Fullerton Cove.xls</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>64</td>
<td>1,077</td>
<td>1,082</td>
<td>2,994</td>
</tr>
<tr>
<td>$1.0 - $399</td>
<td>11</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$400 - $599</td>
<td>31</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$600 - $999</td>
<td>108</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$1,000 - $1,999</td>
<td>144</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$2,000 - $2,999</td>
<td>56</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$3,000 - $4,999</td>
<td>40</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$5,000 - $6,999</td>
<td>21</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$10,000 - $14,999</td>
<td>10</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$15,000 - $19,999</td>
<td>6</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$20,000 - $24,999</td>
<td>3</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$25,000 - $29,999</td>
<td>1</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>$30,000 or more</td>
<td>1</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
<tr>
<td>All incomes not stated</td>
<td>8</td>
<td>1,017</td>
<td>4</td>
<td>15.2</td>
</tr>
</tbody>
</table>

### Labour Force

<table>
<thead>
<tr>
<th>Labour Force Participation</th>
<th>Ferndale.xls</th>
<th>Stockton.xls</th>
<th>Fullerton Cove.xls</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total employed</td>
<td>515</td>
<td>1,966</td>
<td>1,949</td>
<td>4,920</td>
</tr>
<tr>
<td>Full-time</td>
<td>509</td>
<td>1,936</td>
<td>1,924</td>
<td>4,850</td>
</tr>
<tr>
<td>Part-time</td>
<td>151</td>
<td>1,966</td>
<td>1,949</td>
<td>4,920</td>
</tr>
<tr>
<td>Unemployed persons</td>
<td>33</td>
<td>101</td>
<td>4</td>
<td>13.2</td>
</tr>
<tr>
<td>Not in labour force</td>
<td>764</td>
<td>1,684</td>
<td>46.4</td>
<td>1,234</td>
</tr>
</tbody>
</table>

### Occupations

- Managers: 74 (14.1%)
- Professionals: 82 (17.2%)
- Technicians and trades: 75 (15.6%)
- Community and personal service: 80 (11.7%)
- Clerical and administrative: 65 (12.9%)
- Sales: 50 (5.8%)
- Machinery operators and drivers: 35 (6.8%)
- Labourers: 65 (12.9%)

**GHD | Report for Defence Housing Australia - Fort Wallace Planning Proposal, 2126527**
<table>
<thead>
<tr>
<th>Key Industry</th>
<th>Ferntree Gully</th>
<th>Stockyards</th>
<th>Fullarton</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>% Within Area</td>
<td>% Of Project</td>
<td>No</td>
</tr>
<tr>
<td>Agriculture, forestry &amp; fishing</td>
<td>0</td>
<td>0.00%</td>
<td>0.00%</td>
<td>12</td>
</tr>
<tr>
<td>Mining</td>
<td>11</td>
<td>21.4%</td>
<td>31.2%</td>
<td>50</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>54</td>
<td>10.5%</td>
<td>11.1%</td>
<td>165</td>
</tr>
<tr>
<td>Electric, gas, water &amp; waste services</td>
<td>7</td>
<td>6.2%</td>
<td>11.1%</td>
<td>25</td>
</tr>
<tr>
<td>Construction</td>
<td>54</td>
<td>8.6%</td>
<td>12.2%</td>
<td>130</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>44</td>
<td>3.1%</td>
<td>0.7%</td>
<td>44</td>
</tr>
<tr>
<td>Retail trade</td>
<td>54</td>
<td>7.1%</td>
<td>9.0%</td>
<td>37</td>
</tr>
<tr>
<td>Accommodation &amp; local services</td>
<td>24</td>
<td>5.2%</td>
<td>1.3%</td>
<td>132</td>
</tr>
<tr>
<td>Transport, postal &amp; warehousing</td>
<td>24</td>
<td>4.1%</td>
<td>2.8%</td>
<td>87</td>
</tr>
<tr>
<td>Information media &amp; telecommunications</td>
<td>6</td>
<td>1.2%</td>
<td>0.2%</td>
<td>19</td>
</tr>
<tr>
<td>Financial &amp; insurance services</td>
<td>5</td>
<td>1.0%</td>
<td>0.2%</td>
<td>30</td>
</tr>
<tr>
<td>Real estate services</td>
<td>4</td>
<td>9.8%</td>
<td>1.6%</td>
<td>23</td>
</tr>
<tr>
<td>Professional, scientific &amp; technical services</td>
<td>9</td>
<td>7.0%</td>
<td>1.3%</td>
<td>104</td>
</tr>
<tr>
<td>Administrative &amp; support services</td>
<td>27</td>
<td>5.5%</td>
<td>1.0%</td>
<td>135</td>
</tr>
<tr>
<td>Public administration &amp; safety</td>
<td>50</td>
<td>15.6%</td>
<td>4.0%</td>
<td>122</td>
</tr>
<tr>
<td>Primary health care</td>
<td>50</td>
<td>15.6%</td>
<td>4.0%</td>
<td>122</td>
</tr>
<tr>
<td>Education &amp; training</td>
<td>22</td>
<td>4.9%</td>
<td>1.0%</td>
<td>130</td>
</tr>
<tr>
<td>Health &amp; social assistance</td>
<td>10</td>
<td>15.8%</td>
<td>1.5%</td>
<td>24</td>
</tr>
<tr>
<td>Arts &amp; recreation services</td>
<td>22</td>
<td>2.3%</td>
<td>0.3%</td>
<td>22</td>
</tr>
<tr>
<td>Other services</td>
<td>17</td>
<td>2.1%</td>
<td>0.4%</td>
<td>46</td>
</tr>
<tr>
<td>Net Skilled</td>
<td>4</td>
<td>1.2%</td>
<td>0.3%</td>
<td>32</td>
</tr>
<tr>
<td>Educational attainment:</td>
<td>113</td>
<td>5.7%</td>
<td>13.5%</td>
<td>500</td>
</tr>
<tr>
<td>Completion of Year 12 (or equivalent)</td>
<td>326</td>
<td>23.4%</td>
<td>7.0%</td>
<td>930</td>
</tr>
<tr>
<td>Without post-school qualifications</td>
<td>697</td>
<td>55.0%</td>
<td>32.7%</td>
<td>1750</td>
</tr>
<tr>
<td>Educational institution attending</td>
<td>762</td>
<td>49.8%</td>
<td>43.2%</td>
<td>1700</td>
</tr>
<tr>
<td>Basic Community Profile</td>
<td>FeniBay.xls</td>
<td>Stockton.xls</td>
<td>FulteCove.xls</td>
<td>Regional Area</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>--------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>% Within File</td>
<td>% Of Precinct</td>
<td>% Within File</td>
<td>% Of Precinct</td>
<td>% Within File</td>
</tr>
<tr>
<td>Gender</td>
<td>No</td>
<td>35</td>
<td>55.3%</td>
<td>152</td>
</tr>
<tr>
<td>Male</td>
<td>73</td>
<td>30.2%</td>
<td>76</td>
<td>35.0%</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>14.0%</td>
<td>0</td>
<td>4.1%</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>12.0%</td>
<td>21</td>
<td>11.3%</td>
</tr>
<tr>
<td>Technical or Further Educational Institutions</td>
<td>14</td>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Full time student</td>
<td>0</td>
<td>0%</td>
<td>20</td>
<td>22.2%</td>
</tr>
<tr>
<td>Elderly 25-44 years</td>
<td>12</td>
<td>0%</td>
<td>12</td>
<td>8.7%</td>
</tr>
<tr>
<td>Part time student</td>
<td>0</td>
<td>0%</td>
<td>10</td>
<td>26.3%</td>
</tr>
<tr>
<td>Elderly 25-44 years</td>
<td>8</td>
<td>0%</td>
<td>12</td>
<td>43.3%</td>
</tr>
<tr>
<td>Elderly 25-44 years and over</td>
<td>22</td>
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<td>39.5%</td>
</tr>
<tr>
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<td>8</td>
<td>0%</td>
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<tr>
<td>Total</td>
<td>22</td>
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<td>80</td>
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<td>University or other tertiary institution attending</td>
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<td>0</td>
<td>0%</td>
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<tr>
<td>Full time student</td>
<td>11</td>
<td>0%</td>
<td>31</td>
<td>10.0%</td>
</tr>
<tr>
<td>Elderly 25-44 years</td>
<td>14</td>
<td>0%</td>
<td>12</td>
<td>13.3%</td>
</tr>
<tr>
<td>Part time student</td>
<td>0</td>
<td>0%</td>
<td>11</td>
<td>10.5%</td>
</tr>
<tr>
<td>Elderly 25-44 years and over</td>
<td>22</td>
<td>100.0%</td>
<td>21</td>
<td>39.5%</td>
</tr>
<tr>
<td>Full or Part-time student status not stated</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0%</td>
<td>82</td>
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</tr>
<tr>
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<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Full time student</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Elderly 25-44 years</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Part time student</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Elderly 25-44 years and over</td>
<td>22</td>
<td>100.0%</td>
<td>21</td>
<td>39.5%</td>
</tr>
<tr>
<td>Full or Part-time student status not stated</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0%</td>
<td>21</td>
<td>0.7%</td>
</tr>
<tr>
<td>Type of educational institution not stated</td>
<td>199</td>
<td>7.6%</td>
<td>226</td>
<td>6.5%</td>
</tr>
<tr>
<td>Living at same address 1 year ago</td>
<td>1267</td>
<td>78.0%</td>
<td>5450</td>
<td>81.5%</td>
</tr>
<tr>
<td>Living at same address 5 years ago</td>
<td>747</td>
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<td>2470</td>
<td>59.0%</td>
</tr>
<tr>
<td>Transport</td>
<td>62</td>
<td>8.8%</td>
<td>219</td>
<td>15.1%</td>
</tr>
<tr>
<td>Households without a motor vehicle</td>
<td>382</td>
<td>51.5%</td>
<td>570</td>
<td>40.4%</td>
</tr>
<tr>
<td>One motor vehicle</td>
<td>221</td>
<td>30.0%</td>
<td>452</td>
<td>31.5%</td>
</tr>
<tr>
<td>Two motor vehicles</td>
<td>48</td>
<td>0.5%</td>
<td>155</td>
<td>0.4%</td>
</tr>
<tr>
<td>Three motor vehicles</td>
<td>20</td>
<td>2.5%</td>
<td>50</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

GHD | Report for Defence Housing Australia - Fort Wallace Planning Proposal, 21/26527
### Basic Community Profile

#### File Name: (not file extension: .xls or .xlsx)

<table>
<thead>
<tr>
<th>Journey to work (by one method only):</th>
<th>Ferriby.xls</th>
<th>Stockton.xls</th>
<th>Fullerton Cove.xls</th>
<th>Regional Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journey to work</td>
<td>No</td>
<td>% Within File</td>
<td>% Of Precinct</td>
<td>No</td>
</tr>
<tr>
<td>By train</td>
<td>0</td>
<td>0.6%</td>
<td>0.0%</td>
<td>15</td>
</tr>
<tr>
<td>By bus</td>
<td>12</td>
<td>2.2%</td>
<td>0.8%</td>
<td>41</td>
</tr>
<tr>
<td>By ferry</td>
<td>10</td>
<td>2.1%</td>
<td>0.7%</td>
<td>44</td>
</tr>
<tr>
<td>Train (includes light rail)</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Taxi</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Car, as driver</td>
<td>355</td>
<td>73.2%</td>
<td>0.7%</td>
<td>594</td>
</tr>
<tr>
<td>Car, as passenger</td>
<td>33</td>
<td>7.1%</td>
<td>0.0%</td>
<td>81</td>
</tr>
<tr>
<td>Truck</td>
<td>5</td>
<td>1.1%</td>
<td>0.1%</td>
<td>14</td>
</tr>
<tr>
<td>Motorbike/scooter</td>
<td>8</td>
<td>1.8%</td>
<td>0.1%</td>
<td>11</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>27</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>0.7%</td>
<td>0.1%</td>
<td>15</td>
</tr>
<tr>
<td>Worked away</td>
<td>4</td>
<td>0.9%</td>
<td>0.1%</td>
<td>70</td>
</tr>
<tr>
<td>Worked at home</td>
<td>12</td>
<td>2.7%</td>
<td>0.4%</td>
<td>58</td>
</tr>
</tbody>
</table>

## Appendix B - Local Social Infrastructure

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Size /capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community Centre</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fern Bay Community Hall</td>
<td>Fern Bay Reserve, Vardon Rd</td>
<td>Around 160m² Plans in progress for rebuilding One main hall, Kitchen, tables and chairs, disabled toilets.</td>
</tr>
<tr>
<td>Senior Citizens Centre</td>
<td>76 Mitchell St, 2295 - Stockton NSW</td>
<td>Not able to contact</td>
</tr>
<tr>
<td><strong>Childcare – long day care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mission Australia Early Learning Stockton</td>
<td>2 Barrie Crescent, Stockton NSW 2295</td>
<td></td>
</tr>
<tr>
<td><strong>Childcare – preschool</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton Public School Preschool</td>
<td>10 Clyde Street, Stockton 2295</td>
<td>40 children in two groups</td>
</tr>
<tr>
<td><strong>Childcare - OOSH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton School Kids Fun Club Association</td>
<td>1 Monmouth St, Stockton NSW 2295</td>
<td>30 Placements Serves– St Peters Primary and Stockton Public School</td>
</tr>
<tr>
<td>Wemoosh – Mayfield west</td>
<td>Gregson Avenue, Mayfield West</td>
<td>Currently in negotiation to have 30 students in Fern Bay Hall once the construction finishes</td>
</tr>
<tr>
<td><strong>Open space</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton Beach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockton Off-leash Dog Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitt Street Reserve and the nearby skate park</td>
<td>Pitt Street, Stockton</td>
<td>Skate Park.</td>
</tr>
<tr>
<td>Stockton Swimming Centre</td>
<td>Pitt Street, Stockton</td>
<td>50m outdoor pool.</td>
</tr>
<tr>
<td>Griffith Park (future district playground and street skate park)</td>
<td>Hunter Street, Stockton</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Address</td>
<td>Size /capacity</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Ballast Ground</td>
<td>Hunter Street, Stockton</td>
<td>Dog off-leash park</td>
</tr>
<tr>
<td>Hunter Street Reserve</td>
<td>Hunter Street, Stockton</td>
<td></td>
</tr>
<tr>
<td>Breen Park</td>
<td>Dunbar St, Stockton</td>
<td></td>
</tr>
<tr>
<td>Rawson Park</td>
<td>Mitchell Street</td>
<td></td>
</tr>
<tr>
<td>Corroba Park</td>
<td>Meredith Street</td>
<td></td>
</tr>
<tr>
<td>Lynn Oval (cricket ground)</td>
<td>Mitchell Street</td>
<td>Cricket ground.</td>
</tr>
<tr>
<td>North Stockton boat ramp (currently being upgraded)</td>
<td>Booth St, Stockton</td>
<td></td>
</tr>
<tr>
<td>Fern Bay Reserve and playground</td>
<td>Vardon Rd, Fern Bay</td>
<td>Playground facilities.</td>
</tr>
</tbody>
</table>

**Playgrounds**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitt Street Reserve</td>
<td>Pitt Street, Stockton</td>
</tr>
<tr>
<td>Hunter Street Reserve</td>
<td>3 Hunter Street</td>
</tr>
<tr>
<td>Griffith Park</td>
<td>5 Hunter Street,</td>
</tr>
<tr>
<td>Ballast Ground</td>
<td>Lot 74 Hunter Street,</td>
</tr>
<tr>
<td>Breen Park</td>
<td>79 Dunbar Street</td>
</tr>
<tr>
<td>Corroba Park</td>
<td>2 Meredith Street</td>
</tr>
</tbody>
</table>

**Sports grounds**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Size /capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corroba Oval</td>
<td>Meredith Street</td>
<td>Used for soccer, little athletics and cricket; also has a basketball court.</td>
</tr>
<tr>
<td>Lynn Oval</td>
<td>Mitchell Street</td>
<td>Used for both cricket and rugby league.</td>
</tr>
</tbody>
</table>

**Outdoor sports courts/fields**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Size /capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corroba Oval</td>
<td>Meredith Street</td>
<td>1 basketball court</td>
</tr>
<tr>
<td>Dalby Oval Courts</td>
<td>Mitchell Street</td>
<td>Five tennis courts 2 netball courts</td>
</tr>
</tbody>
</table>

**Golf Course**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Size /capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newcastle Golf Club</td>
<td>Vardon Rd,</td>
<td>18 hole green.</td>
</tr>
</tbody>
</table>

**Library**
<p>| Name                          | Address                                           | Size /capacity                                      |
|-------------------------------|                                                  |                                                    |
| Port Stephens mobile library  | Fern Bay Reserve, Vardon Rd. Next to school      | Once a fortnight                                    |
| Stockton Library              |                                                   | Opens three days a week                             |
| <strong>Health Facilities</strong>         |                                                   |                                                    |
| Stockton Surgery              | 78 Mitchell Street, Stockton                     | 2-3 part time doctors and 2 par time nurses         |
| Dr Hamid M A                  | 18 Mitchell Street, Stockton                     | 1 full time GP                                     |
| Fern Bay Medical Centre       | Palm Lake Resort, 1117 Nelson Bay Road, Fern Bay | 1 full time doctor, 1 part time nurse              |
| <strong>Aged housing</strong>              |                                                   |                                                    |
| Westcott Aged Care            | 128 Fullerton Street, Stockton, NSW, 2295.       | 128 permanent care bed facility,. 20 community care packages, a day therapy centre and 8 independent living units. Also provides respite care |
| The Cove                      | The Cove Village; 15 Fullerton Cove Rd, Fullerton Cove NSW 2318 | Currently 200 dwellings, Approximately 380 residents. Over 55’s gated and private community. |
| Bayway Village – over 50s relocatable homes park | 532 properties. Gated private community with modest communal facilities. Primarily over 50s, but also have around 10 younger families. |
| Palm Lakes Resort             | 1117 Nelson Bay Road, Fern Bay, NSW, 2295        | 247 villas, approximately 380-400 residents. Over 50’s lifestyle resort with extensive facilities. Private- gated. Public medical centre on site. |
| <strong>Aged services</strong>             |                                                   |                                                    |
| Meals on Wheels Stockton      | 74 Mitchell St, Stockton NSW 2295                | Service 52 clients, 3 days a week; usage has increased over the past few years |
| <strong>Education</strong>                 |                                                   |                                                    |
| Fern Bay Primary School       | Vardon Rd, Fern Bay                              | 34 enrolments in 2016 and 60 in 2017               |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Size /capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockton Public School</td>
<td>Clyde St, Stockton</td>
<td>267 enrolments, which it considers close to capacity</td>
</tr>
<tr>
<td>Newcastle High School</td>
<td>Parkway Ave, Hamilton South</td>
<td></td>
</tr>
<tr>
<td>St Peters Primary School</td>
<td>Dunbar St, Stockton</td>
<td>St Peters Primary School currently has 136 enrolments and expects 150 in 2018.</td>
</tr>
</tbody>
</table>

**Emergency Services**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockton Fire Station</td>
<td>Hereford St, Stockton</td>
</tr>
<tr>
<td>Stockton Police Station</td>
<td>Douglas St, Stockton</td>
</tr>
<tr>
<td>Stockton Ambulance Station</td>
<td>Hereford St, Stockton</td>
</tr>
</tbody>
</table>
# Appendix C - Age Structure Profile

<table>
<thead>
<tr>
<th>Region Community Profile</th>
<th>Maroubra BCP_1123/11srs</th>
<th>Semana BCP_1123/11srs</th>
<th>Clicoporte BCP_1123/12srs</th>
<th>Fullerton Cove BCP_1123/12srs</th>
<th>Fern Bay Fullerton Cove</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011q</td>
<td>2017q</td>
<td>2011q</td>
<td>2017q</td>
<td>2011q</td>
</tr>
<tr>
<td>Number of dwellings</td>
<td>436*</td>
<td>511*</td>
<td>521*</td>
<td>615*</td>
<td>458*</td>
</tr>
<tr>
<td>Population</td>
<td>741*</td>
<td>145*</td>
<td>1289*</td>
<td>194*</td>
<td>1283*</td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 4 years</td>
<td>46%</td>
<td>0.5%</td>
<td>47%</td>
<td>0.1%</td>
<td>42%</td>
</tr>
<tr>
<td>5 to 11 years</td>
<td>14%</td>
<td>0.3%</td>
<td>13%</td>
<td>0.2%</td>
<td>13%</td>
</tr>
<tr>
<td>12 to 17 years</td>
<td>6%</td>
<td>0.9%</td>
<td>6%</td>
<td>0.9%</td>
<td>5%</td>
</tr>
<tr>
<td>18 to 24 years</td>
<td>20%</td>
<td>2.7%</td>
<td>20%</td>
<td>2.7%</td>
<td>20%</td>
</tr>
<tr>
<td>25 to 34 years</td>
<td>15%</td>
<td>2.0%</td>
<td>15%</td>
<td>2.0%</td>
<td>15%</td>
</tr>
<tr>
<td>35 to 49 years</td>
<td>9%</td>
<td>1.3%</td>
<td>9%</td>
<td>1.3%</td>
<td>9%</td>
</tr>
<tr>
<td>50 to 59 years</td>
<td>12%</td>
<td>1.7%</td>
<td>12%</td>
<td>1.7%</td>
<td>12%</td>
</tr>
<tr>
<td>60 to 69 years</td>
<td>9%</td>
<td>1.3%</td>
<td>9%</td>
<td>1.3%</td>
<td>9%</td>
</tr>
<tr>
<td>70 to 79 years</td>
<td>6%</td>
<td>0.9%</td>
<td>6%</td>
<td>0.9%</td>
<td>6%</td>
</tr>
<tr>
<td>80 and over years</td>
<td>6%</td>
<td>0.9%</td>
<td>6%</td>
<td>0.9%</td>
<td>6%</td>
</tr>
<tr>
<td>Median Age (Years)</td>
<td>66*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average household size (number of persons)</td>
<td>1.5*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Assumptions: HH size of 1.6 and an age distribution of: 20 percent 50-59 years, 40 percent 60-69 years, 37 percent 70-84 years, 3 percent 85 years and older.

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133 Castlereagh St Sydney NSW 2000
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Document Status

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<th>Reviewer</th>
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<td>29/06/17</td>
</tr>
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<td>L Jessop</td>
<td>P Mandke</td>
<td>M Lander</td>
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www.ghd.com
Appendix L of Planning Proposal

Servicing Report

Fort Wallace

Property:
Fullerton St, Stockton

Applicant:
Defence Housing Australia

Date:
October 2017
Limitations Statement

This report has been prepared in accordance with and for the purposes outlined in the scope of services agreed between ADW Johnson Pty Ltd and the Client. It has been prepared based on the information supplied by the Client, as well as investigation undertaken by ADW Johnson and the sub-consultants engaged by the Client for the project.

Unless otherwise specified in this report, information and advice received from external parties during the course of this project was not independently verified. However, any such information was, in our opinion, deemed to be current and relevant prior to its use. Whilst all reasonable skill, diligence and care have been taken to provide accurate information and appropriate recommendations, it is not warranted or guaranteed and no responsibility or liability for any information, opinion or commentary contained herein or for any consequences of its use will be accepted by ADW Johnson or by any person involved in the preparation of this assessment and report.

This document is solely for the use of the authorised recipient. It is not to be used or copied (either in whole or in part) for any other purpose other than that for which it has been prepared. ADW Johnson accepts no responsibility to any third party who may use or rely on this document or the information contained herein.

The Client should be aware that this report does not guarantee the approval of any application by any Council, Government agency or any other regulatory authority.
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APPENDIX A  
SITE SERVICES PLAN AND DBYD INFORMATION

APPENDIX B  
CORRESPONDENCE FROM HUNTER WATER CORPORATION

LIST OF FIGURES

Figure 1: Site Plan.
1.0 INTRODUCTION

ADW Johnson has been engaged by DHA to form part of a consultant team to seek a rezoning of the DHA owned land in Stockton, formally known as Fort Wallace. The purpose of this report is to address the utility servicing requirements for the proposed development and the suitability of the surrounding utility infrastructure to support the proposed rezoning.

2.0 SUBJECT SITE

The site which is the subject of this report is Lot 100/DP1152115, Fullerton Street, Stockton NSW 2295. The total lot area is approximately 10 Hectares, with the existing building foot prints being utilised for the redevelopment. The proposed development consists of 102 community titled residential lots. The planning proposal is for the rezoning of the Fort Wallace site from SP2 (Infrastructure) to Part E3 (Environmental Management), Part R2 (Low Density Residential), and Part RE2 (Private Recreation).

Figure 1: Site Plan.
3.0 METHODOLOGY

Dial before you dig searches were carried out on the site to ascertain the general arrangement of the utility services in the surrounding areas. Further consultation has been made with Hunter Water Corporation to determine the capacity currently in their sewer and water assets to adequately service the proposed development. The Dial before you dig information is attached in Appendix A. Whilst the Hunter Water Corporation advice is attached in Appendix B.

4.0 POTABLE WATER SUPPLY

On inspection of the dial before you dig plans it can be seen that there are three hunter water mains in Fullerton Street. It is expected that the 100 mm diameter water main in the eastern side of Fullerton Street will have sufficient capacity to service the proposed redevelopment of Fort Wallace. A plan supplied by Hunter Water is attached to Appendix A showing the location of the water mains.

Advice received from HWC indicates that there is currently sufficient capacity available in the surrounding water mains. It is noted that during the design phase security of supply will need to be addressed in accordance with Hunter Water’s design guidelines.

5.0 SEWER

Approximately 400 metres to the south of the site is Stockton 4 Waste Water Pump Station (WWPS), as there is plenty of grade on the site it is expected that wastewater will be able to drain to this WWPS.

Unfortunately there is insufficient pumping and emergency storage capacity within this station to accept flows to cater for the proposed development of the Fort Wallace site. It will be necessary to complete an assessment and upgrade of the Stockton 4 WWPS. The upgrading of the WWPS will need to be funded by the developer.

To the south of the proposed development is the former site of Stockton Wastewater Treatment Works (WWTW). Hunter Water have provided the following advice;
   - The site is currently not used for any wastewater treatment purposes,
   - Hunter Water has no future plans to use the site for wastewater treatment purposes. Therefore there is no need for a 400m buffer zone to residential land use,
   - Hunter Water may utilise the site for operational purposes in the future. We confirm that these future operations will not involve the treatment of wastewater.

Hunter Water servicing advice and correspondence is attached in Appendix B.

6.0 ELECTRICITY

Fullerton Street currently has an overhead High Voltage transfer main running from north to South. This High Voltage Main services the surrounding areas and continues down to Stockton. It is envisaged that a High Voltage connection will be made from this transfer
main to service the proposed development.

There are currently several pole mounted substations in the near vicinity to the Fort Wallace site accordingly input will be required from an electrical engineer to confirm the number of substations required to service the proposed development.

7.0 TELECOMMUNICATIONS

The current NBN roll out plan does not include Stockton and Fem Bay at this stage.

Of note, there is significant Telstra infrastructure in the immediate vicinity of the Fort Wallace Site. It will be likely that with consultation with Telstra, servicing of the site will be achievable.

Further consultation with NBN will be required to determine if there are any opportunities to extend the NBN network to the site in the future.

8.0 GAS

A dial before you dig plan from Jemena shows that there are no domestic gas services in the neighbouring area, there are though two large 150 mm and 110 mm mains nearby.

Consultation with Jemena should be sought to clarify whether Jemena will supply any proposed development with gas. It is expected that for commercial reasons Jemena would extend their infrastructure to the site.

9.0 CONCLUSION

In summary, the proposed redevelopment of the Fort Wallace Site will be adequately serviced by the surrounding infrastructure and as such there are no constraints to the proposed rezoning due to the provision of services.
APPLICANT: Mr Andrew Williams

SEQUENCE NO.: 55856632

NOTIFICATION NO.: 11279174

DATE OF ISSUE: 22/09/2016

IMPORTANT

THIS PLAN IS NOT TO BE USED FOR CONVEYANCING

THIS INFORMATION IS VALID FOR 30 DAYS FROM THE DATE OF ISSUE
SERVICE LOCATIONS ARE APPROXIMATE.
HAND DIG UNTIL ACTUAL LOCATIONS ARE IDENTIFIED.
PROPERTY SERVICES ARE NOT SHOWN.
ANY INFORMATION ON THIS PLAN MAY NOT BE UP TO DATE
AND THE CORPORATION ACCEPTS NO RESPONSIBILITY FOR ITS ACCURACY.
REFER TO ATTACHED ADVICE SHEET FOR FURTHER WARNINGS.
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THIS PLAN IS NOT TO BE USED FOR CONVEYANCING
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REFER TO ATTACHED ADVICE SHEET FOR FURTHER WARNINGS.

APPLICANT: Mr Andrew Williams
NOTIFICATION NO.: 11279174

SEQUENCE NO.: 55856632
DATE OF ISSUE: 22/09/2016
APPLICANT: Mr Andrew Williams
SEQUENCE NO.: 5585632
NOTIFICATION NO.: 11279174
DATE OF ISSUE: 22/09/2016

SERVICE LOCATIONS ARE APPROXIMATE. HAND DIG UNTIL ACTUAL LOCATIONS ARE IDENTIFIED. PROPERTY SERVICES ARE NOT SHOWN.

IMPORTANT
THIS PLAN IS NOT TO BE USED FOR CONVEYANCING
ANY INFORMATION ON THIS PLAN MAY NOT BE UP TO DATE AND THE CORPORATION ACCEPTS NO RESPONSIBILITY FOR ITS ACCURACY. REFER TO ATTACHED ADVICE SHEET FOR FURTHER ARRANGINGS.
23 September 2016

Defence Housing Australia
C/- ADW Johnson Pty Ltd
7/335 Hillsborough Road
 Warners Bay NSW 2282

Attention: Mr Lincoln Gibbs

Dear Lincoln

PRELIMINARY SERVICING ADVICE FOR PROPOSED DEVELOPMENT
Lots 100, 101 DP 1152115 & Lot 5 DP 233358 338 Fullerton Street Stockton & 5 Popplewell Road Fern Bay

Thank you for your request for Hunter Water’s preliminary servicing advice for the provision of water and sewer services to the proposed development of the proposed 1 into 244 Community Title lot subdivision at Lots 100, 101 DP 1152115, 5 Popplewell Road, Fern Bay and 1 into 105 Community Title lot subdivision at Lot 5 DP 233358 338 Fullerton Street Stockton.

General information on water and sewer issues relevant to the proposal is included in this correspondence. This information is based on Hunter Water’s knowledge of its system performance and other potential development in the area at the present time.

Preliminary servicing advice is not a commitment by Hunter Water and may be subject to significant change prior to the development proceeding. General information on the provision of Hunter Water funded and delivered infrastructure may also be provided. This advice may also change substantially due to a range of factors. In particular, you should note that water and sewer systems are dynamic by nature and, as such, capacity availability and system performance varies over time. As a consequence, the advice provided herein regarding servicing availability is indicative only. A detailed analysis of available capacity will be undertaken upon lodgement of an application for a Notice of Formal Requirements.

If you proceed with a development application you will need to lodge a further application with Hunter Water to then determine the formal requirements that shall apply. Hunter Water will then issue a Notice of Formal Requirements. You will need to comply with each of the requirements in this Notice for the issue of a Section 50 Compliance Certificate for the specific development.

Hunter Water anticipates that the development will place an additional demand of approximately 349 Equivalent Tenements (ET) on the water supply and wastewater transportation systems and has reviewed system capacity and performance on this basis. As a result, Hunter Water’s preliminary servicing advice is as follows:

244 Community Title lots, 5 Popplewell Road, Fern Bay

Water
The site of the proposed subdivision is located in the Newcastle Water Supply System, and is supplied from the North Lambton 1 Reservoir. The property has a frontage to a 100mm Cast Iron Cement Lined (CICL) water main along Popplewell Road. (please refer to Figure 1 attached).

It is noted that security of supply will need to be provided for this development in accordance with Hunter Water’s design guidelines.
There is currently sufficient capacity available in these mains to serve the proposed development, however, capacity availability and system performance varies over time. A detailed analysis will be undertaken upon lodgement of an application for a Notice of Formal Requirements.

Wastewater Transportation
The development is located within the Fern Bay 1 Waste Water Pump Station (WWPS) catchment which is within the Shortland Waste Water Treatment Works Catchment. There is currently sufficient capacity within the Fern Bay 1 WWPS to serve the proposed development however connection of the development will exhaust the available capacity. Please note that allocation of capacity is subject to a development having determination of a Section 50 application and having a valid development consent issued by the relevant consent authority.

It appears that flows from parts of the development may need to be pumped to access the existing sewer infrastructure, (please refer to Figure 2 attached).

In order to allow connection of this development, a local developer funded servicing strategy should be prepared to investigate the infrastructure required to service this development and any augmentations to Hunter Water’s existing wastewater network. It is suggested that the servicing strategy investigate how the development will gravitate wastewater to the existing network - or if a new WWPS is required.

105 Community Title lot subdivision 338 Fullerton Street Stockton

Water
The site of the proposed subdivision is located in the Newcastle Water Supply System, and is supplied from the North Lambton 1 Reservoir. The property has frontage to a 100mm Cast Iron Cement Lined (CiCL) water main along Fullerton Street to which connection is permitted, (please refer to Figure 3 attached).

It is noted that security of supply will need to be provided for developments that exceed 100 lots in accordance with Hunter Water’s design guidelines.

There is currently sufficient capacity available in these mains to serve the proposed development, however, as noted elsewhere in this correspondence, capacity availability and system performance varies over time. A detailed analysis will be undertaken upon lodgement of an application for a Notice of Formal Requirements

Wastewater Transportation
The development lot is located in the Stockton 4 WWPS catchment, (please refer to Figure 4 attached). There is insufficient pumping and emergency storage capacity within this station to accept flows to cater for this development. Furthermore a sewermain extension will be required to connect the property to the Stockton 4 WWPS.

It will be necessary to complete a developer funded sewer servicing strategy to ascertain the optimal means to connect to Hunter Water’s sewer system. The strategy should address, but not be limited to, the following matters:

- Adjacent development areas;
- Existing asset constraints;
- Pump and emergency storage upgrades to Stockton 4 WWPS
- Development staging and timing; and
- Alternative connection points.
Wastewater Treatment
The proposed development falls within the Sortland Wastewater Treatment Works (WWTW) catchment which has sufficient capacity for the proposed developments.

Financial Contribution
Dependent on the connection points and utilisation of infrastructure, it may be necessary to pay a reimbursement towards capacity uptake in infrastructure assets constructed by other developers. Hunter Water administers reimbursements for a maximum period of 15 years following handover to Hunter Water.

It is not possible to calculate reimbursement values at this time due to the tentative nature of information, connection points etc, and accordingly such calculations are usually deferred until definitive information is available.

Environmental Assessment
Please note that a Review of Environmental Factors will be required for any works external to a particular development site, or where the service design includes infrastructure or activities that may have environmental impacts that would not have been specifically addressed in the consent authorities assessment and determination of the proposed development. Examples may be the construction of new or augmented water and sewer pump stations, sewer vents, trunk mains, reservoirs, development in a Wastewater Treatment Plant buffer zone, or development in a water reserve. Furthermore, a Controlled Activity Approval will be required from the NSW Office of Water for any excavation within 40m of a water body or should groundwater be present.

Prior to commencement of environmental assessment please contact the Hunter Water Developer Services Group to confirm the scope and need for such an assessment. It is recommended to meet and agree these matters prior to the developer engaging the services of a design or environmental consultant. In addition, please refer to the Hunter Water Review of Environmental Factors Guidance Notes, located in the Building & Development section of the Hunter Water website. The document provides the minimum requirements and an example template for the preparation of a REF.

Should you require further clarification or assistance please do not hesitate to contact me on 4979 9476.

Yours Sincerely,

Paul McCoy
Developer Services Engineer

Attachments:

Figure 1 - Water Supply Connection Point - 5 Popplewell Road
Figure 2 - Sewer Infrastructure - 5 Popplewell Road
Figure 3 - Water Supply Connection Point - 338 Fullerton Street
Figure 4 - Sewer Infrastructure – 338 Fullerton Street
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G Distribution Map 32
Defence Housing Australia (DHA) has an ongoing requirement for additional housing in the Newcastle area to cater for Newcastle-based Defence members. DHA has recently purchased two sites: Fort Wallace, Stockton, NSW and Rifle Range, Fern Bay, NSW and intends to obtain the necessary planning approvals to develop these sites for residential use with a mix of housing suitable for both Australian Defence Force (ADF) personnel and the private market.

To develop parts of both sites for residential use, the planning controls need to be amended. A proactive approach to engage and consult with key stakeholders and neighbouring communities to the Rifle Range and Fort Wallace was undertaken between July and early December 2016.

Information distributed to stakeholders and neighbouring communities intended to provide a greater level of certainty in the planning process and confidence in DHA’s approach.

Table 1 Summary information of Fort Wallace and Rifle Range:

<table>
<thead>
<tr>
<th></th>
<th>Fort Wallace</th>
<th>Rifle Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>31.75ha</td>
<td>111.35ha</td>
</tr>
<tr>
<td>LGA</td>
<td>Newcastle</td>
<td>Port Stephens</td>
</tr>
<tr>
<td>Existing Zone</td>
<td>SP2 Infrastructure</td>
<td>E2 Environmental Conservation</td>
</tr>
<tr>
<td>Notional Yield</td>
<td>100 dwellings</td>
<td>235 dwellings</td>
</tr>
</tbody>
</table>

1.1 Stakeholder and Community Consultation

Communications with key stakeholders and neighbouring communities to Fort Wallace and the Rifle Range commenced in July 2016. The purpose of these communication activities was to ensure stakeholders and the community:

» know who DHA is
» are aware of what is happening at Fort Wallace and Rifle Range
» consider the strong links to community
» consider the cultural heritage within Fort Wallace and the Rifle Range
» understood the planning process and what stage of this process they are at
» were aware of the site opportunities and constraints, indicative masterplans, indicative landscape masterplans and proposed housing typologies
» could speak directly with the project team at informal information sessions, or to call or email for additional information.

This report details the outcomes of the stakeholder and community consultation undertaken prior to the Planning Proposal being lodged with Port Stephens Council and Newcastle City Council. As consultation on both sites was integrated, one consolidated report has been prepared addressing both sites. Where responses have related specifically to one site, this has been noted.
2  Summary of consultation activities

A number of different consultation activities were undertaken over the six month period including face to face meetings, distribution of community newsletters, access to a website and a dedicated 1800 phone line and email address. The purpose of these activities was to drive greater public awareness of the project and provide interested parties with information.

Table 2  Consultation activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Detail</th>
</tr>
</thead>
</table>
| **Community Information and Feedback Sessions (CIFS)** | In total, 155 people attended one of the three CIFS  
Two community newsletters distributed to all Fern Bay and Stockton residents and businesses in July and December 2016  
CIFS 3pm to 6.30pm, Thursday 28 July 2016. Newcastle Golf Course, Vardon Road, Fern Bay  
Portside Local Newspaper advertised the Stockton drop-in session Thursday 4 August 2016. Distribution 4000 people  
Drop-in Session 2.30pm to 6pm, Thursday 11 August 2016, Stockton IGA, 53 Mitchell Street, Stockton  
Portside Local Newspaper advertised the Fern Bay CIFS 24 November 2016. Distribution 4000 people  
CIFS 3.30pm to 7pm, Thursday 8 December 2016. Newcastle Golf Course, Vardon Road, Fern Bay |
| **Fort Wallace onsite VIP tour**              | 15 people attended the tour including one representative from DHA and one from Elton Consulting  
Stockton Historical Society, Fort Scratchley Historical Society, Portside Local journalist, Newcastle Herald Journalist and interested persons were invited to attend  
2pm, Tuesday 2 August 2016, Fort Wallace, Fullerton Street, Stockton |
| **Fern Bay & Fullerton Cove Progress Association – monthly meeting** | 16 people attended the meeting including one representative from DHA and one from Elton Consulting  
6.30pm, Thursday 1 September 2016, Fern Bay Community Hall, Vardon Road, Fern Bay |
<table>
<thead>
<tr>
<th>Activity</th>
<th>Detail</th>
</tr>
</thead>
</table>
| **Project information – hard copy**  | » In July 2016, the first issue of a community newsletter was distributed to key stakeholders (via email), and neighbouring communities (letterbox dropped to approximately 3,000 homes)  
» In November 2016, issue two of the community newsletter was distributed to key stakeholders (via email), and neighbouring communities (letterbox dropped to approximately 3,000 homes). Additional copies were also provided to Stockton RSL, Stockton Bowling Club, Portside Local and Newcastle Golf Course, Fern Bay  
» At the first round of CIFS in late July/early August, AO display boards were used to convey information about DHA, the heritage and history of the sites and the planning process  
» At the follow-up CIFS in December, AO boards were used to convey more detail about DHA’s proposed development plans including indicative masterplans and housing typologies |
| **Examples of engagement materials**  | » Please refer to Appendix C for a copy of the July and December community newsletters  
» Please refer to Appendix D for the A0 Displays used in July/August and December  
» Please refer to Appendix E for Q&A Sheet  
» Please refer to Appendix F for CIFS Handout  
» Please refer to Appendix G for a map of the distribution area |
| **Project 1800 phone line**           | » A dedicated project information line (1800 959 797) was established on 25 July 2016  
» Five calls received from July to September 2016  
» Two calls received in November 2016 |
| **Project email account**             | » A dedicated project email contact (dhadevelopments@elton.com.au) commenced 25 July 2016  
» Ten emails received between July and September 2016  
» One email received in November 2016 |
| **Project information – online**      | » A dedicated webpage is assigned to the project on the DHA corporate website  
» Project information and updates are posted to  
» Commenced mid-August 2016  
» Sixteen online sale-related enquiries received |
| **Formal submissions**                | » Zero formal submissions received by Elton Consulting or DHA. |
3 Summary of feedback received

3.1 Key Feedback

During the community engagement and participation period the large majority of feedback received was positive.

Many people said that they appreciated DHA’s proactive engagement approach as well as the amount of quality information provided. They also understood that DHA was at the beginning of the Planning Proposal process.

People commented that the developments would create positive benefits for the local area such as improved public amenity, improved employment and economic growth as well as making the Worimi Conservation Lands and Stockton Beach more accessible to the public. A large majority of people expressed a desire to retain the heritage of Fort Wallace and were positive about adaptive reuse of some existing structures within the site.

Negative feedback received highlighted a variety of community concerns including feelings that traffic along Fullerton Street and Nelson Bay Road needs to be managed better at proposed access points of the developments. A number of people expressed concerns about the level of available parking at Stockton IGA and Stockton Ferry terminal.

Some people enquired into the status of future retail outlets and the sea wall proposed at Stockton by Newcastle City Council.
# 3.2 Community Consultation Reports

## Community Information and Feedback Sessions – July 2016

<table>
<thead>
<tr>
<th><strong>Fern Bay Community Information and Feedback Session</strong></th>
<th><strong>Stockton Drop-in Session</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff:</strong> DHA, Elton Consulting, NCP, Architectus</td>
<td><strong>Staff:</strong> DHA and Elton Consulting</td>
</tr>
<tr>
<td><strong>Time:</strong> 3pm – 6.30pm</td>
<td><strong>Time:</strong> 2.30pm to 6pm</td>
</tr>
<tr>
<td><strong>Date:</strong> Thursday 28 July 2016</td>
<td><strong>Date:</strong> Thursday 11 August 2016 (pension day)</td>
</tr>
<tr>
<td><strong>Location:</strong> Newcastle Golf Course, Vardon Road, Fern Bay</td>
<td><strong>Location:</strong> Stockton IGA, 53 Mitchell Street, Stockton</td>
</tr>
<tr>
<td><strong>Display:</strong> nine display boards, community newsletter and Q&amp;A handout</td>
<td><strong>Display:</strong> nine display boards, community newsletter and Q&amp;A handout</td>
</tr>
</tbody>
</table>

From 25 to 28 July 2016, about 3000 community newsletters were distributed to residents and businesses of Stockton and Fern Bay inviting people to attend the Fern Bay CIFS and the Stockton drop-in session.

Interest was generally positive. Interest was generally positive. Two people expressed a negative view about the proposal.

The team spoke with approximately 60 people. The team spoke with approximately 50 people.

**Positive feedback included:**
- Generally positive about the development and improved amenity in the area
- Level of detail provided to residents so early in the planning process
- Generally enthusiastic about the heritage at Fort Wallace and Rifle Range being retained
- Many older residents wanted to see Fort Wallace and have a look at the site
- Many residents wanted improved access to Stockton Beach
- Support for the memorial walk concept
- Opportunity to look at new facility for teenagers
- Supported housing provided for DHA purposes

**Negative feedback included:**
- Theft and petty crime is common in the area
- Traffic along Nelson Bay Road is busy and it is difficult to turn left or right from Vardon Road and Taylor Road onto Nelson Bay Road
- Lack of S94 contributions being invested into the Fern Bay area
- Community members had a feeling of

**Positive feedback included:**
- Heritage to be preserved at Fort Wallace and made available to the public in some way
- Beach and dune access is important to the community
- Need for more quality housing in the area
- Economic benefits of having more people in the area – i.e. it is good for business
- People seeking to move from Stockton to Fort Wallace or Rifle Range and wanted sales details
- People considered the development a great idea
- Appreciated the information and engagement approach with the community

**Negative feedback included:**
- Need to better manage traffic along Fullerton Street and Nelson Bay Road
- Need to address car parking issues at Stockton IGA and at the Stockton Ferry Terminal
- Concern to protect the environment within the sites
- Information requested about the proposed sea wall which is being managed by
Fern Bay Community Information and Feedback Session | Stockton Drop-in Session
---|---
- neglect – no local newspapers, pamphlets, investment from local Council
- Concern surrounding mosquitoes and snakes in the local area
- Concern for speeding vehicles using Vardon Road and Taylor Road to access Rifle Range
- Concern about the lack of retail outlets (especially groceries) in the area
- Questions about who may move into the area
- Safety concerns

Newcastle City Council

Neutral
- Interest in the type of housing, look of the estate and public amenity to be provided
- Design is important

Neutral
- Interest in the type of housing, look of the estate

Project Emails

Ten received
One person suggested having a CIFS on a Saturday, two sales enquires, one employment enquiry, one wanted to know the type of housing, one request for the concept plan and one provided information on the local area.

1800 project calls

Five received
Two people requested a copy of the community newsletter, one raised a neighbouring fence issue, two people wanted additional information about the proposal and appreciated the information provided.
Progress Association Monthly Meeting

Fern Bay and Fullerton Cove Progress Association Monthly meeting

**Staff:** DHA and Elton Consulting  
**Time:** 6.30pm to 8pm  
**Date:** Thursday 1 September 2016  
**Location:** Fern Bay Community Centre, Vardon Road, Fern Bay  
**Display:** nine display boards, community newsletter and Q&A handout

Interest was generally positive. One person expressed a negative view about the proposal.

The team spoke with approximately 14 people.

DHA spokesperson provided the history of the sites and the handover to DHA in 2015.

**Positive feedback included:**
» Open to the idea of a residential housing development  
» Public access to the Stockton beach and dunes  
» Preserve the heritage within the sites  
» Public amenity within the development may be good for teenagers, e.g. basketball court  
» Appreciated DHA’s straightforward approach to answering questions  
» Hunter Development Corporation Newcastle Port Community Contribution Fund may provide funding for future development

**Negative feedback included:**
» Need to manage traffic flow along Nelson Bay Road, particularly where it intersects with Vardon Road and Taylor Road  
» The current lack of S94 Contribution invested directly into Fern Bay  
» Dust that would be generated during construction of the development
Community Information and Feedback Session – December 2016

Fern Bay CIFS – Indicative masterplan, indicative landscape masterplan and housing typologies for Fort Wallace and Rifle Range

Staff: DHA and Elton Consulting
Time: 3.30pm to 7pm
Date: Thursday 8 December 2016
Location: Fern Bay Community Centre, Vardon Road, Fern Bay
Display: nine display boards including masterplan, community newsletter and Q&A handout

Interest was overall positive.

The team spoke with approximately 45 people.

Positive feedback included:

» Support for residential housing at Rifle Range and Fort Wallace
» General acceptance of the proposed Fort Wallace and Rifle Range indicative masterplan and landscape masterplan
» Support coastal community approach to the development and the proposed community interface
» Valued the strategic location and reasonable scale of the three to four storey apartment sites proposed at Fort Wallace
» Interest in the housing typologies (free-standing homes, courtyard homes, townhouses and cluster homes) proposed for both sites and general considerations to touch lightly on the environment
» Understood the opportunities and constraints for both sites
» Supported two access roads for the Rifle Range site
» Support for intersection upgrade at Nelson Bay Road and Vardon Road and/or Taylor Road, Fern Bay
» Support for public pedestrian access to the Stockton beach and dunes from both sites
» Support bushfire management strategy
» Keen interest in preserving the heritage within the sites and promoting this aspect through signage
» Supported the proposed public amenity within the developments, e.g. sporting field at Rifle Range for teenagers and connected cycle path and footpath from Fort Wallace to Stockton town centre
» Appreciated DHA’s straightforward approach to answering questions
» Key messages from DHA were congruent with key messages provided in July
» Key information regarding each site’s indicative masterplan, landscape masterplan and housing typologies was easy to read and understand
» Three parties indicated strong interest to purchase land and expressed desire to be informed once sales agent appointed

Negative feedback included:

» Strong westerly winds blow over garbage bins, move coal dust and are a bushfire hazard
» Stockton Ferry Terminal car parking is at capacity from Monday to Friday during working hours
» Currently the Rural Fire Service do not have any facilities in Fern Bay. Fern Bay residents identified the need for an RFA in the local area to effectively manage fires that arise from
Fern Bay CIFS – Indicative masterplan, indicative landscape masterplan and housing typologies for Fort Wallace and Rifle Range

- Neighbouring bushland threatening existing (and proposed) residential dwellings in Fern Bay
- Noted that road users along Fullerton Street, Stockton and Nelson Bay Road exceed speed limit and suggested speed cameras be used

**Project Emails**

**One received**

One person wanted to discuss the potential impact that additional people and cars will have on adjacent communities. In particular, the need for additional services required at local schools, supermarkets, retail outlets, doctors, medical services, aged care services, real estate services and additional parking spaces. He was invited to attend the December CIFS to discuss this matter.

Nil reply via email was noted and this person did not attend the CIFS in December 2016.

**1800 project calls**

**Two received**

One person wanted to know about the timing of the completed development and the other wished to know about council amalgamation between Newcastle City Council and Port Stephens Council.
3.3 Stakeholder Consultation Summary Outcomes

The table below outlines the sequence of actions to support pre Gateway consultation with relevant agencies from early July to December 2016.

Table 3 Summary outcomes

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Objective</th>
<th>Action Taken</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Native Title Tribunal</td>
<td>Brief initiatives</td>
<td>Briefing letter sent by Umwelt</td>
<td>Four Aboriginal parties registered</td>
</tr>
<tr>
<td>NSW Native Title Services Office of the Registrar</td>
<td></td>
<td></td>
<td>Members of the Worimi Land Council (WCL) are one of the registered parties</td>
</tr>
<tr>
<td>Hunter Central Rivers CMA Now: Hunter Land Services</td>
<td>Brief initiatives</td>
<td>Briefing letter sent by Umwelt</td>
<td>Complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consultation logged by Umwelt</td>
<td>Noted by stakeholder</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Objective</td>
<td>Action Taken</td>
<td>Outcomes</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Meetings - Port Stephens and Newcastle</td>
<td>Brief council officers on the proposed approach to consultation and the</td>
<td>Meeting attended by DHA/NCP/Architectus/Umwelt BMT WBM sent briefing letter to OEH Elton</td>
<td>In June 2016, engagement officers supported DHA’s proposed proactive engagement approach Refer to Architectus report (December 2016) for Fort Wallace and Rifle Range. Indicative masterplans and landscape masterplan modified to suit Council requirements Indicative masterplan, landscape masterplan and housing typologies for both sites were displayed at CIFS December 2016. Overall community supported indicative masterplans and landscape masterplans at December CIFS</td>
</tr>
<tr>
<td>Council</td>
<td>process for providing feedback</td>
<td>Consulting spoke to Council Engagement officers</td>
<td></td>
</tr>
<tr>
<td>» Planning</td>
<td>Ensure this approach is consistent with council’s requirements and best</td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Engagement</td>
<td>practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Ecology</td>
<td>Understand the council’s consultation outcomes report requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Heritage (Aboriginal and European)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Coastal and biodiversity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Land management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Objective</td>
<td>Action Taken</td>
<td>Outcomes</td>
</tr>
<tr>
<td>-------------</td>
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<td>----------</td>
</tr>
<tr>
<td>NSW National Parks and Wildlife and Worimi Board of Management /Worimi Conservation Lands (WCL)</td>
<td>Brief initiatives Determine further opportunities and constraints regarding potential future dedication of the beachfront and bushland within RR Cultural heritage management process; conservation of Aboriginal heritage (Umwelt) Land management – identify initiatives Assess access provisions</td>
<td>Meeting with DHA, Umwelt, Kleinfelder with NSW National Parks and Wildlife WCL Board of Directors notified through registered members</td>
<td>Boundary changes by negotiation Seaside Fern Bay VPA discussed Water to be contained within DHA sites No cats Community title scheme to manage APZ and bushlands APZ needs to be managed within development site Development must take into consideration Aboriginal and European heritage of each site Need to manage access from private residences to WCL, no legal access to National Park from private land No additional land to be given to WCL without due compensation OEH do not want beach land or any additional park Bollards work well along northern boundary of Rifle Range Need to map RV approved land Future walking trail under investigation through WCL to Port Stephens and good extension of Great North Walk Potential impact of bushfire mitigation measures and Vegetation Management Plan on adjoining land NPWS may be interested in collaborated bushfire and weed mitigation management plan along property boundaries Bonded and friable asbestos found on WCL</td>
</tr>
<tr>
<td>Fort Scratchley Historical Society</td>
<td>Determine further opportunities and constraints</td>
<td>Meeting with DHA and Elton Consulting Onsite VIP Tour of Fort Wallace</td>
<td>Photos, maps and historical records of Fort Wallace provided Marine Rescue suggested as tenant for observation tower Heritage to be managed accordingly</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Objective</td>
<td>Action Taken</td>
<td>Outcomes</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Family and Community Services</strong></td>
<td>Understand The Stockton Centre pending closure, timings, substantial changes Brief FACS on proposed approach, timings</td>
<td>DHA managed briefings at Deputy Secretarial level</td>
<td>Complete Noted by stakeholder</td>
</tr>
<tr>
<td><strong>Office of Environment and Heritage</strong></td>
<td>Umwelt to administer the Aboriginal cultural heritage assessment process. The OEH requirements for Umwelt assessment include provision for public notification to identify interested Aboriginal parties</td>
<td>Umwelt (Aboriginal heritage)</td>
<td>Refer to Umwelt report</td>
</tr>
<tr>
<td><strong>Federal MP - Newcastle</strong></td>
<td>Brief initiatives</td>
<td>Briefing with DHA</td>
<td>Complete Noted by stakeholder</td>
</tr>
<tr>
<td><strong>State MP - Newcastle</strong></td>
<td>Brief initiatives</td>
<td>Briefing with DHA</td>
<td>Complete Noted by stakeholder</td>
</tr>
<tr>
<td><strong>Office of Environment and Heritage</strong></td>
<td>Brief heritage sites within Fort Wallace and Rifle Range (note Commonwealth sites)</td>
<td>Urbis sent a notification letter to OEH Heritage</td>
<td>Heritage listing type to be determined Refer to Urbis report</td>
</tr>
<tr>
<td><strong>Office of Environment and Heritage</strong></td>
<td>Confirm issues to be dealt with by Council and OEH (Flora and Fauna Assessment)</td>
<td>Umwelt (ecology) meeting Umwelt (ecology), DHA/NCP and Architectus</td>
<td>Refer to Umwelt report</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Objective</td>
<td>Action Taken</td>
<td>Outcomes</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>--------------</td>
<td>----------</td>
</tr>
<tr>
<td>Office of Environment and Heritage</td>
<td>Confirm issues regarding coastal management</td>
<td>BMT WTM sent a notification letter</td>
<td>Noted by stakeholder</td>
</tr>
</tbody>
</table>
| Roads and Maritime Services (RMS) | Brief initiatives  
- Consideration on traffic impacts, current capacity of local roundabout and traffic light implications  
- Upgrades of Fullerton St and Nelson Bay Road | Meeting with Better Transport Futures | No specific issues were raised from a traffic and transport perspective  
Refer to Better Transport Futures report |
| Hunter Water (HW) | Understand the future of the HW site south of FW and potential to link Stockton to FW via beachfront of the HW site | ADW Johnson discussed project with HW | Noted by Stakeholder  
Preliminary Services Advice application lodged for the developments |
| NSW Rural Fire Service | Brief initiatives  
- Identify constraints and opportunities | Kleinfelder coordinated correspondence | Noted by Stakeholder |
| Regional Emergency Management Officer – Hunter Central Coast (police, fire, rescue) | Brief initiatives  
- Identify constraints and opportunities | Elton Consulting emailed project outline and community newsletter | Noted by stakeholders |
| Stockton Historic Society | Investigate opportunities to activate and use historic structures (tunnels, rooms at Fort Wallace)  
Understand servicing requirements, provisions, opportunities | Stakeholders attended Fern Bay CIFS  
Onsite VIP Tour of Fort Wallace | Noted by stakeholder  
Heritage to be either protected, managed and/or preserved |
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Objective</th>
<th>Action Taken</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Dune Buggy and beach front activity providers | Brief initiatives  
Understand constraints  
Beach front provisions addressed | Elton Consulting briefed stakeholder on the project  
Invited to attend Fern Bay CIFS | Stakeholder is part of Worimi Conservation Lands  
Refer to Worimi Conservation Lands |
| Defence Families Australia Defence Communities Organisation RAAF Base Williamtown | Provide information on the proposal, process, constraints and opportunities  
Consultation and collate feedback on proposal  
Manage expectations of built form | DHA provided briefing | Need for housing closer to base  
Traffic congestion on Nelson Bay Road  
Need for connection to Newcastle |
| Fern Bay Public School (including P&C, OOSH, Family Daycare) | Provide information on the proposal, process, constraints and opportunities | DHA and Elton Consulting provided briefing | Traffic needs to be better managed at intersection of Nelson Bay Road and Vardon Road for safety reasons  
School to support new families and school children and acknowledged Defence supported aids  
Vehicle use on the beach is a safety issue  
Lack of street lights in Fern Bay  
Kooragang Island Emergency Management Plan addressed |
| Marine Rescue | Brief initiatives  
Identify the opportunity for adaptive reuse of Fort Wallace observation Tower and tenant with suitable organisation | DHA and Elton Consulting provided briefing  
DHA provided onsite tour of Fort Wallace | Marine Rescue (Newcastle) unable to secure approval to operate from Observation Tower, Fort Wallace due to current leasing arrangements with Council |
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Objective</th>
<th>Action Taken</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Media</td>
<td>Brief initiatives&lt;br&gt;Answer questions and provide media release when necessary&lt;br&gt;Follow DHA Media Protocol</td>
<td>Journals attended CIFS&lt;br&gt;Journals attended Fort Wallace VIP Tour&lt;br&gt;DHA provided written responses to questions</td>
<td>Newcastle Herald ran poll which showed 70% support for proposal</td>
</tr>
<tr>
<td>Newcastle Herald</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portside Local</td>
<td></td>
<td></td>
<td>Portside Local printed positive and neutral report on proposal</td>
</tr>
</tbody>
</table>
4 Next Steps

Following preliminary assessment by Councils and the Department of Planning and Environment in order to issue DHA a Gateway Certificate, it is expected that the formal public exhibition of the planning proposals will be augmented with the following:

- A DHA community newsletter will be distributed to all stakeholders, businesses and residents of Fern Bay and Stockton, NSW. The newsletter will explain what is happening at Fort Wallace and Rifle Range, what stage of the planning process DHA are up to and an invitation to the next Community Information and Feedback Session (CIFS)
- A newspaper advertisement(s) will feature details of the next CIFS and include the project phone line, project website and project email account
- A CIFS will be held, with the objective of providing all neighbours and those in the broader community the opportunity to review the proposed changes, seek feedback and to garner interest. The communication approach will be positive and genuine. The CIFS will be in a strategic location, during a time to maximise community involvement. Large maps of both development sites with relevant descriptions will also be made available for public viewing
- Project 1800 phone line continues to be answered and the project team continue to respond to questions and notifications
- Project email account continues to respond to incoming correspondence
- Project information provided online is up to date with key information. People can continue to make an online enquiry

On conclusion of the public exhibition period, a final report of the outcomes will be provided to DHA for Council and State Government assessment and final approval.
Appendices

A  Demographic Information
B  Social Infrastructure Maps
C  Community Newsletters
D  AO Displays
E  Q&A Sheet
F  CIFS Handout
G  Distribution Map
A Demographic Information

The following table provides a summary community profile of Stockton and Fern Bay as at the 2011 Census.

<table>
<thead>
<tr>
<th></th>
<th>Stockton</th>
<th>Fern Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>4195</td>
<td>1625</td>
</tr>
<tr>
<td>Male vs Female</td>
<td>50:50</td>
<td>50:50</td>
</tr>
<tr>
<td>Median age</td>
<td>47</td>
<td>54</td>
</tr>
<tr>
<td>Average people per household</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Married</td>
<td>37.5%</td>
<td>55.6%</td>
</tr>
<tr>
<td>Never married</td>
<td>40.7%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Median weekly household income</td>
<td>$1072</td>
<td>$898</td>
</tr>
<tr>
<td>Median monthly mortgage repayments</td>
<td>$1793</td>
<td>$2200</td>
</tr>
</tbody>
</table>

Department of Defence was the highest employer of Fern Bay residents stated in the 2011 Census at ten percent (10%) of respondents.

Stockton has one supermarket, an IGA located in the main shopping precinct between Mitchell Street and Dunbar Street. According to a resident, the majority of people shop at Aldi or Woolworths in Mayfield (13.6km away), or Coles or Woolworths at Medowie (23.3km away and approximately 9.1km north-west of Williamtown).

Locals typically use the petrol station on Koorangang Island. ‘Rosies’ petrol station was burnt down and has not been rebuilt.
B Social Infrastructure Maps

![Stockton Social Infrastructure Map 1](image-url)
C Community Newsletters
What is happening at Stockton Fort Wallace and Fern Bay Rifle Range?

Last year Defence Housing Australia (DHA) purchased the Fort Wallace and Rifle Range land holdings from the Department of Defence. This land will be developed by DHA to provide additional homes for Defence members and their families.

In the coming months, we will take the first steps towards requesting the necessary planning approvals required to develop two vibrant and sustainable residential communities. We anticipate both sites will offer high quality public areas, improved access to the sand dunes and Stockton beach, as well as a mix of quality dwellings to house Defence families and the wider public.

Who is DHA?

Defence Housing Australia (DHA) is one of the country’s most successful Government Business Enterprises. Our main role is to provide quality housing and related services to Defence members and their families, but we don’t just build houses, we build communities.

When planning a new development, our project teams look beyond the front yard and consider the street layout, the footpath connectivity, the road network, and public spaces like parks to ensure a safe and liveable community. Our role is clear – we are charged with creating a place for families to call home.

Today, we can proudly say that the communities we build exceed community standard and are award-winning. Innovation and sustainability is incredibly important to DHA. We have a pipeline of approximately $3 billion committed to produce cutting-edge developments across the country.

With the ongoing support of our many happy investors and our valued partners, we will continue to build futures for all Australians.
Strong links to community

DHA's vision is to develop Fort Wallace and the Rifle Range into unique coastal communities with links to the Newcastle CBD and the growing Hunter region. The location of these two sites is ideal for our requirement to provide more quality housing in close proximity to jobs at RAAF Base Williamtown, Kooragang Island and Newcastle CBD.

We will be considering a variety of opportunities for the two areas, such as integrated bike paths and scenic walking trails that allow people to enjoy various points of interest within the sites. For instance, Fort Wallace offers a unique insight into the bygone “fort” era with history that is integral to the local and wider community.

Fort Wallace offers unique views of Stockton and the Hunter region and both sites have the potential to provide the community access to Stockton beach, its dunes and the surrounding bushland.

Currently, DHA is working with an expert project team, comprising of architects, planners, urban designers and landscape architects plus a range of specialist consultants. This team is working on identifying and reporting on local considerations regarding the environment, traffic, Indigenous heritage, European heritage, dune morphology and 100 year sea level changes.

By consulting with the local community and its stakeholders we hope to achieve an urban design that sensitively responds to the local environment and supports the local amenity. A place where the natural coastal ecology prevails over the built environment and a rich layer of cultural heritage is celebrated and made accessible to the public.

We intend for these sites to provide future residents, and the wider Stockton community, with the opportunity to connect with the natural environment and the sites’ heritage. Our aim is to create a vibrant sustainable community with world’s best practice as the benchmark.

Cultural heritage

Both sites contain Indigenous and European heritage while Fort Wallace heralds visible remnants of its recent mission to keep Newcastle safe during World War Two.

DHA is committed to working with the local community to understand the significance of these sites and work with local organisations and government with the aim of protecting, managing or providing public access to these culturally significant heritage sites.
What will happen next?
To develop parts of both sites for residential uses, the planning controls need to be amended. The process is called a “Planning Proposal” or “rezoning”. The Planning Proposal will be submitted to Port Stephens Council and Newcastle City Council, and will also need to be assessed and determined by the State Government.

What is the planning process?

**STAGE 1 – Planning Proposal**
- Specialist studies; including heritage, traffic, flora and fauna.
- Stakeholder and community consultation undertaken by DHA.
- Planning proposals lodged with Port Stephens Council and Newcastle City Council.
- Preliminary assessment by councils.
- Department of Planning and Environment issue a Gateway Certificate, which allows the Planning Proposal to go on exhibition.
- Public exhibition of the Planning Proposal.
- Council and State Government Assessment and approval – the planning controls are amended.

**STAGE 2 – Development Applications**
- DHA and the consultant team prepare Development Applications (DAs) showing the details of the proposal.
- Public exhibition of the DAs.
- Development Application assessed by Councils and other agencies (as required) and approved, if appropriate.

**STAGE 2 – Design and Construction**
- DHA to undertake detailed design of the dwellings, parks, and infrastructure, and commence construction.

HAVE YOUR SAY
Make a comment or share your views by coming along to one of our information sessions. See back page for details.
Rifle Range and Fort Wallace have the potential to provide the community access to Stockton Beach, its dunes and the surrounding bushland.

Where can I get more information?

DHA is committed to keeping the local community and stakeholders informed, as well as obtaining your feedback as the planning progresses. We will be sending households regular newsletters and providing community information sessions at key stages of the planning process. The Gateway Rezoning process will also provide formal opportunities for public input.

The community is invited to attend an informal information session to be held Thursday 28 July 2016 between 3pm and 6.30pm at Newcastle Golf Club, Vardon Road, Fern Bay.

Alternatively, you can drop-in to the arcade in front of the Stockton IGA Thursday 11 August 2016 from 2.30pm to 6pm. Stockton IGA is located at 53 Mitchell Street, Stockton.

At these events you will be able to meet some of the project team and view information about the planning proposal to better understand what can be expected.

Project contact details

For more information about the project, to provide feedback or if you have any questions please contact us by emailing dhadevelopments@elton.com.au or call 1800 959 797.

1800 959 797    @ dhadevelopments@elton.com.au
What is happening at Stockton Fort Wallace and Fern Bay Rifle Range?

In April 2016, Defence Housing Australia (DHA) took the first steps toward requesting the necessary planning approvals required to develop two vibrant and sustainable residential communities in the local area.

For more background information refer to https://www.dha.gov.au/development/residential/fort-wallace-stockton-and-rifle-range-fern-bay

What has happened so far?

By August, over 3,500 Fern Bay and Stockton residents received our first community newsletter and over 100 people attended our information sessions.

In September, we were invited to attend the Fern Bay Progress Association meeting to share details about DHA’s plans. The project team has provided information to numerous stakeholder groups at local, state and federal levels.

Overall the feedback has been very positive. People have expressed interest in many elements including:
- how DHA plans to maintain and promote the heritage aspects of Fort Wallace
- how access to the surrounding dunes and Stockton Beach will benefit the community
- the different types of housing being considered and the economic boost and flow-on from having new residents living in the area.

We’ve listened to local resident concerns regarding the environment, road access and traffic hot spots and the project team has been working on identifying and finding adequate responses to these issues. We expect the project team to have their reports for our Planning Proposals finalised by the end of 2016.

Opportunities and constraints

We will be considering a variety of opportunities for the two areas, such as shared walking paths with historical significance, scenic walking trails through the dunes to Stockton Beach, public viewing areas, playgrounds, sporting fields and public spaces that allow people to connect with each other.

Fort Wallace is a historically significant site and where possible, DHA plan to adaptively reuse the original Fort Wallace heritage buildings and gun emplacements.

The Rifle Range site contains a potential koala habitat and we are working with Port Stephens Council to ensure there are no negative impacts on the existing habitat.

To help protect homes from bushfire risks our masterplanning includes an asset protection zone. DHA is investigating a more frequent, low intensity fire management strategy to reduce the bushfire danger to both sites.

The indicative masterplans for both sites will be on display at our upcoming information session.

Whilst we understand the planning proposal process has a way to go, we would like to share with the community our initial ideas, provide information as to what has guided us so far and ask for your feedback. Refer to the back page for details.
Diversity of housing

We anticipate the Fort Wallace and Rifle Range sites will offer a diversity of dwellings for Defence families and the general public to call home.

The proposed ecologically sustainable development includes apartments, townhouses and free standing homes. Five unique typologies are being considered in both masterplans for Fort Wallace and Rifle Range to respond to the unique nature of the sites. A brief description of each housing type is provided below:

**Single eco-homes**
Larger lot sizes, from 550 to 800m², will accommodate single eco-homes. These lightweight homes respond well to all seasons due to their orientation and choice of building materials.

**Cluster homes**
Coastal Cluster homes, as the name suggests, clusters homes into groups of two, three and four. Homes are carefully designed to increase the sense of connection to the surrounding landscape.

**Courtyard homes**
Courtyard homes offer families open plan living space, a single garage and ample rear garden. These two storey detached homes will each include three to four bedrooms. Lot size is expected to be 380m².

**Townhouses with Fonzie Flat**
From the front, these three bedroom compact homes will be attractive as all the garages will be located at the rear of each dwelling. Each two storey home will be situated on a 240m² lot.

**Dune apartments**
To optimise a natural looking skyline of the coastal community, the indicative Fort Wallace masterplan show these apartments adjacent to and below the central hillside. The proposed height of the apartment block is one to four stories. From all apartments, residents will be able to see the surrounding natural bushland and communal areas. Each apartment will have one to three bedrooms.

For more information on these housing types please join us at our next information session. We will share with you the proposed masterplans with housing types clearly shown. Refer to the back page for event details.
What will happen next?

To develop parts of both sites for residential uses, the planning controls need to be amended. The process is called a “Planning Proposal” or “rezoning”. The Fort Wallace Planning Proposal is expected to be submitted to Newcastle City Council by the end of 2016 and the Rifle Range Planning Proposal submitted to Port Stephens Council early 2017. Afterwards, the proposals will go on public exhibition. Then will need to be assessed and determined by both Councils and the State Government. The stages involved in the planning process are detailed to the right.

What is the planning process?

**STAGE 1 – Planning Proposal**

- Specialist studies; including heritage, traffic, flora and fauna.
- Stakeholder and community consultation undertaken by DHA.
- Planning proposals lodged with Port Stephens Council and Newcastle City Council.
- Preliminary assessment by councils.
- Department of Planning and Environment issue a Gateway Certificate, which allows the Planning Proposal to go on exhibition.
- Public exhibition of the Planning Proposal.
- Council and State Government Assessment and approval – the planning controls are amended.

**STAGE 2 – Development Applications**

- DHA and the consultant team prepare Development Applications (DAs) showing the details of the proposal.
- Public exhibition of the DAs.
- Development Application assessed by Councils and other agencies (as required) and approved, if appropriate.

**STAGE 3 – Design and Construction**

- DHA to undertake detailed design of the dwellings, parks, and infrastructure, and commence construction.

**HAVE YOUR SAY**

Make a comment or share your views by coming along to our information session. Refer to the back page for event details.
Community Information Session

The community is invited to attend an informal information session to be held Thursday 8 December 2016 between 3.30pm and 7pm at Newcastle Golf Club, Vardon Road, Fern Bay.

At this event you will be able to talk to members of the project team, view proposed masterplans and provide us with your valuable feedback.

Where can I get more information?

For more information about the project, to provide feedback or if you have any questions please contact us by emailing dhadevelopments@elton.com.au or call 1800 959 797.

For more background information refer to https://www.dha.gov.au/development/residential/fort-wallace-stockton-and-rifle-range-fern-bay
D AO Displays
DHA is one of the country’s most successful Government Business Enterprises. Our main role is to provide quality housing and related services to Defence members and their families, but we don’t just build houses, we build communities.

When planning a new development, we look beyond the front yard. We walk down the street and along the footpaths. We play in the parks, run on the ovals and help kids cross the street safely. Our role is important – we are charged with creating a place for families to call home.

Today, we can proudly say that the communities we build exceed community standard and are award-winning. Innovation and sustainability is incredibly important to DHA. We have a pipeline of approximately $3 billion committed to produce cutting-edge developments across the country.

With the ongoing support of our many happy investors and our valued partners, we will continue to build futures for all Australians.
Last year DHA purchased the Fort Wallace and Rifle Range land holdings from the Department of Defence. We anticipate, this land will be developed by DHA to provide additional homes for Defence members and their families.

Fort Wallace is approximately 32 hectares located east of Fullerton Road. The site is situated directly south of The Stockton Centre and north of Corroba Oval at Stockton.

Rifle Range is approximately 111 hectares east of Nelson Bay Road. The site is situated south of Worimi Conservation Lands, east of Fern Bay Public School and west of Stockton Beach.

We are seeking the necessary planning approvals to develop two vibrant residential communities on these sites that will offer a mix of high quality dwellings to house Defence members and their families, with the remaining lots to be sold to the public.

Aerial image highlighting Rifle Range and Fort Wallace north of Newcastle.
DHA plans to develop Fort Wallace at Stockton and the Rifle Range at Fern Bay into coastal communities with links to the Newcastle CBD and growing Hunter region. The location of these sites responds well to DHA's requirement to provide quality housing in close proximity to jobs at Williamtown RAAF, Kooragang Island and Newcastle CBD.

Fort Wallace located along Fullerton Road has good connectivity with the Stockton town and Stockton community organisations such as the Stockton Surf Life Saving Club, RSL, Bowling Club and local activities like Parkrun. The Stockton ferry travels directly to Newcastle and this service provides great access to the CBD’s entertainment and shopping precincts.

Rifle Range is next door to Fern Bay Public School and Newcastle Golf Course. A short stroll directly north of the site is Worimi Conservation Lands and Port Stephens is less than an hour away by car or bus.

The local coastal communities are active in the Nippers program at Surf Life Saving Clubs.
What’s happening now?

DHA is working with an expert project team, comprising architects, planners, urban designers and landscape architects plus a range of specialist consultants. Planning for the sites has taken into consideration recommendations regarding the environment, Aboriginal heritage, European heritage, ecology, dune morphology and transport/traffic management.

DHA is working on concepts for two masterplanned residential estates with approximately 100 lots planned at Fort Wallace and 220 lots at Rifle Range. There is no commercial, retail or industrial development planned for either site.

Cultural Heritage

Fort Wallace and Rifle Range contain both Indigenous and European heritage. DHA is committed to working with the local community to understand the significance of these sites and work with local organisations and government with the aim of protecting, managing or providing public access to these culturally significant heritage sites.

Concept of a Memorial Walkway that captures the history of the site through signage, public art and landscape design. Concept Only.
The Opportunities

DHA is working with local stakeholders to identify specific areas within Fort Wallace and Rifle Range to protect, manage or share with the broader community.

We will be considering a variety of opportunities for the area, such as integrated bike paths, scenic walking trails that allow people to enjoy various points of interest. For instance, Fort Wallace offers a unique insight into the bygone “fort” era with history that is integral to the local and wider community.

A place where the broader community will be able to enjoy greater connectivity to Stockton beach, its dunes and the surrounding bushland by providing improved access through these new residential estates.

Opportunities for the area include integrated bike paths, scenic walking trails and views of the Hunter region, to name a few.
DHA expects that the rezoning of these sites will allow future residents and surrounding communities to connect with their local natural environment and heritage in a way that is sustainable, sensitive and is a positive contribution to the community.

Urban design principles help shape the look and feel of any residential estate and ensures that important measures are adopted as the estate matures.

The following urban design principles are being considered for Fort Wallace and Rifle Range:

» Touch lightly on the land where homes are raised and work in with the natural topography

» Coastal ecology is embraced by maximising views to the oceans, dunes, river and bush and only those species found locally are planted

» The local history and cultural heritage of the sites are celebrated by retaining heritage structures where ever possible and explore opportunities to connect with the Worimi Conservation Lands

» A diverse community is created by providing a mix of housing typologies that meets defence, private and affordable housing needs and a range of open spaces for residents to experience

» Accessible to the public via local road, pedestrian and cycle networks; improved public transport links to Newcastle CBD and pedestrian access to Stockton beach and its dunes

» Interesting architectural forms are demonstrated through staggered heights of built forms; use natural building materials and finishes; articulated facades; vaulted and skillion roofs and varied street setbacks.

Concept of a Memorial Walkway to provide connectivity from the proposed estate to Stockton Beach. Concept Only.
Awabakal and Worimi peoples were the traditional owners of the land on and around Fort Wallace. They inhabited the area before European settlement.

Fort Wallace was nationally significant as a major component of the integrated system of Defence for the Newcastle Fortress Area. Its prime purpose was protection of Newcastle Harbour and its industries.

Fort Wallace was the third fort built for Newcastle’s defence. Field Marshall, Earl Kitchener originally approved the site and work commenced in 1912. Two Mark 7 guns on central pivot mountings were installed in 1915.

The inter-war period saw the Fort relatively unmanned. Due to the approach of WWII, the Fort was modified. From 1938, the Battery Observation Post and one of the 6 inch gun emplacements were removed for the construction of new 9.2 inch gun emplacements.

The most active phase of Fort Wallace’s history, including the completion of the 9.2 inch installations, proving of the guns and the shelling of Newcastle by a Japanese submarine in June 1942. At the end of the war the fort was closed down and manned by a minimum maintenance staff.

In 1963, work to remove the 9.2 inch guns commenced and the fort was unattended until 1967. In 1967, the 130 Signal Squadron moved to Fort Wallace. New barracks to house 69 people were completed in 1974.

The last members of 130 Signal Squadron left Fort Wallace in 1993.
STAGE 1 – Planning Proposal

Specialist studies; including heritage, traffic, flora and fauna.

Stakeholder and community consultation undertaken by DHA.

Planning proposals lodged with Port Stephens Council and Newcastle City Council.

Preliminary assessment by councils.

Department of Planning and Environment issue a Gateway Certificate, which allows the Planning Proposal to go on exhibition.

Public exhibition of the Planning Proposal.

Council and State Government Assessment and approval – the planning controls are amended.

STAGE 2 – Development Applications

DHA and the consultant team prepare Development Applications (DAs) showing the details of the proposal.

Public exhibition of the DAs.

Development Application assessed by Councils and other agencies (as required) and approved, if appropriate.

STAGE 2 – Design and Construction

DHA to undertake detailed design of the dwellings, parks, and infrastructure, and commence construction.
From 1900 until the outbreak of World War Two, rifle shooting was undertaken at Adamstown Rifle Range.

In 1939-1940, construction of the Rifle Range at Fern Bay began to meet extra local demand. The range was officially opened for use on 28 January 1941 however the government did not formally acquire the site until 1942.

From 1953 the site was a training facility for all shooting in the region and was utilised by the police force, military, school cadets and civilian rifle clubs.

The site was no longer required by the military and was closed in December 1997.
Opportunities and constraints
Rifle Range

DHA is considering a variety of opportunities for the Rifle Range site, such as scenic walking trails to Stockton Beach, playgrounds, an area for possible sporting fields, viewing areas, and public spaces that allow people to connect.

Topography and landscape
To the east of the site a transient dune rises approximately 12 metres above the old Rifle Range site. Future homes will need to be set back from the dune to allow for natural dune migration. We intend to provide pedestrian access through the dune to the beach.

Water sensitive urban design is reflected in our plans. Engineers have advocated the need to use swales to direct water into basins to help manage stormwater discharge and quality.

Ecological
Coastal Sand Apple Blackbutt forest is growing to the north of the site and Coastal Sand Scrub to the east. The proposed masterplan minimises the impact on the flora in these areas.

The Rifle Range site contains a potential koala habitat and we are working with Port Stephens Council to ensure that any impacts on the existing habitat are minimised.

Heritage
The Rifle Range site contains Indigenous and European heritage. DHA is committed to working with the local community, local organisations and government departments to understand the significance of these sites.

DHA is aware that an old anti-aircraft battery exists within the site and will work with government to ensure this asset is managed in accordance with heritage regulations.

Bushfire
To protect homes from bushfire risks our masterplanning includes an asset protection zone. DHA is investigating low intensity fire management to reduce the bushfire danger to the immediate surrounds.

Coastal hazards
DHA has taken into consideration coastal hazards that may impact the site over the next 100 years. Coastal hazards occur where natural coastal processes, such as beach erosion and coastal inundation, threaten homes and communities in the coastal zone.

Rifle Range from the north looking south towards Stockton and Newcastle CBD.

Indicative playgrounds incorporating Australian native trees.
Opportunities and constraints
Fort Wallace

DHA plan to provide the community with a range of high quality contemporary amenities, such as scenic walking trails through the dunes to Stockton Beach, new pathways, public viewing areas, playgrounds and landscaped public spaces.

Heritage
While Fort Wallace is a historically significant site containing heritage buildings, tunnels and gun emplacements, DHA plan to link these Defence remnants together to form an integrated public domain. We are investigating the reuse of heritage structures to provide a café space or an outdoor classroom.

Fort Wallace also contains Indigenous heritage. DHA is committed to working with the local community, local organisations and government departments to understand the significance of these sites.

Topography and landscape
Our masterplanning considers the site’s ranging topography with steep slopes and flat open areas. We propose to sensitively integrate new dwellings into the site’s natural topography to build a unique coastal community.

The majority of proposed dwellings will be located within the centre of the site, set back from coastal hazards and utilising the flatter areas. The site offers many viewpoints to the Pacific Ocean, Newcastle CBD, Stockton Beach, Nobbys Head, Hunter River and the broader Hunter region.

Ecological
Coastal Sand Apple Blackbutt forest and Coastal Sand Scrub grow within the site. Grey headed flying fox has been recorded and DHA is working with Newcastle Council and Department of Planning to minimise any impacts.

Coastal hazards
DHA has taken into consideration coastal hazards that may impact the site over the next 100 years. Coastal hazards occur where natural coastal processes, such as beach erosion and coastal inundation, threaten homes and communities in the coastal zone.
We anticipate the Rifle Range site will provide a diversity of dwellings for Defence families and the general public to call home, including free standing homes, cluster homes, townhouses and courtyard homes.

The Rifle Range site will have two access roads connecting to Taylor Road and Popplewell Road providing access to Nelson Bay Road. This will mitigate traffic congestion and emergency egress concerns through the neighbouring community of Fern Bay – upgrade works will likely be required to Nelson Bay Road.

The proposed number of residential dwellings for this site is approximately 235.
Indicative Masterplan
Fort Wallace

Fort Wallace, located on the Stockton Peninsula, is approximately 32 hectares in size and is five kilometres north of Newcastle CBD.

The proposed ecologically sustainable development includes a diversity of housing types such as apartments, townhouses and free standing homes. Five unique typologies are being considered in this masterplan to respond to the unique nature of the site.

Each home will have its own private open space and the local community will be able to walk or cycle to Stockton, have improved access to Stockton beach and use of new parklands.

The total number of planned residential dwellings for this site is approximately 100.
### Housing types

#### Single eco-homes

Larger lot sizes from 550 to 800m² will accommodate single eco-homes. These lightweight homes respond well to all seasons due to their orientation and choice of building materials. Each dwelling will include three to four bedrooms. Building heights may be one or two storey.

![Indicative single eco-home, not actual design. Architectus 2016.](image)

We anticipate single eco-homes to be made of robust environmentally compatible materials, such as corrugated metal sheeting, steel or timber frames and timber panel cladding.

#### Coastal cluster homes

Coastal cluster homes as the name suggests, cluster homes into groups of two, three and four. These homes are carefully designed to increase the sense of the homes’ connection to the surrounding landscape.

The proposed height of these community title homes is two storey. Each dwelling will include three bedrooms.

![Indicative coastal cluster homes, not actual design. Architectus 2016.](image)

We anticipate single eco-homes and cluster homes to be made of robust environmentally compatible materials, such as corrugated metal sheeting, steel or timber frames and timber panel cladding.
**Housing types**

**Courtyard homes**

Courtyard homes are large family homes, including four bedrooms, three bathrooms, open plan living space, a single garage and an ample rear garden. Dwellings are built to the boundary on one side and set back 1.5 metres on the other. This allows for a side pathway to access the rear garden and improves natural light and ventilation for the dwelling. Lot size is expected to be 380m².

External materials used on the courtyard homes will include corrugated metal sheet, timber panel cladding and rendered masonry.

**Townhouses with fonzie flat**

From the front, these three bedroom compact dwellings will be attractive as all the garages will be located on a laneway at the rear of each dwelling. Each two storey home will be situated on a 240m² lot.

A fonzie flat is a quirky name for self-contained studio apartment, located at the rear of the townhouse above the garage. By placing an apartment over the rear garage, safety and security is improved through passive surveillance over the laneway.
**Housing types**

**Dune apartments**

These small scale apartment buildings are designed to minimise the overall building footprint. The buildings are located to respond to the natural topography of the site and minimise visual impacts across the site.

The proposed height of the apartment block is up to four stories. Each apartment will have one to three bedrooms.

From all apartments, residents will be able to see the surrounding natural bushland and communal areas. Clever design will encourage passive surveillance over public areas to promote a safe and secure community.

We anticipate the apartments to be made of robust materials, such as corrugated metal sheeting, concrete slab, steel frames and timber panel cladding.
Heritage precinct

The heritage precinct sits at the top of the dunes at Fort Wallace and offers panoramic views in all directions. DHA plans to provide the community access to this precinct. The area will offer visitors an opportunity to engage with Fort Wallace’s military history.

We are investigating the reuse of the heritage structures to provide amenities, such as a cafe space or an outdoor classroom. The surrounding dune ecology will be protected and planting will reflect the surrounding native bushland.

Community park

The public parklands emphasize principles of “nature play” through the selection of play facilities, materials, and native planting. Structures will be constructed of natural materials. Trees and shade structures will provide cover from the sun without obscuring views over the dunes. Robust, low-maintenance plantings will blend play areas into the surrounding area.

The dune will act as a windbreak for the area. Picnic tables will be positioned to the east of the dune and therefore sheltered from strong winds from the ocean. The firebreak surrounding the community will double as a bushwalk trail, connecting the park to residential areas. Nearby heritage structures will be adaptively reused to provide public community amenity.
Community interface

The Rifle Range site will be connected to the existing road network and infrastructure. Clear sightlines, footpaths, and walking trails will join the site to Fern Bay.

DHA intends to create a neighbourhood character that emphasizes qualities of connectedness, feels part of the neighbouring community, and is integrated with the surrounding bushland and coastal ecology.

Community park

In a native plant setting, we plan to provide children the opportunity for “nature play” by providing a selection of play facilities. Structures will be constructed of natural materials and sited within the coastal landscape. Large feature trees and shade structures will provide cover from the sun. Robust, low-maintenance plantings will blend play areas into the surrounding coastal landscape. We plan for the community to enjoy social gatherings, picnics and passive recreation near the centre of the Rifle Range community.

Active living

The Rifle Range community will include a number of opportunities for active recreation and outdoor living. The centre of the development features a large public open space with room available for a sports field, subject to council agreement.

The Rifle Range is surrounded by a network of bushwalk trails and shared pedestrian/cycle paths that double as a firebreak. These trails connect the site to the Worimi Conservation Lands to the north, as well as the dune boardwalk that leads to the beach.
Does DHA or the proposed developments at Rifle Range and Fort Wallace have anything to do with the closure of The Stockton Centre?

No. The proposed developments at Rifle Range and Fort Wallace is a DHA initiative. The pending closure of The Stockton Centre is being managed by Families and Community Services (FACS).

DHA’s proposed plans at Fort Wallace and Rifle Range have nothing to do with the pending closure of The Stockton Centre.

How will DHA manage the heritage and ecology of the sites?

The planning proposal of the two sites will take into consideration the recommendations of specialist consultants in dune ecology, Indigenous heritage, European heritage, environment and coastal engineering. We are planning on working with the relevant local stakeholders to develop an ecologically sustainable development to ensure the sites support best practice in urban and landscape design.

Do the proposed developments have anything to do with the contamination at RAAF Base Williamtown?

No. The proposed developments by DHA at Fern Bay and Stockton are approximately 11 to 12 kilometres away from RAAF Base Williamtown and is a completely separate matter.

What impact will this development have on traffic?

Traffic studies indicate that the road network has the capacity to meet the needs of road users for the next 50 years.

Areas of safety concerns, such as the intersection of Nelson Bay Road and Taylor Road, Fern Bay, are being raised with Roads and Maritime Services and Transport for NSW.

Will there be any changes to public transport?

DHA will provide regular updates to Transport for NSW regarding users’ needs. There are no changes planned as at 2016, to the bus service 118 or ferry service from Stockton to Newcastle. However relevant government agencies will be informed by DHA should public transport needs change in the new areas.

What changes are proposed for the surrounding street network?

In 2016, there are no changes being proposed for the surrounding street network.
Attachment B: Draft Section 6.14 - Fort Wallace
6.14 Fort Wallace

Amendment history

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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 all land within the heavy black line as shown in Figure 1 - Fort Wallace.

**Figure 1 - Fort Wallace**

Development (type/s) to which this section applies

This section applies to all development within Fort Wallace.
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. 14 - Coastal Wetlands
- State Environmental Planning Policy No. 55 - Remediation of Land
- State Environmental Planning Policy No. 65 - Design Quality of Residential Apartment Development.
- State Environmental Planning Policy No. 71 - Coastal Protection.
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
- (Draft) State Environmental Planning Policy - Coastal Management 2016

In the event of any inconsistency between this section and the above listed environmental planning instrument, the environmental planning instrument 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:

- 4.04 Safety and Security
- 7.02 Landscape, Open Space and Visual Amenity
- 7.03 Traffic, Parking and Access
- 7.06 Stormwater
- 7.08 Waste Management

The following sections of this DCP may also apply to development to which this section applies:

- 3.01 Subdivision
- 3.02 Single Dwellings
- 3.03 Residential Development
- 4.01 Flood Management - all land which is identified as flood prone land under the Newcastle Flood Policy or within a PMF or area likely to flood
- 4.02 Bush Fire Protection - within a mapped bush fire area/zone
- 4.03 Mine Subsidence - within a mine subsidence area
- 4.05 Social Impact
- 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 items/site and or potential soil disturbance
- 5.05 Heritage Items - known heritage item or proximity to a heritage item
- 5.06 Archaeological Management - known/likely archaeological site or potential soil disturbance
- 5.10 Soil Management - works resulting in any disturbance of soil and/or cut and fill
- 7.04 Movement Networks
- 7.11 Development Adjoining Laneways

In the event of any inconsistency between this section and the above listed DCP sections, this section prevails to the extent of the inconsistency.
Associated technical manual/s

- *Guide to Road Design* 2009, Austroads Standards Australia
- *Guide to Road Safety* 2009, Austroads Standards Australia
- Standard Drawings, Newcastle City Council

Additional information

This section of the DCP has performance criteria that explain the planning outcomes to be achieved. Accompanying the performance criteria are acceptable solutions that illustrate the preferred way of complying with the corresponding performance criterion. There may be other ways of complying with performance criteria and it is up to the applicant to demonstrate how an alternative solution achieves this.

Acceptable Solutions

The acceptable solutions provide a certain outcome of achieving compliance with Council controls for this section. To achieve the acceptable solution the applicant must demonstrate that they have satisfied the required control/s within each section. Any variation from the acceptable solution will mean the application will be required to meet the performance criteria for that section and the application will become a performance based assessment.

Performance Criteria

The performance criteria permit applicants to be flexible and innovative in responding to the DCP requirements. Applications which meet the performance criteria are assessed on merit and it is the applicant's responsibility to demonstrate how the performance criteria have been met. Compliance with the performance criteria can be undertaken through the use of 3D montages, 3D models, constraints mapping and other forms of visual representation.

Note 1: Development application forms, checklists and other explanatory information are available on Council's website to assist with the use of this section of the Development Control Plan.

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, and include:

- 'Fonzie flat' - Self-contained flat above a garage.

Aims of this section

1. To provide appropriate development control principles for the sensitive and responsive development of the site.
2. To ensure best practice design.
3. To guide the delivery of a diversity of housing on the site to serve the needs of the community.
4. To ensure that development of the site is sensitive to the heritage and ecological significance of the site.

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

6. To provide high amenity open space that celebrates the heritage value of the site.

**Site history**

The site is located within a large dune formation known as Stockton Bight. Stockton Bight consists of an inner barrier of Pleistocene age (known as the Inner Barrier), a seaward barrier of Holocene age (known as the Outer Barrier) and a low-lying swampy depression that divides the barriers and is known as the Inter-Barrier depression.

According to Tindale (1974), Enright (1932) and Elkin (1932) the project area is situated within Worimi traditional lands. Ethnohistoric sources indicate that the Worimi had a system of established social organisation and beliefs and an economic system that was largely focused on the rich coastal resources that were capable of supporting populations at greater density than those in the inland areas. Of particular relevance to the site are connections to Willy Price, a Worimi man instrumental in furthering the recognition of Worimi traditional custodianship in the Stockton Bight.

Fort Wallace currently accommodates a range of disused defence buildings and infrastructure. The original fort was constructed in 1912, including two 6" guns which were installed in 1915. These guns were replaced by 9" guns in 1939/40. In 1967, 130 Squadron moved to Fort Wallace, followed by the construction of new barracks in 1974. Additional construction took place on the Fort Wallace site in 1982 to support 130 Squadron, including stores, workshop, administration, training and amenities buildings. 130 Squadron continued to use the site until the end of 1993.

The most recent use of the site was as accommodation by the Australian Navy, with the 1982 constructed buildings re-fitted as accommodation in 1996.

Defence ceased activity on the site in 2003. Fort Wallace was entered into the Commonwealth Heritage List in June 2006. In 2015, DHA purchased the Fort Wallace from the Department of Defence (DoD). The site is currently vacant, non-operational and secured.

**Vision**

The vision for the Fort Wallace site is for a sensitively designed residential community providing housing diversity, best practice design and the creation of new open space and connections, together with the preservation of European and Indigenous heritage and environmental assets.
6.14.01 Urban Structure

This section sets out the desired structure of the site including street layout, development locations, areas of heritage value and public spaces.

A. Street layout and hierarchy

Performance criteria

1. Street layout and hierarchy are clearly legible and intuitive to users, encouraging ease of use and access for pedestrians, cyclists, and vehicles.

2. Streets are as informal as possible (no kerb and gutter or formal avenue trees, informal parking).

3. Adequate access is provided for emergency and maintenance vehicles.

4. Streets incorporate opportunities for Water Sensitive Urban Design and landscape planting of a variety of sizes and types.

5. Wayfinding signage (including street names) is clearly visible and legible.

6. Street layout and construction make use of the existing street infrastructure as much as possible, to minimise disturbance of soil and vegetation.

7. Street layout incorporates varied edge conditions to ensure a sensitive transition to coastal bushland areas. Excessive lengths of perimeter roads are avoided.

Acceptable solutions

1. The street layout and hierarchy is provided as shown in Figure 2 - Street layout and hierarchy.

2. All streets and lanes are designed in accordance with the street sections shown in Figures 3 to 6, unless proposed for dedication to Council, in which case design meets the requirements of Section 7.04 - Movement Networks.
Figure 2 - Street layout and hierarchy

Figure 3 - Road Type 1 Typical Section
**Figure 4 - Road Type 2 Typical Section**

- 01/ Communal open space (Dune apartment)
- 02/ Flush kerbs
- 03/ Vegetated swale
- 04/ Public open space

**Figure 5 - Road Type 3 Typical Section**
Figure 6 - Road Type 4 Typical Section

B. Land use and development

**Performance criteria**

1. Development respects areas of high ecological and heritage value.

2. Development responds to the risks of coastal erosion and sea level rise and provides appropriate setbacks for development and infrastructure.

3. A transition in dwelling form and density from the central development area to the bushland to the north and south is achieved.

4. Buildings respond to the existing natural topography to minimise earthworks (cut and fill) and the built form sits sensitively within the natural landscape.

5. Significant heritage structures are retained as site features where possible, and development reflects a collective understanding and interpretation of the items as a group.

6. A landscaped frontage is provided to Fullerton Street that complements the coastal mangroves on the opposing bank and is able to accommodate landscaped drainage features.
Acceptable solutions

1. The development layout and building typology is provided as shown in Figure 7 - Land use and development area.

Figure 7 - Land use and development area

6.14.02 Built form and character

A. All Character areas

Performance criteria

1. Significant heritage items on the site are integrated, managed, and enjoyed by the community into the future, while responding to the changing nature of the site.

2. Development of the site provides an appropriate interface and transition to sensitive ecological areas.

3. Development incorporates a managed bushland edge to reinforce coastal character.

4. Buildings are low impact and designed to touch lightly on the land, sitting sensitively within the natural landscape and vegetation.

5. Earthworks and areas of hard stand and slab on ground construction are minimised.

6. A mix of building typologies, including small lot housing, is provided for a diverse and sustainable community.
7. Development utilises interesting architectural forms through staggered building heights, natural materials and finishes, articulated facades, vaulted and skillion roofs, and varied street setbacks where appropriate.

8. Unique character areas that respond appropriately to their setting are provided.

Acceptable solutions

1. Built form character areas are established as shown in Figure 8 Character Areas.

Figure 8 - Character areas

B. Area 1 - Dune edge cluster housing

A precinct that manages the sensitive transition between an urban environment and coastal ecology to the north and south of the site. The housing form is typically multi-dwelling housing that reinforces the coastal character of the site with clustered dwellings that minimise building footprint, smaller, defined private open spaces, and larger, communal areas blending seamlessly with the bushland. This area should utilise low impact fencing and native landscaping.

Housing will generally be in accordance with the following precedent and guideline, unless an alternative proposal can demonstrate an improved outcome in line with the key design outcomes of this section.
**Key design outcomes**

Description: This dwelling typology provides an alternative to traditional townhouses or attached houses. By breaking down the layout into clusters of 2, 3 and 4 they provide views through the development to the bush and increase the sense of a connection with the surrounding landscape.

Indicative dwelling yield: 21-25 dwellings.

Maximum site coverage: 60% (all areas under the roof, including secondary dwellings and garages and all impermeable surfaces).

Minimum landscaped area: 40%.

Front setback: 5m.

Construction: Steel or timber frame with suspended composite concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.

*Figure 9 - Dune edge cluster housing character areas*
Figure 10 - Area 1 Dune edge cluster housing typology

Typical layout

- This area is within the lot boundary and is maintained as part of the communal landscape area in accordance with RPS specifications (minimum tree cover 15%)
- Fire Trail - a 6m gravel fire trail
- Lot boundaries - lot boundaries are to be defined with vegetation only. In general, each lot will follow on collective responsibility for the maintenance of the communal open space areas.
- Parking - dwellings generally have a carport or parking space with storage space.
- Communal open space - These areas are to be maintained as native bush gardens with contributions from each of the dwelling owners.
- Private open space - A principle private open space is to be a minimum 55m² and maximum 50m². Fencing to contain pets is allowed but is restricted to 1.5m high timber post and wire mesh with native shrub planting to help reduce its visual impact.
C. Area 2 - Low-scale coastal apartment living

Low-scale apartment precinct with predominately three storey apartment buildings with a coastal character, utilising natural materials, open air balconies and staggered building forms. Built form works with the site topography to minimise the appearance of building height and maintain key views to and from heritage items, particularly the Observation Tower.

Housing will generally be in accordance with the following precedent and guideline, unless an alternative proposal can demonstrate an improved outcome in line with the key design outcomes of this section.

Key design outcomes

Description: These apartment typologies are designed to minimise the overall building footprint and bulk and maximise visual connections with the surrounding landscape. Small footprints allow for up to 4 units per floor with the potential to allow for open undercroft spaces at ground floor and open stairwells and vertical circulation.

Indicative dwelling yield: 42 dwellings.

Maximum site coverage: 65%.

Minimum landscaped area: 35%.

Front setback: 3m.

Construction: Steel frame concrete slab, skillion/vaulted roofs.

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.

Figure 11 - Low-scale coastal apartment living character areas
Figure 12 - Area 2 Low-scale coastal apartment living typology

Typical layout

- Lot boundaries: lot boundaries are to be defined with vegetation only. In general, each lot will take on collective responsibility for the maintenance of the communal open spaces areas.

- Communal open space: These areas are to be maintained as native bush gardens with contributions from each of the dwelling/unit owners.

- Parking: Surface parking at the rear of the building. Some parking may also be provided in undercroft spaces at ground level.

- Private open space: Ground floor apartments will have a small area of defensible space/terrace to be accessible from a living area.
D. Area 3 - Courtyard and attached housing

This precinct has a denser urban character in the central development area with a more traditional subdivision and street layout. This precinct will provide attached and semi-detached housing with high quality, well designed private areas that make the most efficient and effective use of space, serviced by rear lanes. Housing should be a mix of courtyard housing and attached housing.

Housing will generally be in accordance with the following precedent and guideline, unless an alternative proposal can demonstrate an improved outcome in line with the key design outcomes of this section.

Indicative dwelling yield: 33 dwellings

Key design outcomes - Courtyard housing

Description: This typology provides for a large family home including 4 bedrooms, 3 bathrooms, open plan living space, single garage and an ample rear garden. Dwellings are to be constructed on a zero lot line always on the same side with a 1.5m setback along the opposite boundary. This allows for a side pathway to access the rear garden and improves natural light and ventilation.

Maximum site coverage: 60% (all areas under the roof, including secondary dwellings and garages and all impermeable surfaces).

Minimum landscaped area: 40%

Front setback: 3m

Construction: Steel or timber frame on concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding and rendered masonry.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant planting.

Figure 13 - Courtyard and attached housing character areas
Figure 14 - Courtyard housing typology

Indicative first floor plan 1:250

Indicative ground floor plan 1:250
Key design outcomes - Attached housing

Description: These 3 bedroom homes provide compact attached dwellings in locations where increased densities are appropriate. The rear lane access allows the front elevation of the house to be free from garage doors and parked cars which promotes good natural surveillance and an attractive street frontage. Above the rear double garage it is possible to have a secondary dwelling or ‘Fonzie Flat’ that provides a self-contained studio apartment that can provide additional family or guest accommodation, home occupation or rental return. The ‘fonzie flat’ also activates the laneway increasing safety and security through natural surveillance.

Maximum site coverage: 65% (all areas under the roof, including secondary dwellings and garages and all impermeable surfaces).

Minimum landscaped area: 35%

Front setback: 3m

Construction: Steel or timber frame on concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding and rendered masonry.

Sustainability: Locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant planting.
Figure 15 - Attached housing typology

Casuarina shores, showing and example of the relationship between townhouses and flat flats.

Lake Crackenback

Indicative first floor plan 1:250

Indicative ground floor plan 1:250
E. **Area 4 - Single detached eco-living**

Single, low scale detached dwelling houses with a focus on sustainable living and integration with the natural environment.

Housing will generally be in accordance with the following precedent and guideline, unless an alternative proposal can demonstrate an improved outcome in line with the key design outcomes of this section.

**Key design outcomes**

Description: These homes are intended to be lightweight, climate responsive individual homes set within generous lots that are managed and maintained to contribute to the overall natural characteristics of the estate.

Indicative dwelling yield: 7 dwellings.

Maximum site coverage: 50% (all areas under the roof, including secondary dwellings and garages and all impermeable surfaces).

Minimum landscaped area: 50%

Front setback: 5m

Construction: Steel or timber frame with suspended composite concrete slab, skillion/vaulted roof.

External materials: Combination of corrugated metal sheet, timber panel cladding.

Sustainability: Passive solar design, locally sourced materials, naturally ventilated, high thermal performance, rain water harvesting, solar PV cells, minimise cut and fill, native drought tolerant species.

*Figure 16 - Single detached eco-living character areas*
**Figure 17 - Single detached eco-living typology**

Indicative ground floor plan 1:200

Indicative first floor plan 1:200

Indicative dwelling sizes (exc external space and garage): 3 bed = 160m²
F. Open spaces

NOTE: THIS SECTION SHOULD BE REVISED IN RESPONSE TO AN AGREED FUTURE LAND MANAGEMENT STRATEGY WITH COUNCIL.

Performance criteria

1. The amenity of residential development and wellbeing of new and existing communities is supported by high quality open spaces;
2. Open spaces are well designed, safe, and provide opportunities for a range of activities;
3. Open spaces connect to greater public domain and open space networks along the Peninsula;
4. Public spaces protect and celebrate the heritage of Fort Wallace by interpreting the site history through landscape, and providing a landscape buffer between heritage items and development.

Acceptable solutions

1. The location and design of all new open spaces is provided in accordance with Figure 18 - Landscape and open space hierarchy.

Figure 18 - Landscape and open space hierarchy
**Figure 19 - Indicative heritage precinct section**

**Area A - Heritage Precinct**

![Heritage Precinct Diagram]

Legend:
- 01: Native bushland
- 02: Back of dune
- 03: Adapted historic structure
- 04: Gathering and event space
- 05: Carriage way
- 06: Rehabilitation heritage structures
- 07: Dune bushland
- 08: Dune revegetation zone

**Figure 20 - Indicative community park section**

**Area B - Community Park**

![Community Park Diagram]

Legend:
- 01: Sports lawn
- 02: Picnic area
- 03: Native bushland
- 04: Back of dune
- 05: Adaptively reused structure
- 06: Public gathering space
- 07: Carriage way
2. Public access and connections will be provided in accordance with Figure 22.

Figure 22 - Public access and connections
6.14.03 Site planning and built form

This section contains guidelines for building bulk, massing, setbacks and off street car parking.

A. Bulk and massing

Performance criteria

1. The bulk and massing of buildings responds to the lot size with appropriately scaled buildings and setbacks.

2. Buildings are articulated through the use of windows, balconies, materials and finishes to minimise visual bulk.

3. Buildings include modulation to minimise continuous straight walls and reduce perceived visual bulk.

4. Buildings respond to site topography rather than forming one continuous and step with the land form to reduce scale and massing.

Acceptable solutions

1. Development will respond to the character areas and typical typologies set out in 6.14.02 of this DCP.

B. Setbacks

Performance criteria

1. Sufficient setbacks are to be provided to lot boundaries to allow for building separation, create a landscaped setting for buildings, reduce the visual bulk and scale of buildings and provide reasonable sharing of views.

2. Delivery of consistent setbacks to ensure delivery of a high visual quality streetscape with a prevailing sense of openness.

3. Development is to maintain a visual continuity and pattern to buildings and landscape elements.

4. To ensure that each dwelling is afforded a degree of visual privacy through appropriate setbacks which minimise the extent of overlooking.

Acceptable solutions

1. Development will respond to the character areas and typical typologies set out in 6.14.02 of this DCP.

C. Asset Protection Zones

Performance criteria

1. The location and design of dwellings responds to bushfire risk.
2. Asset protection zones are designed and maintained to balance fuel reduction, a landscaped setting for dwellings, and a biodiversity.

3. Clear and equitable management of asset protection zones.

**Acceptable solutions**

1. Asset protection zones are provided generally in accordance with Figure 23.

2. Timber or timber-look products treated to meet Australian Standards for the relevant bushfire attack level (BAL rating) are used.

3. Asset protection zones are designed to manage fuel loads and maintain structure of an open, non-connected tree canopy, spaced large trees, with shrub gardens as islands.

*Figure 23 - Asset Protection Zones*
D. Heritage

Performance criteria

1. Development appropriately responds to heritage items on the site.

2. Development facilitates an appreciation of the heritage items individually and as a whole.

3. Development facilitates the appropriate management of the site’s heritage value into the future.

4. To identify and manage any potential impacts on Aboriginal cultural heritage.

Acceptable solutions

1. A built form development buffer is maintained to heritage items as shown in Figure 24 - Development to buffer to heritage items.

2. Consideration is given to views to and from heritage items on the site from public spaces (see Figure 25 - Internal view corridors and Figure 26 - External view corridors) in the massing and design of buildings and landscaping.

3. Heritage items form part of an integrated public domain strategy for the site.

4. Development of the site is undertaken in accordance with recommendations of an Aboriginal Cultural Heritage Management Plan prepared for the site accompanying a Stage 1 DA.

Figure 24 - Development buffer to heritage items
Figure 25 - Internal view corridors

Figure 26 - External view corridors
E. Car parking

*Performance criteria*

1. Car parking associated with development has a low visual impact.
2. Earthworks and disruption to the site ecology are minimised.

*Acceptable solutions*

1. Car parking is provided at grade.
2. Car parking is located to the rear of properties.
3. Basement car parking is not provided.

F. Fencing

*Performance criteria*

1. Fencing is minimised across the site.
2. Fencing has low visual impact.

*Acceptable solutions*

1. Landscaping is used to delineate the boundary of public, private and communal spaces as an alternative to fencing.
2. Where fences are needed for adequate management of land or safety, fencing is a maximum 1.2m high timber post and wire mesh with native shrub planting.
CCL 28/11/17
FORT WALLACE STOCKTON - ENDORSEMENT OF AMENDMENT TO NEWCASTLE LEP 2012 AND DCP 2012

Attachment C: Report from Urban Design Consultative Group meetings - April and October 2017.
ITEM No.1

Date of Panel Assessment: 15 April 2017
Address of Project: 338 Fullerton Street Stockton
Name of Project (if applicable): Fort Wallace
DA Number of Pre-DA? Pre –DA (Rezoning and new DCP required for change to residential use)
No. of Buildings: Potentially in the order of 103
No. of Units: Nil.

This report addresses the nine Design Quality Principles set out in the Apartment Design Guide (2015) under State Environmental Planning Policy No.65. It is also an appropriate format for applications which do not include residential flats.

Background Summary

It is proposed to utilize the Fort Wallace site, which is no longer required for active defence purposes, for use as a residential site, housing both the general community and defence families and individuals. The presentation to the Group was a preliminary examination of possible controls for the site in the light of the proposed residential use. This forms part of consultation with Council’s Strategic Planning staff, which will lead into the preparation by the applicant’s consultants of Draft LEP and DCP controls for the site.
1. **Context and Neighbourhood Character**
The site is located to the north of Stockton township, on a narrow peninsula located between the ocean-front sand dunes and the north arm of the Hunter River. Immediately to its south is a redundant sewer treatment works, and to its immediate north is the Stockton Centre, which has been for many decades a site housing people with severe intellectual disabilities. The NSW Government is gradually relocating residents of the Stockton Centre to other, more modern and decentralized facilities in the community. It has been mooted that the Stockton Centre site, which is larger than the Fort Wallace site, is likely be proposed for a residential and mixed use development in the medium term.

The Fort Wallace site is subject to fairly severe coastal erosion, which is forecast to accelerate due to rising ocean levels predicted as a consequence of global warming.

In spite of its current relative isolation and constraints, the Fort Wallace site offers very attractive views and aspect, and contains significant European heritage items that exist due to its former military function. It is quite possible also that the site will be found to contain some archaeological items of Aboriginal heritage significance. Being situated as it is between the river bank and the ocean front, it is also potentially of cultural significance to the local Worimi Aboriginal community.

The site is in part vegetated with some significant stands of coastal habitat, which adjoin neighbouring coastal vegetation to provide wildlife corridors.

2. **Built Form and Scale**
The proposed layout of development is largely determined by the coastal erosion line, identified existing heritage items, existing road and access points, and existing stands of remnant vegetation (the majority of which are found on fairly steep locations). The proposed layout for residential development is generally on the more level areas located on the western half of the site.

The Group considered the proposed layout to be generally well-considered and appropriate, but noted that the majority of dwellings were served by roads on both sides. A question was raised whether it might be possible to reduce the extent of hard paving in the form of roadways. It was suggested that the straight parallel rows of townhouses could be made more attractive if the central axis had a slight curve in it.

The proposed development varies in scale between lower-scale single “Eco-homes”, cluster homes and two storey townhouses, courtyard homes to the 4 storey “Dune Apartments”. The suggested locations for the various forms of development were generally considered to be appropriate, but the Group questioned the desirability that the entire developed area should permit building heights of up to 14 metres. It was recommended that more differentiation be applied in permitted heights reflecting the types of development proposed in each block.
The Group was supportive of the precedent photographs and sketches of building form provided, but noted that the great majority of these images suggested buildings of two, and occasionally three storeys. It was recommended that each of the apartment buildings should be staggered in roof height, rather than take on a uniform block form, and that no building should exceed three floors of habitable space.

3. Density
The Group noted that the site is currently isolated and would not usually be considered as appropriate for higher density development because of its limited population and lack of easy access for residents to services. However, it was noted that developments that are likely to occur in the near to medium future on nearby sites to the north, will collectively provide a population that will most probably support a range of services such as retail (proposed on part of the Newcastle Golf Course at Fern Bay), GP health and early childhood education. Mixed-use development and additional residential areas both within the NCC North Stockton area, and the Port Stephens Shire Council’s Fern Bay area, can be expected to provide some level of demand which would support the establishment of at least local-centre standard services.

On the basis of this consideration, as well as the fact that it is proposed that some 50% of the resident population of the Fort Wallace development will be defence families and individuals, it was considered that the area was appropriate for some higher densities than would be achieved by an exclusively single dwelling.

4. Sustainability
The site is in a number of respects a fragile one due to its spit location, and the approaching coastal erosion. It is also subject to a heathland bushfire hazard, which imposes considerable constraints upon both landscaping and building design and materials.

Given the site’s former military use, and the remaining European heritage items, as well as the degradation of the dunes from both unauthorized vehicular access from the beach and from erosion, it is in need of remediation to re-establish the indigenous vegetation on coastal dunes. This remediation needs to be accompanied by a restriction of unauthorized access to the dunes and protection of the retained vegetation, and the definition of a limited number of access routes to the beach.

5. Landscape
The thematic landscape photographs and species selection appears very appropriate to the site, and the retention of the existing stands of vegetation strongly supported by the Group. Given that fire Asset Protection Zones (APZs) need to be created to protect all construction, and within the APZ tree canopies cannot touch and no ground covers are permitted (short mown turf is the norm) the landscape design may struggle to achieve the leafy, coastal feel illustrated. Careful design will be needed to ensure to the extent achievable, a good landscape outcome can eventuate while maintaining functional APZs. Heritage aspects of the site should utilize aspects of natural landscape to closely integrate the retained defence fabric in the overall setting.
6. Amenity
The dwellings should be capable of achieving good amenity. The notional sketch for the layouts of the apartments suggest a single loaded apartment, backing onto a breezeway or internal corridor. This would need to include a plenum over the corridor to allow a crossflow of fresh air in the apartments. Other layouts would more efficiently achieve crossflow ventilation and allow more natural light into kitchens and bathrooms.

7. Safety
Limiting the many potential access points from the beach to the site will better facilitate casual surveillance of a limited number of pathways. Consideration should be given to how a reasonable level of casual surveillance of the heritage locations might be achieved. Where defence heritage fabric such as tunnels is likely to be a safety issue, consideration of conservation should include potential infill with sand to preserve fabric for future use.

8. Housing Diversity and Social Interaction
A good mix of housing types is proposed.

9. Aesthetics
The precedent studies provided, and sketches of possible development for the site are very attractive, and appear quite appropriate in this pleasant coastal setting. However, the restrictions brought about by the high level of bushfire protection needed for the residences (BAL 29) will substantially limit the external use of materials such as timber, and may also impact upon the proposal for residences to be elevated from the ground and supported on slender posts - although this approach is certainly aesthetically appropriate in this context.

The aesthetics of the area will also be impacted by the locations and treatment of the surrounding Asset Protection Zones. This should be considered as part of the design informing the DCP formulation.

Summary Recommendation

The Group supported a mixture of development densities and typologies for the site, but suggested that apartments should be restricted to a maximum of three habitable floors, and should be massed in a stepped formation rather than having long, uniform roof forms. It was also suggested that the proposed long, opposing rows of townhouses be articulated with a gentle curve, and/or by openings between the town houses every second or third dwelling. The height levels in the LEP should vary across the site reflecting the forms of development proposed. The tallest buildings on the site (the apartments) should not exceed a maximum height of 14metres.

Further consideration is needed with respect to possible building design, given the BAL29 bushfire requirement, which also limits material selection. Likewise further investigation is required in regard to achieving landscape outcomes similar to the illustrations, given the need for APZs.
Consultation with the local Worimi Aboriginal representatives is recommended in respect to several matters:

- the possible presence of Indigenous archaeological items on the site, and procedures should excavations unearth these.
- Any cultural considerations that may arise with the new proposed use, and possible interpretive information in relation to Indigenous heritage that might appropriately be displayed on site for visitors.
URBAN DESIGN CONSULTATIVE GROUP MEETING

ITEM No. 7

Date of Panel Assessment: 18 October 2017
Address of Project: 338 Fullerton Street Stockton
Name of Project (if applicable): Fort Wallace
DA Number of Pre-DA?: Site Specific DCP (Draft)
No. of Buildings: NA
No. of Units: NA
Declaration of Conflict of Interest: Nil.

Background Summary
The Group had previously considered a detailed presentation by The Defence Department (the landholder) and its consultants on 15 April 2017, with respect to creating a residential precinct on part of the site at Fort Wallace formerly used for Defence purposes. The document under consideration is the draft Site Specific Development Control Plan for the site.

1. Context and Neighbourhood Character

As previously noted in the Group’s previous report of April 2017, the site is significant in a number of respects. It has both Indigenous and European heritage significance, and is located on a prominent and attractive narrow peninsular of land between the Pacific Ocean and the north arm of the Hunter River. It contains a number of listed heritage items, including Aboriginal artefacts and historical military buildings and infrastructure. There is also a living landscape item (one tree) that is individually listed.

The site adjoins the Stockton Centre to its north, which is an extensive campus which has for many decades accommodated children and adults with severe intellectual and other disabilities. This has been designated by the NSW Government as intended for closure in the relatively near future, and the number of residents accommodated has been greatly reduced over time in anticipation of this occurring.
Fullerton Street, the main road into Stockton, adjoins the site to its west, and remnant coastal heathland abuts much of the northern, eastern and southern parts of the site.

2. Changes Proposed by Landholder since the 15 April presentation to the Group
The Group was advised that there had been a late change requested to the proposed DCP by the proponent. This would vary the residential mix provided by substituting the previously proposed 7 "Eco-homes" with 13 townhouses.

3. The Group was asked to comment in particular on the following issues:

I. The design content in the Draft DCP, in particular setbacks, proposed typologies (residential mix), site coverage, and overall aesthetics.

II. Whether the Draft DCP has responded to the Group’s previous Report, in particular proposed built form and character – eg. Staggered roof height.

III. Ensuring the concept plan contained within the DCP allows for future connections to neighbouring properties.

The Group’s responses were:

I. The residential mix, specifically the deletion of seven free-standing “eco-homes” in favour of 11 townhouses was generally considered acceptable. However, it was noted that the longer row 7 townhouses would benefit for both aesthetic and practical reasons from at least one opening/separation between the townhouses. The appearance of each group of townhouses would be enhanced if their roof levels stepped in response to the local topography, rather than if they maintained a single, a continuous level.

The issue of bushfire risk and the need for the creation of Asset Protection Zones (APZ) was again discussed. The Group recommended that the issue of vegetation/landscape clearing around the designated residential and ancillary areas, for the creation of APZs had potential to significantly alter the appearance of the area, and lower its remnant heathland viability. It is unavoidable that APZs will need to be created, and will have some impact on vegetation, and the impacts of this significant constraint should be assessed as far as practicable as an integral part of the rezoning exercise.

The Group reiterated its appreciation of the character of the potential development and landscaping proposed in the previously presented documentation prepared by the proponent’s consultants, but expressed concern that this "leafy" character could not possibly be maintained, unless careful consideration of the issue of bushfire risk was not addressed as part of the planning process.

II. The Draft might be usefully further reinforced in respect to variation in roof heights – particularly of the taller building forms. The Group noted that the previous recommendation in respect to the Coastal Apartments of a maximum of three levels of habitable space (as illustrated in the
accompanying “character’ illustrations) inferred that any stepping of the heights, should involve a stepping down from these maximum heights.

III. The proposed inter site connections were supported, subject to the comments in (I) above.