COOGEE HOTEL AND POST OFFICE

STRUCTURE PLAN

LOT 512 COCKBURN ROAD, COOGEE

CITY OF COCKBURN

Coogee Hotel and Post Office
Lot 512 (H371) Cockburn Road, Coogee

City of Cockburn

STRUCTURE PLAN

March 2017

Prepared for: **State Heritage Office**

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Job code: SHO COO
File reference: 170206RLGA_Coogee Hotel and Post Office Structure Plan (v6)
Revision No: 7

Quality Assurance

Issue/Version:	Date:	Author:	Reviewer:
1	08 October 2015	Zarina McDonald	Jaclyn Ward
2a	10 November 2015	Zarina McDonald	Jaclyn Ward
2b	24 November 2015	Zarina McDonald	Jaclyn Ward
3	3 February 2016	Zarina McDonald	Jaclyn Ward
4	18 March 2016	Jaclyn Ward	Mark Szabo
5	01 April 2016	Zarina MacDonald	Mark Szabo
6	3 February 2017	Mitch Bisby	Mark Szabo
7	30 March 2017	Mitch Bisby	Mark Szabo

This structure plan is prepared under the provisions of the City of Cockburn Town Planning Scheme No.3

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON: 7 APRIL 2017

Signed for and on behalf of the Western Australian Planning Commission

an officer of the Commission duly authorised by the Commission pursuant to Section 16 of *the Planning and Development Act 2005* for that purpose, in the presence of:

Witness

7 April 2917.

Date

Date of Expiry: 7 APRIL 2027

TABLE 1: TABLE OF AMENDMENTS

AMENDMENT NO.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC

EXECUTIVE SUMMARY

This Local Structure Plan (LSP) applies to Lot 512 Cockburn Road, Coogee; being the land contained within the inner edge of the line denoting the 'Structure Plan Boundary' as shown on the Structure Plan Map.

The objective of the Structure Plan is to facilitate the development of residential, mixed use and local centre uses that will result in the adaptive re-use of the two existing heritage Places on the site, being the Coogee Hotel and Coogee Post Office.

A summary of all key statistics and planning outcomes of the LSP is provided in Table 2 below:

TABLE 2: SUMMARY TABLE

ITEM	DATA	STRUCTURE PLAN REF (SECTION NO.)
Gross Structure Plan Area	0.6445hectares	Section 1.2.2
Area of each land use proposed: Local Centre Residential (R25) Mixed Use (R40)	 0.3083 hectares and 48% 0.2632 hectares and 41% 0.0730 hectares and 11%	 Section 3.1 Section 3.1.2 Section 3.1.1
Estimated Residential Lot Yield (*should residential land uses be developed*)	**TOTAL 7 Lots:** 6 Residential Lots @ R25 1 Multiple Dwelling @ R40	 Section 3.1.3 Section 3.1.3
Estimated Number of Dwellings (*should residential land uses be developed*)	0 - 10 dwellings (depending on type of development)	Section 3.1.3
Estimated residential site density (*should residential land uses be developed*) - dwellings per gross urban hectare *As per Directions 2031* - dwellings per site hectare *As per Liveable Neighbourhoods*	 15 dwellings per gross hectare 29 dwellings per site hectare	Section 1.3.4
Estimated Population (*based on maximum residential land uses potential*)	28 people @ 2.8 people/household	N/A

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

PART ONE | IMPLEMENTATION

1. STRUCTURE PLAN AREA

This Structure Plan is identified as the Coogee Hotel and Post Office Structure Plan. This Structure Plan shall apply to the land contained within the inner edge of the line denoting the Structure Plan Boundary on the Structure Plan Map (**Figure 1**).

2. OPERATION

The date the Structure Plan comes into effect is the date the Structure Plan is approved by the WAPC.

3. SUBDIVISION AND DEVELOPMENT REQUIREMENTS

3.1 LAND USE

Land use permissibility shall be in accordance with the corresponding zone or reserve under the Scheme.

3.2 HERITAGE

The Structure Plan area includes two places listed on the *State Register of Heritage Places* under the *Heritage of Western Australia Act 1990*; being the 'Coogee Hotel (fmr)' (Coogee Hotel) and 'Coogee Post Office', both of which fall under the parent site 'Coogee Hotel and Post Office'. As such, development within the Structure Plan area shall have due regard to any requirements under the Act, together with any provisions of this Structure Plan and relevant Conservation Plan/s.

3.3 DEVELOPMENT CONDITIONS

3.3.1 Design Guidelines

Development shall have due regard for the provisions of the Design Guidelines prepared to support this Structure Plan (refer **Appendix E**), which sets out requirements for both residential and mixed-use/commercial uses.

3.3.2 Vehicle Access

i. No vehicular access shall be permitted to Cockburn Road and part of Beach Road as depicted on the Structure Plan map.
ii. A single, shared access arrangement to Beach Road shall be provided for all future development.
iii. Development shall be designed to facilitate the safe and efficient movement of waste vehicles within the site.

3.3.3 Local Development Plans

A Local Development Plan shall be prepared:

i. To support an application for development approval where said application does not constitute a comprehensive and/or integrated proposal over the site, to the satisfaction of the City of Cockburn; and/or,

ii. As a condition of subdivision approval,

And shall set out:

a) Siting and orientation of development to provide adequate passive surveillance and a complementary relationship with heritage values, such as that set out in the Design Guidelines;

b) Building setbacks and heights that respond to the character of the area, and that have due regard to the requirements of the City of Cockburn's Local Planning Policy 1.7: *Coogee Residential Height Requirements*;

c) Vehicle access and parking arrangements that provide for the safe and efficient movement of vehicles throughout the site, including waste vehicles, with a single point of access to Beach Road;

d) Fencing requirements, including materials, heights and permeability, that respond to the heritage values of the site and the need for adequate passive surveillance; and,

e) Noise management and attenuation requirements, as required by the Acoustic Assessment.

3.3.4 BUILDING HEIGHTS

The maximum building height of all development, including non-residential development, shall comply with the requirements of Local Planning Policy 1.7: *Coogee Residential Height Requirements* and therefore be limited to:

i. Top of external wall (roof above) – 7m

ii. Top of external wall (concealed roof) – 8m

iii. Top of pitch – 10m

4. OTHER REQUIREMENTS

4.1 DEVELOPMENT CONTRIBUTIONS

The Structure Plan Area falls within Development Contribution Area 13 (DCA13). Development may therefore be subject to cost contributions in accordance with the Development Contribution Plan contained at Schedule 12 of the Scheme.

Additional proportional contributions may be required as a condition of subdivision or development approval for the upgrade of the intersection of Cockburn Road and Beach Road. The appropriate proportion shall be determined at the time.

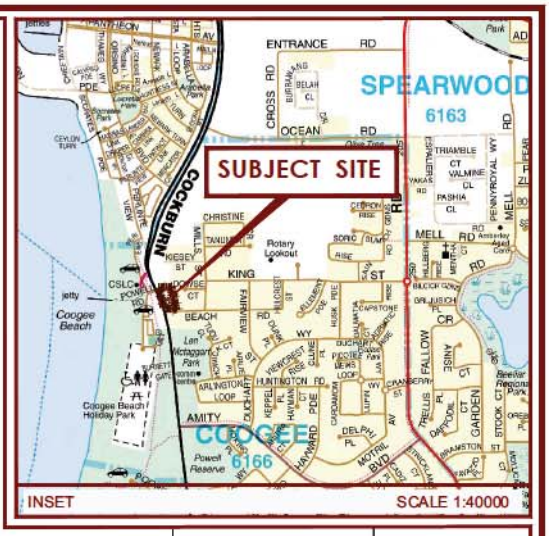
4.2 NOISE ATTENUATION

Development undertaken in accordance with the Concept Development Plan (**Figure 7**) shall comply with the recommendations listed in Section 6 of the Acoustic Assessment (**Appendix D**). Development that deviates from the Concept Development Plan may require an updated Acoustic Assessment to demonstrate compliance with SPP5.4, to the satisfaction of the decision maker.

4.3 CONDITIONS OF SUBDIVISION APPROVAL

The City of Cockburn shall recommend to the Western Australian Planning Commission that a condition be imposed on the grant of any applicable subdivision approval that a notification be placed on Certificates of Title advising: -

i. The lot/s is/are situated in the vicinity of a transport corridor and is currently affected, or may in the future be affected by, transport noise.
ii. The lot/s is/are subject to Design Guidelines.



R40

R25

COCKBURN ROAD

Coogee Post Office

Coogee Hotel (fmr)

DOWSE COURT

BEACH ROAD

LEGEND

- Structure Plan Boundary
- Local Centre
- Mixed use
- Residential
- Heritage Buildings
- No Vehicular Access

FIGURE 1

NORTH

0 5 10 15 20 25

SCALE 1:750 (A4)

Planner: MB/MS
Client: SHO
Date: 20.03.17
Plan No: SHO COO 2-07

STRUCTURE PLAN

LOT 512 COCKBURN ROAD

COOGEE

CITY OF COCKBURN

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PART TWO | EXPLANATORY SECTION

1. PLANNING BACKGROUND

1.1 INTRODUCTION AND PURPOSE

This Structure Plan (SP) has been prepared on behalf of the State Heritage Office and Main Roads WA in order to facilitate the re-use of heritage places and development of surrounding land located at Lot 512 (No.371) Cockburn Road, Coogee (subject land).

This SP has been prepared by Burgess Design Group in accordance with the WAPC's Structure Plan Preparation Guidelines and the City of Cockburn Town Planning Scheme No.3 (the Scheme), with technical inputs from a multidisciplinary team comprising:-

- Kctt – Transport Impact Assessment
- Lloyd George Acoustics –Acoustic Assessment

1.2 LAND DESCRIPTION

1.2.1 Location

The subject land is located in Coogee, approximately 28 kilometres south-west of the Perth CBD and 10.5 kilometres west of Cockburn Central, forming part of the City of Cockburn. The site is located at the corner of Cockburn Road and Beach Road, approximately 50m east of Coogee Beach Reserve. Refer to **Figure 2 – Location Plan**.

1.2.2 Area and Land Use

The subject land incorporates a single landholding; being Lot 512 Cockburn Road, Coogee. The site is 0.6445 hectares in area and accommodates two heritage listed buildings, being the Coogee Hotel and Old Post Office, as seen in **Figure 3 – Aerial Photo.**

1.2.3 Legal Description and Ownership

The subject land is legally described as:

- Lot 512 on Deposited Plan 30417 Volume: 2520 Folio: 407.

The land is owned by Main Roads Western Australia (MRWA); which, with the assistance of the Heritage Council of Western Australia (HCWA), is considering options for the future disposal of the site. Both heritage buildings have been privately leased, primarily for office, storage and residential purposes.

The Certificate of Title is attached at **Appendix A.**

FIGURE 2

NORTH

0 200 400 600 800 1000m

SCALE 1:20,000 (A4)

LOCATION PLAN
LOT 512 COCKBURN ROAD
COOGEE
CITY OF COCKBURN

Planner: JD/ZM
Client: SHO
Date: 13.04.15
Plan No: SHO COO 9-01

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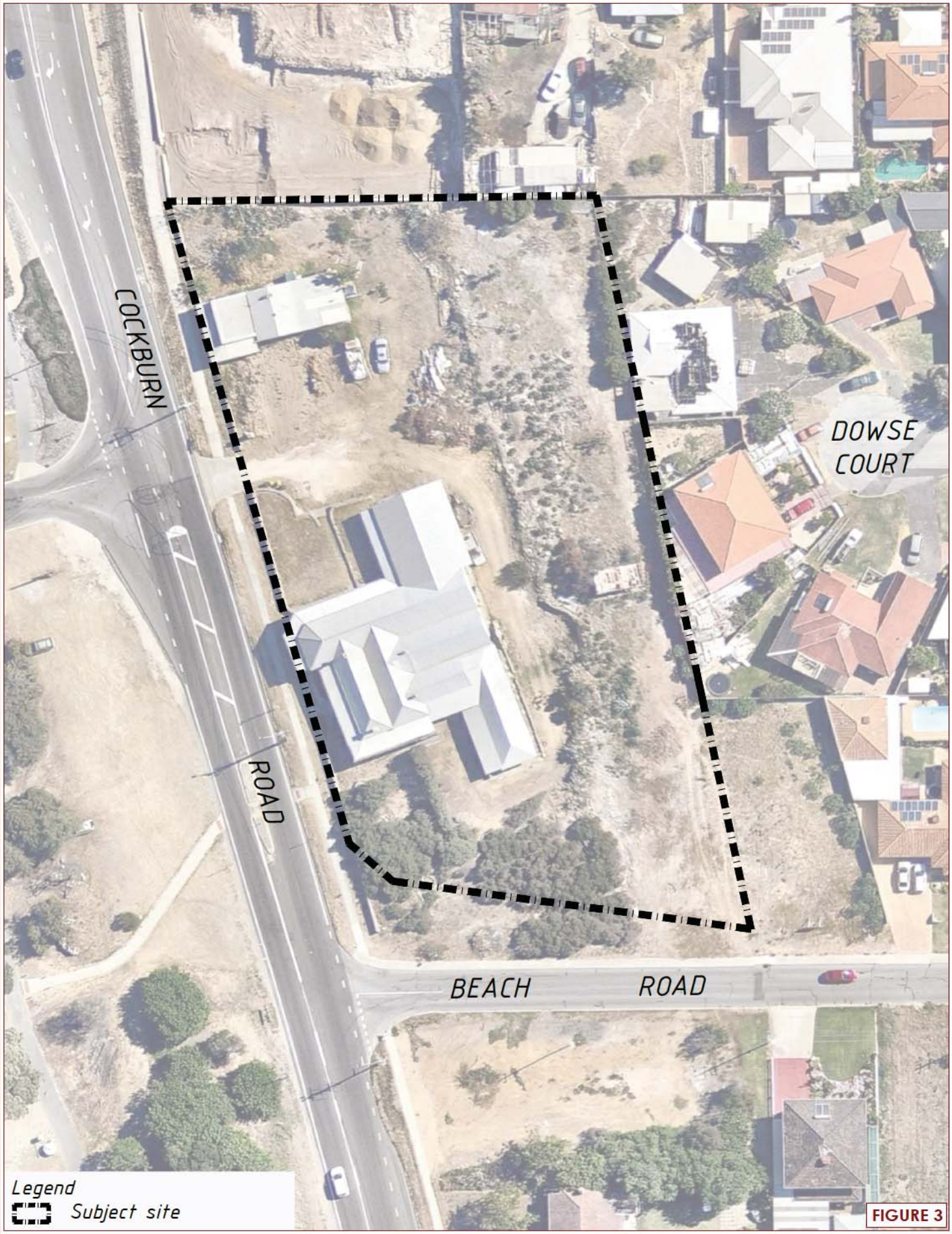

FIGURE 3

NORTH

0 10 20 30 40 50 60 70m

SCALE 1:750 (A4)

Planner: JD/ZM
Client: SHO
Date: 13.04.15
Plan No: SHO COO 9-01

AERIAL
LOT 512 COCKBURN ROAD
COOGEE
CITY OF COCKBURN

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1.3 PLANNING FRAMEWORK

1.3.1 Zoning and Reservations

The subject land is zoned 'Urban' and abuts a 'Primary Regional Road Reserve', being Cockburn Road, under the Metropolitan Region Scheme (MRS). Refer **Figure 4**

The Scheme depicts the land as being within the 'Development Zone', 'Development Area 32' (DA32), and 'Development Contribution Area 13' (DCA13). Refer **Figure 5**.

The objective of the Development Zone is to generally provide for the subdivision and development of land in accordance with an approved structure plan. Schedule 11 of the Scheme sets out specific requirements for each Development Area. The Scheme provisions applicable to DA32 are:

1. *An approved Structure Plan together with all approved amendments shall be given due regard in the assessment of applications for subdivision and development in accordance with clause 27(1) of the Deemed Provisions.*

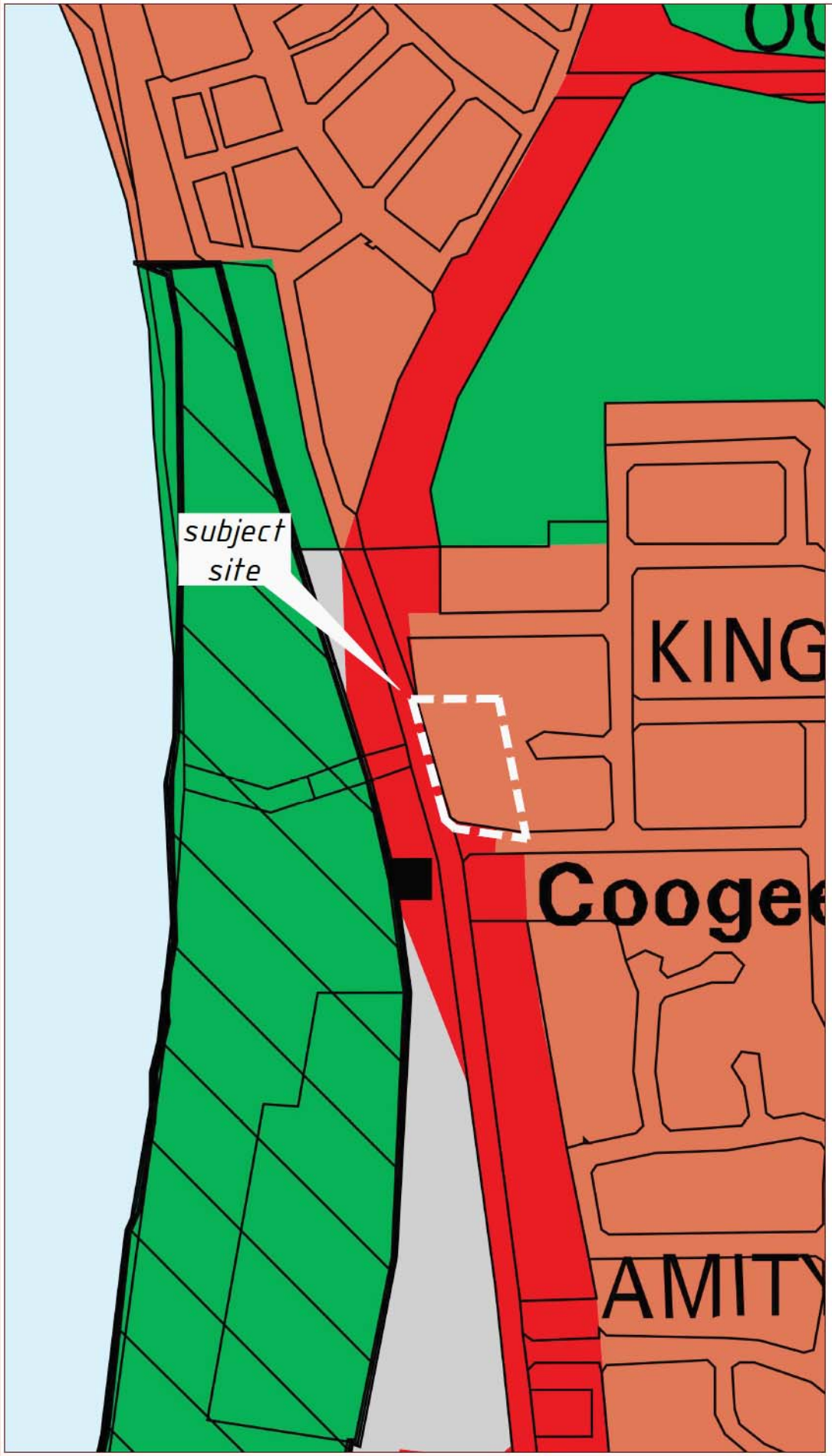
2. *The Structure Plan is to provide for residential development and may include the sympathetic adaptation of the Heritage places for commercial and tourist related uses that are compatible with residential amenity and consistent with the Conversation Plan.*

3. *The Structure Plan is to facilitate the conservation and protection of the cultural heritage significance of the Heritage Places and their setting, consistent with a Conservation Plan.*

4. *No subdivision or development will be supported within the Development Area until the Structure Plan has been adopted by Council and endorsed by the Western Australian Planning Commission (WAPC).*

5. *The maximum building height of any development shall be in accordance with the City of Cockburn's Local Planning Policy 1.7– Coogee Residential Height Requirements.*

The subject site falls within Development Contribution Area 13 (DCA13) and development is therefore subject to cost contributions in accordance with Schedule 12 of the Scheme. DCA13 applies to all land within the City to be subdivided and/or developed for residential, rural residential or resource zone purposes. DCA13 provides for proportional contributions toward regional, sub-regional and local infrastructure items.



Legend

scheme boundary

Reserved lands

- parks and recreation
- R — restricted public access
- railways
- port installations
- State forests
- water catchments
- civic and cultural
- waterways
- primary regional roads
- other regional roads
- public purposes - denoted as follows:
  - H — hospital
  - HS — high school
  - TS — technical school
  - CP — car park
  - U — university
  - CG — Commonwealth Government
  - SEC — State Energy Commission
  - SU — special uses
  - WSD — Water Authority of WA
  - P — prison

Zones

- urban
- urban deferred
- central city area
- industrial
- special industrial
- rural
- rural - water protection
- private recreation

Notice of delegation

- bush forever area

Redevelopment schemes

- redevelopment scheme/act area

FIGURE 4

NORTH

0 50 75 100 150

SCALE 1:5,000 (A4)

METROPOLITAN REGION SCHEME
LOT 512 COCKBURN ROAD
COOGEE

Planner: JD/ZM
Client: SHO
Date: 13.04.15
Plan No: SHO COO 9-01

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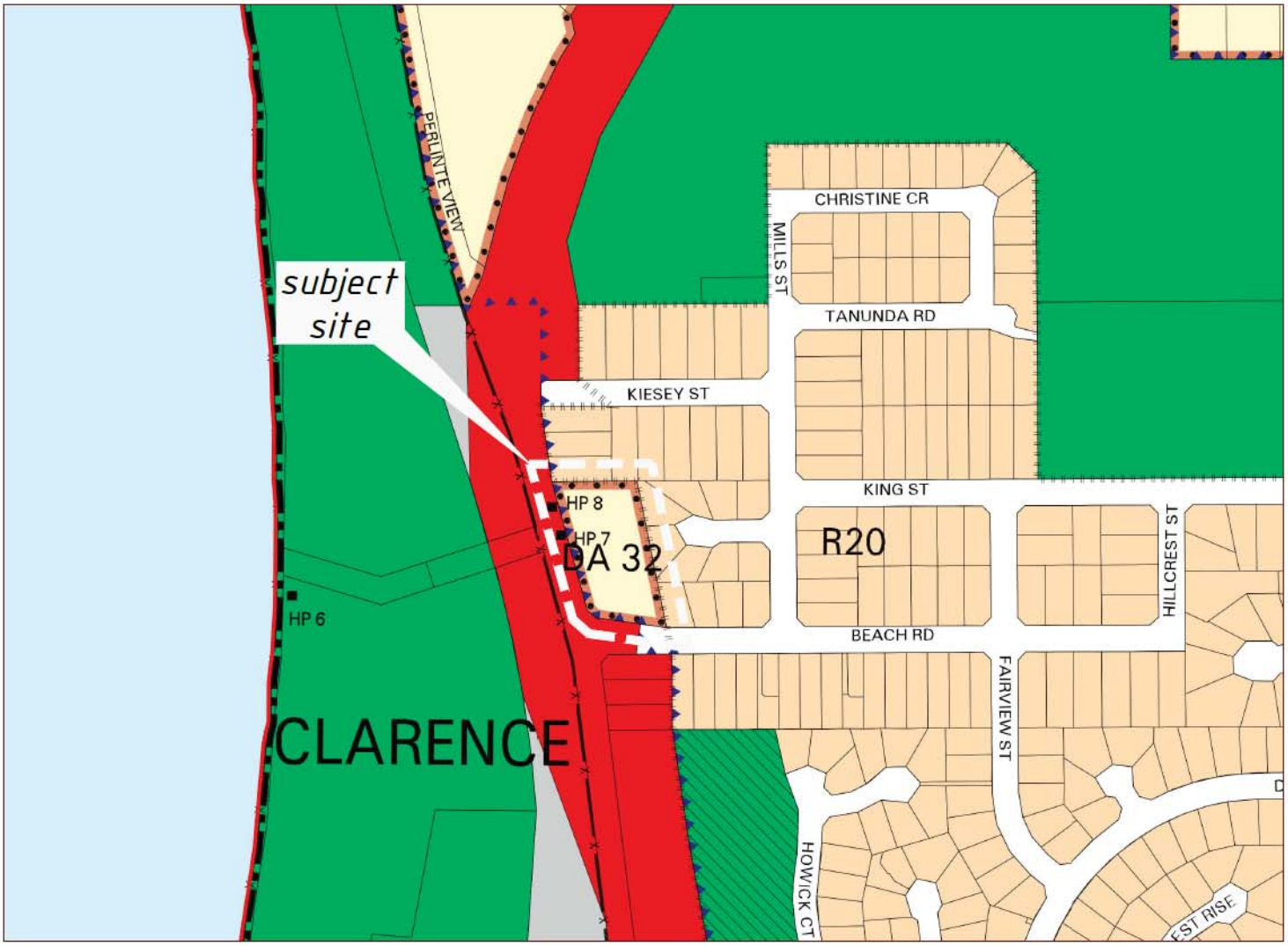
CITY OF COCKBURN



LEGEND

METROPOLITAN REGION SCHEME RESERVES

- PARKS AND RECREATION
  - R — RESTRICTED PUBLIC ACCESS
- RAILWAYS
- PORT INSTALLATIONS
- STATE FORESTS
- WATER CATCHMENTS
- CIVIC AND CULTURAL
- WATERWAYS
- PRIMARY REGIONAL ROADS
- OTHER REGIONAL ROADS
- PUBLIC PURPOSES - DENOTED AS FOLLOWS:
  - H — HOSPITAL
  - HS — HIGH SCHOOL
  - TS — TECHNICAL SCHOOL
  - CP — CAR PARK
  - U — UNIVERSITY
  - CG — COMMONWEALTH GOVERNMENT
  - SEC — STATE ENERGY COMMISSION
  - SU — SPECIAL USES
  - WSD — WATER AUTHORITY OF WA
  - P — PRISON

ZONES

- DEVELOPMENT
- DISTRICT CENTRE
- LOCAL CENTRE
- REGIONAL CENTRE
- RESIDENTIAL
- BUSINESS
- MIXED BUSINESS
- SPECIAL USE
- INDUSTRY
- LIGHT AND SERVICE INDUSTRY
- CONSERVATION
- RESOURCE
- RURAL
- RURAL LIVING

LOCAL SCHEME RESERVES

- LAKES & DRAINAGE
- LOCAL ROAD
- PARKS & RECREATION
- PUBLIC PURPOSES
- PUBLIC PURPOSES DENOTED AS FOLLOWS:
  - AG — DEPT OF AGRICULTURE
  - C — CIVIC
  - DOT — DEPT OF TRANSPORT
  - FPA — FREMANTLE PORT AUTHORITY
  - FS — FIRE STATION
  - GS — GAS PIPELINE
  - K — PRE-SCHOOL
  - OP — OIL PIPELINE
  - P — POLICE STATION
  - PO — POST OFFICE
  - PS — PRIMARY SCHOOL
  - TAB — TOTALISATOR AGENCY BOARD
- PUBLIC PURPOSES DENOTED AS FOLLOWS:
  - TE — TELSTRA
  - WC — WATER CORPORATION
  - WP — WESTERN POWER

OTHER

- R20 — R CODES
- AI — ADDITIONAL USES
- RI — RESTRICTED USES
- SCHEME BOUNDARY
- LOCAL GOVERNMENT BOUNDARY
- TOWNSITE – LAND ACT
- SU 3 — SPECIAL USE AREA (SEE SCHEME TEXT)
- DA 30 — DEVELOPMENT AREA (SEE SCHEME TEXT)
- DCA 7 — DEVELOPMENT CONTRIBURION AREA (SEE SCHEME TEXT)
- JA — JANDAKOT AIRPORT (SEE SCHEME TEXT)
- BUILDING ENVELOPE
- PEEL-HARVEY COASTAL PLAN CATCHMENT AREA
- HERITAGE PLACE (SEE SCHEME TEXT)
- NO ZONE

FIGURE 5

NORTH

0 50 75 100 150

SCALE 1:5,000 (A4)

TOWN PLANNING SCHEME NO.3

LOT 512 COCKBURN ROAD

COOGEE

Planner: JD/ZM
Client: SHO
Date: 13.04.15
Plan No: SHO COO 9-01

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1.3.2 Planning Strategies

Directions 2031 and Beyond

Directions 2031 is a long-term strategic plan for the Perth Metropolitan and Peel Regions, and provides a framework for urban growth with a focus on urban consolidation and an efficient built form.

Directions 2031 establishes a minimum density target of 15 dwellings per gross Urban zoned hectare, based upon an integrated and diverse approach to housing provision. The LSP supports residential development in accordance with the dwelling targets set out in Directions 2031, enabling the equivalent of 15 dwellings per gross Urban zoned hectare of land.

This Structure Plan will ensure the integrity of the heritage place is not compromised. This is considered to address other objectives set out by Directions 2031 of protecting and enhancing our heritage.

1.3.3 Planning Policies

State Planning Policy 2.6: *State Coastal Planning Policy* (SPP2.6)

SPP2.6 provides guidance for decision-making within the coastal zone including managing development and land use change; establishment of foreshore reserves; and to protect, conserve and enhance coastal values.

As the Structure Plan Area is within 300 metres of the horizontal shoreline datum, maximum height limits apply to all development within the site as set out in Part One of this Structure Plan.

State Planning Policy No. 3.5: *Historic Heritage Conservation*

State Planning Policy No.3.5 Historic Heritage Conservation (SPP 3.5) acknowledges that in some cases, the conservation and protection of a heritage place may require a change of use to ensure a reasonable beneficial use or return. Adaptive re-use of a heritage building without compromising its heritage qualities can often be one of the best ways of ensuring its future conservation.

As such, the proposed Structure Plan provides flexibility to the uses permitted within and surrounding the heritage buildings.

State Planning Policy 3.7: *Planning in Bushfire Prone Areas (SPP3.7)*

SPP3.7 directs how land use should be addressed in bushfire risk management in Western Australia, and applies to all land that is identified as being 'Bushfire Prone' by the Fire and Emergency Services Commissioner as highlighted on the Map of Bushfire Prone Areas.

The Structure Plan Area falls within a designated Bushfire Prone Area, and in accordance with the requirements of State Planning Policy 3.7: *Planning in Bushfire Prone Areas* (SPP3.7), a Bushfire Hazard Level (BHL) Assessment has been prepared to support the Structure Plan (refer **Appendix G** and **Section 2.1.4**).

State Planning Policy 5.4: *Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (SPP5.4)

SPP5.4 aims to mitigate adverse noise-impacts on noise sensitive development in the vicinity of major road or rail infrastructure.

The Structure Plan Area abuts a 'major road'; being Cockburn Road, which is reserved as a 'Primary Regional Road' under the MRS, classified as a 'Primary Distributor' by Main Roads WA, and is estimated to carry upwards of 16,000 vehicles per day. As such, an Acoustic Assessment has been prepared to identify potential noise impacts and set out suitable management measures (refer **Appendix D** and Section 2.1.6 for details).

Liveable Neighbourhoods

Liveable Neighbourhoods is a state-wide development control policy that facilitates the development of sustainable communities. It provides an integrated planning and assessment policy for the preparation of Structure Plans and subdivision designs and represents an alternative performance-based approach to conventional subdivision policies.

This Structure Plan has been prepared with the principles of the *Liveable Neighbourhoods* policy in mind and should be assessed against the objectives and requirements of each of the *Liveable Neighbourhoods* design elements.

In particular, the Structure Plan provides a site responsive approach in its design and provides a reliable framework to coordinate the more detailed development and planning process that is to follow.

This Structure Plan is considered to:

- effectively integrate future development with the adjacent existing land uses and minimise land use conflict;
- ensure lots and streetscapes have a suitable level of amenity;

Liveable Neighbourhoods states that urban densities of at least 15 dwellings per urban hectare and an average of 22 dwellings per site hectare should be provided in new urban areas. Whilst the subject land is not a new urban area, a residential site density of 29 dwellings per hectare can be achieved, which is consistent with the target of Liveable Neighbourhoods.

City of Cockburn Policy ADP64 Heritage Conservation Design Guidelines

The key objectives of this Policy that relate to Lot 512 are considered to be:

- *To ensure that works, including conservation, restoration, alterations, additions, changes of use and new development, respect the heritage significance associated with heritage places*; and
- *To encourage opportunities for interpretation where it can enhance understanding and enjoyment of heritage places, and strengthen the relationships between the community and its heritage.*

The following policy provisions have therefore been considered in the preparation of this Structure Plan for the Coogee Hotel and Post Office site:

3. Change of Use

(a) Adaptive reuse of heritage places may be supported provided:

(i) The proposed use(s) will not impact negatively on the amenity of the surrounding area.

(ii) Any required modifications do not substantially detract from the heritage significance of the place and are consistent with the provisions of this policy.

(iii) The use is consistent with the Scheme and other relevant Council policies.

(b) Where there is a Conservation Plan for a heritage place any proposed new use(s) will be assessed on the basis of the recommendations contained within the Conservation Plan.

(c) Where possible, evidence of the original use of a building should be retained, and in some circumstances interpretation may be appropriate to help understand the former use where it is not readily apparent (refer to 7.0).

City of Cockburn Local Planning Policy 1.7 Coogee Residential Height Requirements (LPP1.7)

The maximum building height of any development shall be in accordance with the City of Cockburn's Local Planning Policy LPP1.7 – Coogee Residential Height Requirements.

Maximum building height of residential development shall be limited to:

(i) Top of wall (roof over) – 7m

(ii) Top of Wall (parapet) – 8m

(iii) Top of pitched roof – 10m

City of Cockburn On-site Drainage Requirements (Residential Lots)

The City's requirement for stormwater disposal is that all stormwater falling within the lot boundaries is contained within the lot, either through soak wells or other approved methods. The City requires the onsite storage capacity for residential lots be designed to contain the 1 in 20 year storm of 5 minutes duration. This is based on the requirements for gutter & downpipe sizing by Building Codes of Australia.

Any future development will need to comply with the City of Cockburn's drainage requirements in this regard.

2. SITE CONDITIONS AND CONSTRAINTS

2.1 SITE ANALYSIS

The subject site contains two single-storey limestone, brick and iron heritage buildings; being the Coogee Hotel and the Coogee Post Office. Both are located in the western portion of the site, addressing Cockburn Road. The remainder of the site is vacant.

The former Hotel has been extended to the north and occupies a total footprint of around 885m^2, with an internal building area of around 640m^2. A portion of the western verandah extends beyond the existing cadastral boundary.

The former Post Office has been extended to the east and occupies a total footprint of around 172m^2, with an internal building area of around 98m^2.

Detailed physical descriptions of the buildings can be found in the Coogee Hotel and Post Office Conservation Plan 1999 (refer to **Appendix B**).

There is a steep bank or ridge, running in a north-south direction, along the eastern third of the site. An existing, low limestone retaining wall defines the western boundary of the site, and presently extends beyond the cadastral boundary at the south-west corner truncation.

The eastern portion of the site remains largely un-developed, except for a small brick and iron outbuilding in a ruinous condition which will be removed to facilitate further development of the site.

2.1.1 Biodiversity and Natural Area Assets

The subject land is observed as being cleared of any remnant vegetation and is not considered to provide any habitat of significance for native fauna.

2.1.2 Landform and Soils

Geological mapping of the site shows the surface geology of the site as including Tamala Limestone, and sand derived from Tamala Limestone. The site is further identified as containing no known risk of Acid Sulfate Soil (ASS) within 3 metres of natural soil surface.

The DoW Perth Groundwater Atlas indicates that the site slopes gradually towards the south west, with surface levels ranging from 10 mAHD in the north east corner to 6 mAHD in the south west corner.

2.1.3 Groundwater and Surface Water

No surface water features are identified within the site. The site is not located within any surface or groundwater protection areas and does not contain any wetlands, streams or water courses. The regional groundwater levels at the site are estimated to be at 1m Australian Height Datum (AHD) or 5m below natural surface level as based on regional groundwater mapping and topography data.

2.1.4 Bushfire Hazard

The subject site is located within a designated Bushfire Prone Area, as shown on the Department of Fire and Emergency Services' *Map of Bushfire Prone Areas*.

In accordance with the requirements of State Planning Policy 3.7: *Planning in Bushfire Prone Areas* (SPP3.7), a Bushfire Hazard Level (BHL) Assessment has been prepared to support the Structure Plan (refer **Appendix G**). This Assessment found that vegetation within and surrounding the site has a 'Low' BHL, primarily due to it comprising managed or non-vegetated areas, or areas that are subject to exclusions under Australian Standard 3959-2009 due to fragmentation and limited size. As such, the Structure Plan and subsequent development does not require the application of SPP3.7.

2.1.5 Heritage

Aboriginal Heritage

A search of Department of Aboriginal Affairs' Aboriginal Heritage Inquiry System reveals there are no known or registered aboriginal heritage sites.

European Heritage

The subject site is a State Registered place under the *Heritage of Western Australia Act 1990* (place number 3648). The place contains two significant buildings: the Coogee Hotel; and, the Coogee Post Office.

This Structure Plan facilitates the protection of these places as they are listed for conservation under the Act. To that end, the land is also the subject of a Heritage Agreement requiring present and future owners to conserve and maintain the existing heritage places. A Conservation Plan was prepared for the Coogee Hotel and Post Office in December 1999 on behalf of Main Roads WA. It outlines the heritage significance of Coogee Hotel and Post Office, and identifies general conservation policies to provide guidance and direction in their future use, development and conservation. This conservation plan is required to be reviewed and updated, if necessary, by the State Heritage Office (SHO) prior to any development works taking place, in consultation with landowners. The Coogee Hotel and Post Office Conservation Plan is the primary guiding document for the conservation and future use of the place.

Archaeology

A professional archaeological survey of the site was carried out in 2006 as recommended in the Conservation Plan, under the authorship of Dr Shane Burke.

The survey objective was to 'Investigate for physical evidence of past development and assess the significance of any evidence found'.

The methodology was as follows:

- Excavation of 20 test squares located across the site, and one large pit of 1 m x 1 m
- Location of test pits chosen to 'test subsurface artefact richness and provide stratigraphic data'.
- Excavation by trowel with all soil deposits sieved by a 3mm screen.

Materials found: 430 artefacts were discovered, mostly fragments of glass bottles, plus some fragments of crockery, mostly dating from the period 1901-1927.

The conclusions of the study were:

i. 'The material remains are common components at many other WA archaeological site – both residential and retail – from this period'

ii. 'The archaeological test pitting and excavation...concludes that there is low significance at a State level but moderate significance at a regional level'

The report recommended that "No further archaeological assessment is necessary due to the place's low archaeological significance".

2.1.6 Noise Attenuation

An Acoustic Assessment has been prepared to identify potential noise impacts arising from Cockburn Road and set out suitable management measures (refer **Appendix D**).

The Assessment found that noise impacts can be effectively managed across the site. Specific noise levels applicable to development and acceptable treatment packages, as outlined in SPP5.4, will depend upon the siting and design of development, together with the types of uses that are proposed. For the purposes of the Assessment, the Concept Development Plan contained at **Figure 7** has been assessed and determined to comply with the policy measures; subject to 'Package A' treatments to the ground floor and 'Package B' treatments to upper floors, together with appropriate siting of outdoor living areas and other potentially sensitive uses or activities.

Development undertaken in accordance with the Concept Development Plan (**Figure 7**) shall comply with the recommendations listed in Section 6 of the Acoustic Assessment. Development which deviates from the Concept Development Plan may require an updated Acoustic Assessment to demonstrate compliance with SPP5.4, to the satisfaction of the City of Cockburn.

2.2 OPPORTUNITIES AND CONSTRAINTS

A context plan has been prepared and is included at **Figure 6** which broadly describes the context of the subject land by illustrating the opportunities and constraints associated with the site.

Key matters identified within the context plan are discussed below and have been considered in the preparation of the LSP. Specifically the relationship of the subject site and:

- The adjacent Coogee Beach public access and Bus Public Transport routes, in terms of considering appropriate land uses and densities applicable to the site;
- The surrounding R20 single residential development and the need for an appropriate interface and transition with the established local residential area;
- The proximity of Cockburn Road to the site and possible access and noise implications that required detailed assessment and consideration;
- The location of 'Category A' heritage buildings on site and the need to support re-use of the structures and ensure future development integrates with the existing structures.

NORTH

0 20 40 60 80 100m

SCALE 1:3,000 (A3)

CONTEXT PLAN
LOT 512 COCKBURN ROAD
COOGEE
CITY OF COCKBURN

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Plan No: SHO COO 9-01 Client: SHO
Date: 28.04.15 Planner: JD/ZM

3. LAND USE AND SUBDIVISION REQUIREMENTS

The Structure Plan designates 'Local Centre', 'Mixed Use' and 'Residential' uses over the site, with a view to facilitating development that will both respond to the context of the site and surrounding development, and enhance the heritage values of the place (refer **Figure 1**).

Land use permissibility shall be in accordance with the corresponding zone under the Scheme.

3.1 Local Centre

The Structure Plan designates 'Local Centre' uses over the majority of the site, which comprises 0.3083ha of land and contains the Coogee Hotel.

The Local Centre area has been designated to:

a) Provide for the adaptive re-use of the Coogee Hotel and enhance the heritage values of the place; and

b) Encourage tourist-orientated commercial uses that support local job-creation.

3.1.1 Mixed use (R40)

'Mixed Use R40' uses are designated over the north western corner of the lot, which comprises approximately 0.0730ha of land and includes the Coogee Post Office.

The 'Mixed Use R40' area has been designated to:

a) Provide for the adaptive re-use of the Coogee Post Office; and,

b) Provide for the development of suitable residential and small-scale commercial uses.

The preferred development scenario for the 'Mixed Use R40' portion of the site includes an adaptive re-use of the Coogee Post Office for commercial uses, such that its heritage value is preserved or enhanced, together with a residential component developed at a scale that is commensurate with and complementary to the heritage character of the site.

3.1.2 Residential R25

The balance of the site is designated 'Residential R25', comprising approximately 0.2632ha of the site.

The 'Residential R25' area has been designated to:

a) Provide for the development of single-dwellings, generally in accordance with the R25 development standards set out in the R-Codes, of a type and scale that is compatible with the heritage character of the site;
b) Provide a suitable interface with and transition to existing low density (R20) residential development to the east; and,
c) Provide for limited small-scale commercial uses that are compatible with both the residential zone and the heritage values of the site.

3.1.3 Concept Plan

A Concept Development Plan has been prepared to illustrate a preferred development scenario for the site (refer **Figure 7**). The Plan is intended to guide applications for residential development over the site, and to that end depicts:

- A single shared access point to Beach Road;
- Vehicle parking arrangements;
- Location of a strategic visual linkage between the Coogee Hotel and Post Office;
- A low-density (R25) residential interface, comprising approximately 6 lots, with existing development to the east;
- The adaptive re-use of the Post Office building, including the development of a multiple dwelling; and,
- Building orientation to achieve passive surveillance and a suitable built-form relationship with heritage buildings.

3.1.4 Coogee Hotel Public Open Space

A sufficient supply of public open space exists in the vicinity of the site; notably comprising:

- Coogee Beach Reserve – 4.4574ha, comprising a beach, jetty, active recreation areas (grass playing fields, playgrounds), cafe, and walking and cycling paths (60 metres west);
- Len Mctaggart Park – 1.4397ha, comprising grass playing fields, a playground and a community centre (80 metres south);
- Mills Street Playground – 0.1950ha, comprising grassed area and a playground (170 metres north east); and
- Perlinte Park – 0.9765ha, comprising passive recreation areas, and walking and cycling paths (200 metres north west).

Given the existing supply of excellent recreation facilities surrounding the site, together with the limited size of the structure plan area itself, being approximately 0.6445ha, no public open space is proposed as part of the Structure Plan.

Two areas of communal private open space have been allocated under the Concept Development Plan (**Figure 7**), one located centrally between the two heritage buildings and another to the east of the proposed site access.

Given the very small size of any Public Open Space that would be required for this development the City has indicated that it does not support its provision. Small areas of Public Open Space are difficult and expensive to maintain.

It is noted that the Heritage Conservation Plan requires the retention and protection of the open space area between the two heritage buildings. The plan does not completely restrict the potential development of this area as it may be useful for certain functions associated with the eventual re-use of the heritage buildings, but it is important that this open area remains generally open in nature and that any potential development is controlled. This control will come through the referral of any development application on the land requiring referral and assessment by the State Heritage Office.

The area of private open space fronting Cockburn Road also provides an opportunity for varying forms of heritage interpretation such as, public art, walkways, plaques, memorials or signage. This area of private open space forms part of the Development Conditions for the site, and applies to all types of development with the aim to maintain the relationship between the two heritage buildings, which is a key component of the structure plan.

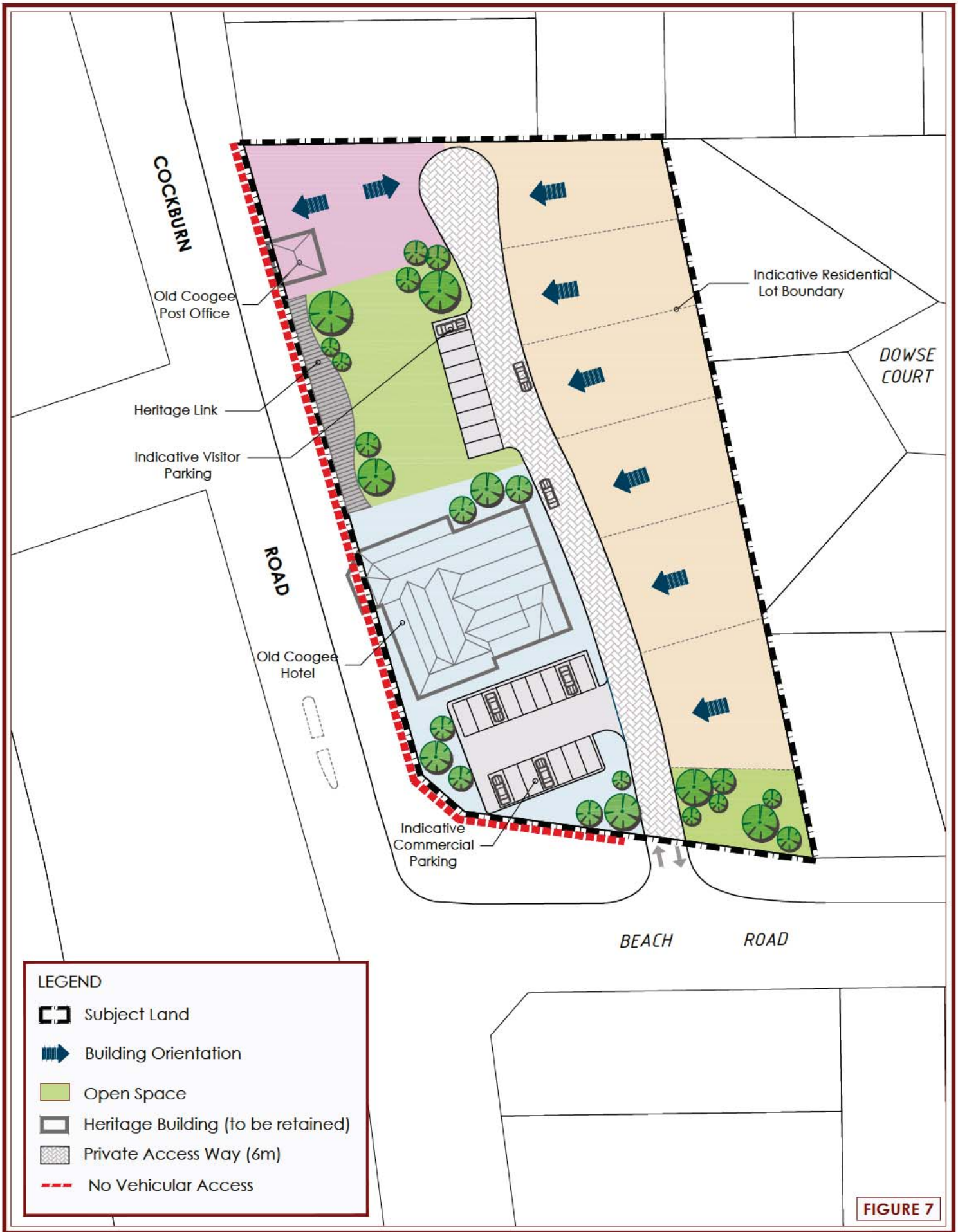

FIGURE 7

NORTH

0 10 20 30 40 50 60 70m

SCALE 1:750 (A4)

CONCEPT DEVELOPMENT PLAN
LOT 512 COCKBURN ROAD
COOGEE

Planner: JD/ZM
Client: SHO
Date: 3.03.16
Plan No: SHO COO 2-06

CITY OF COCKBURN

BURGESS DESIGN GROUP
TOWN PLANNING + URBAN DESIGN
PO Box 8779, Perth Business Centre 6849
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A second area of communal private open space is shown on the concept plan located at the vehicle access point to the site. This area of open space would primarily assist in providing separation of residential uses from Beach Road, as well as general landscaping and drainage functions.

Future planning applications for both commercial and residential land uses will need to address drainage and landscaping of private open space areas in greater detail.

3.2 MOVEMENT NETWORKS

A Transport Assessment Report has been prepared by Kctt over Lot 512 Cockburn Road, Coogee, to assess access opportunities, parking capabilities and to estimate the generation and distribution of traffic associated with future development of the site (refer to **Appendix C**).

A summary of the key transport findings is provided below.

3.2.1 Existing Road Network

The current road network comprises Cockburn Road, forming the southern boundary of the subject site, and Beach Road, forming the western boundary of the site.

Cockburn Road is classified as a Primary Distributor and is reserved as a Primary Regional Road under the MRS. It is currently constructed as two lane divided carriageway in this area and has a posted speed limit of 70km/h. Access to the site is currently via Cockburn Road.

Beach Road is classified as an Access Road and intersects as a full movement intersection with Cockburn Road. No access to the site is currently provided by Beach Road.

3.2.2 Vehicle Access and Traffic Management

No vehicular access or egress will be allowed from the subject site to Cockburn Road in order to limit the interaction with Cockburn Road and therefore to improve safety. The LSP therefore proposes any access/egress to be from Beach Road only, Access should be located at least 30 metres from the intersection of Beach Road and Cockburn Road.

At full residential development, as per the DGP, the site is expected to generate 113 vehicular movements per day with a forecasted impact of around 22 vehicular movements per hour during peak hour. The expected peak operating times for the proposed development will coincide with AM and PM peak times for traffic on Cockburn Road, however the predicted yields for the proposed development are relatively low and the intersection of Beach Road and Cockburn Road is not considered to exhibit a decreased Level of Service (LOS).

With reference to the Residential Design Codes and LSP3, the proposed development configuration shown on the concept plan (Figure 7) would require a total of 19 car parking bays, plus provision of on-site parking within each of the proposed residential allotments to suit the residential yield. The current indicative layout shows a total of 22 parking bays, plus 1 ACROD bay and 1 loading bay. The site can therefore accommodate a development of this size and scale.

3.2.3 Public Transport

Existing public transport services in the area consist of two (2) bus services, Route 532 Fremantle Station to Cockburn Central Station, and Route 825 Rockingham Station to Fremantle Station, travelling along Cockburn Road. A bus stop is located on Beach Rd (Stop No.23777), and Cockburn Rd (Stop No.10661).

The operating Bus Routes are as follows:

- Bus route No.522 – Cockburn Central Station – Spearwood, twice a day on working days;
- Bus route No.825 – Fremantle Station – Rockingham Station (via Cockburn Road and Patterson Road); with 20 minute minimum intervals on working days and one hour intervals on Saturdays;

The subject site has substantial access to public transport within convenient distances that should promote the use of public transport.

3.2.4 Pedestrian and Bicycle Network

Concrete footpaths are located on the east side of Cockburn Road and the north side of Beach Road. There are two uncontrolled pedestrian crossing points on Cockburn Road in proximity to the site, which link to existing footpath networks within the Woodman Point Reserve:

- Approximately 25m north of Kiesey Street (about 10m from the north boundary of the subject site);
- Approximately 25m north of Beach Road, near the southwest corner of the Hotel; and
- Pedestrian connectivity available to Coogee Beach.

The following is a list of the major cyclist infrastructure (Perth Bicycle Network) within an 800 metre radius of the subject site:

- Beach Road, King Street, Amity Boulevard and Ocean Road are all classified as "Good Road Riding Environments".
- Beach Road and Cockburn Road have footpath connections to bus stops.
- Cockburn Road is classified as a "Poor Road Riding Environment".

Orsino Boulevard and Cockburn Road are both classified as "Bicycle Lanes or Sealed Either Side". Shared path networks exist along Orsino Boulevard and Amity Boulevard.

3.3 INFRASTRUCTURE COORDINATION AND SERVICING

3.3.1 Power

Existing high and low voltage overhead distribution powerlines run along Cockburn Road and Beach Road. There is sufficient power capacity in the area to cater for the demand of the proposed lots. Western Power's Network Capacity Tool shows the greater than 25MVA capacity is available for at least the next 5 years.

3.3.2 Telecommunications

Existing Telstra services are available nearby and extensions can be undertaken to service the site.

3.3.3 Water

Reticulated water is currently available to the subject site, with an existing 225mm diameter water steel water distribution main located within the Cockburn Road reserve. Additionally, a 100mm diameter ductile steel water main is located within the Beach Road reserve.

An existing water connection is located off Cockburn Road however a new water service from Cockburn Road will be required to service the residential R25 portion of the site.

3.3.4 Sewer

Reticulated sewerage is currently available to the subject area by extension. An existing 150mm gravity fed sewer main runs along the western boundary of the site. This sewer is up to 4.5m deep with levels of 5.59 and 5.07 R.L recorded by the Water Corporation. It should be noted that the site can only be connected to the existing gravity sewer network subject to the land achieving minimum site levels.

3.3.5 Gas

A gas connection is available feeding from an existing low pressure gas pipe line occurring in Cockburn Road. ATCO Gas will provide gas reticulation at no additional cost to the developer other than the cost to supply a common trench.

3.3.6 Drainage

The proposed development is considered suitable for on-site stormwater disposal for all lots. Any access road will need to be set below the lot levels to ensure runoff from extreme stormwater events flows away from properties.

3.4 GENERAL SUBDIVISION AND DEVELOPMENT REQUIREMENTS

The following matters should be considered at subsequent planning and development stages:

- Implementation of the Heritage Agreement.
- Implementation of the Coogee Hotel and Post Office Design Guidelines.
- Implementation of the Acoustic Assessment.
- The provision of Developer Contributions in accordance with Schedule 12 of the Scheme.
- Preparation of a Local Development Plan in accordance with Part One of this Structure Plan.

3.5 DEVELOPMENT CONTRIBUTIONS

The subject site falls within Development Contribution Area 13 (DCA13) and development is therefore subject to cost contributions in accordance with Schedule 12 of the Scheme.

DCA13 applies to all land within the City to be subdivided and/or developed for residential, rural residential or resource zone purposes. DCA13 provides for the proportional contribution of costs toward regional, sub-regional and local infrastructure items.

The Contribution rates are subject to annual review and any necessary variations and amendments. As of January 2017, the Contribution Rates for the 2016-17 financial year for Coogee are listed as $5,248.00 per lot or dwelling.

4. CONCLUSION

The Structure Plan as described in this report satisfies the planning frameworks adopted by the City of Cockburn and the Western Australian Planning Commission, and the advice received during consultation with other agencies.

The proposed development has been shown to be an ideal and timely addition to the area. Additionally, the proposed land uses will support the ongoing growth of local and regional services and amenities, whilst capitalising on the capacity of existing infrastructure, whilst enhancing the special heritage values of the site.

In light of the information presented herein, the Structure Plan is shown to be a logical and well planned addition to the community of Coogee.

APPENDIX A

CERTIFICATE OF TITLE

WESTERN AUSTRALIA

REGISTER NUMBER	
512/DP30417	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
1	9/7/2002

RECORD OF CERTIFICATE OF TITLE

VOLUME 2520 FOLIO 407

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 512 ON DEPOSITED PLAN 30417

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

COMMISSIONER OF MAIN ROADS OF WATERLOO CRESCENT, EAST PERTH
(AF I142932) REGISTERED 18 JUNE 2002

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *H957187 MEMORIAL. HERITAGE OF WESTERN AUSTRALIA ACT 1990. LODGED 13.12.2001.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	DP30417.
PREVIOUS TITLE:	368-65A.
PROPERTY STREET ADDRESS:	371 COCKBURN RD, COOGEE.
LOCAL GOVERNMENT AREA:	CITY OF COCKBURN.
RESPONSIBLE AGENCY:	MAIN ROADS WESTERN AUSTRALIA.

APPENDIX B

CONSERVATION PLAN (1999)

COOGEE HOTEL AND POST OFFICE CONSERVATION PLAN

Commissioned by
DEPARTMENT OF CONTRACT & MANAGEMENT SERVICES
on behalf of
MAIN ROADS WESTERN AUSTRALIA

Prepared by
HOCKING PLANNING & ARCHITECTURE
in association with
MORGAN URBAN PLANNING SERVICES
JOHN TOOHEY, HISTORIAN

December 1999

CONTENTS

APPENDIX C

ACOUSTIC ASSESSMENT

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Acoustic Assessment

Structure Plan for Coogee Hotel and Post Office Site

Reference: 15043164-01.docx

Prepared for:
State Heritage Office
C/- Burgess Design Group

Member Firm of Association of Australian Acoustical Consultants

Report: 15043164-01.docx

Lloyd George Acoustics Pty Ltd

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Prepared By:	Terry George 
Position:	Project Director
Date:	13 January 2016

Table of Contents

List of Tables

List of Figures

Appendices

1 INTRODUCTION

Burgess Design Group are preparing a structure plan for Lot 512 Cockburn Road, Coogee (refer *Figure 1-1* for locality). The site currently contains two heritage listed buildings, being the Old Coogee Hotel and Post Office. It is proposed to redevelop the site, with a concept plan provided in *Figure 1-2*, comprising 6 residential lots and a Local Centre Zone for the hotel and post office. A Local Centre Zone can support a range of uses such as retail, office, shop or the like. It is assumed that the likely uses of these buildings will be professional offices, consulting rooms and possibly a café, however this would become more refined at the development stage.

Figure 1-1 Site Locality

This report considers the potential noise impacts to the site, being dominated by road traffic on Cockburn Road, as well as outlining the requirements for development of the commercial parts.

Appendix B contains a description of some of the terminology used throughout this report.

Figure 1-2 Site Concept Plan

2 CRITERIA

2.1 Road Traffic Noise Criteria

The criteria relevant for road traffic noise to noise sensitive developments such as residences, is the *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (hereafter referred to as SPP 5.4) produced by the Western Australian Planning Commission (WAPC). The objectives in the Policy are to:

- Protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals;
- Protect major transport corridors and freight operations from incompatible urban encroachment;
- Encourage best practice design and construction standards for new development proposals and new or redevelopment transport infrastructure proposals;
- Facilitate the development and operation of an efficient freight network; and
- Facilitate the strategic co-location of freight handling facilities.

The Policy's outdoor noise criteria are shown below in *Table 2-1*. These criteria apply at any point 1-metre from a habitable façade of a noise sensitive premises and in one outdoor living area.

Table 2-1 Outdoor Noise Criteria

Period	Target	Limit
Day (6am to 10pm)	55 dB $L_{Aeq(Day)}$	60 dB $L_{Aeq(Day)}$
Night (10pm to 6am)	50 dB $L_{Aeq(Night)}$	55 dB $L_{Aeq(Night)}$

Note: The 5 dB difference between the target and limit is referred to as the margin.

In the application of these outdoor noise criteria to new noise sensitive developments, the objectives of SPP 5.4 is to achieve -

- acceptable indoor noise levels in noise-sensitive areas (e.g. bedrooms and living rooms of houses); and
- a 'reasonable' degree of acoustic amenity in at least one outdoor living area on each residential lot.

With regards to the above, acceptable indoor noise levels are described to be 35 dB $L_{Aeq(Night)}$ in bedrooms and 40 dB $L_{Aeq(Day)}$ in other habitable rooms. Depending on the external noise levels, the Policy's Guidelines provide deemed-to-satisfy construction standards to achieve the internal design goals. These architectural packages are provided in *Appendix A* and apply as follows:

- Package A – External noise levels of 56-60 dB $L_{Aeq(Day)}$ / 51-55 dB $L_{Aeq(Night)}$
- Package B - External noise levels of 61-63 dB $L_{Aeq(Day)}$ / 56-58 dB $L_{Aeq(Night)}$
- Package C - External noise levels of 64-65 dB $L_{Aeq(Day)}$ / 59-60 dB $L_{Aeq(Night)}$

With regards to the one outdoor living area, noise levels are to preferably be no more than the *target*, but can be up to the *limit* taking into consideration practicability and reasonableness.

For commercial properties, SPP 5.4 does not apply, however should the commercial parts be used for offices, a design level of 45 dB $L_{Aeq(Day)}$ is recommended, being the maximum design sound level for general office areas prescribed in Australian Standard 2107:2000 *Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

2.2 Environmental Noise Criteria

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

Regulation 7 defines the prescribed standard for noise emissions as follows:

"7. (1) Noise emitted from any premises or public place when received at other premises –

(a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and

(b) Must be free of –

i. Tonality;
ii. Impulsiveness; and
iii. Modulation".

A "...noise emission is taken to *significantly contribute to* a level of noise if the noise emission exceeds a value which is 5 dB below the assigned level..."

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

(a) The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and

(b) The noise emission complies with the standard after the adjustments of *Table 2-2* are made to the noise emission as measured at the point of reception.

Table 2-2 Adjustments for Intrusive Characteristics

Tonality	Modulation	Impulsiveness
+ 5dB	+ 5dB	+ 10dB

Note: The above are cumulative to a maximum of 15dB.

The baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown in *Table 2-3*.

Table 2-3 Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive	0700 to 1900 hours Monday to Saturday (Day)	45 + influencing factor	55 + influencing factor	65 + influencing factor
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + influencing factor	50 + influencing factor	65 + influencing factor
	1900 to 2200 hours all days (Evening)	40 + influencing factor	50 + influencing factor	55 + influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + influencing factor	45 + influencing factor	55 + influencing factor

The closest residences are those proposed as part of this development. Cockburn Road is currently considered a secondary road in accordance with the Noise Regulations (between 6,000 and 20,000 vehicles per day) and in the future will be considered a major road (> 20,000 vpd). Whilst the influencing factor will be 6 dB in the future, until such time traffic volumes increase to 20,000 vpd, the influencing factor is 2 dB. As such, the assigned noise levels are shown in *Table 2-4*.

Table 2-4 Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive	0700 to 1900 hours Monday to Saturday (Day)	47	57	67
	0900 to 1900 hours Sunday and public holidays (Sunday)	42	52	67
	1900 to 2200 hours all days (Evening)	42	52	57
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	37	47	57

3 METHODOLOGY

Noise measurements and modelling for road traffic noise have been undertaken in accordance with the requirements SPP 5.4 as described below in *Sections 3.1 and 3.2*.

3.1 Site Measurements

Noise monitoring was undertaken at one location in order to:

- Quantify the existing noise levels;
- Determine the differences between different acoustic parameters ($L_{A10,18hour}$, $L_{Aeq(Day)}$ and $L_{Aeq(Night)}$); and
- Calibrate the noise model for existing conditions.

The instrument used was an ARL Type 316 noise data logger, located at an existing residence to the south of the site at 383 Cockburn Road (refer *Figure 3-1*). The logger was approximately 18 metres from the edge of the road, with the microphone 1.4 metres above ground level. The logger was programmed to record hourly L_{A1}, L_{A10}, L_{A90}, and L_{Aeq} levels. This instrument complies with the instrumentation requirements of *Australian Standard 2702-1984 Acoustics – Methods for the Measurement of Road Traffic Noise*. The logger was field calibrated before and after the measurement session and found to be accurate to within +/- 1 dB. Lloyd George Acoustics also holds current laboratory calibration certificate for the loggers.

Figure 3-1 Noise Logger at 383 Cockburn Road

3.2 Noise Modelling

The computer programme *SoundPLAN 7.4* was utilised incorporating the *Calculation of Road Traffic Noise* (CoRTN) algorithms, modified to reflect Australian conditions. The modifications included the following:

- Vehicles were separated into heavy (Austroads Class 3 upwards) and non-heavy (Austroads Classes 1 & 2) with non-heavy vehicles having a source height of 0.5 metres above road level and heavy vehicles having two sources, at heights of 1.5 metres and 3.6 metres above road level, to represent the engine and exhaust respectively. By splitting the noise source into three, allows for less barrier attenuation for high level sources where barriers are to be considered. Note that corrections are applied to the exhaust of –8.0 dB (based on Transportation Noise Reference Book, Paul Nelson, 1987) and to the engine source of –0.8 dB, so as to provide consistent results with the CoRTN algorithms for the no barrier scenario.

Predictions are made at heights of 1.4 metres above ground floor level and at 1.0 metre from an assumed building façade (resulting in a + 2.5 dB correction due to reflected noise).

Various input data are included in the modelling such as ground topography, road design, traffic volumes etc. These model inputs are discussed on the following page.

3.2.1 Ground Topography, Road Design & Cadastral Data

Topographical data was based on that on file for the Cockburn area from previous projects. This data represents the existing topography and no consideration has been given to potential site earthworks.

Buildings have also been included as these can provide barrier attenuation when located between a source and receiver, in much the same way as a hill or wall provides noise shielding. All buildings are assumed to be single storey with a height of 3.5 metres, although consideration has been given to noise levels at an upper floor of the proposed residences.

3.2.2 Traffic Data

Traffic data includes:

- Road Surface – The noise relationship between different road surface types is shown below in *Table 3-1*.

Table 3-1 Noise Relationship Between Different Road Surfaces

Road Surfaces						
Chip Seal			Asphalt			
14mm	10mm	5mm	Dense Graded	Novachip	Stone Mastic	Open Graded
+3.5 dB	+2.5 dB	+1.5 dB	0.0 dB	-0.2 dB	-1.0 dB	-2.5 dB

The existing and future road surfaces are assumed to be dense graded asphalt.

- Vehicle Speed – The existing posted speed is 70km/hr and this is expected to be unchanged in the future.

- Traffic Volumes – Information was obtained from Main Roads Western Australia as follows:

    - 2011 Cockburn Road south of Rockingham Road – 10,300 vehicles per day (vpd) northbound and 9,800 southbound observed with the modelled being 6,900 vpd in each direction. Hence a shortfall of 3,400 vpd northbound and 2,900 vpd southbound;

    - 2013 (September) Traffic count north of Powell Road was 8,162 vpd (8.4% heavy) northbound and 7,895 vpd (9.3% heavy) southbound. These values are used for the purposes of model calibration.

    - 2031 Cockburn Road north of Beach Street – 8,400 vpd (12% heavy) northbound and 10,000 vpd (10% heavy) southbound. Adjusting the modelled values results in 11,800 vpd northbound and 12,900 southbound.

3.2.3 Ground Attenuation

The ground attenuation has been assumed to be 0.2 (20%) within road reserves, 0.65 (65%) elsewhere, except for public open space, which was set to 1.00 (100%). Note 0.0 represents hard reflective surfaces such as water and 1.00 represents absorptive surfaces such as grass.

3.2.4 Parameter Conversion

The CoRTN algorithms used in the *SoundPlan* modelling package were originally developed to calculate the $L_{A10,18hour}$ noise level. The WAPC Policy however uses $L_{Aeq(Day)}$ and $L_{Aeq(Night)}$. The relationship between the parameters varies depending on the composition of traffic on the road (volumes in each period and percentage heavy vehicles).

As noise monitoring was undertaken, the relationship between the parameters is based on the results of the monitoring – refer *Section 4.1*.

4 RESULTS

4.1 Noise Monitoring

The results of the noise monitoring are summarised below in *Table 4-1* and shown graphically in *Figure 4-1*.

Table 4-1 Measured Average Noise Levels – Monitoring Location

Date	Average Weekday Noise Level, dB			
	$L_{A10,18hour}$	$L_{Aeq,24hour}$	$L_{Aeq\ (Day)}$	$L_{Aeq\ (Night)}$
Monday 11-May-2015	68.1	65.3	66.7	58.9
Tuesday 12-May-2015	67.9	65.0	66.4	58.5
Wednesday 13-May-2015	68.3	64.5	66.0	58.2
Thursday 14-May-2015	68.1	64.5	65.9	58.3
Friday 15-May-2015	68.9	64.8	66.2	58.1
Average Weekday	**68.2**	**64.8**	**66.2**	**58.4**

The average differences between the weekday $L_{A10,18hour}$ and $L_{Aeq(Day)}$ is 2.0 dB and this conversion has been used in the modelling for both existing and future noise. The average differences between the weekday $L_{Aeq(Day)}$ and $L_{Aeq(Night)}$ is 7.8 dB. This same difference has been assumed to exist in future years. As such, it is the daytime noise levels that will dictate compliance, since these are at least 5 dB more than night-time levels.

4.2 Noise Modelling

The noise modelling results are provided for the following scenarios:

- Figure 4-2: Existing $L_{Aeq(Day)}$ Noise Levels: Ground Level
- Figure 4-3: Future $L_{Aeq(Day)}$ Noise Levels: Ground Level
- Figure 4-4: Future $L_{Aeq(Day)}$ Noise Levels: Upper Level

Figure 4-1: Noise Monitoring Results

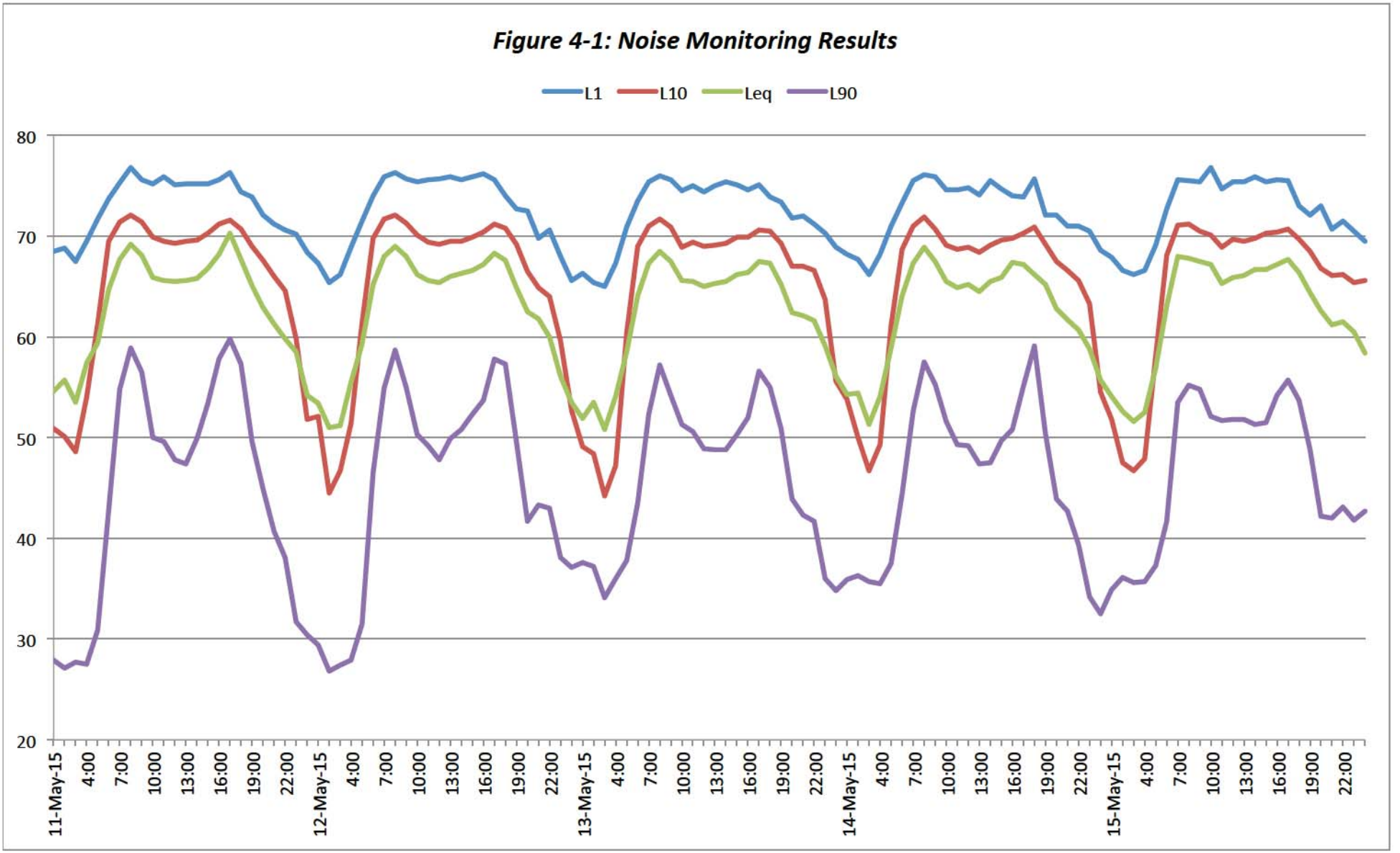
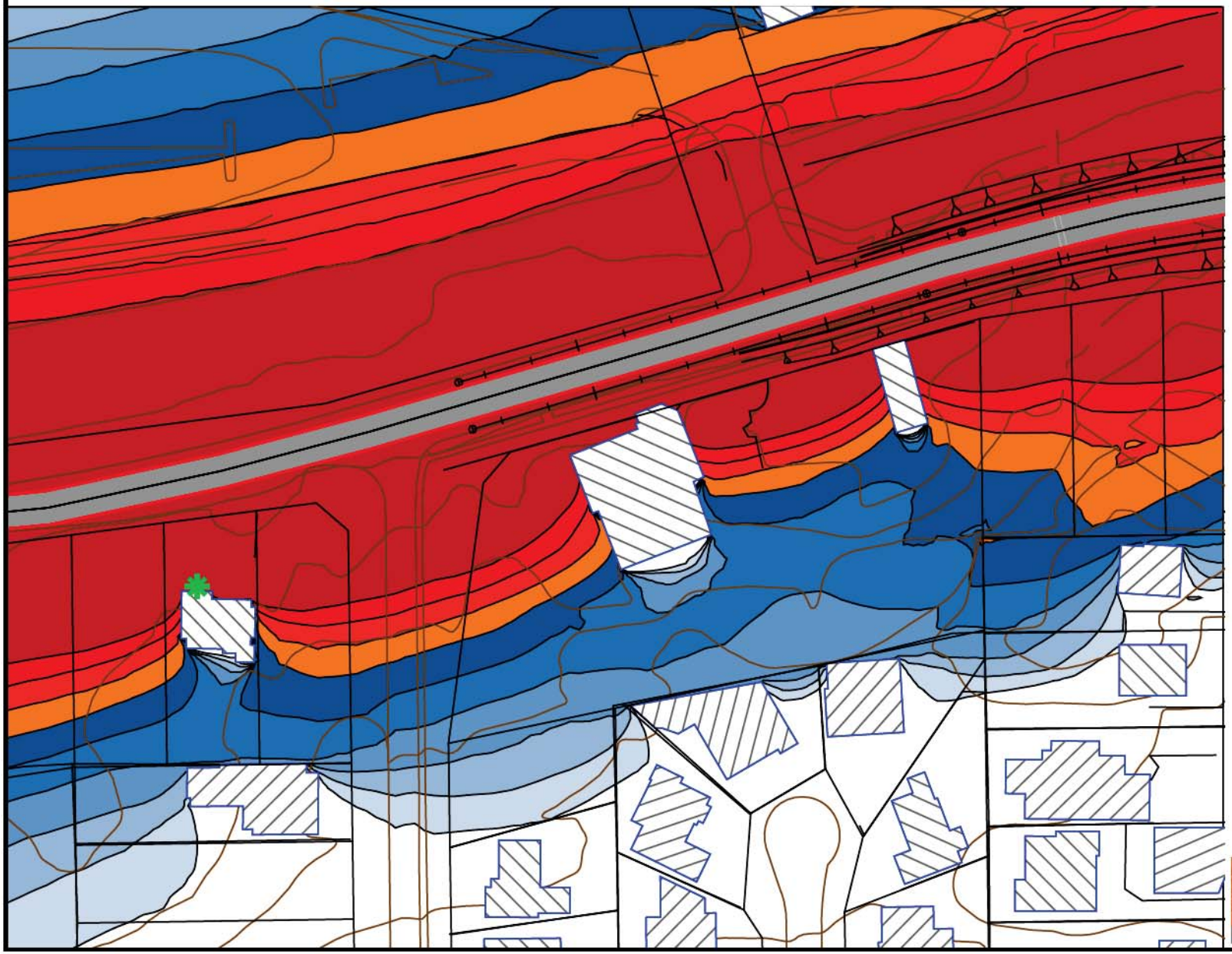


Figure 4-2

Coogee Hotel & Post Office

LAeq(Day) Noise Level Contours - Existing



Noise levels
LAeq,night dB

	< 55
55 <=	< 56
56 <=	< 57
57 <=	< 58
58 <=	< 59
59 <=	< 60
60 <=	< 61
61 <=	< 62
62 <=	< 63
63 <=	

Signs and symbols

- Road Surface
- Building
- Noise Logger

9 June 2015

Length Scale 1:1200

0 5 10 20 30 40 m

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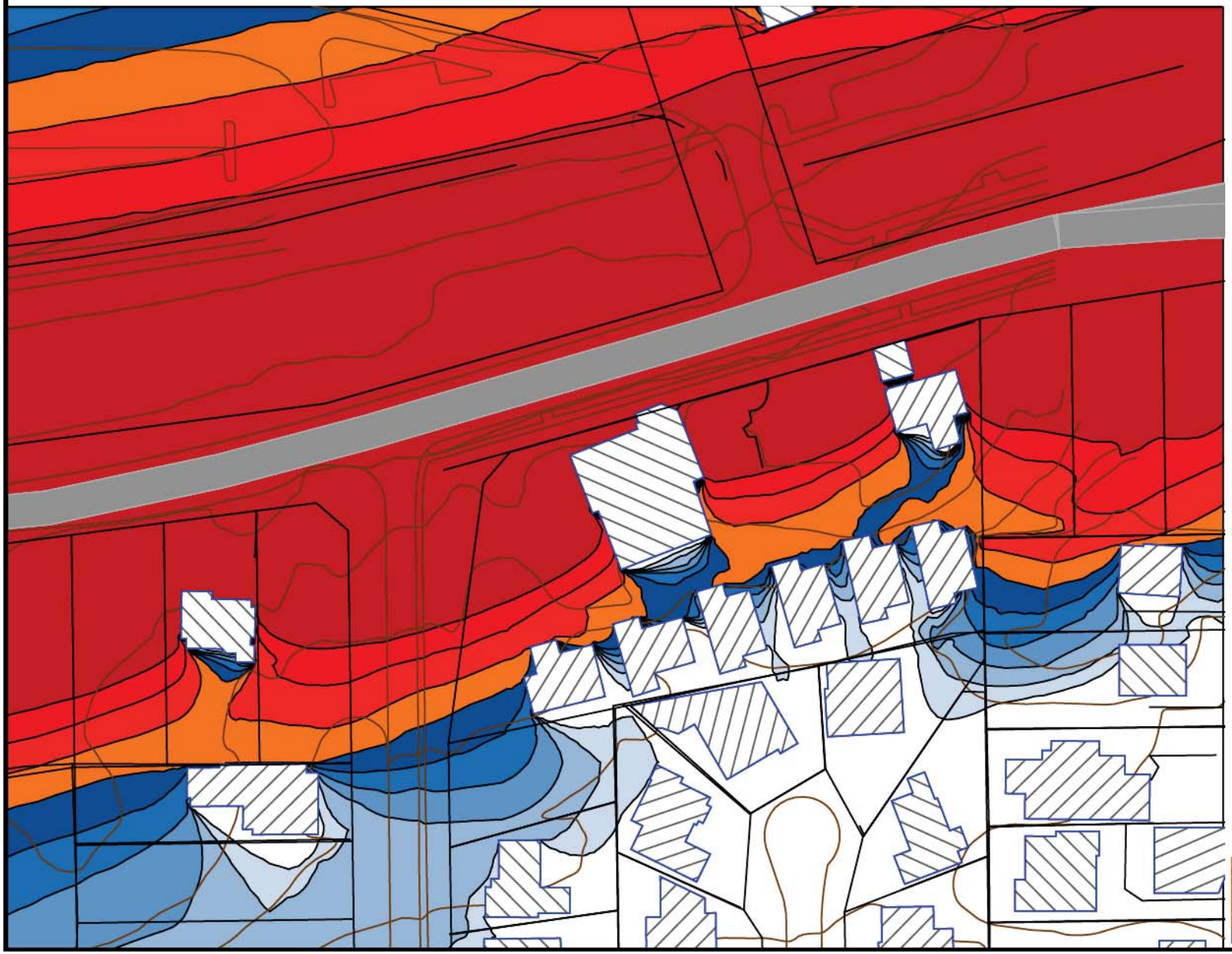
Figure 4-3

Coogee Hotel & Post Office

LAeq(Day) Noise Level Contours - Future



Noise levels
LAeq,Day dB

	< 55
55 <=	< 56
56 <=	< 57
57 <=	< 58
58 <=	< 59
59 <=	< 60
60 <=	< 61
61 <=	< 62
62 <=	< 63
63 <=	

Signs and symbols

Road Surface

Building

13 January 2016

Length Scale 1:1200

0 5 10 20 30 40 m

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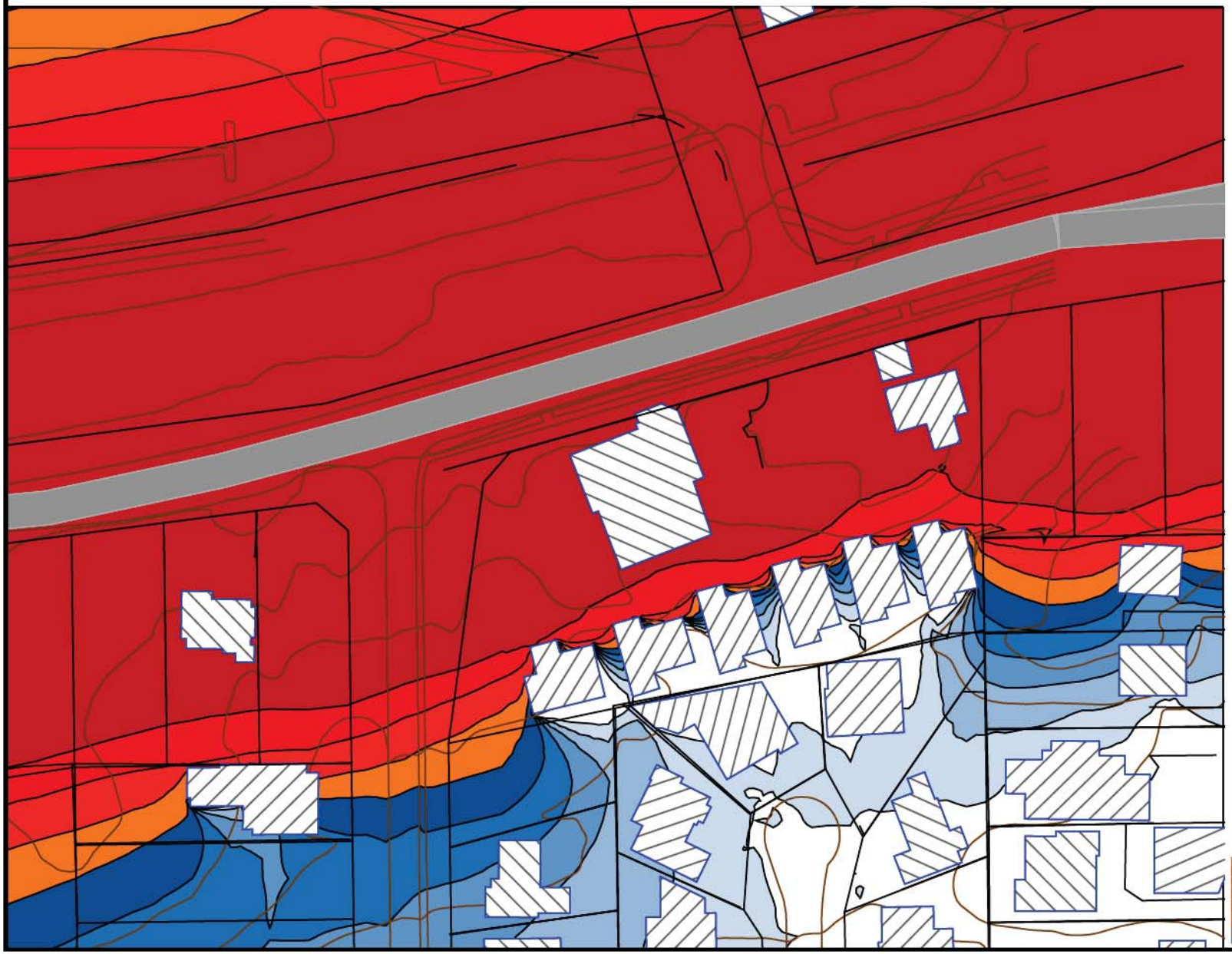
Figure 4-4

Coogee Hotel & Post Office

LAeq(Day) Noise Level Contours - Future: Upper Floor



Noise levels
LAeq,Day dB

	< 55
55 <=	< 56
56 <=	< 57
57 <=	< 58
58 <=	< 59
59 <=	< 60
60 <=	< 61
61 <=	< 62
62 <=	< 63
63 <=	

Signs and symbols

Road Surface

Building

13 January 2016

Length Scale 1:1200

0 5 10 20 30 40 m

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5 DISCUSSION

5.1 Road Traffic Results

In terms of road traffic noise impacts to the proposed residences, noise levels will be within the *margin* on the ground floor but above the *limit* at a potential upper floor. As such, these dwellings will require:

- Notifications on titles;
- Package A architectural upgrades (refer *Appendix A*) to ground floor; and
- Package B architectural upgrades (refer *Appendix A*) to upper floors.

Ground floor outdoor areas will be below the *limit* and therefore are considered to satisfy the reasonable acoustic amenity requirement. Locating an outdoor area on the east side of the future houses will result in noise levels to this area being below the *target* and as such, this should be encouraged.

As discussed in *Section 2.1*, there is no mandatory requirement for control of road traffic noise to the commercial parts of the development. However, external noise levels are likely to be in the order of 70 dB $L_{Aeq(Day)}$. Since the internal noise criteria is 5 dB higher than that for living areas or residential developments, Package C architectural upgrades can be considered for the commercial parts of the development. The final requirements will depend on what is permitted for the heritage parts of the building and what is the final use. In any case, the following recommendations are provided:

- Tenant to undertake a detailed review of road traffic noise impacts to their proposed tenancy once fit-out is known.
- Less sensitive spaces should be located closest to the road such as kitchens, toilets, storage, corridors etc. More sensitive spaces such as private offices, boardrooms etc should be located furthest from the road.
- External openings such as windows and doors shall be kept to a minimum, both in relation to the number of and size.
- External openings for mechanical services shall be acoustically treated so that these noise paths are not an acoustic weakness.

5.2 Environmental Noise

Whilst a detailed study cannot be undertaken at this stage in relation to the environmental noise emissions from commercial properties to neighbouring residences, the following recommendations are provided to minimise the noise impacts:

- Residence to have an outdoor living area on the east side of the building. This will provide an outdoor area shielded from both road traffic noise and commercial properties;
- Residences to incorporate an enclosed garage along the western boundary to minimise the noise sensitive areas adjoining the commercial areas;

- Parking and driveway areas to be a smooth asphalt surface. Any drainage grates or the like shall be plastic or steel fitted with rubber gasket to minimise impact noise as cars drive over.
- Tenant to undertake an environmental noise assessment to ensure compliance is achieved with the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*. Where a commercial tenancy will operate outside of the hours of 7am to 7pm Mondays to Saturdays, that tenancy must develop, maintain and implement a noise management plan.
- Design of the commercial tenancies to give consideration to their environmental noise emissions by:
    - Take into account noise specifications when selecting mechanical plant.
    - Ensure mechanical plant is appropriately vibration isolated from the building structure.
    - Select air-conditioning plant that has 'quiet' night mode settings.
    - Locate external plant away from the proposed residences and/or provide screening between the plant and residences.
    - Select equipment (e.g. exhaust fans) with variable speed drives.
    - Mechanical design to allow for attenuators to be incorporated within the design where appropriate.
    - Any external, alfresco type areas to be located on the western side of the building so that the commercial buildings provide screening to the residences.
    - No external speakers to be permitted for commercial tenants.
    - Plant is to be maintained in good working order.
    - Deliveries and commercial bin servicing to be restricted to 7am to 7pm, Mondays to Saturdays. Truck drivers to turn off their radios and vehicle's engines whilst unloading.

6 CONCLUSION & RECOMMENDATIONS

The concept plan shown for the structure plan is supported acoustically in that the most sensitive uses (residential) will be located furthest from the road, with commercial and public open space serving as a buffer to road traffic noise. Whilst there is no mandatory criteria for road traffic noise to commercial properties and in fact SPP 5.4 would encourage locating commercial uses adjacent major roads, control of road traffic noise to the commercial uses is still to be considered. Also, by locating commercial uses near residential uses, some consideration should also be given to noise emissions from these commercial properties to the residences.

Based on the concept plan, the following is recommended to support the local structure plan for Lot 512 Cockburn Road, Coogee:

- Proposed residences to have notifications on title. Notification to include potential noise from road traffic, as well as the adjoining commercial uses.
- Proposed residences to incorporate Package A (refer *Appendix A*) architectural treatments to ground floor and Package B architectural treatments to any upper floor.
- Each residence to incorporate an enclosed garage on the western side.

- Residence to have an outdoor living area on the east side of the building.
- Parking and driveway areas to be a smooth asphalt surface. Any drainage grates or the like shall be plastic or steel fitted with rubber gasket to minimise impact noise as cars drive over.
- Commercial properties to undertake a detailed review of road traffic noise impacts to their proposed tenancy once the fit-out is known. Prior to determining the fit-out, consideration should be given to:
    - Locating less sensitive spaces closest to the road such as kitchens, toilets, storage, corridors etc.
    - Locating more sensitive spaces such as private offices, boardrooms etc furthest from the road.
    - External doors and windows to be fitted with acoustic type seals.
    - External openings such as windows and doors shall be kept to a minimum, both in relation to the number of and size.
    - External openings for mechanical services shall be acoustically treated so that these noise paths are not an acoustic weakness.
- Commercial tenants to undertake an environmental noise assessment to ensure compliance is achieved with the prescribed standards of the *Environmental Protection (Noise) Regulations 1997*. Where a commercial tenancy will operate outside of the hours of 7am to 7pm Mondays to Saturdays, that tenancy must develop, maintain and implement a noise management plan.
- Design of the commercial tenancies to give consideration to their environmental noise emissions by:
    - Take into account noise specifications when selecting mechanical plant.
    - Ensure mechanical plant is appropriately vibration isolated from the building structure.
    - Select air-conditioning plant that has 'quiet' night mode settings.
    - Locate external plant away from the proposed residences and/or provide screening between the plant and residences.
    - Select equipment (e.g. exhaust fans) with variable speed drives.
    - Mechanical design to allow for attenuators to be incorporated within the design where appropriate.
    - Any external, alfresco type areas to be located on the western side of the building so that the commercial buildings provide screening to the residences.
    - No external speakers to be permitted for commercial tenants.
    - Plant is to be maintained in good working order.
    - Deliveries and commercial bin servicing to be restricted to 7am to 7pm, Mondays to Saturdays. Truck drivers to turn off their radios and vehicle's engines whilst unloading.

Appendix A

ACCEPTABLE TREATMENT PACKAGES

The packages and information provided on the following pages are taken from *Implementation Guidelines for State Planning Policy 5.4 Road and Rail Transport Noise and freight Considerations in Land Use Planning*; December 2014.

Where outdoor noise levels are above the *target* level, excluding the effect of any boundary fences, the Guidelines propose acceptable treatment packages that may be implemented without requiring detailed review. The packages are also intended for residential development only. At higher noise levels or for other building usages, specialist acoustic advice will be needed.

The acceptable treatment packages are intended to simplify compliance with the noise criteria, and the relevant package should be required as a condition of development in lieu of a detailed assessment.

Transition between each package should be made on the basis of the highest incident $L_{Aeq(Day)}$ or $L_{Aeq(Night)}$ value to the nearest whole number determined for the building development under assessment.

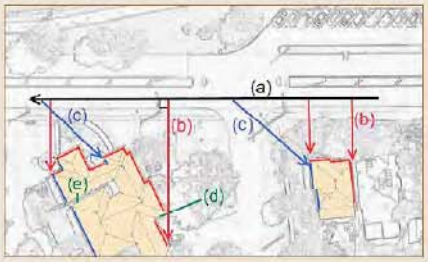
Any departures from the acceptable treatment specifications need to be supported by professional advice from a competent person that the proposal will achieve the requirements of the Policy.

With regards to the packages, the following definitions are provided:

- **Facing** the transport corridor: Any part of a building façade is 'facing' the transport corridor if any straight line drawn perpendicular to its nearest road lane or railway line intersects that part of the façade without obstruction (ignoring any fence).
- **Side-on** to transport corridor: Any part of a building façade that is not 'facing' is 'side-on' to the transport corridor if any straight line can be drawn from it to intersect the nearest road lane or railway line without obstruction (ignoring any fence).
- **Opposite** to transport corridor: Neither 'side on' nor 'facing', as defined above.

Determining building face orientation

The following sketch shows two residences in proximity to a road.



'Facing' façades are identified by drawing straight lines (b) perpendicular (at a 90 degree angle) to the road (a). Where these lines intersect a façade – without obstruction – the façades are shown in red as 'facing' the road.

Façades shown in blue are not 'facing' but have clear lines (c) that intersect the road at any angle, and are therefore classed as 'side on' to the road.

The remaining façades are 'opposite' to the road.

Package A

Area	Orientation to Road or Rail Corridor	Package A (up to 60 dB $L_{Aeq(Day)}$ and 55 dB $L_{Aeq(Night)}$)
Bedrooms	Facing	• Windows systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Side	• Windows systems: As above.
	Opposite	No requirements
Other Habitable Rooms Including Kitchens	Facing	• Windows and external door systems: Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to be same performance including brush seals.
	Side	• Windows and external door systems: As above.
	Opposite	No requirements
General	Any	• Walls (minimum $R_w + C_{tr}$ 45) – Two leaves of 90mm thick brick with minimum 50mm cavity • Roof and ceiling (minimum $R_w + C_{tr}$ 35) – Standard roof construction with 10mm plasterboard ceiling and minimum R2.5 insulation between ceiling joists. • Eaves to be closed using 4mm compressed fibre cement sheet. • Mechanical ventilation – Refer following pages.

Note: Any penetrations in a part of the building envelope must be acoustically treated so as to not downgrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

Package B

Area	Orientation to Road or Rail Corridor	Package B (up to 63 dB $L_{Aeq(Day)}$ and 58 dB $L_{Aeq(Night)}$)
Bedrooms	Facing	• Windows systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Side	• Windows systems: As above.
	Opposite	• Windows systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 25) – 4mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Alternatively, 6mm thick glass (monolithic, toughened or laminated) in sliding frame.
Other Habitable Rooms Including Kitchens	Facing	• Windows and external door systems: Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming $R_w + C_{tr}$ 31 performance. Alternative, change to hinged door with perimeter acoustic seals and 10mm thick glass.
	Side	• Windows and external door systems: Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Glass doors to be same performance ($R_w + C_{tr}$ 28) including brush seals.
	Opposite	No requirements
General	Any	• Walls (minimum $R_w + C_{tr}$ 50) – Two leaves of 90mm thick brick with minimum 50mm cavity. Cavity to include 25mm thick, 24kg/m^3 insulation and where wall ties are required, these are to be anti-vibration/resilient type. • Roof and ceiling (minimum $R_w + C_{tr}$ 35) – Standard roof construction with 10mm plasterboard ceiling and minimum R2.5 insulation between ceiling joists. • Eaves to be closed using 4mm thick compressed fibre cement sheet. • Mechanical ventilation – Refer following pages.

Note: Any penetrations in a part of the building envelope must be acoustically treated so as to not downgrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

Package C

Area	Orientation to Road or Rail Corridor	Package C (up to 65 dB $L_{Aeq(Day)}$ and 60 dB $L_{Aeq(Night)}$)
Bedrooms	Facing	• Windows systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 34) – 10.5mm thick VLam Hush glass in fixed sash, awning or casement opening with seals to openings.
	Side	• Windows systems: • Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Opposite	• Windows systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
Other Habitable Rooms Including Kitchens	Facing	• Windows and external door systems: Glazing up to 40% of floor area (minimum $R_w + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Doors to be either 40mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming $R_w + C_{tr}$ 31 performance. Alternatively, change to fully glazed hinged door with perimeter acoustic seals and 10mm thick glass.
	Side	• Windows and external door systems: Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals certified to R_w 30. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming $R_w + C_{tr}$ 31 performance. Alternatively, change to hinged door with perimeter acoustic seals and 10mm thick glass.
	Opposite	• Windows systems: Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
General	Any	• Walls (minimum $R_w + C_{tr}$ 50) – Two leaves of 90mm thick brick with minimum 50mm cavity. Cavity to include 25mm thick, 24kg/m^3 insulation and where wall ties are required, these are to be anti-vibration/resilient type. • Roof and ceiling (minimum $R_w + C_{tr}$ 40) – Standard roof construction with 2 x 10mm plasterboard ceiling and minimum R3.0 insulation between ceiling joists. • Eaves to be closed using 6mm thick compressed fibre cement sheet. • Mechanical ventilation – Refer following pages.

Note: Any penetrations in a part of the building envelope must be acoustically treated so as to not downgrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

Mechanical Ventilation requirements

It is noted that natural ventilation must be provided in accordance with F4.6 and F4.7 of Volume One and 3.8.5.2 of Volume Two of the National Construction Code. Where the noise *limit* is likely to be exceeded, a mechanical ventilation system is usually required. Mechanical ventilation systems will need to comply with AS 1668.2 – *The use of mechanical ventilation and air-conditioning in buildings*.

In implementing the acceptable treatment packages, the following must be observed:

- Evaporative air conditioning systems will meet the requirements for Packages A and B provided attenuated air vents are provided in the ceiling space and designed so that windows do not need to be opened.
- Refrigerant based air conditioning systems need to be designed to achieve fresh air ventilation requirements.
- External openings (e.g. air inlets, vents) need to be positioned facing away from the transport corridor where practicable.
- Ductwork needs to be provided with adequate silencing to prevent noise intrusion.

Notification

Notifications on certificates of title and advice to prospective purchasers warning of the potential for noise impacts from major transport corridors help with managing expectations.

The area of land for which notification is required should be identified in the noise management plan and contain a description of major noise sources nearby (e.g. 24-hour freight rail).

Notification should be provided to prospective purchasers, and required as a condition of subdivision (including strata subdivision) for the purposes of noise sensitive development or planning approval involving noise sensitive development, where external noise levels are forecast or estimated to exceed the 'target' criteria as defined by the Policy.

In the case of subdivision and development, conditions of approval should include a requirement for registration of a notice on title, which is provided for under Section 165 of the Planning and Development Act 2005 and Section 70A of the Transfer of Land Act 1893. An example of a suitable notice is:

Notice: This lot is situated in the vicinity of a transport corridor and is currently affected, or may in the future be affected, by transport noise. Transportation noise controls and Quiet House design strategies at potential cost to the owner may be required to achieve an acceptable level of noise reduction. Further information is available on request from the relevant local government offices.

Appendix B

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

L_{ASlow}

This is the noise level in decibels, obtained using the A frequency weighting and the S time weighting as specified in AS1259.1-1990. Unless assessing modulation, all measurements use the slow time weighting characteristic.

L_{AFast}

This is the noise level in decibels, obtained using the A frequency weighting and the F time weighting as specified in AS1259.1-1990. This is used when assessing the presence of modulation only.

L_{APeak}

This is the maximum reading in decibels using the A frequency weighting and P time weighting AS1259.1-1990.

L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

L_{A1}

An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "*intrusive*" noise level.

L_{Aeq}
The equivalent steady state A-weighted sound level ("equal energy") in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the "average" noise level.

L_{A90}
An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the "*background*" noise level.

$L_{A10,18hour}$
The $L_{A10,18\ hour}$ level is the arithmetic average of the hourly L_{A10} levels between 6.00 am and midnight. The *CoRTN* algorithms were developed to calculate this parameter.

$L_{Aeq,24hour}$
The $L_{Aeq,24\ hour}$ level is the logarithmic average of the hourly L_{Aeq} levels for a full day (from midnight to midnight).

$L_{Aeq,8hour}$ / $L_{Aeq\ (Night)}$
The $L_{Aeq\ (Night)}$ level is the logarithmic average of the hourly L_{Aeq} levels from 10.00 pm to 6.00 am on the same day.

$L_{Aeq,16hour}$ / $L_{Aeq\ (Day)}$
The $L_{Aeq\ (Day)}$ level is the logarithmic average of the hourly L_{Aeq} levels from 6.00 am to 10.00 pm on the same day. This value is typically 1-3 dB less than the $L_{A10,18hour}$.

One-Third-Octave Band
Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level
Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise
A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between -

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

Modulating Noise

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

a variation in the emission of noise that —

(a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;

(b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness is:

a variation in the emission of a noise where the difference between $L_{A\ peak}$ and $L_{A\ Max\ slow}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing Factor (IF)

$$= \frac{1}{10}(\%\ \text{Type A}_{100} + \%\ \text{Type A}_{450}) + \frac{1}{20}(\%\ \text{Type B}_{100} + \%\ \text{Type B}_{450})$$

where:

$\%\ \text{Type A}_{100}$ = the percentage of industrial land within a100m radius of the premises receiving the noise

$\%\ \text{TypeA}_{450}$ = the percentage of industrial land within a 450m radius of the premises receiving the noise

$\%\ \text{Type B}_{100}$ = the percentage of commercial land within a100m radius of the premises receiving the noise

$\%\ \text{TypeB}_{450}$ = the percentage of commercial land within a 450m radius of the premises receiving the noise

+ Traffic Factor (maximum of 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 100m

R_w

This is the weighted sound reduction index and is similar to the previously used STC (Sound Transmission Class) value. It is a single number rating determined by moving a grading curve in integral steps against the laboratory measured transmission loss until the sum of the deficiencies at each one-third-octave band, between 100 Hz and 3.15 kHz, does not exceed 32 dB. The higher the R_w value, the better the acoustic performance.

C_{tr}

This is a spectrum adaptation term for airborne noise and provides a correction to the R_w value to suit source sounds with significant low frequency content such as road traffic or home theatre systems. A wall that provides a relatively high level of low frequency attenuation (i.e. masonry) may have a value in the order of –4 dB, whilst a wall with relatively poor attenuation at low frequencies (i.e. stud wall) may have a value in the order of -14 dB.

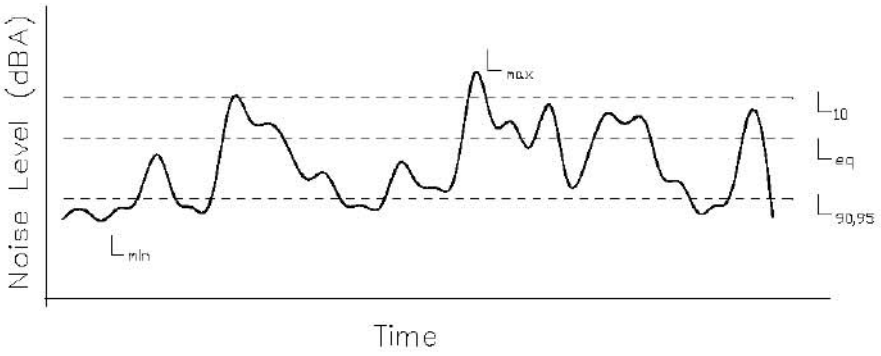
Satisfactory Design Sound Level

The level of noise that has been found to be acceptable by most people for the environment in question and also to be not intrusive.

Maximum Design Sound Level

The level of noise above which most people occupying the space start to become dissatisfied with the level of noise.

Chart of Noise Level Descriptors



Austroads Vehicle Class

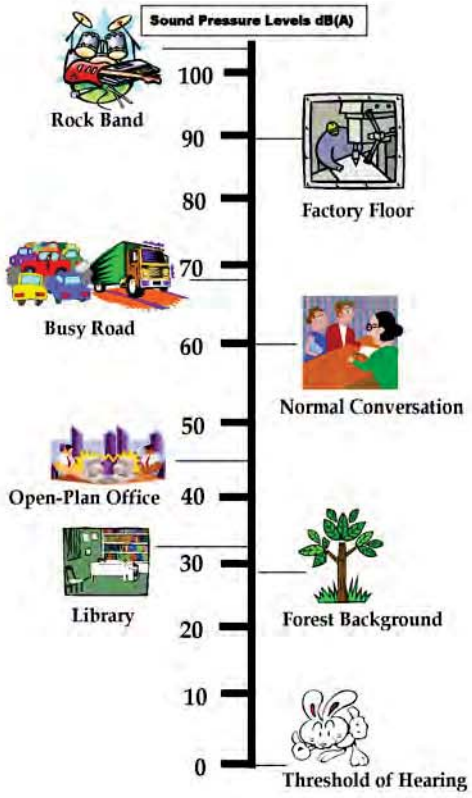
AUSTROADS Vehicle Classification System

Level 1 Length (Indicative)	Level 2 Axles and Axle Groups		Level 3 Vehicle Type	AUSTROADS Classification		
Type	Axles	Groups	Typical Description	Class	Parameters	Typical Configuration
					LIGHT VEHICLES	
Short up to 5.5m		1 or 2	Short Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	d(1) < 3.2m and axles = 2	
	3, 4 or 5	3	Short – Towing Trailer, Caravan, Boat, etc	2	groups = 3 d(1) ≥ 2.1m, d(1) < 3.2m, d(2) ≥ 2.1m and axles = 3, 4 or 5	
					HEAVY VEHICLES	
Medium 5.5m to 14.5m	2	2	Two Axle Truck or Bus	3	d(1) > 3.2m and axles = 2	
	3	2	Three Axle Truck or Bus	4	axles = 3 and groups = 2	
	> 3	2	Four Axle Truck	5	axles > 3 and groups = 2	
Long 11.5m to 19.0m	3	3	Three Axle Articulated Three axle articulated vehicle, or Rigid vehicle and trailer	6	d(1) < 3.2m, axles = 3 and groups = 3	
	4	> 2	Four Axle Articulated Four axle articulated vehicle, or Rigid vehicle and trailer	7	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 4 and groups > 2	
	5	> 2	Five Axle Articulated Five axle articulated vehicle, or Rigid vehicle and trailer	8	d(2) < 2.1m or d(1) < 2.1m or d(1) > 3.2m axles = 5 and groups > 2	
	> 6	> 2	Six Axle Articulated Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3	
Medium Combination 17.5m to 36.5m	> 6	4	B Double B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6	
	> 6	5 or 6	Double Road Train Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6	
Large Combination Over 33.0m	> 6	> 6	Triple Road Train Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6	

Definitions: Group: Axle group, where adjacent axles are less than 2.1m apart
Groups: Number of axle groups
Axles: Number of axles (maximum axle spacing of 10.0m)

d(1): Distance between first and second axle
d(2): Distance between second and third axle

Typical Noise Levels



APPENDIX D

TRANSPORT IMPACT ASSESSMENT

TRANSPORT IMPACT STATEMENT

Lot 512 Cockburn Road,

Coogee

August 2016

Rev C

kctt

HISTORY AND STATUS OF THE DOCUMENT

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Rev A	23.04.2015	C Kleyweg	C Kleyweg	23.04.2015	Issued for Review
Rev B	04.05.2015	C Kleyweg	C Kleyweg	04.05.2015	Additional comments re tip generation / attraction
Rev C	26.08.2016	M Kleyweg	M Kleyweg	29.08.2016	Additional comments by e-mail 26/08/2016

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Revision	Date of issue	Quantity	Issued to
Rev A	23.04.2015	1 (PDF)	Mr Mike Betham (State Haritage Office) Mr Jaclyn Drummond (Burgess Design Group)
Rev B	04.05.2015	1 (PDF)	
Rev C	29.08.2016	1 (PDF)	

Document Printed	29/08/2016 2:12 PM
File Name	D:\Box Sync\Box Sync\KCTT Projects\KC00000 Archived Projects\KC00322.000 Lot 512 Cockburn Road Coogee TIA\Outgoing\Report & Appendices\160826 Rev C\KC00322 000 Lot 512 Cockburn Road Coogee TIA Rev C.docx
Author	Marina Lipovac Tanaskovic
Project Manager	Marina Kleyweg
Name of the Project	Lot 512 Cockburn Road, Coogee
Name of the Document	Lot 512 Cockburn Road, Coogee - Transport Impact Statement
Document Version	KC00322.000_R01 Rev C

Table of Contents

Tables

Appendices

Appendix 1 – The Layout of the Proposed Development

Appendix 2 – Transport Planning and Traffic Plans

Appendix 3 – Vehicle Turning Circle Plan

1. Introduction

1.1 Transport Impact Statement Layout

KCTT have been requested to provide a Transport Impact Statement for the proposed development of Lot 512 Cockburn Road, Coogee. This Transport Impact Statement has been completed in accordance with the guidelines illustrated in the WAPC Transport Impact Assessment Guidelines – Part 2 (Structure Plans).

The purpose of this document is to provide commentary and analysis on the parking requirements and potential traffic and transport impact that the proposed development of this site may have on the surrounding road and transportation networks.

The following is the scope of work in this report: -

- Discuss and review all road improvement works undertaken by Main Roads WA on Cockburn Road in the vicinity of the property, and discuss any future upgrade requirements which may impact the property.
- Undertake research relating to public transport routes, bicycle networks and pedestrian path networks;
- Undertake research on the road network inclusive of VPD and AM / PM peak data for Cockburn Road;
- Review the proposed parking volumes and provide commentary relating to the proposed development and its likely requirements for parking;
- Review the likely impact of the development on the adjacent road network in terms of its likely daily traffic generation, likely hours of operation, likely impacts in the AM and PM peaks and the likely traffic flow from the subject site into the external network;
- Review any likely issues with site safety;
- Provide vehicle turning movements, checking issues such as waste management;
- Provide graphics for vehicle turning movements, pedestrian, cyclist and public transport mapping, daily, AM and PM traffic volumes, traffic flow diagrams, locality plan (inclusive of local parking and nearest community land-uses inclusive of shopping, schools etc);
- Complete a report and checklist in accordance with the requirements of the WAPC Transport Impact Assessment Guidelines – Individual Developments.
- SIDRA analysis at key local intersection of Cockburn Road, Powell Parade and the site entrance, plus the intersection of Cockburn Road and Beach Road.

This Transport Impact Statement is presented in the following sequence: -

- Section 1 – Introduction

This section provides a brief description on the role of this report in the Local Structure Plan process, the general layout of the report and a list of the guideline and reference documents used in its composition.

- Section 2 – Transport Impact Statement

This section provides research and analysis of the key items required for submission of a Transport Impact Statement for Local Structure Plans in accordance with the Transport Assessment Guidelines nominated above. In this section, KCTT have examined the following subject areas: -

- Section 2.1 – Outline of the Development Proposal

This section provides a brief description of the proposed land uses, as will be submitted to the City of Cockburn for this Local Structure Plan.

- Section 2.2 – Vehicle Access and Parking

This section provides a detailed description of the parking requirements using the local authority planning scheme provisions and providing a detailed assessment of whether reciprocity of parking requirements are appropriate in this proposal.

- Section 2.3 – Provision for Delivery and Service Vehicles

This section provides a detailed assessment of the requirements for delivery and service vehicles, both within the subject site and at intersections within the surrounding road networks.

- Section 2.4 – Hours of Operation

This section describes the general operating times for the proposed land usage as proposed under this Local Structure Plan. This information will assist in determining the likely timing of the AM and PM peaks, and therefore the peak impact on the existing and surrounding transportation network. The peak vehicle generation is the key for determining intersection capacities within a road network.

- Section 2.5 – Daily Vehicular Volumes and Vehicular Types

This section provides details on traffic generation rates used to determine daily traffic generation from the proposed development. It also discusses the estimated peak hour traffic as well as the expected predominant type of vehicle which will be accessing the proposed development.

- Section 2.6 – Management of Traffic Generated by the Subject Site

This section summarises the expected traffic generated by the land uses as proposed in the Local Structure Plan for the subject site and provides an assessment of the cumulative impact of the existing traffic volumes and the proposed traffic volumes as generated by the development.

- Section 2.7 – Public Transport Access

This section provides a summary of the existing public transportation services available within an 800 metre radius of the subject site and whether any improvements to the network should be considered.

- Section 2.8 – Pedestrian and Cyclist Access

This section provides a summary of the existing pedestrian and cyclist infrastructure available within an 800 metre radius of the subject sites boundaries and whether any improvements to the networks should be considered.

- Section 3 – Transport Impact Statement Checklist

This section provides a concise, tabulated Executive Summary of the detailed information presented in Section 2 of this report. The intention of this checklist is to document the findings of this report, and / or any of the likely transportation / safety issues which should be considered as part of the Local Structure Plan submission. This checklist has been developed in accordance with the requirements of the Transport Assessment Guidelines for Local Structure Plans.

1.2 Notes Pertaining To This Report

This report has been provided as one of the inputs into the overall Local Structure Plan submission to the City of Cockburn for the proposed mixed use development of Lot 512 Cockburn Road, Coogee on behalf of the proponent.

1.3 Available Information and Technical Literature

This section provides a brief description of the inputs used in the compilation of this report: -

- WAPC Transport Impact Assessment Guidelines – Volume 2 Structure Plans
- WAPC Transport Impact Assessment Guidelines – Volume 5 (referenced for PM peak hour and traffic splits)
- NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation / attraction rates for various land uses)
- Guide to Traffic Management – Part 3: Traffic Studies and Analysis, Austroads, 2008
- Guide to Traffic Management – Part 11: Parking, Austroads, 2008
- Guide to Traffic Management – Part 12: Traffic Impacts of Developments, Austroads, 2008
- City of Cockburn Town Planning Scheme Nº3, Adopted 20th December 2002, updated 20th May 2014;

2. Transport Impact Statement

2.1 Outline of the Development Proposal

This Local Structure Plan considers the proposed development of Lot 512 Cockburn Road, Coogee under the jurisdiction of the City of Cockburn. The site is bounded by Cockburn Road to the west, Beach Road to the south and residential property lots to the north and east. Proposed commercial / office would be situated in the existing Old Coogee Hotel and the existing Old Coogee Post Office which are currently abandoned.

The proposed LSP is a mixed land use comprising of: -

Table 1 - Proposed Land Uses within the Development

Type	Units	Yield [Building Area]	Yield [Lot Area]
Residential			
Residential	6	132 to 143m² each	340 to 348m² each
Total Residential	**6**	**n.a.**	**n.a.**
POS			
Public Open Space 1		-	780m²
Public Open Space 2		-	223m²
Commercial / Office			
Old Coogee Hotel	1	611 m²	1,297m²
Old Coogee Post Office *	1	189 m²	527m²
Total Commercial		**800 m²**	**1,824m²**

Note: * Old Coogee Post Office includes 1 residential unit and 1 commercial unit.

Plans for the proposed LSP have been provided in Appendix 1 of this report.

2.2 Vehicular Access and Parking

2.2.1 Vehicular Access

The subject site offers vehicular access from Beach Road and fronts Cockburn Road.

Cockburn Road is classified as an Urban Highway / Primary Distributor by Main Roads Western Australia. In the vicinity of the subject site, Cockburn Road is a two-way two-lane undivided road with a speed limit of 70kph. There are currently two bus services, Routes No 522 and 825, which operate on this road with the bus stop fronting the subject site. In the vicinity of the subject site pedestrian paths are provided on the eastern side. On-street parking is not allowed on either side of the road reservation. No vehicular access will be allowed from the development of the subject site to Cockburn Road.

Beach Road is classified as an Urban Local Road / Access Road by Main Roads Western Australia. In the vicinity of the subject site, Beach Road is a two-way one-lane undivided road with provision for on-street parking. The legal speed limit on Beach Road is 50kph. Pedestrian paths are provided on the northern sides of the road reservation. There is currently one bus service, (Route No 522) which operates on this road. The intersection of Cockburn Road and Beach Road is a full movement intersection.

The table below shows the most recent available traffic data for the surrounding network. The following information has been obtained from Main Roads WA and from the City of Cockburn.

Table 2 - Traffic Volumes for Roads Adjacent to the Subject Site

Road Name	Functional Classification / Road Hierarchy	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)	Heavy Vehicle %	Year	Legal Speed Limit
Cockburn Road – H025 [2.42 – 5.36]	Urban Highway / Primary Distributor	South of Spearwood Avenue	18,683	AM 07:15 – 1,705 PM 16:30 – 1,841	8.5	March 2014	70kph
		North of Orsino Boulevard	15,151	AM 07:30 – 1,443 PM 16:30 – 1,568	9.0	September 2013	
		North of Powell Road	16,059	AM 07:30 – 1,556 PM 16:30 – 1,696	8.8		
		North of Amity Boulevard	15,527	AM 07:30 – 1,552 PM 16:30 – 1,648	9.2		
Hamilton Street*	Significant Urban Local Road / Distributor A	North of Winfield Street	7,139	AM 11:15 – 514 PM 16:30 – 636	4.7	April 2013	60kph
	Significant Urban Local Road / Distributor B	60m North of King Street	7,848	n/a	n/a	February 2005	50kph
		60m South of King Street	6,143	n/a	n/a	February 2005	
Beach Road*	Urban Local Road / Access Road	60m East of Cockburn Road	1,486	n/a	n/a	November 2007	50kph
Mills Street*	Urban Local Road / Access Road	20m South of Dowse Court	692	n/a	n/a	November 2007	50kph
Kiesey Street*	Urban Local Road / Access Road	80m East of Cockburn Road	942	n/a	n/a	January 2007	50kph
King Street	Urban Local Road / Access Road	30m West of Hillcrest Street	918	n/a	n/a	May 2002	50kph
		14m East of Hillcrest Street	1,689	n/a	n/a	November 2007	
Hillcrest Street*	Urban Local Road / Access Road	30m South of King Street	247	n/a	n/a	April 2005	50kph
Fairview Street*	Urban Local Road / Access Road	50m North of Beach Road	169	n/a	n/a	November 2007	50kph
Duchart Way*	Urban Local Road / Access Road	20m East of Dalmatia Court	380	n/a	n/a	November 2006	50kph

Note* This traffic volume data is sourced from the City of Cockburn. All other data is sourced from Main Roads Western Australia.

Formal peak hour data has been recorded and shown in Table 2 for various locations. The most significant of these is Cockburn Road – North of Powell Road. An analysis of the available data within 400 metres of the proposed development suggests the following peak periods: -

- Cockburn Road – (North of Powell Road):
  - AM peak occurs in the period between 07:30 and 08:30. Traffic volumes in the AM peak are approximately 9.7% of the total daily volumes;
  - PM peak occurs in the period between 16:30 and 17:30. Traffic volumes in the PM peak are approximately 10.6% of the total daily volumes.

2.2.2 Crash Data

The following table shows the crash data from the Main Roads WA database for crashes and incidents for roads adjacent to the subject site between the 1st January 2011 and 31st December 2015.

Table 3 - Crash Data

Road Name	Road Hierarchy	Functional Classification	Speed Limit	Crash Statistics	
Cockburn Road [2.42 – 5.07]	Primary Distributor	Urban Highway	70kph	Total of 58 incidents: • 5 Hospital • 11 Medical • 28 PDO Major • 14 PDO Minor MR Type: • 4 Involving Overtaking • 1 Involving Parking • 1 Involving Animal • 52 Other/ Unknown	MR Nature: • 30 Rear End • 7 Sideswipe Same Direction • 3 Right Angle • 11 Right Turn Thru • 1 Hit pedestrian • 3 Hit Object • 2 Non Collision • 1 Other/ Unknown
Cockburn Road & Beach Road	Primary Distributor / Access Road	Urban Highway / Urban Local Road	70kph / 50kph	Total of 4 incidents: • 1 Medical • 2 PDO Major • 1 PDO Minor MR Type: • 4 Other/ Unknown	MR Nature: • 2 Rear End • 2 Right Angle
Beach Road & Mills Street	Access Road / Access Road	Urban Local Road / Urban Local Road	50kph / 50kph	Total of 1 incident: • 1 PDO Major MR Type: • 1 Other/ Unknown	MR Nature: • Right Angle
Cockburn Road & Powell Road	Primary Distributor / Access Road	Urban Highway / Urban Special Purpose Road	70kph / 50kph	Total of 1 incidents: • 1 PDO Minor MR Type: • 1 Involving Pedestrian	MR Nature: • 1 Hit Pedestrian

KCTT have reviewed the crash data presented above. We have reviewed the likelihood of incidents at the Cockburn Road from SLK 2.42 to SLK 5.97 [3,550 metres] as:

Cockburn Road from SLK 2.42 to SLK 5.97 [3,550 metres]

- Killed and Serious Injury (KSI) Crashes (Fatality + Hospital) = 5 per every 5 years;
- All Crashes = 58 per every 5 years.

Main Roads WA utilise the Crash Rate / MVKT (million vehicle kilometres travelled) to compare crash rates across the entire road network. The calculations for MVKT for this section of road are: -

Cockburn Road from SLK 2.42 to SLK 5.97 [3,550 metres]

- Approximately 16,000 VPD
- VKT (5 year period) = 16,000 * 365 * 5 years * 3.55km = 103.66 MVKT
- KSI Crash Rate = 5 per 103.66 MVKT = 0.05
- All other crash Rate = 58 per 103.66 MVKT = 0.56

Therefore the crash rate along Cockburn Road from SLK 2.42 to SLK 5.97 is 58 incidents per 103.66 million kilometres travelled or equivalent to an incident rate of 0.56 crashes / MVKT. This rate is lower than the network average of 3.52 crashes / MVKT over a 5-year period.

The crash rate for KSI crashes along Cockburn Road is 5 incident recorded in the 5 year period per 103.66 million kilometres travelled or equivalent to an incident rate of 0.05 crashes / MVKT. This crash rate is lower than the network average of 0.18 over the 5 years. Average crash rates for the metropolitan road network can be seen in the table below obtained from Main Roads WA.

CRASH DENSITY AND CRASH RATE ON METROPOLITAN LOCAL ROADS NETWORK ONLY

	ALL CRASHES		KSI CRASHES (FAT+HOS)	
	DENSITY ALL CRASHES/KM over 5 years	CRASH RATE/MVKT	DENSITY KSI CRASHES/KM over 5 years	CRASH RATE/MVKT
LOCAL - MIDBLOCK	3.52	1.17	0.18	0.06
LOCAL - ALL	7.69	2.54	0.37	0.12

NOTE: BASED ON 5-YEARS DATA FOR THE PERIOD 2009 TO 2013.

The volume of incidents at the intersection of Cockburn Road and Beach Road is not significant given the volumes of traffic on Cockburn Road. All access and egress to Cockburn Road has been removed from this site to limit the interaction with Cockburn Road and therefore to improve safety.

2.2.3 Vehicle Parking Requirements

Vehicle parking requirements are provided for both the current City of Cockburn Town Planning Scheme No 3 and in conjunction with the Residential Design Codes.

Residential Parking

The City of Cockburn Town Planning Scheme No 3 states that residential parking requirements are to be calculated in accordance with the Residential Design codes.

Section 6.5.1 of the Residential Design Codes, On-Site Parking Provision, provides guidance on the minimum parking provision requirements for single houses:-

- Parking for residents (dwelling area > 120m^2) – 2 parking spaces per dwelling;
- Parking for visitors - 0.25 parking spaces per dwelling.

Non-residential parking

Section 5.9 of the City of Cockburn Town Planning Scheme No 3, Commercial and Industrial Uses, Table 3, Vehicle Parking Provision provides guidance on the requirements of parking provisions for commercial developments. The following parking requirement should be considered applicable: -

- Office - 1 space per 50m² GLA.

We have used office for general purposes to determine a likely base parking requirement. The table below shows the minimum likely car parking requirements for the indicative development layout shown in Appendix 1 which has been calculated in accordance with the Residential Design Codes and the revised City of Cockburn Town Planning Scheme No 3. Given the project is at LSP phase presently, the nominated land uses below are provided as a guide only and are subject to change.

Table 4 - Car Parking Requirements (R Codes and City of Cockburn Parking and Access Policy Manual Requirements)

Criteria / Units	Requirement	Unit / Yield	Total
Residential Land Use - Resident's Parking			
Residential Units with GFA >=110m²	2 parking bays per dwelling	6	12*
Residential Land Use - Visitor's Parking			
Residential Units	0.25 parking bays per dwelling	6	2
Total – Residential (Visitors Bays)			**2 ***
Non-Residential Land Use			
Coogee Hotel (allow potential office land usage)	1 space per 50m² GLA	611m² GLA	13
Coogee Post Office (allow potential office land usage)	1 space per 50m² GLA	189m² GLA	4
Total - Offices			**17**
Total for the Development			**19**

Note The parking bays for the residential land uses have been shown locally within each lot within a double garage.*

With reference to the Residential Design Codes and the City of Cockburn Town Planning Scheme No 3, the proposed development configuration shown in the LSP would require a total of **19** car parking bays, plus provision of on-site parking within each of the proposed residential allotments to suit the residential yield. The current indicative layout shows 22 parking bays, plus 1 ACROD bay and 1 loading bay. We believe the site can therefore accommodate a development of this size and scale.

2.2.4 Bicycle Parking

Section 5.9 of the City of Cockburn Town Planning Scheme No 3, Commercial and Industrial Uses, Table 3, Vehicle Parking Provision stipulates that bicycle parking provisions for the proposed development should be made in accordance with the ratio shown below in Table 5.

- Restaurant – not applicable for single houses;
- Office - 1 space per 500m² GLA

Table 5 - Bicycle Parking Requirements (City of Cockburn Town Planning Scheme No3)

Land Use	Yield	Employee / Resident Parking Spaces	No of Parking Spaces
Residential House	6 Units	n/a	0
Office	189m²	1 space per 500m² GLA for employees	1

Office	611m²	1 space per 500m² GLA for employees	2
Total			**3**

The table above shows the minimum requirements for the proposed development is 3 bicycle parking spaces in accordance with Section 5.9 of the City of Cockburn Town Planning Scheme Nº3, Commercial and Industrial Uses, Table 3 – Vehicle and Bicycle Parking Provision.

2.2.5 ACROD Parking

The commercial component of the subject development is classified as Class 5 according to the Australian Building Code and requires the provision of a minimum of 1 ACROD bay per 100 standard car bays provided. The proposed plan identifies a total of 1 ACROD bay in accordance with this requirement.

Class 5 - *(An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9)*:

- 1 ACROD bay for every 100 carparking spaces or part thereof.

This development proposal is deemed as satisfying the National Construction Code Series' requirements.

2.3 Provision for Delivery and Service Vehicles

The subject site fronts Cockburn Road and Beach Road, offering vehicular access / egress to the proposed development solely via Beach Road to the south of the site. Delivery and service vehicles will be allotted a parking bay within subject site.

The minimum parking requirements for provision of delivery and service vehicles according to the NSW RTA Guide to Traffic Generating Developments are as follows: -

- Residential flat buildings (50% of spaces adequate for trucks):
  - < 200 flats or home units - 1 space per 50 flats or home units;

The minimum parking requirements for provision of delivery and service vehicles according to Section 5.9 of the City of Cockburn Town Planning Scheme No3, Commercial and Industrial Uses, Table 3, Vehicle Parking Provisions are as follows: -

- Residential - not applicable;
- Office - 1 per 500m²;

The following table provides a preliminary calculation for the delivery and service vehicle parking requirements for the proposed development on the basis of the development yields.

Table 6 - Provision of Delivery and Service Vehicle Parking for Development

Land Use Type	Parking Requirements	Yields	Parking Bays
Residential	1 space per 50 flats or home units	6	1
Office	1 per 500m²	800m²	2
Total Vehicle Parking for Proposed Development			**3 ***

Note: * It is expected that service bays will not be utilised concurrently for residential and commercial use therefore reciprocity can be applied. We believe that a total of 1 designated service vehicle parking space would be

sufficient to cater for the total requirements of this development. This is further supported on the basis that the parking space requirement for residential land usage requires only one space for up to 50 home units and the total proposed is 6 dwellings.

West Vehicles movements being accommodated with an adequate circle (Appendix 3).

2.4 Hours of Operation

For residential land uses, the hours of operation are not applicable. The peak trip generations from a residential development are likely to be between 07:30 - 08:30 daily for the morning and 16:00 - 17:00 in the evening peak.

Office hours are likely to be generally between 08:00 and 17:00 which will generally coincide with the AM and PM peak for residential purposes.

An analysis of traffic volumes data obtained from the MRWA from September 2013 for Cockburn Road north of Powell Road shows that the morning peak is in the period between 07:30 - 08:30 and the afternoon peak period is between 16:30 and 17:30.

The expected peak operating times for the proposed development will coincide with AM and PM peak times for traffic on Cockburn Road, however because the yields are relatively low for the proposed development, we do not believe the intersection of Beach Road and Cockburn Road will exhibit a decreased LOS.

2.5 Daily Vehicular Volumes and Vehicular Types

The WAPC Transport Assessment Guidelines for Developments offers the following AM / PM peak vehicle trip generation rates for the proposed residential land uses in this development: -

- **Residential** - 0.8 vehicle trips per dwelling for the AM and PM peak hours. A 25% IN / 75% OUT split has been adopted for the AM peak and a 67% IN / 33% OUT split for the PM peak hour.
- **Offices** - PM Peak - 2 vehicular trips per 100m² of GFA. The same rate is assumed for the AM peak. An 80%IN / 20%OUT split has been assumed for the AM peak and the reverse for the PM peak.

The WAPC Transport Assessment Guidelines does not offer daily vehicle trip generation rates for the residential land uses proposed within the development. The NSW RTA Guide to Traffic Generating Developments suggests developments of this type in Sydney tend to generate between 4 and 5 vehicular trips per dwelling. In Perth, the Department of Planning and Infrastructure conducted a series of studies in the late 1990's / early 2000's which showed that higher density dwellings tended to average closer to **5.5 vehicle movements per day**. These studies assumed that anywhere between 50% and 60% of commuters were travelling to work "by car, as driver". Therefore KCTT propose to use a VPD of 5.5 vehicular trips per day per residence.

The NSW RTA Guide to Traffic Generating Developments offers the following vehicle trip generation rate for the commercial land uses proposed within development: -

- **Office / Commercial** - 10 vehicular trips per 100m² of GFA (PM Peak - 2 per 100m² of GFA). An 80% / 20% IN/OUT split has been assumed for the AM peak and the reverse for the PM peak.

Table 7 - Trip Generation

Land Use Type	WAPC Transport Assessment Guidelines for Developments / NSW RTA Guide To Traffic Generating Developments Requirement	Yield	Daily Traffic Generation	Peak Hour Traffic Generation
Residential Units	5.5 vehicle trips per unit (Peak 0.85 vehicle trips per unit)	6 Units	33 VPD	6 VPH
Office	10 vehicular trips per 100m² of GFA (PM Peak - 2 per 100m² of GFA)	800m²	80 VPD	16 VPH
Total – Proposed Development			**113 VPD**	**22 VPH**

KCTT believe that the subject site will have a low to negligible impact on the existing road network.

2.6 Management of Traffic Generated by the Subject Site

The LSP proposes one point of access / egress to Beach Road approximately 30 metres from the intersection of Beach Road and Cockburn Road.

As shown in Section 2.5 of this report, the total LSP is expected to generate **113** vehicular movements per day with a forecasted impact of around **22** vehicular movements per hour in the peak hour.

2.6.1 Traffic Flow

Based on our analysis of employment opportunities, location of schools, shopping centres and preferred locations for social and recreational activities we believe the traffic attracted to and generated from the LSP would be distributed onto the adjacent road network as follows: -

- 100% **(113 VPD / 22 VPH)** from service road to Beach Road
  - 80% **(90 VPD / 18 VPH)** turn right onto Beach Road – west;
    - 60% **(54 VPD / 11 VPH)** turn left onto Cockburn Road – north
    - 40% **(36 VPD / 7 VPH)** turn right onto Cockburn Road – south
  - 20% **(23 VPD / 4 VPH)** turn right onto Beach Road – east;

The traffic flow diagram is shown in Appendix 2 for clarity of the traffic flow resulting from the proposed LSP.

2.7 Public Transport Access

The bus stops that are located within vicinity of the subject site are as follows: -

- In front of the subject site on Beach Road for bus routes 522;
- In front of the subject site on Cockburn Road for bus routes 825;
- Approximately 100 metres south from the subject site on the north side of Cockburn Road for bus routes 522 and 825.

The operating Bus Routes are as follows:

- Bus route No 522 – Cockburn Central Station – Spearwood, twice a day on working days;
- Bus route No 825 – Fremantle Station – Rockingham Station (via Cockburn Road and Patterson Road); with 20 minute minimum intervals on working days and one hour intervals on Saturdays;

KCTT believe that the proposed LSP has substantial access to public transport within convenient distances that should promote the use of public transport.

The local public transportation options are shown on the attached plan KC00322.000_S03 in Appendix 2 for clarity.

2.8 Pedestrian and Cyclist Access

The following is a list of the major cyclist infrastructure (Perth Bicycle Network) within an 800 metre radius of the subject site: -

- Beach Road, King Street, Amity Boulevard and Ocean Road are all classified as "Good Road Riding Environments".
- Beach Road and Cockburn Road have footpath connections to bus stops.
- Pedestrian connectivity available to Coogee Beach.
- Cockburn Road is classified as a "Poor Road Riding Environment".
- Orsino Boulevard and Cockburn Road are both classified as "Bicycle Lanes or Sealed Either Side".
- Shared path networks exist along Orsino Boulevard and Amity Boulevard.

The local pedestrian and cyclist access options are shown on the attached plan KC00322.000_S02 in Appendix 2 for clarity.

3. Transport Impact Statement Checklist for Structure Plan

The following is the summary / checklist for a Transport Impact Statement as shown in the Department for Planning and Infrastructure's Transport Assessment Guidelines – Part 2.

Item	Status	Comments/Proposals
Proposed Development Configuration under LSP		
Proposed land uses	Y	Proposed Mixed Land Use comprising of residential and office land-uses in the existing Old Coogee Post Office and Old Coogee Hotel buildings, plus Public Open Space
Existing land uses	Y	The following land uses exist on the subject site (abandoned): • Old Coogee Post Office and • Old Coogee Hotel
Context with surrounds	Y	Complementary
Vehicular Access and Parking		
Access arrangements	Y	The subject site offers vehicular access from Beach Road.
Public, private, disabled parking set down / pick up	Y	With reference to the Residential Design Codes and the City of Cockburn Town Planning Scheme No 3, the proposed development configuration shown in the LSP would require a total of **19** car parking bays, plus provision of on-site parking within each of the proposed residential allotments to suit the residential yield. The current indicative layout shows 22 parking bays, plus 1 ACROD bay and 1 loading bay. We believe the site can therefore accommodate a development layout of this size and scale.
Service vehicles (non-residential) N/A		
Access arrangements	Y	All access and egress is to be via Beach Road with a proposed access / egress located approximately 30 metres from the intersection of Beach Road and Cockburn Road.
On / off-site loading facilities	Y	Loading facilities to be provided internal to the development.
Service vehicles (residential)		
Rubbish collection and emergency vehicle access	Y	All access and egress is to be via Beach Road with a proposed access / egress located approximately 30 metres from the intersection of Beach Road and Cockburn Road.
Hours of operation (non-residential only)	Y	Residential and office peak periods are likely to roughly coincide at 08:00 to 09:00 and 17:00 to 18:00.
Traffic volumes		
Daily or peak traffic volumes	Y	As shown in Section 2.5 of this report, the total LSP is expected to generate **113** vehicular movements per day with a forecasted impact of around **22** vehicular movements per hour in the peak hour.
Type of vehicles (eg cars, trucks)	Y	Predominantly light vehicles and small service vehicles.
Traffic Management on Frontage Streets		

Public transport access	Y	In front of the subject site on Cockburn Road and Beach Road.
Nearest bus/train routes	Y	Bus Routes: • Bus route No 522 – Cockburn Central Station – Spearwood, twice a day on working days; • Bus route No 825 – Fremantle Station – Rockingham Station (via Cockburn Road and Patterson Road); with 20 minute minimum intervals on working days and one hour intervals on Saturdays; Refer to Section 2.7.
Nearest bus stops/train stations	Y	Bus stops that are located within the vicinity of the subject site are as follows: - • In front of the subject site on Beach Road for bus routes 522; • In front of the subject site on Cockburn Road for bus routes 825; • Approximately 100 metres south from the subject site on the north side of Cockburn Road for bus routes 522 and 825.
Pedestrian / cycle links to bus stops/train station	Y	• Beach Road, King Street, Amity Boulevard and Ocean Road are all classified as "Good Road Riding Environments". • Beach Road and Cockburn Road have footpath connections to bus stops. • Pedestrian connectivity available to Coogee Beach. • Cockburn Road is classified as a "Poor Road Riding Environment". • Orsino Boulevard and Cockburn Road are both classified as "Bicycle Lanes or Sealed Either Side". • Shared path networks exist along Orsino Boulevard and Amity Boulevard.
Pedestrian access/facilities		
Existing pedestrian facilities within the development (if any)	N	No existing facilities within the subject site.
Proposed pedestrian facilities within development	Y	Pedestrian paths will be available within the proposed LSP.
Existing pedestrian facilities on surrounding roads	Y	Footpath facilities on the northern side of Beach Road and the eastern side of Cockburn Road
Proposals to improve pedestrian access	N	The development configuration in the LSP does not propose any further modifications to the existing pedestrian network.
Cycle access/facilities		
Existing cycle facilities within the development (if any)	N	No existing facilities within the subject site
Proposed cycle facilities within development	Y	Proposed office land-uses will be required to provide end of trip facilities for cyclists under the City of Cockburn's standards.
Existing cycle facilities on surrounding roads	Y	• Orsino Boulevard and Cockburn Road are both classified as "Bicycle Lanes or Sealed Either Side" Please refer to KC00322.000_S02 in Appendix 2

Proposals to improve cycle access	N	The development configuration in this LSP does not propose any further modifications to the existing cycling network.
Site specific issues		
Identify issues	Y	1. Provision of sufficient parking bays to cater for the requirements of the development configuration proposed under this LSP. 2. Determine the impact on the surrounding network. 3. Vehicle turning templates at the proposed new access / egress locations for light and service vehicles.
Remedial measures	Y	1. The plans for the proposed development configuration shown in this LSP show **22** standard parking bays, 1 ACROD bay and 1 loading bay which is a surplus of 4 parking bays. 2. The subject site will have a negligible impact with the proposed development configuration generating **113 VPD and 22 VPH**. 3. Main access / egress radiuses from the streets should be designed in accordance with Appendix 3.

Appendix 1

The layout of the proposed development

01 Proposed Site Plan (Option 3G) 1:500

Legend

- BS — Bus stop
- Cadastral boundary
- Structures to be demolished
- Demolished building footprint
- Proposed road closure
- Potential zone for new building / outdoor area
- Direction of vehicular traffic
- P — Parking bay
- U/A — Universal access parking bay
- Minor contour
- 8.000 — Major contour

DBYD Services

- Sewer line
- Water line
- Power line
- Gas line

LOT & BUILDING AREAS

Lot	Dwellings	Lot Area m²	Building Area m²	Car Bays
Coogee Hotel		1297	611	14 (patron parking) 1 (loading zone)
Coogee Post Office	1 Residential 1 Commercial	527	189	2 (private)
Rear Lots (North East)	6 Residential	340 - 348	132 - 143	2 (private) per dwelling
POS 1		780	-	9 (visitor)
POS 2		223	-	-

STATUS	**REVISIONS**		**NOTES**	**PAPER SIZE**	**SCALE**	**CLIENT**	**DWG** / **PROJECT NUMBER**
DRAFT	A/ 13/04/15 ISSUED AS DRAFT FOR COMMENT			A3	1:500	State Heritage Office	Proposed Site Plan - Option 3G / 2014032
				DRAWN RD / **APPROVED** KP / **CHECKED** KP		**PROJECT** Coogee Hotel & Post Office	**ISSUE DATE** 13/4/15 / **DWG NUMBER** SK-16 / **REVISION** A

PALASSIS ARCHITECTS + ARCHITECTURE HERITAGE

Appendix 2

Transport Planning and Traffic Plans