Central Coast Council

Local Planning Panel Meeting

Attachments Provided Under Separate Cover

Thursday 25 November 2021

Central Coast Council

Attachments Provided Under Separate Cover to the

Local Planning Panel Meeting

To be held Remotely - Online,
on Thursday 25 November 2021
Commencing at 2:00pm

INDEX

PLANNING REPORTS

PLANNING REPORTS - OUTSIDE OF PUBLIC MEETING

Planning

Working Beyond Expectations

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Statement of Environmental Effects

Avoca Tourist Park

Property:
Lot A DP 449600, Lots 2, 3, 9 in DP 976799
255, 255A 255B Avoca Drive and 19 Picketts Valley Road, Kincumber

Applicant:
Avoca Land Pty Ltd

Date:
December 2020

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Project Management • Town Planning • Engineering • Surveying
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Document Control Sheet

Issue No.	Amendment	Date	Prepared By	Checked By
A	Draft to Client	11th December 2020	SVD	CS

Limitations Statement

This report has been prepared in accordance with and for the purposes outlined in the scope of services agreed between ADW Johnson Pty Ltd and the Client. It has been prepared based on the information supplied by the Client, as well as investigation undertaken by ADW Johnson and the sub-consultants engaged by the Client for the project.

Unless otherwise specified in this report, information and advice received from external parties during the course of this project was not independently verified. However, any such information was, in our opinion, deemed to be current and relevant prior to its use. Whilst all reasonable skill, diligence and care have been taken to provide accurate information and appropriate recommendations, it is not warranted or guaranteed and no responsibility or liability for any information, opinion or commentary contained herein or for any consequences of its use will be accepted by ADW Johnson or by any person involved in the preparation of this assessment and report.

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The Client should be aware that this report does not guarantee the approval of any application by any Council, Government agency or any other regulatory authority.

Executive Summary

This Statement of Environmental Effects (SEE) has been prepared by ADW Johnson to accompany a development application (DA) with Central Coast Council for a Caravan Park over Lot A DP 449600, Lots 2, 3 and 9 in DP 976799 at 255, 255A and 255B Avoca Drive and 19 Picketts Valley Road, Kincumber.

Application Details

Applicant:	Avoca Land Pty Ltd
Development Description:	Avoca Grove Tourist Park
Site Description:	Lot A DP 449600, Lots 2, 3 and 9 in DP 976799 at 255, 255A and 255B Avoca Drive and 19 Picketts Valley Road, Kincumber
Owner:	Avoca Land Pty Ltd
Development Cost:	$9,273,541

Development Standards/Controls

Zone:	E4 Environmental Living Zone
Definition:	Caravan Park
Permissibility:	Permissible with Consent (Gosford Local Environmental Plan 2014 – "LEP")
Maximum Height of Building:	8.5m

External Referrals

Bushfire:	Yes – Special Fire Protection Purpose (Rural Fire Service – Integrated)
Waterfront land:	Yes – Development within waterfront land and dam dewatering (NSW Natural Resources Access "NRAR" Regulator – Integrated)
Classified Road:	Yes – Development requires construction within the Avoca Drive (Transport for New South Wales (TfNSW) – Integrated)
Traffic Generating Development Road:	Yes – Development provides more than 50 spaces with access to a Classified Road (Transport for New South Wales (TfNSW) – Concurrence)

Summary

The proposed development achieves all key planning controls.

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1.0 Introduction

1.1 SUMMARY

ADW Johnson has been engaged by Avoca Land Pty Ltd ("the proponent") to prepare and lodge a development application (DA) with Central Coast Council ("Council") for a tourist park over Lot A DP 449600, Lots 2, 3 and 9 in DP 976799 at 255, 255A and 255B Avoca Drive and 19 Picketts Valley Road, Kincumber.

This Statement of Environmental Effects (SEE) has been prepared pursuant to Section 4.15 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and accompanying regulations, and addresses the necessary issues that require assessment to assist Council in making a determination on the subject application.

The proposed development will involve the construction of a tourist park comprising 68 sites. Of these, 31 will be used as "long-term" sites and 39 for "short-term" sites. Consent is also sought for the construction of a recreational area for mini golf, tennis and horse riding; community centre; amenities building; managers office; internal private roads including the intersection onto Avoca Drive; bulk earthworks/regrading and retaining; and landscaping. Water, sewer, stormwater, power and telecommunication services will also be provided under the proposal. Plans of the proposed development are provided within **Appendices 1**, **4** and **5** and further details are provided within Section 3.

The development is proposed to be used as a tourist park with draw card amenities and recreation facilities. The site will accommodate short stay visitors where stays will be limited to 180 days in any 12 month period, and long stay visitors/residents over this.

The development is located within the *E4 Environmental Living Zone (E4 Zone)* where it is permissible with consent under the definition of "caravan park". The objectives of the E4 Zone pertain to low-impact residential development in areas with special ecological, scientific or aesthetic values. To ensure consistency with this objective, the development has been designed to avoid these areas by being located over predominantly cleared portions of the site, set well back from any side or road boundary and areas of potential archaeological sensitivity.

It is noted that a development across the site was recently refused for a Residential Land Leased Community involving 202 sites, where the majority were proposed for long term occupation and future development with manufactured homes. The subject development distinguishes itself from this application as being developed primarily for the tourist market as opposed to the previous which was developed for over 50s living. This point aside, the development has been designed with the reasons for refusal received from the Local Planning Panel (LPP) in mind. This feedback has been filtered through to the collaborative team of experts to ensure a balanced outcome can be achieved. The proposed development has therefore been designed to accommodate a high quality tourist park whilst respecting the site constraints and fundamentals of the E4 zoning.

On this basis, Council are requested to support the application.

1.2 DEVELOPMENT APPLICATION DETAILS

STATEMENT OF ENVIRONMENTAL EFFECTS PREPARED BY:	
Name:	ADW Johnson Pty Ltd 5 Pioneer Avenue, Tuggerah NSW 2259
Contact:	Stephanie Van Dissel – Senior Town Planner Ph: (02) 4305 4300 Fax: (02) 4305 4399 Email: stephaniev@adwjohnson.com.au
PROJECT TEAM:	
Architect	CED Building Design
Town Planner	ADW Johnson
Civil Engineer & Stormwater	ADW Johnson
Landscaping	Terras Landscape Architects
Traffic	McLaren Traffic Engineering
Ecologist	Phillip Goodman
Bushfire Consultant	Peterson Bushfire
Aboriginal Heritage	McCardle Cultural Heritage
Flooding	GRC Hydro
Geotech & Contamination	Qualtest Laboratory
Quantity Surveyor	MCG Quantity Surveyors
Waste Management	Phillip Goodman
Noise Assessment	Spectrum Acoustics

2.0 The Site

2.1 LOCATION

The subject site is located on the northern side of Avoca Drive, Kincumber; approximately 2.5km east of Kincumber Shopping Village and 3.8km west of Avoca Beach (see Figure 1).

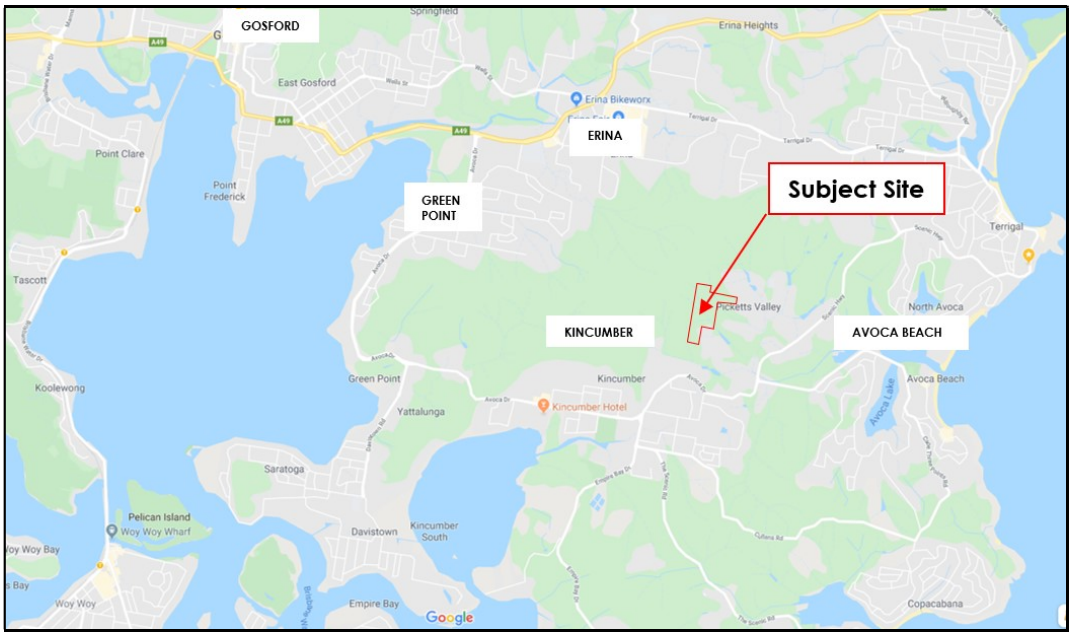

Figure 1: Locality Map

2.2 LAND TITLE

The subject site comprises:

- Lot A DP 449600;
- Lot 2 DP 976799;
- Lot 3 DP 976799; and
- Lot 9 DP 976799 (see Figure 2).

The site has a total area of 24.12ha and contains a number of easements for sewer, none of which will impact on the proposed development. Copies of the Deposited Plans are provided as **Appendix 2.**

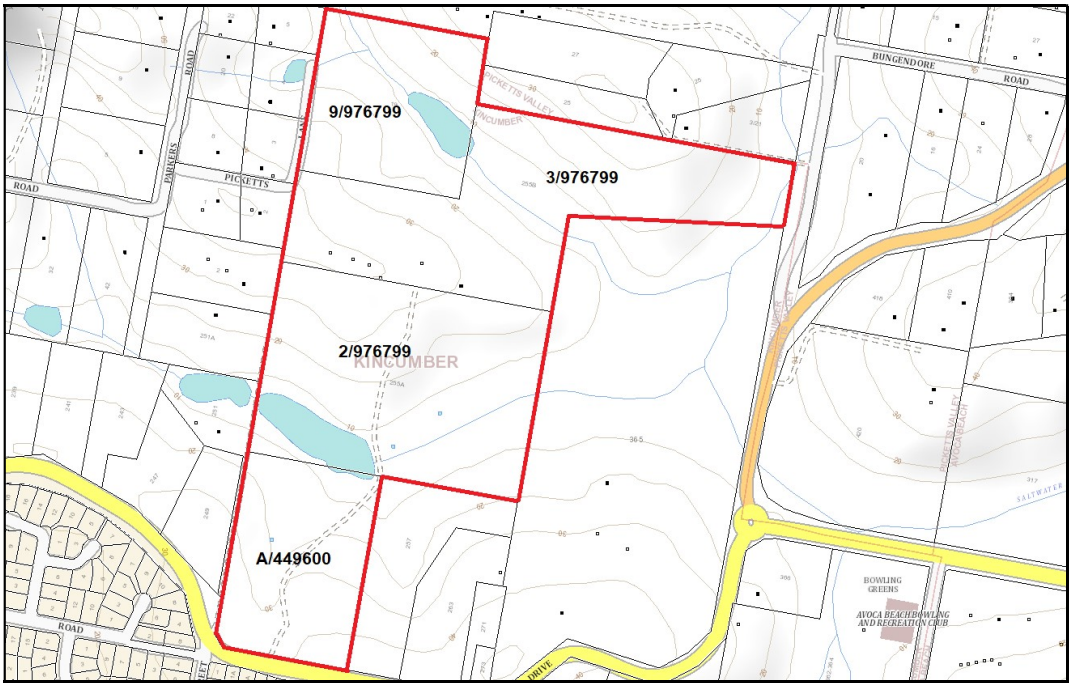

Figure 2: Lot Description

2.3 OWNERSHIP

The site is located over Lot A DP 449600 and Lots 2, 3 and 9 in DP 976799 which are all owned by Avoca Land Pty Ltd. Consent to the lodgement of this application is provided within an Authority to Lodge Letter which accompanies the DA.

Copies of the Certificates of Title are provided in **Appendix 3**.

2.4 PHYSICAL DESCRIPTION

2.4.1 Site

The subject site is an irregular shaped piece of land, comprising approximately 24ha with a frontage of approximately 154m to Avoca Drive and 82m to Picketts Valley Road (see Figure 3). The site currently contains three (3) dwellings and a number of ancillary structures and outbuildings including horse stables. One (1) dwelling house and the dam are located at the southern end of the site, with the remaining dwelling houses, sheds, and stables located approximately in the centre of the site between two (2) watercourses.

Figure 3: Aerial Image

2.4.2 Access

Vehicular access to the site is currently available in two (2) locations via a bitumen access crossing from Avoca Drive within the southern portion of the site, and existing farm track from Picketts Valley Road within the north-eastern portion of the site.

2.4.3 Watercourses

The site contains two (2) modified watercourses; which based on the topographic maps using Six Maps, consist of a second order watercourse in the north and a third order watercourse in the south. Both watercourses run from west to east and contain existing farm dams (see Figure 4).

A review of the topography of the upstream catchments found that Six Maps identifies a number of watercourses at the very upstream end of the catchment based on inferred local depressions traversing down the sides of steep escarpments. Based on this review the southern watercourse more accurately represents a 2nd order stream. The proposed development seeks to formalise this watercourse through the site by removing the existing farm dam and re-establishing a riparian corridor through the planting of appropriate vegetation under a Controlled Activity Approval. Discussions with NRAR have occurred in this regard, who have confirmed that legislatively this watercourse is a third order watercourse but that only a 20m riparian corridor is required.

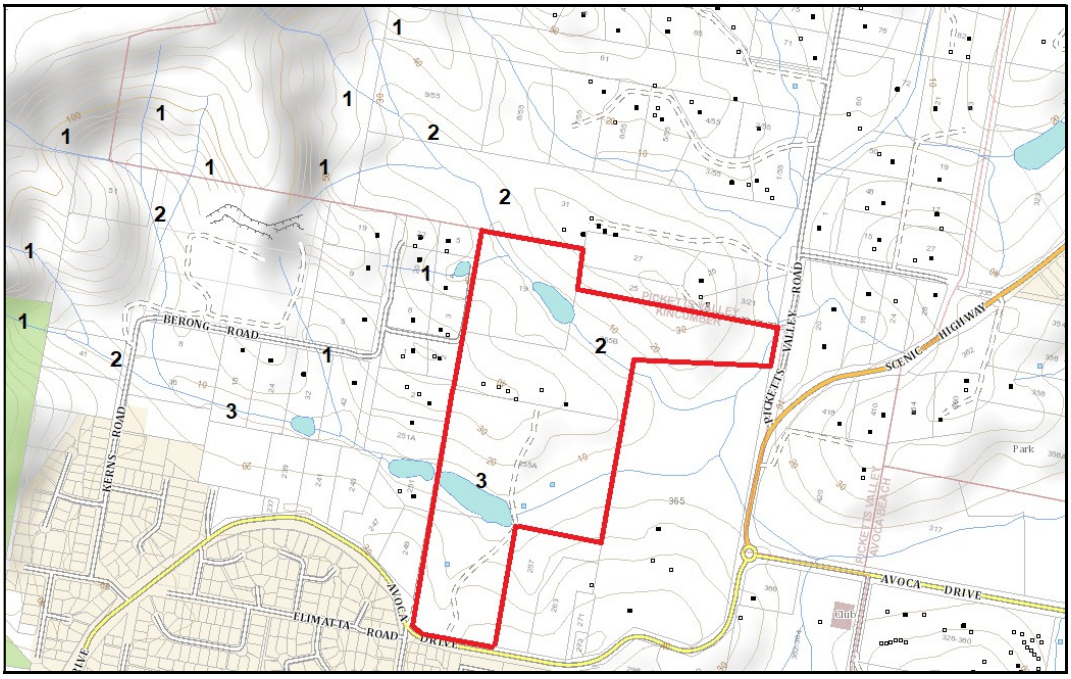

Figure 4: Topographic Map showing Stream Order

2.4.4 Topography

The land is undulating with varying slopes to 20% and is dissected by two (2) watercourses which traverse the property in a generally east-west orientation. The levels vary from approximately RL 40m at the southern side boundary with Avoca Drive, falling away to the north to approximately RL 6m at the southern watercourse. The elevation rises again to around RL 40m near the centre of the site then falls away to around RL 6m at the northern watercourse, rising again to around RL 30m at the northern end of the site.

2.4.5 Vegetation & Bushfire

The majority of the subject site, generally within the centre, has been cleared through previous timber milling and agricultural activities and as such, generally contains improved pasture with scattered trees. The rear and front of the site, however are heavily vegetated. As a result of this vegetation and vegetation on adjoining properties, the site is considered to be bushfire prone.

2.4.6 Visual Environment

The local landscape is characterised by a mix of conventional low density residential development on both sides of Avoca Drive (500m to the west), then screened rural residential housing on the north side of Avoca Drive and low density residential to the south.

The site has limited vantage points viewable from public places, with the greatest exposure along the Avoca Drive frontage from passing motorists.

The site falls away from Avoca Drive, and is visually separated from land to the north (Picketts Valley) by the vegetated low ridge.

2.4.7 Context

The site is located on the north-eastern urban fringe area of the suburb of Kincumber. Land immediately to the south is zoned residential and developed with low density residential housing and also seniors housing, being part of the nearby Brentwood Retirement Village. Upon part of this site is a DA currently under assessment for a 108 bed age care facility.

Land adjacent to the west is smaller lot rural residential development, with lot sizes varying from approximately 4,500m² to 1ha. Further to the west is small lot rural residential development, then low density residential development and a quarry and landscape supply business (Kerns Road area).

To the east is a larger rural residential allotment containing two (2) dwellings and a building previously used as a business premise.

Adjacent land at 257 Avoca Drive contains an older style single dwelling. 263 Avoca Drive contains Higher Grounds Cafe 63. Consent has also been issued upon this land for nine (9) tourist units and subdivision.

To the north, separated by a heavily vegetated low ridge (which will remain in this natural state), is fragmented rural residential land of Picketts Valley.

The site is suitably located to key facilities as indicated in the following table:

Summary of Key Facilities within Close Proximity to the Site

Facility	Distance	Comments
Kincumber Shopping Village	2.5km	Supermarket, speciality shops, pharmacy, medical centre,
Kincumber Branch library	2.5km	Providing a range of library and Council services
Erina Fair Shopping Centre	9km	Regional shopping centre with a broad range of retail and commercial facilities
Gosford Train Station	13.7km	Direct trains to Sydney & Newcastle
Gosford Public Hospital	14km	Major public hospital for the Central Coast.
Terrigal Ambulance Station	5km	Emergency services
Fire & Rescue NSW	2.3km	Emergency services
Avoca Beach Bowling Club	1.4km	Recreation, social and dining facilities
Transport	The locality is well services with a regular bus service at Avoca Dr frontage, taxis, Uber and Club courtesy buses available to the site	
Within 3km is a variety of other shops, services, clubs, recreation facilities, walking trails, beaches and community facilities .		

2.4.8 Summary

What is evident from the above, is that whilst the site contains some constraints, it also contains key opportunities which lend themselves to the development proposed. These primarily involve the large portions of cleared land, ability to adopt large setbacks to boundaries; as well as take advantage of existing access points, views and proximity to all essential services.

A series of site photos of the site are provided below.

Photo 1: Looking North across Southern Watercourse Crossing

Photo 2: Looking East, Downstream of Southern Watercourse

Photo 3: Looking North up Central Low Ridge to Existing Dwellings

Photo 4: Looking East across Horse Paddock. Northern watercourse, Dam and Northern Vegetated Low Ridge also Visible

Photo 5: Looking South East towards Central Dwelling and Stables

Photo 6: Looking South East towards Southern Watercourse

3.0 Description of the Proposed Development

3.1 PROPOSED DEVELOPMENT

The proposed development comprises a tourist park including the following elements:

- Demolition of existing dwellings (retention of existing central dwelling), stables and other ancillary minor features;
- Remediation of the site;
- 31 long-term sites on the outer edge of the site, positioned as such due to the proximity to bushfire threat vegetation;
- 37 short-term sites within the centre of the site which are shielded from the abovementioned bushfire threat;
- Community Centre including kitchen, bathroom, pool, seating, BBQ area and parking;
- Managers Office including caretaker's dwelling, workshop, community store, parking, and turn around area;
- Amenities building including toilets, showers and laundry;
- Recreation area including mini golf, tennis courts and horse riding area;
- Landscaping including riparian revegetation, fenced dog park, bushwalking tracks including canopy walk, exercise circuit, playground and jumping pillow;
- Bulk earthworks including importing and spreading of fill, benching and/or retaining;
- Stockpiling of fill as required;
- Construction of stormwater infrastructure including two (2) basins;
- Dewatering and reshaping of dam on southern watercourse, back into a flowing watercourse;
- Realignment of existing southern watercourse crossing, and upgrade to formal road crossing with stormwater culverts;
- Construction of internal roads including 8m wide perimeter fire trail;
- Upgrade of existing track for fire access purposes and provision of passing bays;
- Entry/exit to Avoca Drive, including altered intersection treatment at this point;
- Provision of underground water, sewer and electrical services as required, including offsite lead in works for water along Avoca Drive and removal of existing overhead power;
- Installation of sewer pump station and electrical kiosk; and
- Removal of trees/vegetation where required.

Plans detailing the above are provided as **Appendices 1**, **4** and **5.**

3.2 OPERATIONAL DETAILS

The proposed development will be run as a tourist park with both long and short term sites able to accommodate a variety of different forms of moveable dwellings. The future installation of these dwellings will be dictated by the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 and are not proposed under the subject DA (LG Regs).

The site will be managed by a full time manager who will reside on site. Other operational details are clearly defined by the LG Regs.

3.3 DESIGN RESPONSES TO COUNCIL ISSUES

DA/57698/2019 for a 202 site caravan park was previously proposed over the site and refused at a Local Planning Panel meeting on 6th August 2020. The proposed design, whilst not proposing the same style of development (being for a tourist park as opposed to a Residential Land Leased Community), has nonetheless responded to the reasons for refusal as follows:

Original	Proposed
a) The proposed development is not consistent with the objectives of the E4 Environmental Living zone under the provisions of the Gosford Local Environmental Plan 2014	
Residential Land Leased Community including 202 sites.	Tourist Park including 68 sites
Development footprint of 153,863m^2	Impact area of 80,200m^2
Removal of 491 trees	Removal of 210 trees
Up to 160,000m^3 of cut and fill requiring the importation of 17,888m^3 of fill.	Up to 70,000m^3 of cut and fill requiring the importation of circa 5,500m^3
Western setback: 10m Avoca drive setback: 30m	Western setback: 30m Avoca Drive setback: +400m
b) The proposed development would result in additional stormwater run-off and increased downstream flooding.	
A Water Cycle Management Plan (WCMP) and Flood Impact Assessment (FIA) were included with the original DA and no stormwater or flooding matters were raised by Council during their assessment. The context behind this reason for refusal is therefore unknown. Regardless, an updated WCMP and FIA have been prepared within **Appendices 13** and **14** respectively. In addition to this a Soil and Water Management Plan (SWMP) has now been included within **Appendix 19**.	
c) The proposed development would result in significant cut and fill, earthworks and removal of vegetation on the site which would impact the ecological values, visual and scenic quality of the area.	
Removal of 491 trees and 5.21 ha (excluding APZs)	Removal of 210 trees and 2.1ha (excluding APZs)
Up to 160,000m^3 of cut and fill requiring the importation of 17,888m^3 of fill.	Up to 70,000m^3 of cut and fill requiring the importation of circa 5,500m^3
Retaining walls: Up to 8m	Retaining walls: Up to 4.4m
d) The site is not suitable for the proposed development due to its landscape, scenic and ecological qualities which should be preserved.	
The development has been amended as detailed above to address this issue.	
f) Insufficient information has been provided on potential contamination, road works within the site, ecology impacts, heritage impacts, waste impacts, soil and water management, emergency and construction access, bush fire hazard, and tree retention.	
All of these issues have been discussed within the following SEE and accompanying plans and reports.	
g) The proposal is an overdevelopment of the site, inconsistent with the current and future desired character of the locality and approval is not in the public interest.	
As shown above, the proposed development is vastly different to that refused in terms of it's primarily tourist use, significantly reduced footprint, greater vegetation retention and increased setbacks.	

h) Pursuant to Draft Central Coast LEP (2018) the proposed development is prohibited within E4 Environmental Living zone.
The Draft Central Coast LEP (Draft LEP) is not considered imminent and certain and as such, assessment should be weighted towards the existing permissibility. This point aside, the Draft LEP contains savings provisions which ensure the previous and subject development are assessed against the existing LEP.

4.0 Planning Controls

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The installation of movable dwellings on the proposed sites is not part of this application and is subject to separate approval under the Local Government Act 1993 due to the fact that moveable dwellings within the meaning of the Local Government Act 1993 are specifically excluded from the definition of 'building' in Section 1.4 of the EP&A Act.

> ***Section 1.4 – Definitions***
> ***building*** *includes part of a building, and also includes any structure or part of a structure (including any temporary structure or part of a temporary structure), but does not include a manufactured home, moveable dwelling or associated structure within the meaning of the Local Government Act 1993.*

Noting the above; the following assessment has addressed *Section 4.15* of the EP&A Act with regards to the proposed sites and ancillary development only.

4.2 LOCAL GOVERNMENT ACT 1993

A moveable dwelling is defined in the Local Government Act 1993 (LG Act) as follows:

> ***moveable dwelling means:***
> *(a) any tent, or any caravan or other van or other portable device (whether on wheels or not), used for human habitation, or*
> *(b) a manufactured home, or*
> *(c) any conveyance, structure or thing of a class or description prescribed by the regulations for the purposes of this definition.*

Under Section 68 of the LG Act, approval from Council is required for the operation of a Caravan Park. It is acknowledged that Council will impose a condition of consent requiring that a Section 68 approval be obtained in this regard.

4.3 LOCAL GOVERNMENT (MANUFACTURE HOME ESTATE, CARAVAN PARKS, CAMPING GROUNDS AND MOVEABLE DWELLINGS) REGULATION 2005

The purpose of the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 is to provide opportunities for affordable alternatives in short-term and long-term accommodation through appropriate design, and promotion of health, safety and amenity of the occupiers.

The objective of this Regulation is to provide opportunities for affordable alternatives in short-term and long-term accommodation:

(a) By continuing to force (in amended form) the standards for the design of manufacture homes estates, caravan parks and camping grounds established by the former Regulations, and
(b) By continuing to force (in amended form) the standards for the design and construction of manufactured homes and other moveable dwellings and for their siting established by the former Regulations, and

(c) By continuing to force (in amended form) that standards to promote health, safety and amenity of the occupiers of manufactured homes and other moveable dwellings established by the former Regulations.

Part 3 of the Regulation relates to caravan parks, camping grounds and moveable dwellings and is applicable to this application. Clause 71 requires that approval must not be granted to the operation of a caravan park unless the proposal complies with the relevant requirements of Subdivisions 1-8 of Division 3. These are addressed within the compliance table provided as **Appendix 7.**

Divisions 4 and 5 pertain to the installation of manufactured homes and moveable dwellings, which do not require development consent in accordance with Clause 8(4A) of SEPP 21 – Caravan Parks. This will be assessed by Council separately to the subject DA.

4.4 ENVIRONMENTAL PLANNING INSTRUMENT (EPI) (S4.15(1)(A)(I))

4.4.1 Gosford Local Environmental Plan 2014 (LEP)

Land Use Table: Zoning, Permissibility and Objectives

The site is located within the E4 Environmental Living Zone under the Gosford LEP 2014 (see Figure 5).

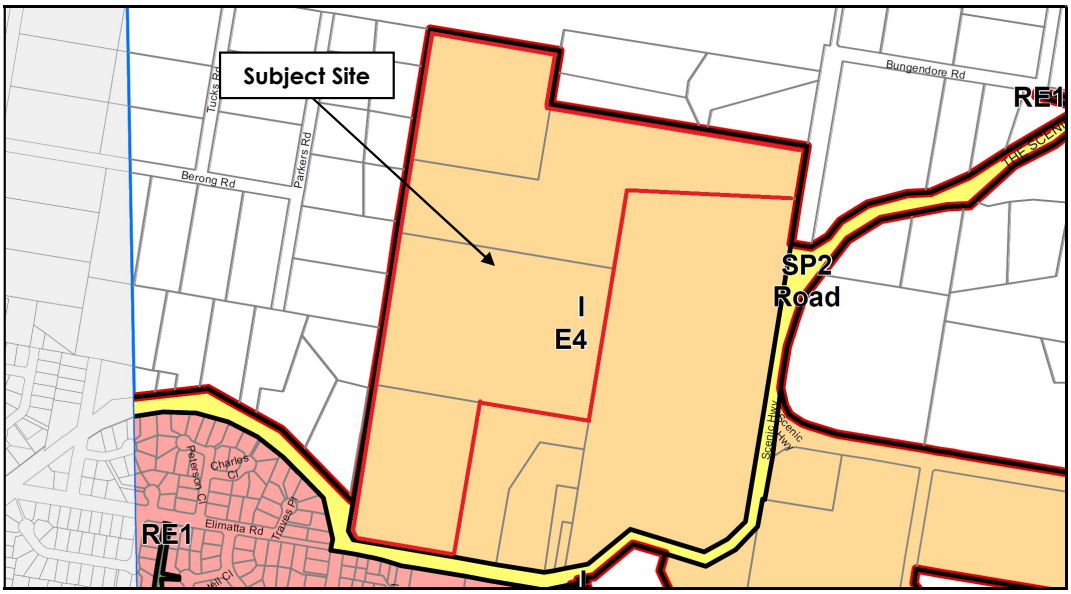

Figure 5: Zone Map

The proposed development is defined as a '*caravan park*' based on the definitions in the Gosford LEP 2014, where *Caravan park* is defined as:

> ***Caravan park*** *means land (including a camping ground) on which caravans (or caravans and other moveable dwellings) are, or are to be, installed or placed.*

A caravan park is permitted with consent in the E4 Zone.

Clause 2.3 of the LEP stipulates that the consent authority must have regard to the objectives for a development in a zone when determining a development application in respect of land within the zone.

The proposed development is located within the E4 zone where the following objectives apply:

- *To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.*
- *To prevent development that could destroy, damage or otherwise have an adverse effect on those values.*

The above objective does not preclude development not considered low-impact residential but rather precludes this style of development from areas with special ecological, scientific or aesthetic values. The objective is not exhaustive in that only low impact residential development is considered appropriate within the E4 Zone, but rather that this style of development should be kept to these specific areas.

No guidance is given within the objective pertaining to what constitutes "low impact", however, one must assume that the permitted uses listed within the E4 zone are not considered such.

Regardless of how the above objective is interpreted, it is considered that the proposed development is for a low impact tourist park which has been designed to avoid the majority of vegetation across the site as well as being set well back from any common or road boundaries.

Further, no guidance is given within the objective with regards to what constitutes areas with *special ecological, scientific or aesthetic values*. In this regard, the site is not identified within any EPI as having "special ecological attributes"; it is not located within an E2 Zone where land is generally considered to involve *high ecological, scientific, cultural or aesthetic values';* and the development avoids all areas of Ecologically Endangered Communities as shown within Council's mapping system.

There are no scientific values recorded against the site, with no listings in any Local, State or other register for European heritage value. A search of records for any registered Aboriginal sites resulted in nil findings and the only recorded potential archaeological deposit (PAD) is retained within riparian setbacks.

Finally, there are no clearly identified special aesthetic values identified within an EPI, and aside from the Avoca Drive frontage, there are a few public vantage points from where the site is visible. To address this, the development has been designed with large landscaped setbacks to reduce visibility from surrounding residents and passing traffic.

Taking the above into consideration, the proposed development does not contravene the above objectives.

- *To promote ecologically, socially and economically sustainable development and the need for, and value of, biodiversity in Gosford.*

The submitted Biodiversity Development Assessment Report (BDAR) has considered local biodiversity conditions and has provided measures to mitigate any impacts of the development. The development is largely proposed upon land previously cleared for agricultural pursuits – making good of previous clearing works so as to minimise impacts on the natural environment.

The development will provide a sense of place and security for both permanent and tourist residents. The facilities proposed will forge lasting memories for visitors not only of the development itself but the surrounding services and businesses on the Central Coast. If embraced by Council, this tourist park will be a draw card to the Coast and a place where regular visits continue. These qualities all promote a healthy and vibrant social and economic community and are considered to be an asset to the local area.

The development will be the management responsibility of one (1) single entity. All internal roads, community facilities, landscaped gardens and retained bushland will be maintained by the operator, at no cost to Council. The development is therefore able to more consistently achieve this objective over the current land use which is largely uncontrolled in terms of ecology and maintenance.

- *To provide land for low-impact tourist-related development.*

The proposed tourist park implicitly achieves this objective through the provision of a wide range of recreational facilities able to cater for both long term residents and short term visitors. For reasons mentioned above, the proposed development is also considered low impact.

- *To ensure that development is compatible with the desired future character of the zone*

The site is located within *Unit 13 – Scenic Buffer* of the *Kincumber* Character Statement where the desired character aims at protecting the scenic quality of the area whilst also accommodating modest development. For reasons mentioned above, it is considered that the proposed development achieves this. Full consideration of the Character Statement is provided below.

Taking the above into consideration, the proposed development complies with the objectives of the E4 Zone.

Principle Development Standards: Clause 4.3 Height of Buildings

The site is identified as being subject to a maximum height limit of 8.5m (see Figure 6). The maximum height of any building proposed is 7.6m.

Figure 6: HOB Map

Principle Development Standards: Clause 5.10 Heritage Conservation

The site is not identified as containing or being adjacent to any items of heritage significance, or as being located within a heritage conservation area on Council's Heritage Map.

An Aboriginal Heritage Information Management System (AHIMS) search was completed, which revealed that the site does not contain any items or places of Aboriginal significance. This point aside, an Aboriginal Heritage Due Diligence Assessment was undertaken as part of the previous DA which revealed a potential archaeological deposit (PAD) adjacent to the southern bank of the northern dam (see Figures 7 and 8). This area has been retained within riparian setbacks, with no work proposed within close proximity. In accordance with standard protocols, should nearby excavations reveal any matters of significance, appropriate procedures will be implemented.

Figure 7: Identified Areas of Potential Archaeological Sensitivity

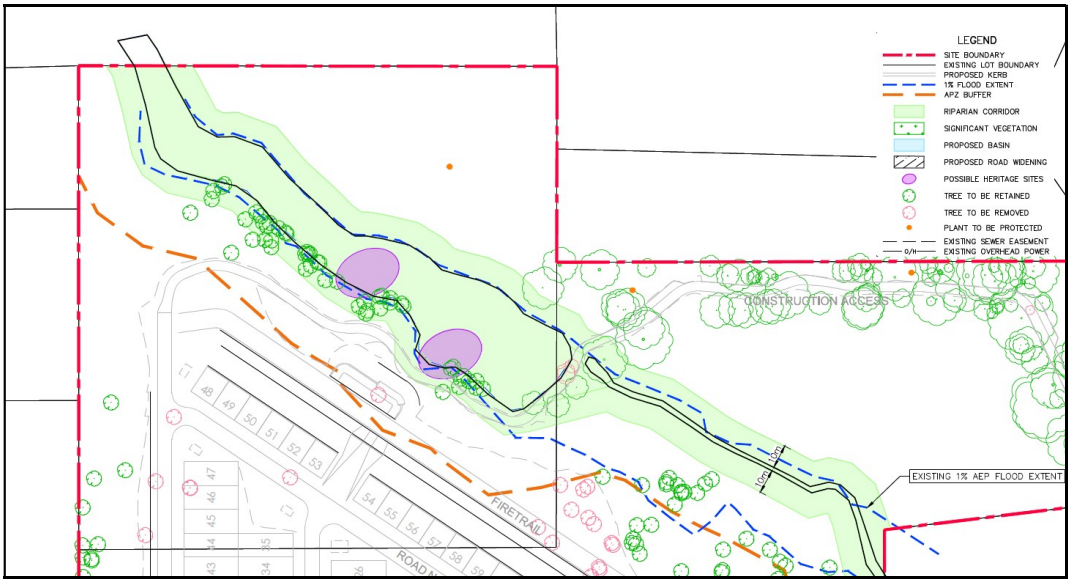

Figure 8: Location of PADs in Relation to Development

A copy of the Aboriginal Heritage Due Diligence Assessment is provided within **Appendix 6**.

Principle Development Standards: Clause 7.1 Acid Sulfate Soils

The site is identified as containing Class 5 Acid Sulfate Soils, where works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5m AHD and by which the water table is likely to be lowered below 1m AHD on adjacent Class 1, 2, 3 or 4 land, requires the preparation of an Acid Sulfate Soils Management Plan (see Figure 9). As works

associated with the proposed development are located over 500m from adjacent Class 1, 2, 3 or 4 land, an Acid Sulfate Soils Management Plan is not required.

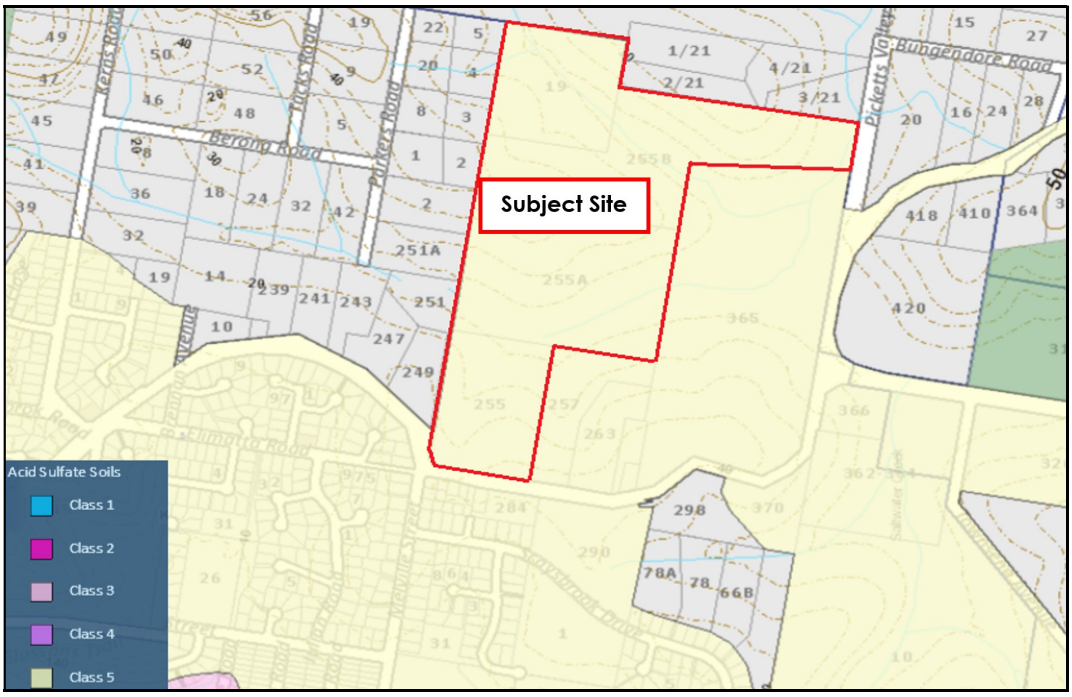

Figure 9: Acid Sulfate Soils Map (Source: Council's Online Mapping System)

Principle Development Standards: Clause 7.2 Flood Planning

Clause 7.2 states:

(3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:
(a) is compatible with the flood hazard of the land, and
(b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and
(c) incorporates appropriate measures to manage risk to life from flood, and
(d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and
(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

Whilst the subject site is not identified as flood prone land under Council's mapping or within the GLEP 2014, as watercourses are located onsite and due to catchment flooding occurring within the area, GRC Hydro were engaged to undertake a FIA as part of the previous DA (see **Appendix 14**). The FIA assessed the following aspects of the previous development which remain the same within the proposed:

- Creek crossing including an embankment with a crest that typically ranges from 9m to 10m AHD and 5 x 2.4m x 0.9m box culverts on a slab link system;
- 2 x 1.2m x 0.6m culvert on southern watercourse; and
- 7,000m^3 increase in flood storage.

The results of the previous FIA indicated that all proposed sites were above the level of the Probable Maximum Flood (PMF) and the Flood Planning Level (FPL), and that the creek crossing is above the level of the 1% AEP event. The same conclusions can be drawn of the proposed development, given that all key aspects as discussed above remain and that no sites are located any closer to the flood affected portion of the site (to the contrary they have been significantly reduced).

Based on the above, the development complies with Clause 7.2 as follows:

a) All sites, facilities and access would be above the 1% AEP flood level and therefore compatible with the flood hazard of the land;
b) The FIA concludes that the proposed development would not increase the potential flood affectation across other properties;
c) All sites will be built above the 1% AEP flood level to ensure there is no risk to property in the event of a flood. In addition to this, the main entry road into the development will be above the 1% AEP flood level and as such, in the event of a flood, flood free access will be available;
d) Provision of erosion and sedimentation controls, along with the proposed basins and general stormwater management systems will ensure that the development will not impact on the environment; and
e) There will be no social and economic costs to the community as a consequence of flooding.

Taking the above into consideration, despite the development being located within flood impacted land, suitable measures have been proposed to ensure the requirements of Clause 7.2 are met.

Principle Development Standards: Clause 7.3 Floodplain Risk Management

Clause 7.3 relates to caravan parks and as such, requires assessment to ensure "the development will not, in flood events exceeding the flood planning level, affect the safe occupation of, and evacuation from, the land". As discussed above, the FIA prepared for the site concludes that all sites will be above the PMF and access will be above the 1% AEP flood level. This will ensure safe occupation of the site during a PMF and safe evacuation in the event of a 1% AEP event.

Remaining Mapping

The following is noted with respect to the remaining mapping layers under the LEP:

- The site is subject to a minimum lot size of 4ha, however no subdivision is proposed;
- The site is not subject to a maximum floor space ratio;
- The site is not subject to additional permitted uses;
- The site is not identified as land reserved for acquisition;
- The site is not identified as an urban release area;
- The site is not identified as key site;
- The site is not identified as caravan parks and manufactured home estates.

Taking the above into consideration, the proposed development is consistent with the Gosford LEP 2014.

4.4.2 State Environmental Planning Policy (SEPP) 21 – Caravan Parks

SEPP 21 – Caravan Parks aims to encourage the orderly and economic use and development of land used or intended to be used as a caravan park, the proper management and development of land so used, the provision of community facilities for land so used, and the protection of the environment of, and in the vicinity of, land so used.

The objectives of State Environmental Planning Policy 21 – Caravan Parks are:

Table 3: SEPP 21 Objectives

Objective	Comment
(1) The aim of this Policy is to encourage: (a)The orderly and economic use and development of land used or intended to be used as a caravan park catering exclusively or predominately for short-term residents (such as tourists) or for long term residents, or catering for both, and	The proposed development provides for the orderly and economic development of a caravan park, catering for both short term and long term residents.
(b)The proper management and development of land so used, for the purpose of promoting the social and economic welfare of the community, and	The tourist park has been designed to have large setbacks on all sides to preserve neighbouring outlook and distance the development from adjoining land users. The development will include both long term and short term visitors and residents which will ensure a balanced mix of community. The site will also be managed by onsite manager who can monitor social cohesion. A range of economic effects will flow from the propose development. These are generally expected to be positive, as they will result in both short-term stimulus in the development stage, and long term contribution from the residents and visitors of the site through their interaction with the local economy. Overall it is concluded that, on balance,

	the socioeconomic effects of the proposed development are likely to be beneficial to the local and regional communities. Further detail in relation to the social and economic impacts of the development are discussed within the Social and Economic Impact Assessment provided as **Appendix 15.**
(c)The provision of community facilities for land so used, and	The proposed development incorporates extensive community facilities including a Community Centre; mini golf, tennis and horse riding open space as well as walking trails and other features to promote healthy and engaged living and tourist activities.
(d) The protection of the environment of, and in the vicinity of, land so used.	The potential environmental impacts have been assessed by an experienced and registered ecologist and where possible, significant trees and vegetation have been avoided during design. The southern riparian corridor, which has been modified over the agricultural history to now include a dam and channelised watercourse will be rehabilitated to improve both hydrological and ecological functions. Existing trees and vegetation along property boundaries will be retained where possible and added with supplementary landscape works.

In accordance with Clause 8(2) of SEPP 21, before granting development consent to the use of the land for the purpose of a caravan park, the Council must determine the number of sites that are suitable for long-term residence and the number of sites that are not suitable for long-term residence, but are suitable for short-term residence.

Pursuant to Clause 10 of SEPP 21, the following matters must be considered by Council prior to granting a development consent required by this Policy:

(a) *whether, because of its location or character, the land concerned is particularly suitable for use as a caravan park for tourists or for long-term residence,*

The subject site is ideally located to accommodate a caravan park, within a popular holiday and retiree area within close proximity to the local beaches and waterways. The location is well connected to Erina Fair by roads and regular public bus services, providing good access to services and facilities not afforded locally.

(b) *whether there is adequate provision for tourist accommodation in the locality of that land, and whether existing or potential tourist accommodation will be displaced by the use of sites for long-term residence,*

There are a number of existing tourist and visitor accommodation options within Kincumber/Avoca, including:

- 160 The Round Drive Avoca Beach – The Palms at Avoca;
- 243 Avoca Drive, Avoca Beach – Avoca Valley Bed and Breakfast;
- 326-360 Avoca Drive Avoca Beach – Avoca Beach Hotel;
- 370 Avoca Dr, Avoca Beach – Riley's Accommodation;
- 263 Avoca Drive, Kincumber – nine (9) Tourist and Visitor units (approved under DA40779/2011);
- Various other forms of private rental accommodation accessed through internet sites such as Airbnb, Stayz etc.

The proposed development proposes a different style of tourist accommodation to those above will not impact on the ability to meet current and future tourism demand. Further, the proposed long term sites will not displace existing or proposed tourist accommodation.

(c) *whether there is adequate low-cost housing, or land available for low-cost housing, in that locality,*

The proposed development may contribute to redressing the loss of caravan park accommodation which has been identified as being contributing factor to the loss of affordable housing within the Affordable and Alternative Housing Strategy 2020. Further details in this regard are provided within the Social and Economic Impact Assessment provided at **Appendix 15**.

(d) *whether necessary community facilities and services are available within the caravan park to which the development application relates or in the locality (or both), and whether those facilities and services are reasonably accessible to the occupants of the caravan park,*

In addition to those nearby services previously identified with 3km of the site (refer to Section 2.4.7 above); Kincumber generally has good access to important public and social infrastructure and services. Nearby public bus services and rail transport provide convenient access to major urban and city centres (i.e. Newcastle and Sydney).

The proposed development also includes provision for a range of recreational infrastructure and activities for residents and visitors of the caravan park. These include a community building and extensive outdoor recreational activities.

(e) *any relevant guidelines issued by the Director, and*

N/A

(f) *the provisions of the Local Government (Caravan Parks and Camping Grounds) Transitional Regulation 1993.*

Discussed above and within **Appendix 7**.

4.4.3 SEPP Infrastructure 2007 (ISEPP)

Clause 101 – Development with Frontage to Classified Road

Clause 101 states:

(2) The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:
(a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and
(b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:
(i) the design of the vehicular access to the land, or
(ii) the emission of smoke or dust from the development, or
(iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and

The proposed development will gain access via a two-way driveway from Avoca Drive which is a classified road. A Traffic and Parking Impact Assessment (TPIA) has been prepared by McLaren Traffic Engineering who have confirmed that this arrangement achieves the requirements of Clause 101(2)(a) and (b) given that providing alternate access via Picketts Valley Road would be impractical given the flood affected nature of this access. With this in mind, to ensure the proposed access does not impact the safety and efficiency of Avoca Drive, it has been placed on the eastern most extent of the property in line with advice from Transport for NSW (TfNSW). Further, the access will be designed such that right turns out of the site will be restricted and that channelised left and channelised right turn treatments (CHL/CHR) will be constructed to facilitate the safe entry of vehicles to the site.

(c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

The proposed development is not for a sensitive use such as a hospital, school, aged care facility etc.

Clause 104 – Traffic Generating Development

The proposed development gains access off a Classified Road and provides more than 50 parking spaces due to the fact that each site will provide parking for one (1) space. For this reason, the development is listed within Schedule 3 as being "traffic generating development" and will require the concurrence of the RMS.

4.4.4 SEPP (State and Regional Development) 2011

The proposed development does not constitute State Significant Development under this SEPP and hence, the provisions relating to same are not relevant.

As the proposed development does not have a suitable value (over $30 million) and is not located within the coastal zone, it is also not identified as Regionally Significant Development under Schedule 7 and as such, does not require the Joint Regional Planning Panel to become the consent authority.

4.4.5 SEPP (Coastal Management) 2018

The Coastal Management SEPP aims to promote an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016.

The SEPP applies to land within the coastal zone which includes coastal wetlands and littoral rainforests area, coastal vulnerability areas, coastal environment areas and coastal use areas. The subject site is not identified as containing coastal wetlands, coastal wetlands proximity area, coastal environment area, and coastal use areas (see Figure 10).

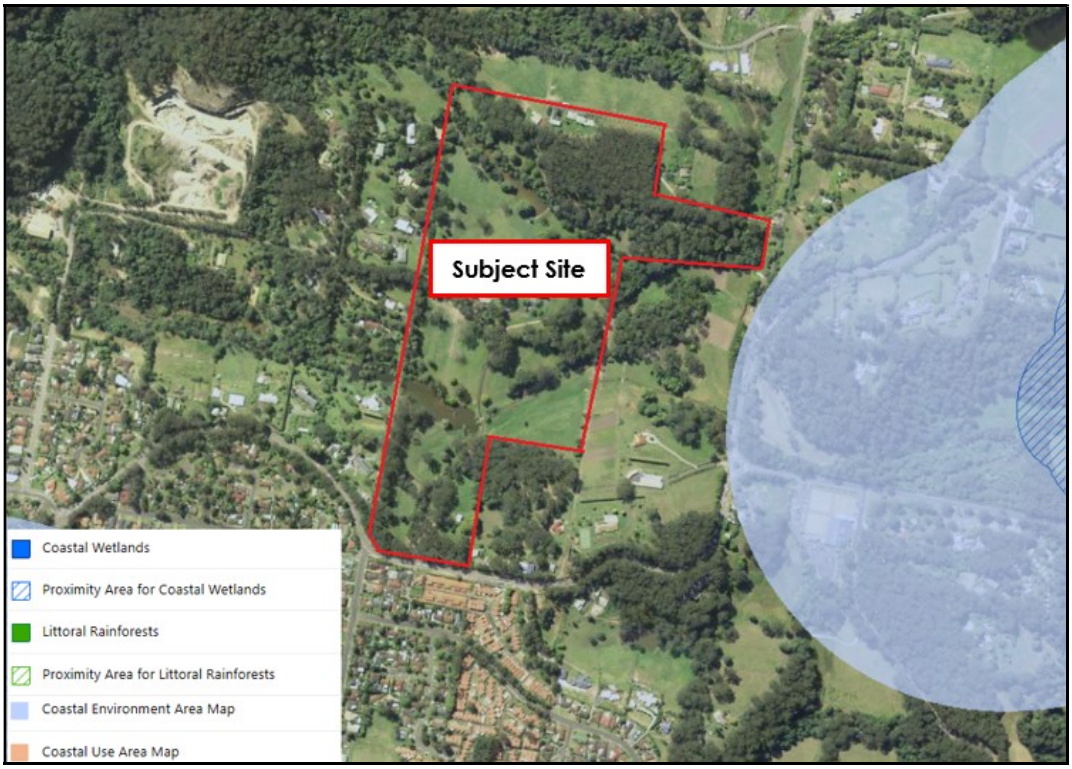

Figure 10: SEPP Coastal Management (2018)

4.4.6 SEPP 55 Remediation of Land

Clause 7 of SEPP 55 states:

> *(1) A consent authority must not consent to the carrying out of any development on land unless:*
> *(a) it has considered whether the land is contaminated, and*
>
> *(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
> *(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*

To assist Council with their assessment with regards to the above a Preliminary Contamination Assessment, Remediation Action Plan, Construction Contaminated Land Management Plan and Hazardous Substance Audit have been prepared and provided within **Appendix 9.** These reports all confirm that the development can achieve the requirements of Clause 7.

4.4.7 SEPP (Koala Habitat Protection) 2020

The subject site does not contain any of the trees listed in Schedule 2 of the Koala SEPP 2020 and as such this SEPP does not apply. Further information is provided within the Biodiversity Development Assessment Report (BDAR) within **Appendix 10**.

4.5 DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS (S4.15(1)(A)(II))

Section 4.15(1)(a)(ii) of the EP&A Act requires any proposed environmental planning instrument (EPI) that has been the subject of public consultation to be considered in determining a DA.

The Draft Central Coast Local Environmental Plan 2018 was put on public exhibition between 6th December 2018 and 28th February 2019 and as such, is a matter for consideration.

The subject site retains its E4 zoning under the Draft LEP, as well as all key building envelope and mapping controls with the exception of building height where the previous 8.5m limit has been removed. The permissible uses within the E4 zoning however, have been amended to make caravan parks prohibited.

The weight to be given to draft EPIs has been extensively examined within the Courts where a generally accepted rule is that if the draft EPI is "imminent and certain" it warrants greater consideration. Since exhibition almost three (3) years ago, the Draft LEP has been presented to two (2) Council meetings for adoption, one (1) on 9th December 2019 and one (1) on 9th March 2020. Both times, the adoption was deferred. On Council's yourvoiceourcoast website which provides updated on the status of the Draft LEP, the following is provided:

> *Staff are working with Councillors to progress the draft Central Coast Local Environmental Plan (CCLEP) and draft Central Coast Development Control Plan (CCDCP).*

During the notification period, a number of major concerns were raised with regards to the Draft LEP. Taking this into consideration and based on the above statement, the content and timing of the Draft LEP is unknown and far from "imminent and certain". Were the Draft LEP to be adopted at the upcoming Council meeting on 14th December 2020, the timing for its adoption is still unknown given that removing permissibility for caravan parks in the E4 Zone is inconsistent with the Section 9.1 Directions, in particular 3.2 which States:

> *(4) In identifying suitable zones, locations and provisions for caravan parks in a planning proposal, the relevant planning authority must:*
>
> *(a) retain provisions that permit development for the purposes of a caravan park to be carried out on land, and*

For the Draft LEP to be adopted, the Director-General of the Department of Planning, Infrastructure and Environment (DPIE) need to be satisfied that the justification for the inconsistency is warranted. This again suggests that the Draft LEP is not "imminent and certain" and as such, its permissibility does not warrant greater consideration that the existing E4 zoning provisions.

Further to the above, savings provisions currently included under Clause 1.8A of the Draft LEP ensure that the current Gosford LEP 2014 permitted uses remain applicable. As such, the proposed development is to be determined in accordance with the provision of the current Gosford LEP 2014 under which it was lodged. This approach was confirmed in the recent Land and Environment Court Case between '*Codling and Central Coast Council (2019)*, with Commission Gray stating the following (at 74):

> "*Firstly, even if the draft CCLEP was made in its current terms, the proposed development is saved by the savings provisions in draft Clause 1.8A, which provides that a development application made before the commencement of the CCLEP must be determined as if the plan had not commenced.*"

Finally, the objectives of the Draft LEP are generally consistent with the existing objectives which have been thoroughly addressed previously.

4.6 GOSFORD DEVELOPMENT CONTROL PLAN 2014 (S4.15(1)(A)(III))

4.6.1 Chapter 2.1 – Character

The site is located within *Unit 13 – Scenic Buffer* of the *Kincumber* Character Statement (see Figure 11).

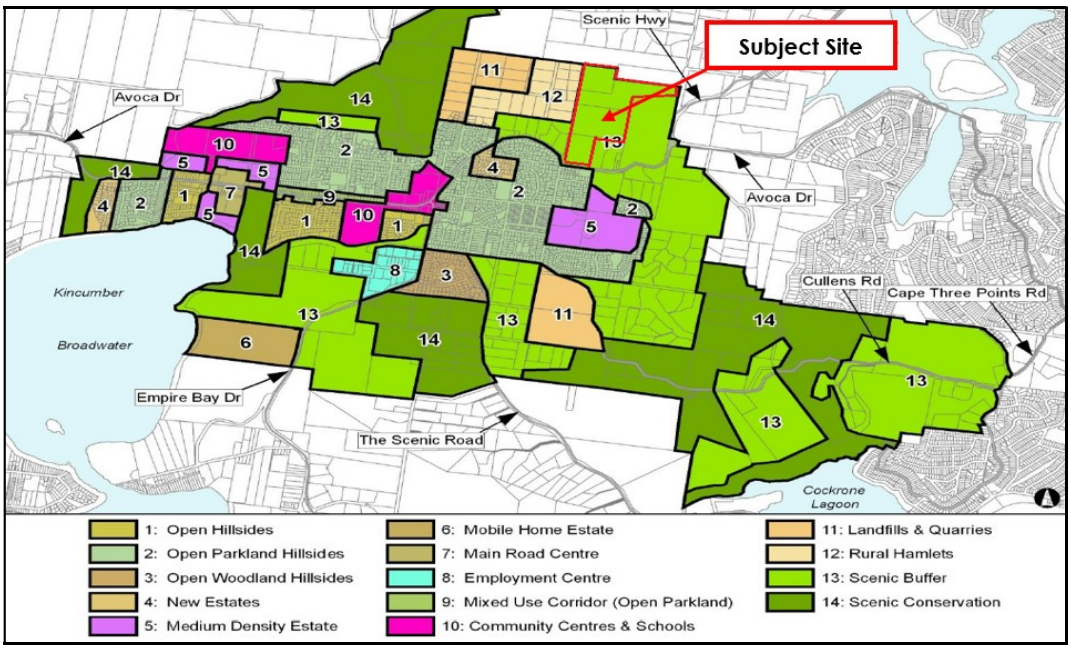

Figure 11: Kincumber Character Unit Mapping

The development responds to the desired character as follows:

Desired Character
These should remain rural-residential buffers where the scenically-distinctive semi-rural and natural qualities of prominent backdrops to Gosford City's major roads and tourist routes are preserved by appropriate very-low density residential developments associated with low-impact rural activities, and by small-scale businesses or community and educational facilities that have a modest impact.

Addressed: The development is considered to represent a small-scale business having a modest impact. It is setback considerably from all boundaries, including over 400m from Avoca Drive, ensuring that the built form will have no impacts on the semi-rural backdrop of the area particularly when views from major roads.

Retain natural slopes and prevent further fragmentation of the tree canopy in order to maintain habitat values and informal scenic characters of hillside or valley properties, plus meandering roads with unformed verges. Along creeks, ridges, slopes or road frontages, conserve all mature bushland remnants that provide scenically-prominent backdrops visible from any road or nearby property. Limit intrusion of structures upon their landscape setting by concentrating new buildings and pavements in existing clearings. Use low-impact construction such as suspended floors and decks rather than extensive cut-and-fill, particularly on elevated slopes or near bushland.

Addressed: The proposed development has retained the majority of the vegetation across the site including the vegetated riparian corridors of the two (2) watercourses and vegetated setbacks on all boundaries. The proposed access road meanders around key vegetation and to follow the contours of the site to minimise earthworks.

In areas that are defined as bushfire prone, hazard must not be increased by inappropriate new plantings or structures. Minimise the extent of cleared asset protection zones by fire-resistant siting, design and construction for all new structures plus effective management of gardens. The ideal compromise between desired scenic quality and hazard-reduction would limit clearing to the understorey plus thinning of the canopy to establish breaks between existing trees.

Addressed: Vegetation removal for the purposes of Asset Protection Zones (APZ) has been minimised by placing the development primarily across cleared portions of the site and by using roads and setbacks for APZ purposes. Bushfire management protocols will also be followed to ensure landscaping and buildings are appropriate for the area in terms of bushfire threat.

Maintain the informal character of existing semi-rural hillsides by avoiding tall retaining walls, extensive terraces or broad driveways that would be visible from any road or nearby property, and provide boundary fences that are see-through such as traditional post-and-rail designs. Surround all buildings with extensive garden setbacks, planted with new trees and shrubs that are predominantly indigenous to complement the established canopy. Noxious or environmental weeds must not be planted, and existing infestations should be controlled.

Addressed: As discussed above, significant setbacks have been proposed which will involve see-through fencing and screening landscaping incorporating native species indigenous to the area. This will ensure than any roads or retaining are screened from view.

In order to minimise their scale and bulk, all new structures that would be visible from a road or nearby property should reflect the modest character and simple articulation of

traditional farm buildings. For example, divide floorspace into a series of linked pavilion structures or wings of rooms that are surrounded by landscaped courtyards, and preferably, provide parking in carports or separate garages. Roofs should be simple hips or gables without elaborate articulation, gently-pitched to minimise the height of ridges and flanked by wide eaves or extensive verandahs to disguise the scale of exterior walls. (In bushfire prone areas, verandahs, roofs and suspended floors must be screened to prevent the entry of sparks and flying embers.)

Addressed: The proposed development has placed key buildings including the manager's office, community centre and amenities buildings all over 50m from any side boundary. Any future moveable dwelling will be modest in size given the limited site of the sites proposed.

Disguise the scale of facades that are visible from the street by incorporating extensive windows and verandahs, some painted finishes rather than expanses of plain masonry, and avoid wide garages that would visually-dominate any frontage. Ensure that outbuildings are compatible with the scale and design of their associated dwelling, particularly by using a similar roof pitch and wide eaves. Any commercial signs should be limited in size and number.

Addressed: All proposed buildings are well setback from all boundaries, include large verandahs and/or decking and use natural colours to blend with the existing landscape.

Taking the above into consideration, the proposed development has been designed to ensure the desired character of Kincumber is not eroded.

4.6.2 Chapter 2.2 – Scenic Quality

The site is located in the *Kincumber Land Unit* within *East Brisbane Water Geographic Unit* (see Figure 12).

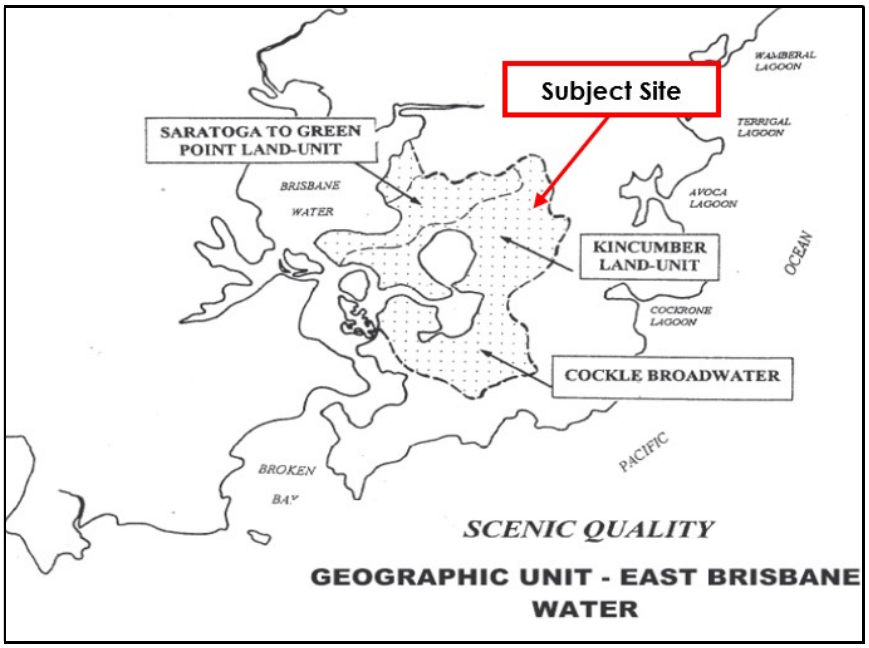

Figure 12: Scenic Quality Mapping

Chapter 2.2 generally relates to rezoning, however the following objectives are considered relevant:

1. *Maintain broad patterns of land use within area to ensure protection of landscape diversity and in particular Environmental/Conservation and Scenic Protection zoned areas.*
3. *Opportunities for increases in densities and scale are available in urban areas, not subject to visibility constraints or other physical constraints. Visually constrained land includes land viewed from main roads, waterfront areas and land on higher slopes.*
6. *Continue to attempt to secure lands identified for inclusion in the Coastal Open Space System as part of the visual landscape.*
8. *Recognise importance of privately owned Environmental/Conservation zoned land in providing a complimentary land system to and a buffer area for COSS lands*

The civil design and layout of the site has been undertaken to minimise cut/fill and to ensure buildings that integrate with the surrounds.

An extensive landscape masterplan has also been developed to not only screen the development but to enhance the existing vegetation and environmental attributes across the site.

A large vegetated portion of the site, both north of the northern riparian zone and south of the southern riparian zone will remain in its natural vegetated state and provide an important green corridor and linkage to the local Coastal Open Space lands.

4.6.3 Chapter 3.10 – Environmental Controls for Development in Zone E4

This chapter applies to all land in Gosford zoned E4 Environmental Living, and as such, applies to the subject site. The specific requirements for this chapter are as follows:

a) <u>*Restrict the amount of development on land on slopes greater than 20%.*</u>
Building works, accessways, ancillary development or land uses shall not be located on land on the subject site which has a slope of 20% or greater. Where this is not possible, due to the extensive areas of the land having slopes over 20%, development can occur on the steeper land as long as building methods are adopted which rely on minimal disturbance to the land surface such as pole or similar type construction.

The development has been positioned so as to avoid the areas of steepest slope and to position sites to follow the contours as opposed to cut across them. This ensures areas with a slope of 20% are avoided and earthworks are minimised in other areas.

b) <u>*Maximise retention of existing native vegetation*</u>
All development including all building works, access, bushfire asset protection zones should be confined to existing cleared areas (as identified on February 1999 Aerial Photo series). Ground truthing will be expected as part of the development application submission.

If the site is vegetated and does not contain any cleared areas or existing cleared areas are insufficient to accommodate the development, Council may consider sensitive design that minimises native vegetation removal whilst having regard to bushfire protection asset zones.

The proposed development has been positioned over primarily cleared portions of the site ensuring minimal vegetation removal is required for the development footprint. Further, APZs have been positioned over proposed roads and setbacks to further lessen impacts in this regard. Overall only 2.1ha of vegetation will require removal, with the majority of native vegetation being retained including important linkages along the north and south riparian zones. This land will provide an important green corridor and linkage to the local Coastal Open Space lands.

c) *Restrict the amount of cut and fill.*
The extent of cut and fill for buildings is to be limited to a maximum of 1m and in other cases is to be minimised.

As discussed above, considerable effort has been afforded to the placement of the development to minimise cut and fill where possible.
Retaining walls have been reduced by over 3m and the volume of earthworks almost halved from the previous DA. Whilst retaining walls are still over 1m, they have been proposed at these heights to limit battering and consequent additional vegetation removal.

d) *Ensure provision of utility services protects ecological and landscape values of land and catchment.*
For any tourist-related development, connection to Council's sewer system is required. No exceptions will be considered even if augmentation is required or the development is of a small scale. All other utility services are to be located underground.

The proposed development will connect to Council's sewer system. Additionally, all other utility services are to be provided underground.

e) *Encourage a design of tourist development which is compatible with the natural/rural character of Environmental land in the City.*
Layout of development on site to be such that the development, either through the existing natural/rural character or through introduced landscaping and building design, blends into the natural/rural landscape.

Further, development should comply with the aims and objectives of the Chapters on Scenic Quality and Character.

As discussed above, the proposed tourist park has been designed to ensure minimal impacts throughout. This is discussed in greater detail under Chapter 2.1.

4.6.4 Chapter 6.1 – Acid Sulfate Soils

As discussed above; the site is identified as containing Class 5 Acid Sulfate Soils, where works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5m AHD and by which the watertable is likely to be lowered below 1m AHD on adjacent Class 1, 2, 3 or 4 land, requires the preparation of an Acid Sulfate Soils Management Plan.

As works associated with the proposed development are located over 500m from adjacent Class 1, 2, 3 or 4 land, an Acid Sulfate Soils Management Plan is not required.

4.6.5 Chapter 6.3 – Erosion and Sedimentation Control

The proposed development will require a maximum cut and fill across the development site including the importation of circa 5,500m^3 of fill. To prevent downstream impacts in this regard, various erosion and sedimentation control devices will be implemented during the construction phase. Further details in this regard are included in the SWMP within **Appendix 19.**

During the construction period, it is recommended that the basins are constructed early and used as temporary sediment basins. It is also recommended that an appropriate Erosion and Sedimentation Control Plan is implemented during the entire construction period to minimise the quantity of sediments being conveyed to the basin.

4.6.6 Chapter 6.6 – Tree and Vegetation Management

As the proposed development exceeds the Biodiversity Offset Scheme, a Biodiversity Development Assessment Report (BDAR) has been prepared within **Appendix 10**. This point aside, Tree Assessment Reports (TAR) have also been prepared for the development footprint and the access track to Picketts Valley Road (refer to **Appendix 11**). The TAR has calculated that within the development footprint, 210 trees will be removed and 88 will be within close proximity to works ("threatened").

Threatened trees are those trees that have the potential to be retained either with minor modifications to the layout or with monitoring during the constructions works by an AQF5 arborist. All other trees should be adequately protected during the works to ensure they are not subjected to further impacts.

The TAR has provided a number of standard mitigation measures to be adopted during construction to ensure maximum retention of the threatened trees as possible. It is assumed Council will condition these as necessary.

4.6.7 Chapter 6.7 – Water Cycle Management

A Water Cycle Management Plan has been prepared, addressing the requirements of Chapter 6.7, and is provided as **Appendix 13.**

Stormwater runoff from the adjoining property to the east will be conveyed via a headwall and stormwater pipe to the southern watercourse. Stormwater runoff from the proposed development will be conveyed via pit and pipe networks and the proposed roads to the existing watercourses with appropriate stormwater quality and quantity treatment.

The proposed stormwater system has been designed to safely convey the minor and major flows from within the development to the receiving waters without adversely impacting downstream properties and infrastructure.

The stormwater detention provided by the proposed basins will allow the limiting of the post-development critical peak discharges leaving the site to less than that of pre-development for all storm events up to the 1% AEP, thereby not increasing the risk of flood inundation to existing downstream development and not increasing the demand on the downstream stormwater infrastructure.

A treatment train process of rainwater tanks, GPTs and biofiltration basins have been designed to effectively reduce the nutrients and gross pollutants from stormwater runoff from the proposed development.

MUSIC modelling has demonstrated that the treatment train for runoff from the proposed development complies with the performance target objectives of CCC prior to discharge into the downstream waterways.

4.6.8 Chapter 7.1 – Car Parking

Parking requirements for this development are governed by the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005,* which has been addressed above.

Further assessment of parking has been undertaken by McLaren Traffic Engineers within the Traffic and Parking Impact Assessment within **Appendix 8.**

4.6.9 Chapter 7.2 – Waste Management

In accordance with the requirements of this Chapter, a Waste Management Plan (WMP) has been prepared and is provided as **Appendix 17.**

As with most best-practice building projects, the amount of waste to be generated during the construction phase will generally be minimal due to the use of pre-ordered and pre-fabricated building materials to ensure wastage – and hence cost – is minimised.

Waste generated during the construction phase will be sorted and either re-used onsite or will be taken to a material recycling facility where possible. All non-recyclable waste will be removed to Council's Waste Depot.

With regards to the ongoing operational management of waste; appropriate waste storage has been provided within the development, ensuring each site has easy access to a collection point. All roads have also been designed to ensure a private waste contractor can easily and safely collect waste.

4.7 PLANNING AGREEMENTS (S4.15(1)(A)(IIIA)) AND CONTRIBUTION PLANS

The site falls outside of the Kincumber Contribution Plan 16C and as such, will require the payment of contributions in accordance with the Central Coast Regional Section 7.12 Development Contributions Plan 2019 which requires contributions to be paid at a rate of 1% of the development cost.

4.8 COASTAL ZONE MANAGEMENT PLAN (S4.15(1)(A)(IV))

N/A

4.9 STRATEGIC DOCUMENTS

4.9.1 Central Coast Regional Plan 2036

The Central Coast Regional Plan 2036 outlines the visions, goals and actions that are geared to growing the regional economy, accelerating housing supply, and protecting and enhancing the natural environment. The plan identifies the current population to

grow by an additional 75,500 people by 2036, with 55% of this growth being people aged 65 and older. To cater for this growth, an additional 41,500 dwellings are required by 2036.

To meet the projected housing demands over the next 20 years, the CCRP requires an average of 2,000 new homes to be constructed each year.

With an aging population, it will become a necessity to develop housing which provides for seniors and retirees. The proposed development will be attractive to this demographic through the long term sites as they will provide a downsized housing option to standard residential and an additional style of retirement living to standard retirement villages.

Further to the above; the Social and Economic Impact Assessment (SEIA) identifies those items of the CCRP which are addressed by the proposed development as follows:

Table 1: Relationship of proposed project to CCRP 2036

Plan Ref.	CCRP element	Relevance of proposal to element
P.8	There is greater housing diversity to suit the changing needs of the community, particularly the ageing population and the needs of weekend and seasonal visitors.	The proposed development may provide additional capacity, particularly for weekend and seasonal visitors.
P.8	The region's renowned natural environment provides attractive settings for a range of lifestyles and is a drawcard for visitors beyond the region.	The caravan park may attract and accommodate people visiting the area.
P.15	The region's unique and productive natural environment, including its coastline, will support growth in the tourism, lifestyle housing, agriculture and resource sectors.	The proposed development directly addresses the objective of supporting tourism and providing lifestyle housing.
P.23	Capitalise on the region's location and coastline to enhance the visitor economy with a focus on events-based tourism and update planning controls.	The caravan park would provide additional capacity to support enhancement of the visitor economy.
P.29	Around 9 per cent of total tourism expenditure in regional NSW occurs in the Central Coast. The sector is worth around $880 million a year to the region and is growing. The Central Coast can leverage its natural assets and proximity to Sydney to generate more jobs and economic activity from tourism.	The caravan park would contribute to tourism capacity and support related economic and employment growth.

Full details in this regard are provided within the SEIA (refer to **Appendix 15**).

Based on the above, it is clear that the subject site provides a strategically ideal opportunity to facilitate the delivery of additional dwellings to assist in achieving these targets.

4.9.2 Central Coast Community Strategic Plan 2018-2028

The Central Coast Community Strategic Plan identifies a need for a "range of housing options to meet the diverse and changing needs of the community including adequate affordable housing" and "tourism and visitor growth". The proposed development will assist in achieving both of these requirements.

4.9.3 Central Coast Positive Aging Strategy 2014

On the Central Coast 25% of the region's population is aged 60 years and over compared to 20% for NSW. This equates to a total of 78,270 people. By 2021 the number of people aged over 60 is expected to increase by approximately 15,000 people or 18.5%.

This proposal is consistent with this strategy, particularly by provided a form or housing particularly attractive to an aging population and one which is not readily available within the southern sector of the Central Coast.

4.9.4 Department of Planning & Environment – Improving the Regulation of Manufactured Homes, Caravan Parks, Manufactured Homes Estates and Camping Grounds 2015

This paper highlights the changing role and functions of parks and estates in both the tourism and residential housing sector. Caravan parks, manufactured home estates, moveable dwellings and manufactured homes provide a diversity of housing choices in a range of locations across NSW. These facilities and forms of housing provide options for long term residential uses, such as permanent residential accommodation in a caravan park, and short term uses such as tourism uses.

The paper notes that caravan parks are becoming increasingly popular for seniors and retirees. As the aging population continues to grow, it is likely that the trend and demand for this style of development will continue.

4.9.5 Affordable and Alternative Housing Strategy 2020

The proposed development will facilitate in one of the overarching aims of the Affordable and Alternative Housing Strategy being to "provide effective policy solutions to address the growing need for affordable and alternative housing within the Central Coast LGA".

4.9.6 Gosford Coastal Open Space Strategy

The Coastal Open Space System (COSS) is a network of reserves supporting native vegetation that are managed by Gosford City Council for a number of environmental and community values.

The purpose of the COSS strategy is to identify the strategic directions and the major actions required to conserve and preserve a sustainable Coastal Open Space System including the acquisition of identified lands for the system.

The subject land is located between a large COSS holding – Kincumba Mountain to the west and a smaller but integral COSS holding to the east at the upper reaches of Avoca Lagoon.

The subject land contains approximately 8ha of native bushland adjacent to the northern riparian zone and northern boundary. This vegetated land can provide an important local green corridor and linkage between these two (2) existing COSS holdings, contributing to longer term green corridor connections in the locality.

Retained vegetation along both riparian zones will also provide further small linkages east and west (see Figure 13).

Figure 13: Retained Vegetation able to Supplement COSS Network

4.10 INTEGRATED DEVELOPMENT

4.10.1 Roads Act 1993

The proposed development will require construction within the Avoca Drive road reserve and as such, will require General Terms of Approval (GTA) under Section 138 of the Roads Act 1993.

GTAs are generally not required for works within a public road as Council is the consent authority as well as the roads authority. This does not apply to the subject development as Avoca Drive is a TfNSW controlled road.

4.10.2 Rural Fires Act 1997

The subject site is classified as "bushfire prone" land under Council's constraints mapping. Given the proposed development is classified as a "Special Protection Purpose" under the Rural Fires Act 1997 however, Council are required to refer the application to the Rural Fire Service (RFS) as per the "Integrated Development" provisions of Section 4.46 of the EP&A Act.

4.10.3 Water Management Act 2000

The subject site is located within "waterfront land" and includes watercourse crossings and the need to dewater the large dam located along the southern watercourse. The development therefore requires a Controlled Activity Approval from NRAR pursuant to Section 91 of the Water Management Act 2000. A SWMP and Dam Dewatering Management Plan have been provided within **Appendix 19** and **Appendix 22** respectively to assist NRAR with their assessment.

5.0 Environmental Assessment

5.1 THE LIKELY IMPACTS OF DEVELOPMENT (S4.15(1)(B))

5.1.1 Context and Setting

The context and setting of the site has been addressed in detail within preceding sections of the SEE. In summary, the proposed development is considered an ideal, low impact style of residential and tourist accommodation in terms of its semi-rural/residential setting.

5.1.2 Access, Transport and Traffic

Access

As previously discussed, access to the site will be gained off Avoca Drive via a CHL/CHR intersection treatment. This has been designed to achieve the requirements of Clause 92 of the LG Regs. Secondary emergency access will also be available via the existing track to Picketts Valley Road.

Internal Access

Internal access to the development is provided via 6m wide sealed private roads which achieve Clause 94 of the LG Regs. Pedestrian pathways will also be provided linking the sites to the recreation and community facilities as well as the surrounding bushland.

Parking

Parking for the site has been provided in line with Clauses 96-98 of the LG Regs through provision of one (1) space on each site and 16 visitor spaces including one (1) disabled space.

Public Transport

A bus stop is located only a 200m walk from the site, which provides a regular service to Erina Fair Bus Interchange approximately every 30 minutes.

Traffic

TPIA found that the proposed development would generate 18 peak inbound and outbound trips.

The following conclusions were made in this regard:

- To reduce the potential for disruption of traffic flows along Avoca Drive, it is proposed that right turns out of the site be restricted and that channelised left and channelised right turn treatments (CHL/CHR) be constructed to facilitate the safe entry of vehicles to the site; and
- The road network has ample mid-block and intersection capacity to cater for the development without the need to upgrade the local road network.

Full details with regards to the above are provided within the TPIA within **Appendix 8**.

5.1.3 Public Domain

The proposed development will have minimal impacts on the public domain given its significant setback from any road boundary.

5.1.4 Utilities

Water and sewer services are available to the subject site, with connections to be provided to each site. Connection to water will involve a 200mm lead in water connection along Avoca Drive and the sewer service will require the installation of a sewer pump station.

Electricity and telecommunication facilities to service the proposed allotments will be provided underground and will involve the removal of the existing overhead power and the installation of an electrical kiosk.

Full details with regards to the above are provided within the concept engineering plans within **Appendix 1**.

5.1.5 Stormwater, Drainage, Water Quality

The stormwater, drainage and water quality design for the development has been addressed in detail within preceding sections of the SEE. In summary, the proposed development achieves all best practice standards in terms of water quantity and quality management. Full details in this regard are provided within the WCMP within **Appendix 4** and the SWMP within **Appendix 19**.

5.1.6 Flooding

The flooding attributes of the site and how the development responds to these, have been addressed in detail within preceding sections of the SEE. In summary, all sites and access will be above the 1% flood level, and no additional flooding impacts will be experienced by surrounding properties as a result of the development. Full details in this regard are provided within the FIA within **Appendix 14**.

5.1.7 Ecology

As discussed above, the portion of the site proposed for development is generally cleared, containing mainly disturbed grasslands. There are however, patches of native vegetation identified as Plant Community Type (PCT) Smooth-barked Apple/ Turpentine/ Blackbutt open forest in ranges of the Central Coast (PCT 1579, HU 793) and Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast (PCT 1568, HU 782). Neither of these are identified as threatened ecological communities (see Figure 14).

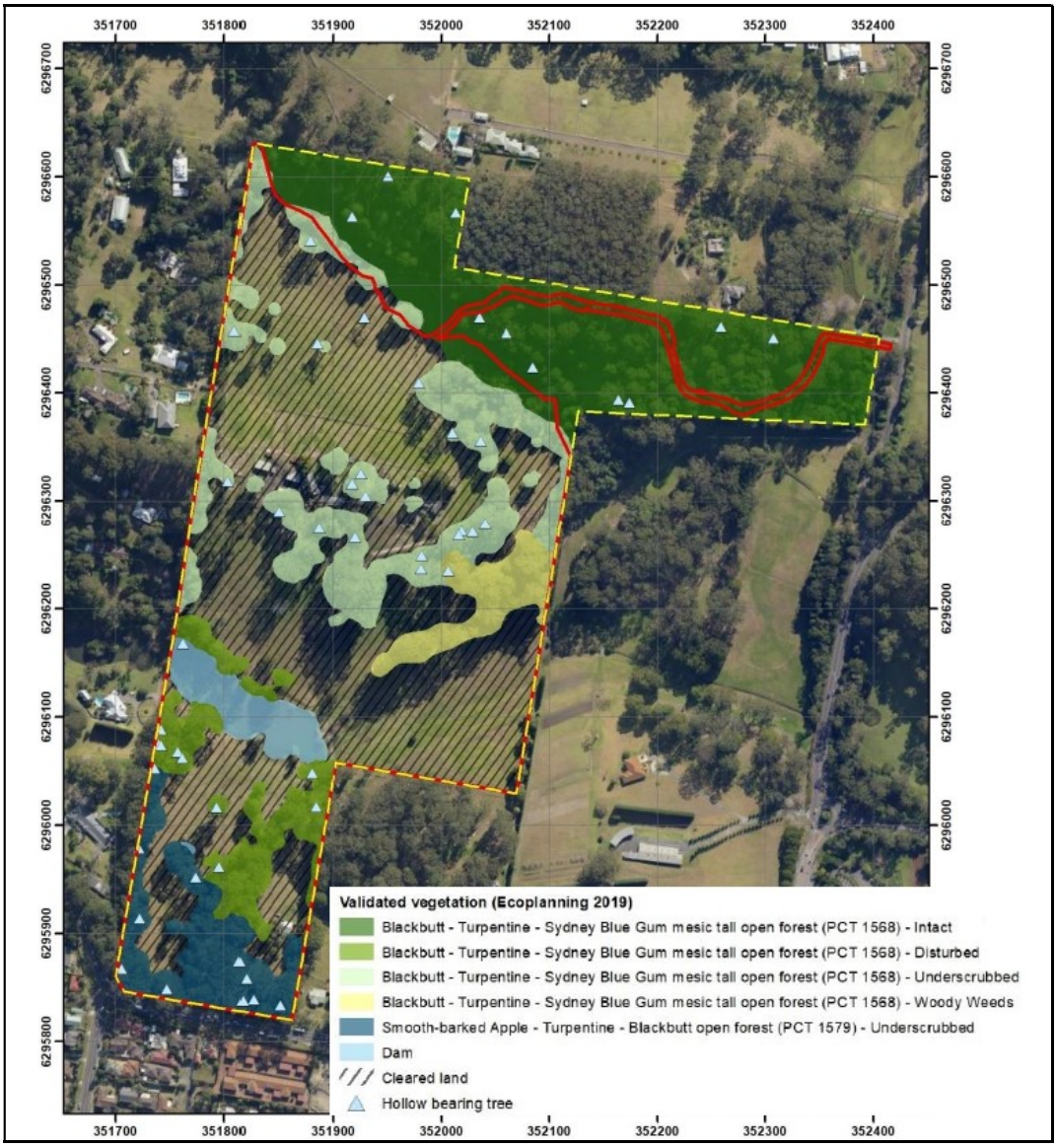

Figure 14: Plant Community Types

The Biodiversity Conservation Act 2016 (BC Act) requires that all DAs be assessed for all possible clearing which is considered to be reasonable as part of the proposal. Whilst the proposed development has been positioned over the predominantly cleared portions of the site, the following vegetation will require removal/modification to account for the development footprint, all batters, access, basins, APZs and other ancillary aspects:

- PCT 1568:
  - 1.92ha to be cleared for the development and access track; and
  - 3.62ha to be managed as an APZ.
- PCT 1579:
  - 0.18 ha to be cleared for the development; and
  - 1.2ha to be managed as an APZ.

The BC Regulation 2017 sets out threshold levels for when the Biodiversity Offsets Scheme (BOS) will be triggered, thereby requiring an accredited assessor to apply the Biodiversity Assessment Method (BAM) to assess the impacts of a proposal. These thresholds have been assessed as follows:

The subject site has a minimum lot size control of 4ha under the LEP and as such, has a clearing threshold of 2ha as shown within the table below:

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

The proposed development only just exceeds 2ha in clearing (2.1ha) excluding APZ management areas. For this reason, the development requires a Biodiversity Development Assessment Report (BDAR) to be prepared.

A BDAR has been prepared by Ecoplanning to assess the residual impacts of the development upon threatened entities in accordance with the BC Act following the consideration of avoid and minimise techniques. Ecoplanning have concluded that to offset these residual impacts, the following biodiversity credits should be retired:

- 48 x PCT 1568 – Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest credits
- 15 x PCT 1579 PCT 1579 – Smooth Barked Apple – Turpentine – Blackbutt open forest credits
- 128 x Large-eared Pied Bat credits
- 6 x Green and Golden Bell Frog credits
- 85 x Southern Myotis credits
- 85 x Powerful Owl credits
- 85 x Masked Owl credits
- 128 x Eastern Cave Bat credits

Further to the above the following additional measurs are proposed to minimise impacts:

- Pre-clearance protocols including On-site supervision of habitat tree felling and relocation of fauna; soft felling operations; Recreating green and golden bell frog habitat in the vegetated riparian zone
- Preparation and adherence to a Construction Envtionemtnal Management Plan
- Preparation and adherence to a Vegetation Management Plan.

Further information in this regard is provided within the BDAR located within **Appendix 10**.

5.1.8 Heritage

Matters pertaining to heritage have been discussed above. Beyond this, it is noted that previous assessment in this regard for the previous DA raised concern over the removal of the existing farm cottage. These comments have been taken on board and the proposed plans retain this cottage.

5.1.9 Geotechnical Considerations

Contamination

A Preliminary Contamination Assessment (PCA) and Phase 2 Contamination Assessment were undertaken by Qualtest across the site which revealed the following:

- Contaminants across the site include lead and asbestos in surface soils in the vicinity of a residential dwelling on Lot A DP 449600; microbiological contamination associated with a septic system; buried asbestos pipework on Lot 3 and Lot 9;
- A Remediation Action Plan (RAP) including an Asbestos Removal Plan (ARP) should be undertaken;
- Following remediation, a Contaminated Land Management Plan should be prepared including an Unexpected Finds Procedure (UFP).

A RAP has now also been prepared and provides a number of options to remediate the site with the preferred including:

- Former and Current Buildings: Dispose excavated soil (including ACM) as waste to licensed waste facility;
- Septic Tanks: Excavate and expose to UV radiation or dispose to licenced waste facility;
- Asbestos pipes: Dispose ACM to a licensed facility.

The above remediation will be undertaken in accordance with a Contaminated Land Management Plan and Hazardous Substance Audit.

Full details with regards to the management of contaminants are provided within the PCA, Phase 2 Contamination Assessment, RAP, Construction Contaminated Land Management Plan and Hazardous Substance Audit within **Appendix 9.**

Geotechnical

A Preliminary Geotechnical Report has been prepared by Qualtest which revealed the key considerations for the site included the undulating topography; presence of watercourses, drainage depressions, dams; and presence of alluvial soils. The report provides a variety of standard construction and preparation measures to be adopted to appropriately address these conditions.

Full details with regards to the above are provided within the Preliminary Geotechnical Report in **Appendix 21**.

5.1.10 Bushfire

As noted previously, the subject site is classified as "bushfire prone" land (see Figure 15).

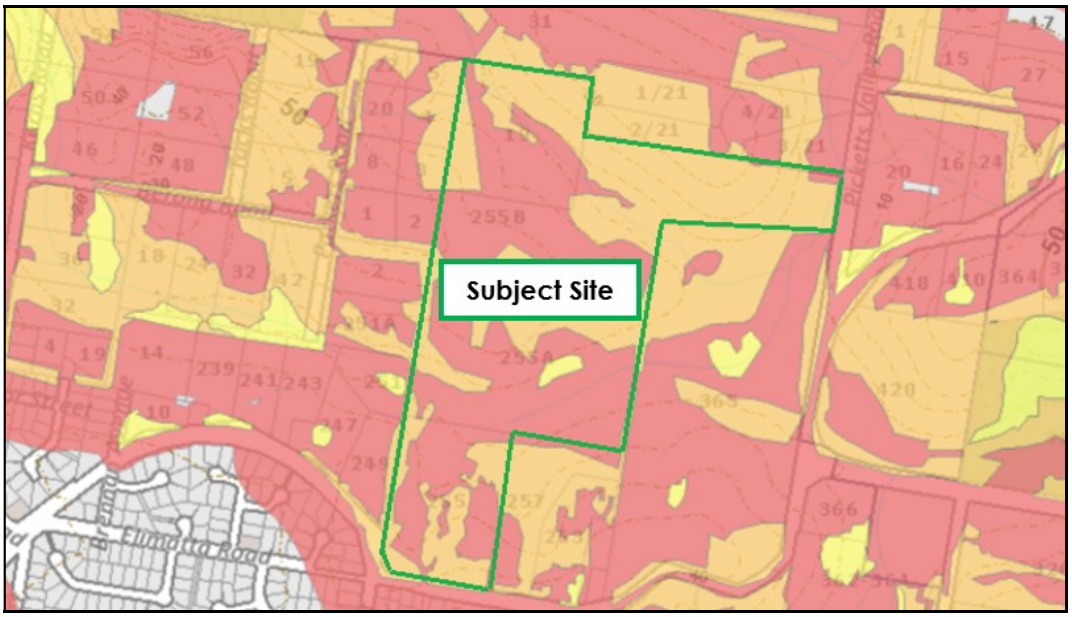

Figure 15: Bushfire Mapping

Given the proposed development is classified as a "Special Protection Purpose" under the Rural Fires Act 1997, Council are required to refer the application to the RFS to gain their General Terms of Approval as per the "Integrated Development" provisions of Section 4.46 of the EP&A Act.

To identify the extent of bushfire threat and to assist the RFS in their assessment of the proposal, a Bushfire Assessment has been prepared by Peterson Bushfire Consulting (refer to **Appendix 12**).

To inform the Bushfire Assessment, Peterson Bushfire Consulting have conducted a slope and vegetation assessment which has concluded that APZs of between 24m and 37m apply for long-term sites and 67m and 93m for short-term sites. These will be accommodated along roads, front building setbacks and existing cleared/managed portions of the site (see Figure 16).

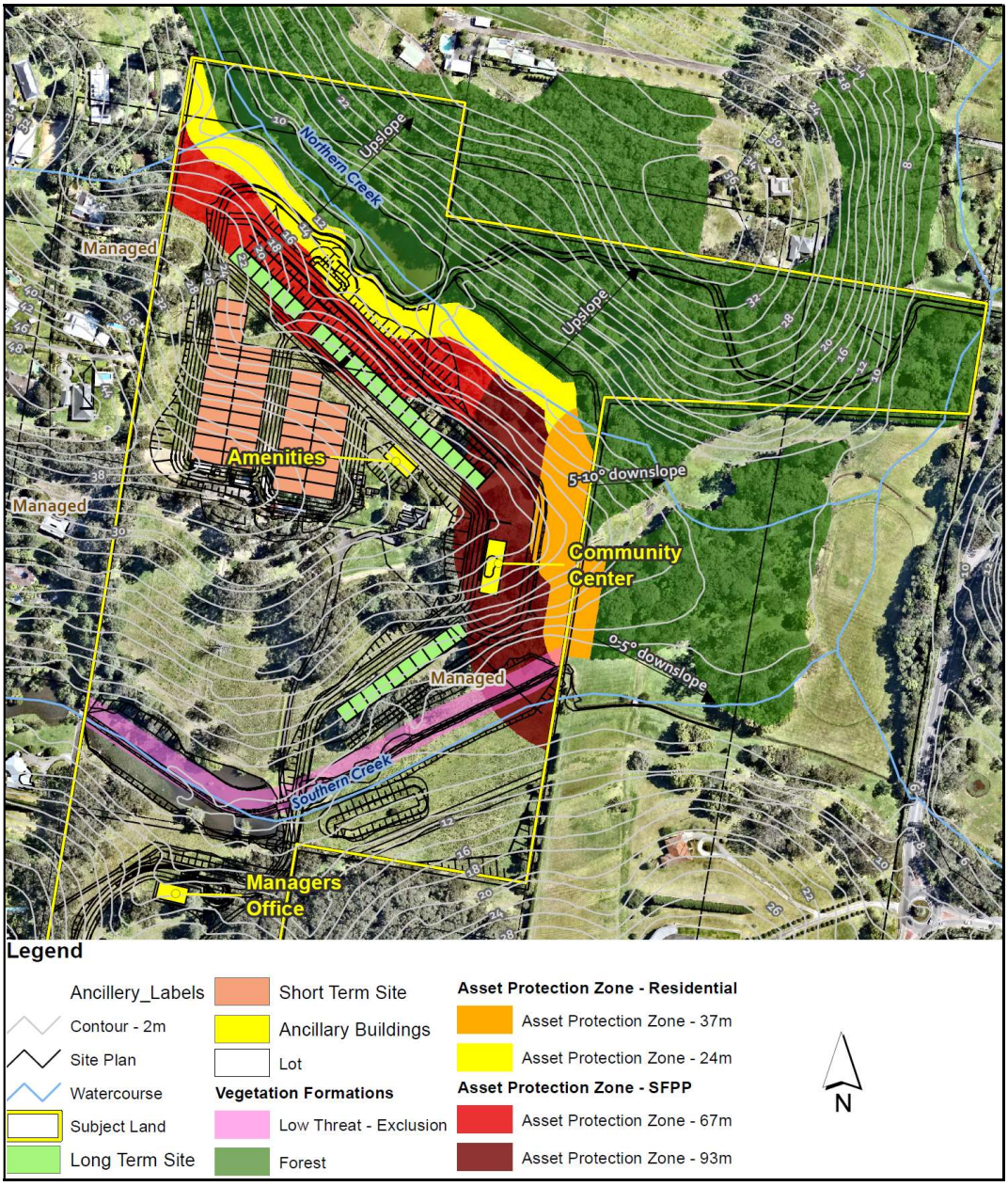

Figure 16: Bushfire Hazard Analysis and APZ

Other measures recommended include:

- Applying Bushfire Attack Level 12.5 to some sites excluding those to be used for caravans and also to the manager's office which can be used as a bushfire refuge;
- Inclusion of an 8m perimeter road which has been provided using all weather materials (referred to as a "fire trail" on the Concept Engineering plans in Appendix 4);
- Use of the existing access on to Picketts Valley Road as an alternate access;
- Management of APZs as Inner and Outer Protection Areas (IPA);

- Preparation of a 'Bushfire Emergency Management and Evacuation Plan'; and
- Provision of hydrants, clearance to overhead electricity and installation of any gas in accordance with Australian Standards.

Taking the above into consideration, the proposed development is considered to achieve the requirements of PBP 2019.

5.1.11 Noise and Vibration

As part of the previous DA, Council requested an acoustic report for construction and operational noise prepared in accordance with the NSW EPAs Industrial Noise Policy (2000). Spectrum Acoustics were engaged to prepare this report and advised that there would be no adverse impacts on or from the proposal either during construction or operation subject to the implementation of the Construction Noise Management Plan.

Given that the subject development proposes a significant reduced site yield, increases setbacks and retained vegetation, the acoustic impacts will only be reduced over the previous DA. For this reason, the recommendations prepared within the previous report are still able to be complied with under the subject development.

Full details with regards to the above are provided within the Noise Assessment and Construction Noise Management Plan within **Appendix 20**.

5.1.12 Social and Economic Impact

A Social and Economic Impact Assessment (SEIA) has been prepared by Aigis Group which provides an analysis of the local population and assessment of the development upon this. The SEIA indicates that the area contains households with lower incomes; higher proportion of single or lone households; higher proportion of older residents; and higher proportion of local visitors (i.e. those travelling within the LGA for tourist reasons). Added to this, it is noted that the area contains little availability for affordable housing and caravan park style tourist accommodation; represents the States fifth highest visited region; and generates a higher proportion of its income and employment through tourism. With this in mind, the proposed development, providing both long and short term sites represents a clear opportunity for Council to take advantage of the above where relevant and remedy notable gaps in accommodation.

The SEIA also provides an assessment of the developments impact on the surrounding environment and generally concludes that due to the nature of the large lots surrounding and the significant setbacks and retained vegetation along boundaries, these impacts are minimised. The proposed development also differs from that previous proposed on the site which generated significant community opposition.
Whilst this opposition is likely to remain with the proposed development, the following key differences must be noted:

- The scale and density of the development has significantly reduced;
- Setbacks to nearby boundaries have increased considerably and buildings considered to have high activity are located within the centre of the site;
- The proportion of short term sites has increased, resulting in less permanent activity across the site, most notably traffic;
- The existing access track off Picketts Valley Road will no longer be used for construction access; and
- The majority of the vegetation on site will remain.

To further address community concerns the SEIA recommends establishing channels for communication with stakeholders, during the development and operational stage.

In terms of economic benefits, the initial investment in the proposed development is estimated at $9,273,541. Using a conservative multiplier (1.47x), the SEIA has advised that the flow on effects of this investment are circa $13 million. Added to this, the development would generate up to 222 full time equivalent positions using a multiplier of 24 per $million.

Occupation of the site, both long and short term, would also contribute additional income for businesses and support employment in the local and regional tourism and hospitality sectors. Longer term guests of the park are likely to patronise local and regional businesses, thus supporting further economic and employment activity.

Full details with regards to the above, along with general recommendations are provided within **Appendix 15**.

5.1.13 Landscaping

The landscape design proposed as part of this development is extensive and includes:

- Planting canopy trees along Avoca Drive and within buffer areas;
- Revegetation of the riparian corridors using appropriate species;
- Tree planting along roads using Glochidion Ferdinandi, Corymbia "Little Spotty", Callistemon Viminalis, and Corymbia Eximia "Nana";
- Provision of extensive walking tracks and boardwalks throughout;
- Planting out basins using appropriate species;
- Horse riding areas, mini golf, and tennis;
- Playground equipment including jumping pillow;
- BBQ area with decking and seating;
- Fitness equipment;
- Canopy walk;
- Fenced dog park; and
- Fencing.

Full details with regards to the above are provided within **Appendix 5**.

5.1.14 Waste

The waste management requirements of the site have been addressed in detail within preceding sections of the SEE. In summary, the proposed development provides ample waste storage for all sites and associated buildings, and access to this is safe and convenient for both residents and visitors as well as the future waste contractor. Waste management protocols will also be followed in terms of demolition and construction waste, with this being integral to the development industry in terms of economic efficiencies. Full details in this regard are provided within the WMP within **Appendix 17**.

5.1.15 Safety, Security and Crime Prevention

The following section has been prepared in accordance with the "*Crime prevention and the assessment of development applications. Guidelines under section 79C of the Environmental Planning and Assessment Act 1979*". Using this guideline, the following CPTED Principles are recommended for the subject development:

- Territorial re-enforcement:
  - The use of a fence along all boundaries is required;
  - A boom type gate (entry/exit) which is accessible via a code;
  - Signage at entry points into the site should be erected and clearly identify direction of travel and areas where entry is prohibited;
  - Clearly signpost any area in the site where access is prohibited or is private.

- Surveillance:
  - Landscaping should not inhibit natural surveillance (block sightlines) or provide concealment and entrapment opportunities. When selecting and maintaining vegetation, consideration should be given to the possibility of areas becoming entrapment sites in the future. Heavy vegetation should be avoided at the entrance areas of all buildings throughout the site so as not to provide concealment opportunities and inhibit lines if sight;
  - The building design should not inhibit natural surveillance (block sightlines) or provide concealment or entrapment opportunities;
  - Australian and New Zealand lighting standard 1158.1 – Pedestrian; requires lighting engineers and designers to consider crime risk and fear when selecting lamps and lighting levels;
  - Pathways/line of pedestrian travel should be lit with low lighting to mark path of travel;
  - CCTV is recommended at entry points.

- Access control:
  - All entry points (pedestrian and vehicle) should be clearly signposted and identify the area as being private property;
  - Trees should not be planted close to any buildings as it creates a natural ladder to the roof of any building;
  - All contractors to register at a central point for WHS reasons and for awareness of who is on site. Contractors are recommended to carry a visitor tag/lanyard for the duration of their visit. This will minimise unauthorised entry.

- Space/Activity Management:
  - Directional signage is to be provided throughout the development. The signage is to be clear and legible to aid 'way finding' throughout the development, especially for visitors;
  - Installation of 'park smarter' signage (or similar) is recommended to minimise opportunity for theft from vehicle;
  - The area should be well maintained. Any evidence of anti-social behaviour (e.g. graffiti, broken lights etc) should be cleaned/fixed/replaced within 24 hours. A maintenance plan should be developed for the site;
  - Regular walk through to ensure the site is kept clean and also monitor the grounds.

Further to the above, the use of 'hot spot' maps shows where crime is concentrated (the higher concentration / number of the incidence of crime appear a darker shade of red). The purpose of this is to identify the areas / locations where crime is more likely to occur, as well as the incidence and type of crime, so resources and strategies can be put into place to address specific issues. The hot spot maps for the proposed development demonstrate that the site and surrounding area is not an area where there is a high incidence of crime (refer to **Appendix 16**).

Overall, the design elements of the proposed development are consistent with CPTED principles. Furthermore, a community manager will be available during business hours and contactable outside these hours. This, together with the adoption of the strategies outlined above, conclude that the mean crime risk is consider to be low.

5.2 THE SUITABILITY OF THE SITE FOR THE DEVELOPMENT (S4.15(1)(C))

The site is considered entirely suitable for the proposed development for the following reasons:

- The site is located on the urban fringe, opposite an existing retirement village and residential development and in close proximity to other residential development and numerous services;
- The number of persons aged 65 and older are forecast to grow in this Region by 41,000 to 2036. The proposed development will provide an attractive form of accommodation for this age group;
- The site has reticulated sewer lines passing through and the capacity to connect to this service. Other infrastructure is located in the immediate vicinity and available to the site with relatively minimal expenditure and disturbance;
- The majority of the site has been historically cleared through previous use;
- Whilst the site is broadly mapped in Council's DCP as 'Scenic Buffer', the site has limited vantage points viewable from public places, with the greatest exposure along the Avoca Drive where a 400m+ setback is provided.

For all of the above reasons, the current use of the site is considered an inefficient use of land in this location and the site is more conducive to the proposed development.

5.3 ANY SUBMISSIONS MADE IN ACCORDANCE WITH THE ACT (S4.15(1)(D))

The proposed development will require public notification in accordance with Chapter 1.3 of the DCP. As part of the previous DA, a letterbox drop was conducted on 27th August 2019 to approximately 170 nearby households and businesses. The material included a letter inviting comment on the proposal and was delivered to premises in the defined area, in return-addressed envelopes, addressed 'for the attention of the resident/householder'. Responses received from this consultation have been addressed in previous sections of the report and within the Social and Economic Impacts Assessment in **Appendix 15.**

5.4 THE PUBLIC INTEREST (S4.15(1)(E))

The public interest attributes of the development are evident as demonstrated in previous sections of the report. These are summarised as follows:

- The proposed development will provide an attractive alternate housing arrangement particularly suited to an aging population;
- The development will more efficiently use land situated in a highly desirable area with easy access to public transport and services;
- The development will provide additional construction and ongoing jobs in a key sector for the Central Coast;
- The proposal presents an opportunity to conserve local green corridors and linkages in to the existing COSS lands;
- The development will result in a local investment of circa $9 million dollars; and
- The development with contribute towards Section 7.12 funds used for local public infrastructure.

For these reasons, approval of the application is considered to be in the public interest.

6.0 Conclusion

The subject site is currently underdeveloped and has the potential to become a key Central Coast tourist destination and provider of an alternate form of housing to assist in achieving the ambitious residential and employment targets set for the region.

The development has been designed to respect its neighbours as well as the prominent nature of Avoca Drive through the provision of significant setbacks. This, paired with the retention of the majority of vegetation within the site, ensures that it will fit seamlessly and with low impact in its E4 zoned setting.

A team of expert consultants have undertaken a collaborative design journey to ensure all aspects of the development are fully explored with all constraints taken into consideration within the final submitted proposal.

Aside from the above, the proposed development complies with the relevant provisions of Gosford Local Environmental Plan 2014 as well as the controls within the Gosford Development Control Plan 2014.

Taking the above into consideration, the proposal addresses all matters under Section 4.15 of the EP&A Act and on this basis, Council is requested to grant development consent to the application.

Appendix 1

CONCEPT ENGINEERING PLAN

Appendix 2

DEPOSITED PLANS

Appendix 3

CERTIFICATES OF TITLE

Appendix 4

BUILDING DESIGN PLANS

Appendix 5

LANDSCAPE PLANS

Appendix 6

ABORIGINAL DUE DILIGENCE ASSESSMENT

Appendix 7

LOCAL GOVERNMENT REGS COMPLIANCE TABLE

Appendix 8

TRAFFIC AND PARKING IMPACT ASSESSMENT

Appendix 9

GEOTECHNICAL AND CONTAMINATION REPORTS

Appendix 10

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Appendix 11

TREE ASSESSMENT REPORTS

Appendix 12

BUSHFIRE ASSESSMENT

Appendix 13

WATER CYCLE MANAGEMENT PLAN

Appendix 14

FLOOD IMPACT ASSESSMENT

Appendix 15

SOCIAL AND ECONOMIC IMPACT ASSESSMENT

Appendix 16

CPTED MAPS

Appendix 17

WASTE MANAGEMENT PAN

Appendix 18

QUANTITY SURVEYORS REPORT

Appendix 19

SOIL AND WATER MANAGEMENT PLAN

Appendix 20

NOISE ASSESSMENT

Appendix 21

PRELIMINARY GEOTECHNICAL ASSESSMENT

Appendix 22

DAM DEWATERING MANAGEMENT PLAN

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Geotechnical Investigation

Proposed New Residence
36 Coral Crescent, Pearl Beach

Prepared for
Trish Affleck

Project 104148.00
November 2020

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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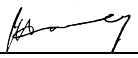
Reviewer		3 November 2020

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Report on Geotechnical Investigation
Proposed New Residence
36 Coral Crescent, Pearl Beach

1. Introduction

This report presents the results of a geotechnical investigation undertaken by Douglas Partners Pty Ltd (DP) for a proposed new residence at 36 Coral Crescent, Pearl Beach. The investigation was commissioned by Trish Affleck, with Diana Jones of Professional Construction Services Pty Ltd acting as the client's agent, and was undertaken in accordance with DP proposal CCT200328.P.001.Rev0 dated 30 September 2020.

It is understood that the existing residence is proposed to be demolished and a new two-storey residence with lower level garage/storage and mid-level swimming pool constructed. Additionally, the site is located at a beachfront property and is mapped as being within the design zone for coastal processes.

The aim of the investigation was to assess the subsurface soil and groundwater conditions across the site in order to provide:

- Appropriate site classification in accordance with the requirements of AS2870-2011;
- Geotechnical parameters for the design of piled footings taking due account of the potential impacts of coastal erosion;
- Retaining wall design parameters and safe batter slopes; and
- Acid sulfate soil assessment.

The assessment has been prepared to address the geotechnical requirements of Chapter 6.2 of CCC (2013).

The investigation comprised a cone penetration test (CPT) on the landward side of the existing residence, together with boreholes and dynamic penetrometer tests (DPT) on both the seaward and landward sides of the site. Details of the field work are given in the report, together with comments relating to design and construction practice.

For the purpose of the assessment DP was provided with draft architectural drawings prepared by Archibon Design Building Services, dated 8 September 2020.

2. Site Description

The site is located at 36 Coral Crescent, Pearl Beach and is identified as Lot 273 in DP 14817. The lot is rectangular shaped, with a surface area of approximately 670 m^2 and is bounded to the north and south by previously developed residential lots, to the east by Pearl Beach and to the west by Coral Crescent.

Figure 1 shows a recent aerial image of the site and its location with respect to surrounding features.

Figure 1: Aerial image of the site showing the location of the proposed development
(Image sourced from Nearmap PhotoMaps, dated 05 September 2020)

Pearl Beach comprises an approximately 50 m wide strip of bare sand between the water's edge and the boundary of residential properties and, in the vicinity of the site, the beach runs in a north-east to south-west direction.

At the time of investigation, the site comprised a single-storey dwelling located in the central portion of the lot and a detached garage in the north-western corner.

The majority of the site is relatively flat with surface levels in the order of approximately 7 m AHD. Towards the western end of the lot, surface levels fall to approximately 5.3 m AHD at the level of Coral Crescent road surface. At the eastern end of the site, surface levels fall to approximately 4.0 m AHD at the level of Pearl Beach, and continue to fall towards the shoreline.

Figure 2 to Figure 4, below, show photographs of the site in its current condition.

Figure 2: Photograph of the front of the existing residence, located on the western side looking east

Figure 3: Photograph of the rear of the existing residence, located on the eastern side looking west

Figure 4: Photograph of the beach to the east of the site, located on the eastern side looking south-east

3. Published Data

3.1 Geology

Reference to regional geological mapping (GSNSW, 2019) indicates that the site is underlain by the Quaternary aged coastal marine deposits comprising marine deposited sand and aeolian-reworked coastal sand dunes.

3.2 Acid Sulfate Soils

Review of acid sulfate soil (ASS) risk mapping indicates that the site is not mapped as being located within an area containing acid sulfate soil. However, the site is within 50 m of an area mapped as having a 'high probability' of occurrence of acid sulfate soils to the east, likely within the bottom sediments of Pearl Beach.

4. Field Work

4.1 Field Work Methods

Field work was undertaken on 19 October 2020 and included the following:

- One cone penetration test (CPT 1) on the landward side of the existing residence, taken to a depth of 16.5 m;
- Two boreholes (Bore 1 and Bore 2) drilled with hand tools on both the seaward and landward sides of the residence to depths of 2 m and 3 m, respectively; and
- One dynamic penetrometer test adjacent to Bore 2, taken to a depth of 4.7 m.

In the CPT test, a 35 mm diameter cone with a following 135 m long friction sleeve is attached to rods of the same diameter and pushed continuously into the soil by hydraulic thrust provided by the truck upon which the CPT equipment is mounted. Strain gauges in the cone and sleeve measure the resistance to penetration, and the results are displayed on a digital monitor and stored on computer for later plotting. The CPTs were completed in the presence of a geotechnical engineer who operated the CPT computer and dipped the holes for groundwater levels.

The dynamic penetrometer test (DPT) was carried out in accordance with Test Method AS 1289.6.3.3 to provide information on the relative density of the sands and to probe for the surface of the underlying weathered rock.

Soil samples for testing of acid sulfate soils were placed in airtight plastic bags, and were hand-pressed to remove all excess air, before being snap-locked and transported to the laboratory under iced conditions for subsequent screening to assess for the presence of acid sulfate soils.

Test locations were set out with reference to the site plan of the proposed development and in accessible locations due to the presence of existing buildings. The test locations are shown on Drawing 1, included in Appendix B. The coordinates and surface elevation of the test locations were recorded using a differential GPS, which generally has an accuracy of ± 50 mm.

Engineering logs of the subsurface conditions encountered in the boreholes were prepared by a geotechnical engineer who also collected representative samples for identification purposes and subsequent laboratory testing. Details of the conditions encountered in the boreholes are given in the log sheets which are presented in Appendix C. These logs should be read in conjunction with the explanatory notes, which define the descriptive terms and classification methods.

4.2 Field Work Results

Based on the results of the investigation, subsurface conditions typically comprise the following:

From (m)	To (m)	Description
Surface (0.0)	0.3	FILLING / TOPSOIL: silty sand, with rootlets
0.3	4.5	SAND / Silty SAND: loose to medium dense
4.5	12.3	SAND / Silty SAND: medium dense
12.3	14.6	SAND: dense
14.6	>16.5	SAND: very dense

The dynamic penetrometer test undertaken adjacent to Bore 2 to 4.7 m depth generally indicated the presence of medium dense sands to 4.6 m, then refusal in dense to very dense sand.

No free groundwater was encountered during the drilling of the boreholes. After withdrawal of the CPT rods in CPT 1 the hole collapsed at 3.4 m depth, indicating the probable presence of free groundwater. It should be noted that groundwater levels are variable and can be affected by factors such as soil permeability and recent climatic conditions

5. Laboratory Testing

To assess for the presence of acid sulfate soils, 10 soil samples collected from the boreholes were tested in DP's laboratory using a calibrated pH meter for measurement of pH in water (pH_F) and pH following oxidation in hydrogen peroxide (pH_{FOX}) in accordance with Stone *et al* (1998).

Based on the results of the screening tests, two samples were selected and forwarded to Envirolab Services Pty Ltd to undergo Chromium Reducible Sulfur Suite (S_{Cr}) testing. The results of these tests are summarised in Table 1, laboratory test certificates are presented in Appendix D.

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Geotechnics / Environment / Groundwater

Table 1: Results of Acid Sulfate Soil Screening and Laboratory Testing

Bore	Sample Depth [a] (m)	Sample Description	Soil Textural Classification	Screening Test Results				Laboratory Results						
				pH			Strength of Reaction [b]	pH_{KCL}	S_{KCL} (%S)	S_{CR} (%S)	S_{NAS} (%S)	Titratable Actual Acidity, TAA (%S)	Acid Neutralising Capacity, ANC (%S)	Sum of Existing and Potential Acidity (%S)
				pH_F	pH_{FOX}	pH_F - pH_{FOX}								
1	0.60	FILL / SAND: pale grey, trace gravel	Coarse	6.5	5.4	**1.1**	1	-	-	-	-	-	-	-
	1.00	FILL / SAND: pale grey, trace gravel	Coarse	6.4	5.0	**1.4**	1	-	-	-	-	-	-	-
	1.50	SAND: pale grey	Coarse	6.4	5.8	0.6	1	-	-	-	-	-	-	-
	2.00	SAND: pale grey	Coarse	6.3	5.5	0.8	1	-	-	-	-	-	-	-
2	0.50	SAND: grey	Coarse	6.5	4.3	**2.2**	1	6.1	<0.005	<0.005	NA	<0.01	NA	<0.005
	1.10	SAND: pale yellow-brown	Coarse	6.4	4.5	**1.9**	1	5.3	<0.005	<0.005	NA	<0.01	NA	<0.005
	1.50	SAND: pale yellow-brown	Coarse	6.1	5.0	**1.1**	1	-	-	-	-	-	-	-
	2.00	SAND: pale yellow-brown	Coarse	6.1	5.2	0.9	1	-	-	-	-	-	-	-
	2.50	SAND: pale yellow-brown	Coarse	6.0	5.1	0.9	1	-	-	-	-	-	-	-
	3.00	SAND: pale yellow-brown	Coarse	6.0	5.3	0.7	1	-	-	-	-	-	-	-
ASSMAC Indicators		Coarse Texture: 'Sands, poorly buffered'		**<4**	**<3.5**	**>1**	-	-	-	-	-	-	-	**0.01**
		Coarse Texture: 'Sands to loamy sands'												**0.03**
		Medium Texture: 'Sandy loams to light clays'												**0.06**
		Fine Texture: 'Medium to heavy clays'												**0.1**

Notes:

a Depth below ground surface

b Strength of Reaction
1: denotes no or slight reaction
2: denotes moderate reaction
3: denotes violent reaction
4: denotes "volcano" ie. Very rigorous effervescence, gas evolution and heat
F after number indicates a bubbling/frothy reaction (organics)

Bold notates exceedance of net acidity action criteria or ASSMAC indicator

6. Proposed Development

It is understood that the existing residence is proposed to be demolished and a new two-storey residence constructed over three different levels. Based on the architectural drawings provided, it is understood that excavations for the proposed development would be minimal and limited to those required for the construction of the swimming pool, retaining walls and the lift pit. It is understood that a retaining wall up to approximately 1.5 m depth is required at the level of the proposed garage in the north-western corner. Retaining walls less than approximately 1 m in height may also be required at garage level in the north-eastern corner.

No details of the expected column loadings were known at the time of reporting; however, it is anticipated that column working loads will be in the range of approximately 400 kN to 500 kN. Due to the risk of coastal erosion undermining footings, piled footings for the development that may be affected would have to be constructed to the 'stable foundation zone'. Further comments on this 'stable foundation zone' and its impact on footing design are given in Section 7.2.

Plan showing the lower level garage and ground floor of the proposed development are shown in Figure 5 and Figure 6, below.

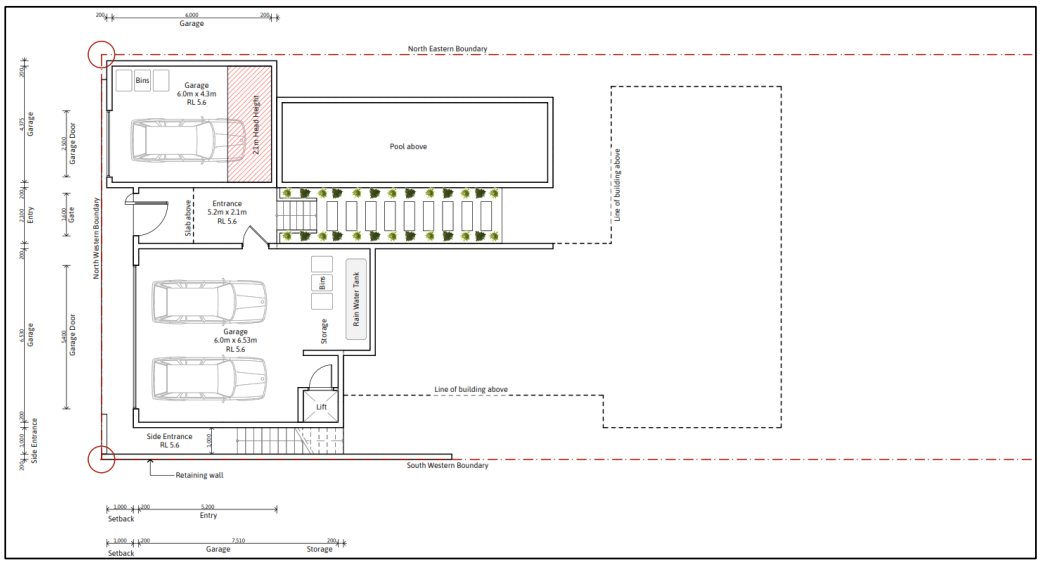

Figure 5: Plan showing the lower garage level of the proposed development

(Adapted from Archibon Design Building Services architectural drawings, dated 8 September 2020)

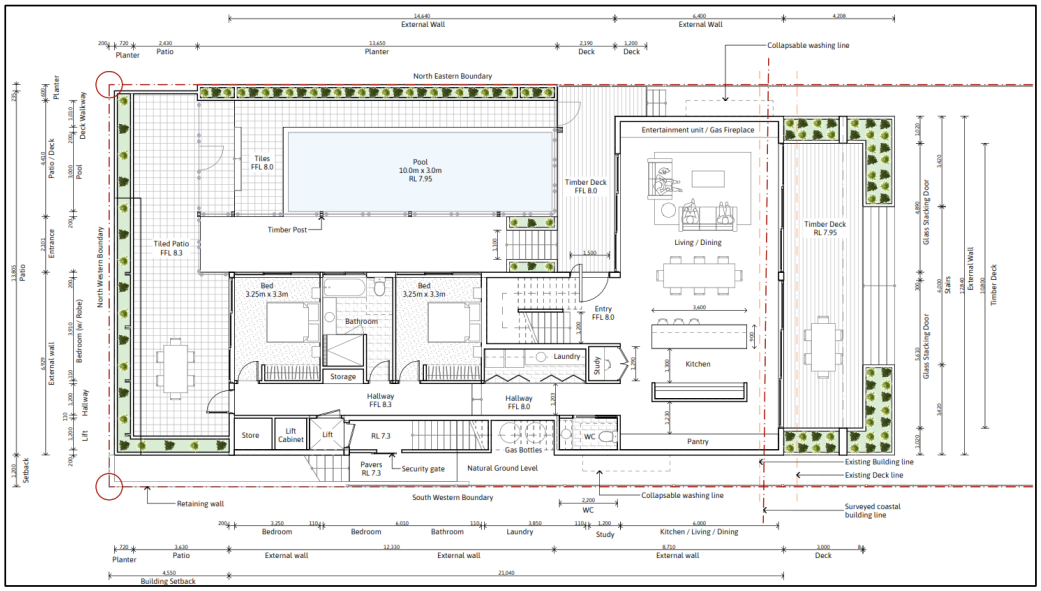

Figure 6: Plan showing the ground floor of the proposed development

(Adapted from Archibon Design Building Services architectural drawings, dated 8 September 2020)

7. Comments

7.1 Subsurface Conditions

The results of the site investigation are generally consistent with the local geological mapping and previous investigation in the area, with loose to medium dense aeolian sand encountered in the upper 1 m to 2 m, then loose to very dense marine deposited sand encountered to the depth of investigation of 16.5 m. The results of CPT 1 indicate that loose to medium dense sand are present to 4.5 m depth (approximately RL 0.5 m AHD), then medium dense sand to 12.3 m depth (approximately RL -7.3 m AHD), dense sand to 14.6 m depth (approximately RL -9.6 m AHD), and very dese sand below to the limit of the investigation.

The presence of existing buildings at the site and limited access to the site precluded investigation within the footprint of the proposed building, however, comparison of the subsurface conditions inferred in CPT 1, located near the western boundary of the site, subsurface conditions encountered in Bore 2, located near the eastern boundary of the site and the conditions encountered in previous investigations in the area indicate that the underlying soils probably comprise sands of similar density to those inferred in CPT 1. This, however, has not been proven during the present investigation and additional investigation within the building footprint will be required once the existing building has been removed, to confirm founding conditions.

7.2 Coastal Erosion Model

The coastal erosion lines have previously been determined through analysis and extrapolation of beach erosion data and assume that the subsurface profile above RL -1 m is composed entirely of sand and that there are no protective structures such as revetments. Various zones are defined when considering coastal erosion and these are briefly discussed below:

- The **Zone of Wave Impact** delineates where a structure would suffer direct wave attack during a severe coastal storm;
- The **Zone of Slope Adjustment** (ZSA) relates to the portion of the seaward face of the beach that would slump to the natural angle of repose of the beach sand following removal of sand by wave erosion;
- The **Zone of Reduced Foundation Capacity** (ZRFC) for footings is delineated to take account of the reduced bearing capacity of the sand adjacent to the storm erosion face. It is standard practice to transfer all structural loads below this zone, as the factor of safety within the zone is less than 1.5 following the design erosion event;
- The **Stable Foundation Zone** underlies the ZRFC and is considered to be beyond the influence of storm erosion. The interface of the ZRFC and the Stable Foundation Zone is determined by a line drawn at the angle of repose of the sand allowing for a factor of safety of 1.5, and is taken from the scour level of RL -1 m AHD from the landward limit of the Zone of Wave Impact; and
- **The Coastal Building Line** is shown in (CCC, 2013) and is defined as either the 2050 ZSA, the general allowable setback from the seaward cadastral boundary or previous (existing) building lines, whichever is in the most landward position.

Drawing 2 shows a general model of these various zones and is included in Appendix B. It is noted that erosion profiles are based on a design storm occurring within a particular planning period (e.g. through to the Year 2050 or 2100), but that allowance also has to be made for an extreme storm event.

7.3 Coastal Engineering Assessment

At the time of reporting, DP had not been provided with a coastal engineering assessment report for the proposed development. Generally, such reports include a review of the erosion lines, prediction of the design storm wave run-up heights, and comment on whether or not the proposed development would lead to an increase in risk of erosion or damage to adjacent properties. The report would also likely comment on 'extreme storm events', which need to consider potential impacts beyond the design storm event.

It is noted that a zone of reduced foundation capacity will extend in a north-westerly direction from the Year 2100 zone of reduced foundation capacity hazard line. The zone of reduced foundation capacity is calculated on the assumption that the soils behind the zone of wave impact would slump to their angle of repose, and incorporates a factor of safety of 1.5. Using an angle of repose of 30^{o}, the zone of reduced foundation capacity can be approximated by a line drawn above the horizontal at an angle of 21^{o}.

Generally, structures must have their footings carried to below the zone of reduced foundation capacity, unless it can be proven that the founding soils are not cohesionless and hence susceptible to slumping in a design storm event. Investigation at the site indicates that the soils above the zone of reduced foundation capacity are cohesionless.

7.4 Footings

As indicated above, all footings seaward of the 2100 zone of reduced foundation capacity hazard line must be constructed below RL-1.0 m AHD. Any elements of the structure which are on the landward side of the 2100 zone of reduced foundation capacity hazard line should have footings constructed to the "stable foundation zone", which is approximated by a line drawn from RL -1.0 m AHD at the 100 year wave line sloping up to the north-west at the safe angle of repose of dune sand.

If bedrock or stiff or better clay (which are not as susceptible to slumping and erosion) are encountered above RL -1 m AHD, then the slumped dune profile will be affected. However, the results of this investigation suggest that bedrock or stiff clay is not present above RL -11.5 m AHD at the location of CPT 1. Similarly, the results of Bore 2, DPT testing and previous nearby investigations indicates that cohesionless conditions are present to at least similar depths as CPT 1. Given the presence of sand at the front (western) portion of the site in CPT 1 to 16.5 m depth, and sand within at least the upper 3 m depth of Bore 2, unless further investigation proves the presence of clay soils, it has been assumed that sand conditions are present to a similar depth at the rear (eastern) portion of the site.

Therefore, based on the potential for erosion to occur and in accordance with the requirements of Chapter 6.2 of (CCC, 2013) it will be necessary to support the proposed residence on piles founded within the Stable Foundation Zone. Piled footings founded below approximately 6 m to 8 m depth (approximately RL-1 m AHD) within the medium dense sand would be suitable at this site.

7.4.1 Design Geotechnical Strength Reduction Factor

The design geotechnical strength of a pile ($R_{d,g}$) is the ultimate geotechnical strength ($R_{d,ug}$) multiplied by the geotechnical strength reduction factor (ϕ_g), such that:

$$R_{d,g} = \phi_g \, . \, R_{d,ug}$$

The calculated design geotechnical strength ($R_{d,g}$) must equal or exceed the structural design action effect (E_d). Further reference can be made to AS 2159-2009 regarding these terms and the design procedure.

Selection of the basic geotechnical strength reduction factor (ϕ_g) is based on a series of individual risk ratings (IRR) which are weighted and lead to an average risk rating (ARR). The individual risk ratings and final value of ϕ_g depend on the following factors:

- Site: the type, quantity and quality of testing;
- Design: design methods and parameter selection;
- Installation: construction control and monitoring;
- Pile testing regime; testing benefit factor based on percentage of piles tested and the type of testing;
- Redundancy: whether other piles can take up load if a given pile settles of fails.

Using the methodology outlined in the piling code, an average risk rating of 3.41 has been calculated, which relates to a 'moderate' overall risk category. A basic geotechnical strength reduction factor, ϕ_{gb}, of 0.48 is applicable for low redundancy (i.e. single piles) whereas this would increase to 0.56 for a high redundancy pile arrangement (e.g. pile groups). For design purposes, the basic geotechnical strength reduction factor has been adopted as the geotechnical strength reduction factor (ie $\phi_g = \phi_{gb}$) with $\phi_g = 0.48$.

The above assessment assumes that no static or high-strain dynamic testing of installed piles will be undertaken. The strength reduction factor (ϕ_g) could be increased if such testing is carried out.

7.4.2 Pile Design

The design of piles at the site should allow for the development of lateral earth pressures associated with the progressive slumping of the dune face as the beach retreats landward during an extreme storm event as per the requirements of Chapter 6.2 of (CCC, 2013).

In the zone of slope adjustment, a triangular earth pressure distribution based on an average bulk unit weight of 20 kN/m^3 for the slumping material and an earth pressure coefficient approaching that for the passive condition would be appropriate to account for the movement of sand around the piles. In this instance, a passive earth pressure coefficient of 3.0 is recommended for the section of pile within the zone of slope adjustment. For the section of the pile within the zone of reduced foundation capacity, the lateral forces acting on the pile should be calculated using an active earth pressure coefficient of 0.3.

Lateral restraint will be developed over the remaining length of the pile and the same earth pressure distribution should be used for this purpose, although restraint against the slumping material derived from the zone of reduced foundation capacity should ignored in calculations.

Allowance should also be made for forces associated with waves impacting on the seaward face of the piles as they become exposed with the progressive erosion of the dune, however, it is likely that the movement of the slumping sand would be the governing condition.

Given that sands are present at the site, piles to be installed for this project would need to be constructed without being affected by possible collapsing soils. A number of construction methods would be suitable for the support and transfer of structural loads to beneath the zone of reduced foundation capacity. The limitations of each construction technique and estimated pile capacities are discussed briefly below:

- **Driven Timber or Precast Concrete Piles** – Driven timber or precast concrete piles would be geotechnically feasible at the site. Piles are generally driven using hydraulic hammers, however, the noise and vibration associated with their installation and presence of loose sands would probably render them unsuitable for the site.
- **Continuous Flight Auger (CFA) Piles** – Piles are formed by drilling a continuous flight auger into the ground. Upon reaching the desired depth of penetration, the auger is withdrawn and bored spoil is transported to the surface whilst still providing support to the excavation and concrete is pumped through the hollow auger stem. When this operation is complete a reinforcing cage is placed in the concrete column using vibrating unit. This piling method could also be used for the construction of a contiguous pile retaining wall, if required.

The use of uncased bored piles would also be problematic due to the sandy subsurface profile which would require casing of the sands to allow penetration to a suitable depth and as such hasn't been considered for this development.

Steel screw piles have been considered, however, they are not considered suitable for the site. The lateral load and buckling capacity of these piles would likely be insufficient after slumping of the dune face has occurred.

Based on the results of CPT 1, the ultimate geotechnical strength for various diameter CFA piles have been estimated based on the assumption that all of the sand is eroded away within the zone of slope readjustment during a coastal erosion event. The estimates of the ultimate geotechnical strengths are provided in Table 1, below.

Table 2: Estimated Ultimate CFA Pile Capacities

Pile Diameter (m)	Founding Level (m AHD)	Foundation Strata	Ultimate Geotechnical Strength (kN)
0.45	-1	Medium dense sand	450
0.45	-7	Dense sand	800
0.6	-1	Medium dense sand	700
0.6	-7	Dense sand	1,500

These ultimate capacities would be required to be multiplied by a geotechnical strength reduction factor to calculate limit state design strength. As per Section 7.4.1, a strength reduction factor (ϕ_g) of 0.48 is suggested at this site.

Pile installation should be carried out together with at least periodic inspections by a geotechnical engineer to verify that the design assumptions given in this report are appropriate.

As noted in Section 7.1, additional investigation will be required once access is available to the entire building footprint. This investigation should comprise two Cone Penetrometer tests (CPT) within the rear (eastern) portion of the site which was inaccessible to vehicular mounted equipment during the current investigation. This will allow more accurate definition of founding depths and capacities for piled footings across the site.

7.5 Excavation Support

It is understood that excavations for the proposed development will be limited to those required for construction of the swimming pool, lift pit and retaining walls. It is understood that excavations of up to approximately 2 m depth will be required for construction of the swimming pool and lift pit and approximately 1.5 m depth for construction of retaining walls.

It is anticipated that where excavations are sufficiently distant from site boundaries (or permission has been granted from the adjacent property owner), existing structures or in-ground services, a short term (construction) batter slope may be appropriate to allow construction of retaining walls, subject to regular inspection by a geotechnical engineer or engineering geologist.

For excavations of up to 2 m depth, short term (construction) batter slopes of 1.5H:1V are recommended within the natural sand. Any temporary batters should be reinstated promptly after the completion of construction and regular monitoring of the stability of the batters should also be undertaken especially following wet weather.

Where space doesn't allow for retaining walls to be constructed in front of temporary batter slopes, then it is anticipated that temporary support measures in the form of trench boxes or sheet piles may be suitable to facilitate construction.

In the event that sheet piles are used for temporary support, then it is recommended that dilapidation surveys of nearby structures be carried out prior to commencement of the work, so that claims for damage, should they eventuate, are able to be appropriately assessed. Vibration monitoring during insertion of the sheet piles is also recommended in such instances.

Furthermore, it is important that the excavation support methods maintain appropriate foundation support of the adjacent structures. While no excavation method or procedure can absolutely guarantee that no damage will occur to adjacent structures, services or pavements, the risks can be minimised by using an appropriate support system.

For the design of retaining walls, a triangular earth pressure distribution can be adopted to calculate earth pressures. The earth pressure coefficients apply for well drained retained materials. Separate account should be made in the design for additional surcharge loads, during or after construction. Design of retaining walls should be based on the parameters given in Table 3.

Table 3: Retaining Wall Design Parameters - Unfactored

Material	Bulk Unit Weight (kN/m^3)	Active Earth Pressure Coefficient, K_a	At Rest Earth Pressure Coefficient, K_o	Passive Earth Pressure Coefficient, K_p
Sand (Loose to Medium Dense)	20	0.3	0.45	3.0

It should be noted that the parameters provided in Table 3 are ultimate values and a suitable factor of safety should be applied to design.

Where retaining walls are not able to tolerate deflections, then they should be designed based on ‘at rest’ conditions rather than ‘active’ conditions. The design of the retaining walls should also account for any surcharge loads, such as from vehicles or from any proposed structures and from inclined slopes located behind the wall.

The earth pressure design parameters given in Table 3 are based on the requirement for full drainage behind the retaining walls. If drainage is not provided behind retaining walls, then the walls should be designed to withstand hydrostatic pressures over the full height of the respective walls. Alternatively, if retaining walls are backfilled with free draining material, then this should comprise geotextile encapsulated free draining backfill (such as 10 mm or 20 mm single size aggregate) with a slotted drainage pipe at the base of the wall for the relief of hydrostatic pressures. Retaining walls greater than 2 m high should have an additional subsoil pipe within the backfill at mid-height of the wall. Water collected by the drainage system should be discharged to a formal stormwater drainage system downslope of the proposed building.

7.6 Site Classification

Given the assumptions made in Section 7.3, and accounting for the possibility for storm erosion to affect the site, the site would be classified as ‘Class P’ in accordance with the procedures given in AS 2870-2011.

7.7 Acid Sulfate Soils

Samples collected during the investigation were tested for the presence of acid sulfate soils; the results of this testing are presented in Table 1 and discussed below.

The results of the screening tests for pH in H_2O (pH_F) were in the range 6.0 to 6.5 pH units. Stone *et al* (1998) suggests that actual acid sulfate soils (AASS) may be present if pH_F is less than 4 pH units. This condition did not occur in any of the samples screened.

The results of the screening tests for pH following the addition of H_2O_2 (pH_{Fox}) were in the range of 4.3 to 5.8 pH units. Stone *et al* (1998) suggests that potential acid sulfate soil (PASS) conditions may be present where pH in H_2O_2 (pH_{Fox}) is less than 3.5 pH units. This condition did not occur in any of the samples screened

Stone *et al* (1998) also suggests that potential acid sulfate soil conditions may be present where the difference between pH in H_2O (pH_F) and pH in H_2O_2 (pH_{Fox}) is greater than 1 pH unit. This condition occurred in five of the ten samples screened. Further indications of the presence of acid sulfate soils include change in colour after oxidation, effervescence, and generation of heat; these conditions were not observed to occur in any of the samples screened.

Screening tests are generally considered as indicative only and can be affected by the presence of organic material. Definitive and quantitative results are obtained from laboratory testing by either Suspension Peroxide Oxidation Combined Acidity and Sulfur (SPOCAS) or Chromium Reducible Sulfur Suite (S_{Cr}) methods. S_{Cr} testing was carried out on two samples that exceeded the above indicators of acid sulfate soils. The results of these tests are presented in Table 1.

As outlined in Dear *et al* (2014), the action criteria which define the requirement for management of acid sulfate soils vary depending on the amount of soil disturbed and the textural classification of the soil. The method for determining net acidity (or existing and potential acidity) has been derived from the Dear *et al* (2014) and Ahern *et al* (2004) and can be summarised as follows:

- When $pH_{KCL} < 4.5$, Sum of existing and potential acidity = Scr + $_S$-TAA + a-S_{NAS}
- When $4.5 \leq pH_{KCL} < 5.5$, Sum of existing and potential acidity = Scr + $_S$-TAA
- When $5.5 \leq pH_{KCL} < 6.5$, Sum of existing and potential acidity = Scr + optional fineness factor.

Where: S_{Cr} = Chromium Reducible Sulfur
pH_{KCL}= Potassium Chloride Suspension pH
$_S$-*TAA* = Titratable Actual Acidity
S_{NAS} = Net Acid Soluble Sulfur

It is anticipated that less than 1,000 tonnes of soil will be disturbed during the construction of the proposed residence.

Based on the results of the analytical testing, the following comments are made:

- The sample of grey sand with collected from 0.5 m depth in Bore 2 is not considered to be an acid sulfate soil and does not require management; and
- The sample of pale yellow-brown sand collected from 1.1 m depth in Bore 2 is not considered to be an acid sulfate soil and does not require management.

Based on the conditions encountered in the two boreholes, the results of the screening and laboratory tests indicate that an acid sulfate soil management plan is not required for the proposed development.

8. References

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Stone, Y., Ahern, C. R., & Blunden, B. (1998). *Acid Sulfate Soil Manual.* Acid Sulfate Soil Management Committee (ASSMAC).

9. Limitations

Douglas Partners (DP) has prepared this report for this project at 36 Coral Crescent, Pearl Beach in accordance with DP's proposal dated 30 September 2020 and acceptance received from Trish Affleck dated 12 October 2020. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Trish Affleck for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and

assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

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

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

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

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

Reports

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

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

July 2010

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

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

Site Inspection

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

Appendix B

Drawing 1 – Test Location Plan
Drawing 2 – Coastal Erosion Model

Aerial Image Plan

Drawing adapted from Metromap Image, dated 6 April 2020

9 0 9 18 27 36 m

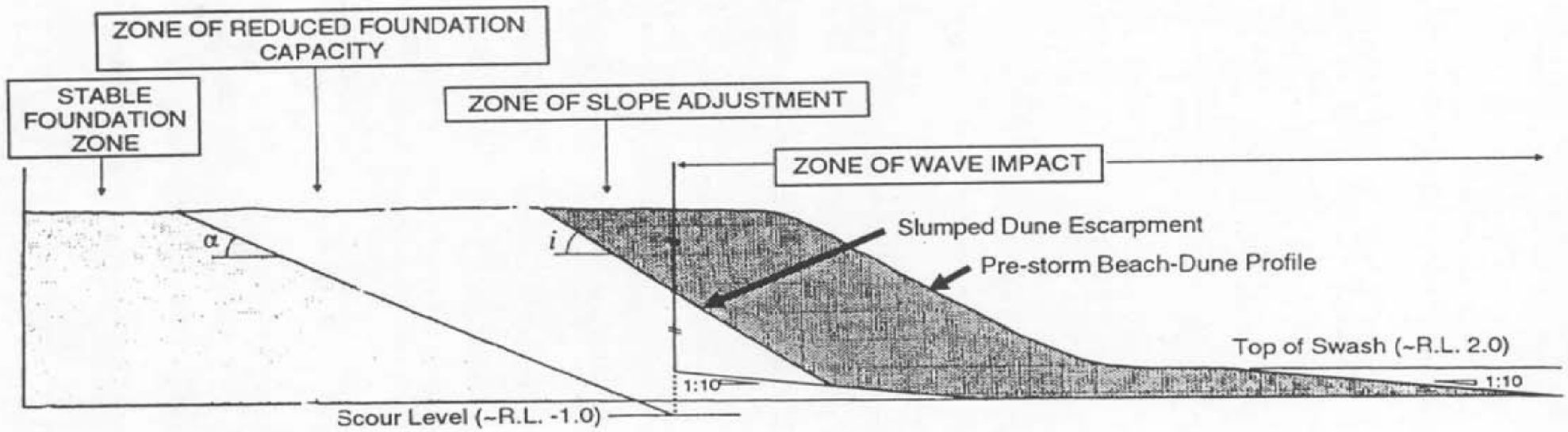
Locality Plan

Proposed Development Plan

Drawing adapted from Archibon Building Design Services draft ground floor plan dated 8 September 2020

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Trish Affleck		TITLE: **Test Location Plan** **Proposed New Residence** **36 Coral Crescent, Pearl Beach**	N
	OFFICE: Central Coast	DRAWN BY: JBR		
	SCALE: 1:300 @ A3	DATE: 27.10.2020		

PROJECT No:	104148.00
DRAWING No:	1
REVISION:	0



Angle of repose of dune sand: $i \sim \phi$

Safe angle of repose of dune sand: $\alpha = \tan^{-1}((\tan\phi)/1.5)$

Drawing adapted from Nielsen et al., Dune Stability - Considerations for Building Foundations, 1992

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Trish Affleck		TITLE: **Coastal Erosion Model**		PROJECT No: 104148.00
	OFFICE: Central Coast	DRAWN BY: JBR	**Proposed New Residence**		DRAWING No: 2
	SCALE: NTS	DATE: 2.11.2020	**36 Coral Crescent, Pearl Beach**		REVISION: 0

Appendix C

Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Cone Penetration Tests
Field Work Results

Sampling Methods

Douglas Partners

Sampling
Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits
Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers
Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers
The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling
The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling
A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests
Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

July 2010

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

May 2019

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

May 2019

Symbols & Abbreviations

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

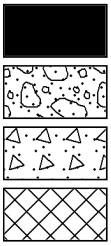
fg	fragmented
bnd	band
qtz	quartz

May 2017

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt

Road base

Concrete

Filling

Soils

Topsoil

Peat

Clay

Silty clay

Sandy clay

Gravelly clay

Shaly clay

Silt

Clayey silt

Sandy silt

Sand

Clayey sand

Silty sand

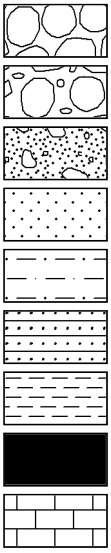
Gravel

Sandy gravel

Cobbles, boulders

Talus

Sedimentary Rocks



Boulder conglomerate

Conglomerate

Conglomeratic sandstone

Sandstone

Siltstone

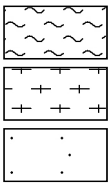
Laminite

Mudstone, claystone, shale

Coal

Limestone

Metamorphic Rocks

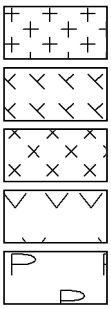


Slate, phyllite, schist

Gneiss

Quartzite

Igneous Rocks



Granite

Dolerite, basalt, andesite

Dacite, epidote

Tuff, breccia

Porphyry

May 2017

Cone Penetration Tests

Douglas Partners

Introduction

The Cone Penetration Test (CPT) is a sophisticated soil profiling test carried out in-situ. A special cone shaped probe is used which is connected to a digital data acquisition system. The cone and adjoining sleeve section contain a series of strain gauges and other transducers which continuously monitor and record various soil parameters as the cone penetrates the soils.

The soil parameters measured depend on the type of cone being used, however they always include the following basic measurements

- Cone tip resistance q_c
- Sleeve friction f_s
- Inclination (from vertical) i
- Depth below ground z

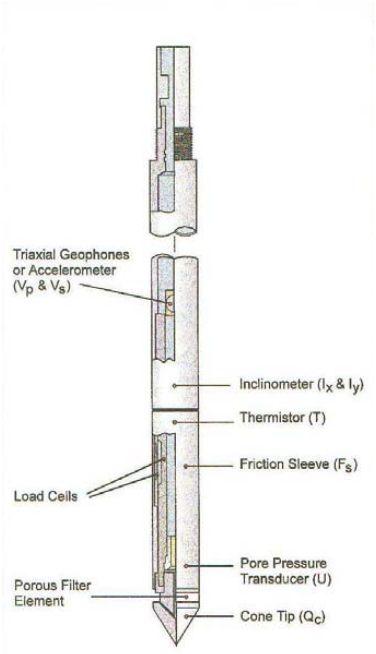


Figure 1: Cone Diagram

The inclinometer in the cone enables the verticality of the test to be confirmed and, if required, the vertical depth can be corrected.

The cone is thrust into the ground at a steady rate of about 20 mm/sec, usually using the hydraulic rams of a purpose built CPT rig, or a drilling rig. The testing is carried out in accordance with the Australian Standard AS1289 Test 6.5.1.

Figure 2: Purpose built CPT rig

The CPT can penetrate most soil types and is particularly suited to alluvial soils, being able to detect fine layering and strength variations. With sufficient thrust the cone can often penetrate a short distance into weathered rock. The cone will usually reach refusal in coarse filling, medium to coarse gravel and on very low strength or better rock. Tests have been successfully completed to more than 60 m.

Types of CPTs

Douglas Partners (and its subsidiary GroundTest) owns and operates the following types of CPT cones:

Type	Measures
Standard	Basic parameters (q_c, f_s, i & z)
Piezocone	Dynamic pore pressure (u) plus basic parameters. Dissipation tests estimate consolidation parameters
Conductivity	Bulk soil electrical conductivity (σ) plus basic parameters
Seismic	Shear wave velocity (V_s), compression wave velocity (V_p), plus basic parameters

Strata Interpretation

The CPT parameters can be used to infer the Soil Behaviour Type (SBT), based on normalised values of cone resistance (Qt) and friction ratio (Fr). These are used in conjunction with soil classification charts, such as the one below (after Robertson 1990)

July 2010

Cone Penetration Tests

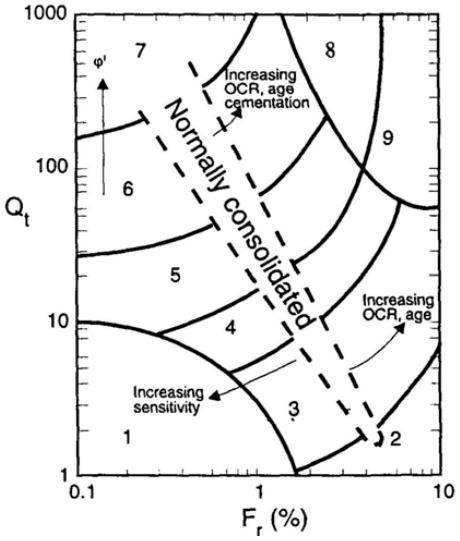


Figure 3: Soil Classification Chart

DP's in-house CPT software provides computer aided interpretation of soil strata, generating soil descriptions and strengths for each layer. The software can also produce plots of estimated soil parameters, including modulus, friction angle, relative density, shear strength and over consolidation ratio.

DP's CPT software helps our engineers quickly evaluate the critical soil layers and then focus on developing practical solutions for the client's project.

Engineering Applications

There are many uses for CPT data. The main applications are briefly introduced below:

Settlement

CPT provides a continuous profile of soil type and strength, providing an excellent basis for settlement analysis. Soil compressibility can be estimated from cone derived moduli, or known consolidation parameters for the critical layers (eg. from laboratory testing). Further, if pore pressure dissipation tests are undertaken using a piezocone, in-situ consolidation coefficients can be estimated to aid analysis.

Pile Capacity

The cone is, in effect, a small scale pile and, therefore, ideal for direct estimation of pile capacity. DP's in-house program ConePile can analyse most pile types and produces pile capacity versus depth plots. The analysis methods are based on proven static theory and empirical studies, taking account of scale effects, pile materials and method of installation. The results are expressed in limit state format, consistent with the Piling Code AS2159.

Dynamic or Earthquake Analysis

CPT and, in particular, Seismic CPT are suitable for dynamic foundation studies and earthquake response analyses, by profiling the low strain shear modulus G_0. Techniques have also been developed relating CPT results to the risk of soil liquefaction.

Other Applications

Other applications of CPT include ground improvement monitoring (testing before and after works), salinity and contaminant plume mapping (conductivity cone), preloading studies and verification of strength gain.

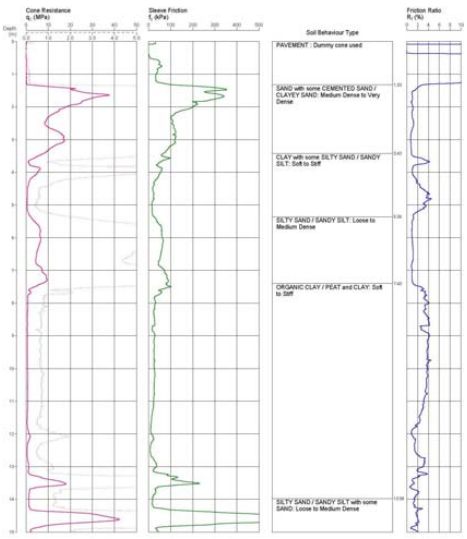


Figure 4: Sample Cone Plot

July 2010

CONE PENETRATION TEST

CPT1
Page 1 of 1

CLIENT: Trish Affleck

PROJECT: Proposed New Residence

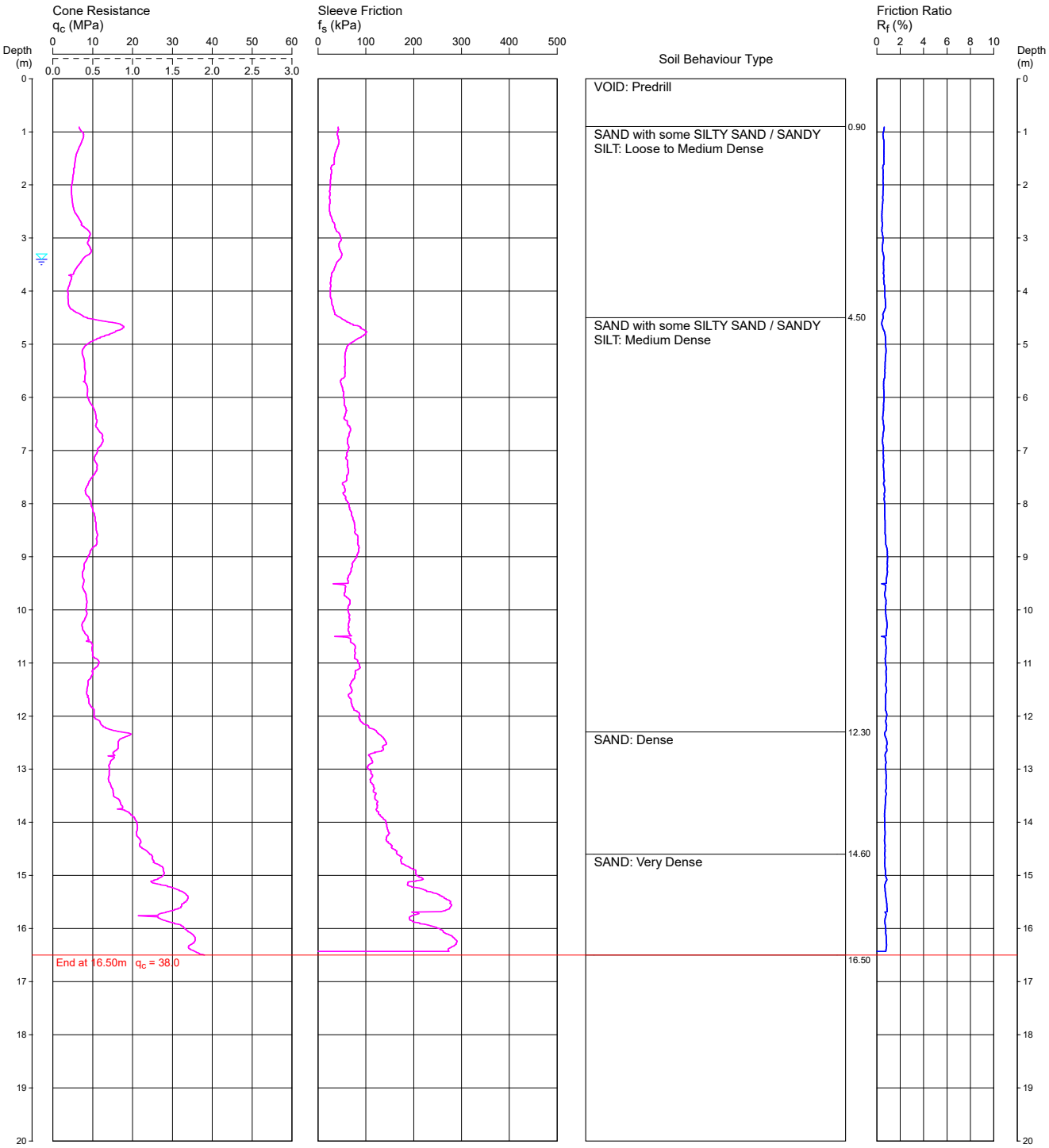
LOCATION: Coral Crescent Pearl Beach

REDUCED LEVEL: 5.0

COORDINATES: 343018.3E 6287652.9N MGA94 Zone 56H

DATE 19/10/2020

PROJECT No: 104148



REMARKS: Predrilled to 0.9m depth. Hole collapsed at 3.4m depth after testing.

Water depth after test: 3.40m depth (assumed)
File: P:\104148.00 - PEARL BEACH, 36 Coral Cres Geotech Inves\4.0 Field Work\CPT Results\CPT1.CP5
Cone ID: unknown **Type:** unknown

ConePlot Version 5.9.2

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Trish Affleck
PROJECT: Proposed New Residence
LOCATION: 36 Coral Crescent, Pearl Beach

SURFACE LEVEL: 5.3 AHD
EASTING: 343022.5
NORTHING: 6287654.8
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 104148.00
DATE: 19/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
	0.1	FILL/SAND: fine to medium grained, brown, trace sandstone/roadbase gravel, dry							
	0.3	FILL/Sandy GRAVEL: medium grained, dark grey, fine to coarse grained sand, angular roadbase gravel, dry to moist							
		SAND SP: fine to medium grained, pale grey, dry, loose to medium dense, aeolian soil		D	0.6				
	1			D	1.0				1
	1.2	SAND SP: medium grained, pale grey, moist, medium dense, alluvial soil		D	1.5				
	2			D	2.0				2
	2.0	Bore discontinued at 2.0m - limit of investigation							
	3								3
	4								4

RIG: HAND TOOLS **DRILLER:** M. Bobby **LOGGED:** M. Bobby **CASING:**

TYPE OF BORING: 60mm dia Hand Auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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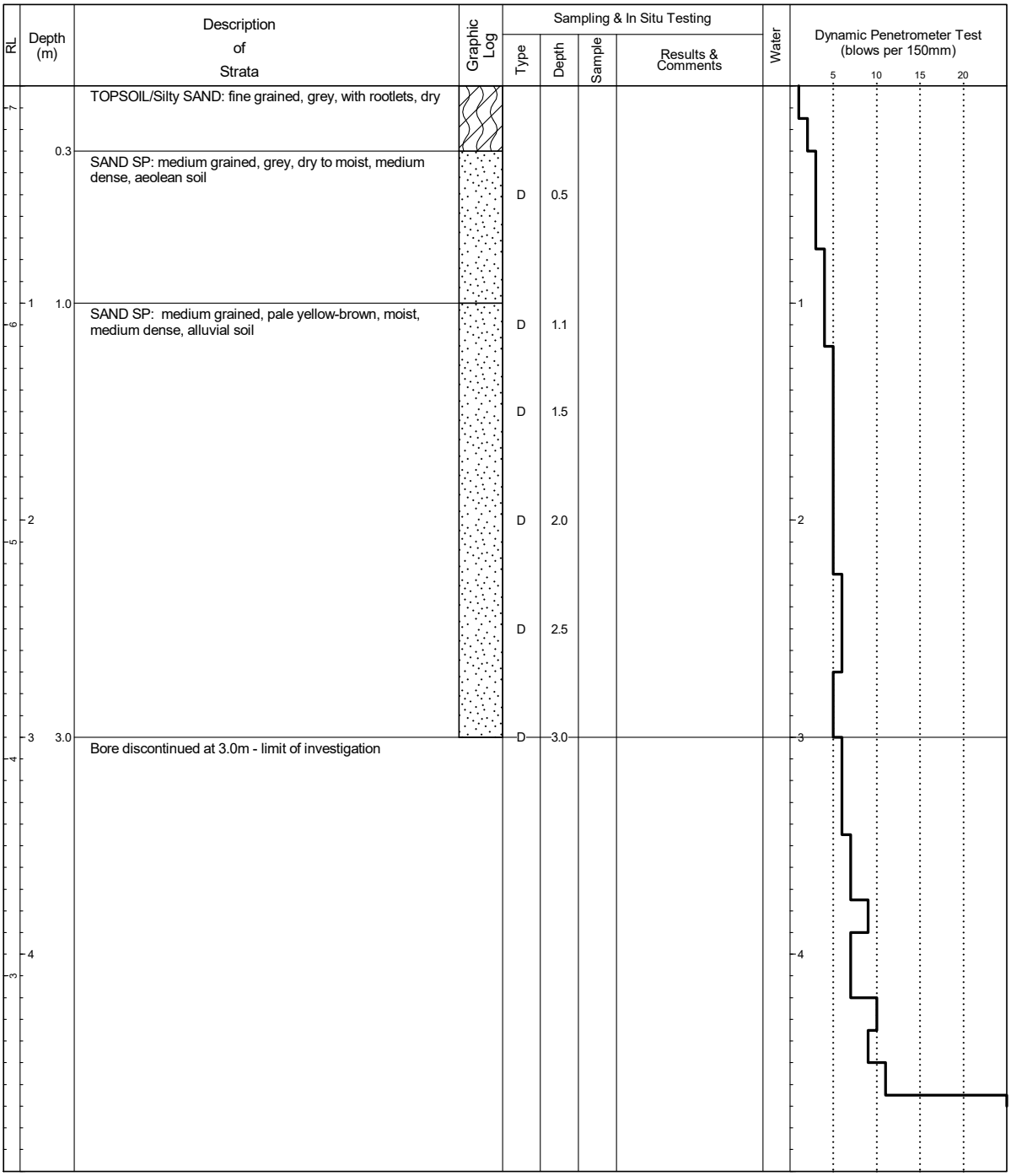
BOREHOLE LOG

CLIENT: Trish Affleck
PROJECT: Proposed New Residence
LOCATION: 36 Coral Crescent, Pearl Beach

SURFACE LEVEL: 7.1 AHD
EASTING: 343047
NORTHING: 6287628.3
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 104148.00
DATE: 19/10/2020
SHEET 1 OF 1



RIG: HAND TOOLS **DRILLER:** M. Bobby **LOGGED:** M. Bobby **CASING:**

TYPE OF BORING: 60mm dia Hand Auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

Appendix D

Laboratory Test Results

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 254347

Client Details

Client	Douglas Partners Tuggerah
Attention	James Rayner
Address	Unit 5, 3 Teamster Close, Tuggerah, NSW, 2259

Sample Details

Your Reference	**104148.00, Proposed New Residence, Pearl Beach**
Number of Samples	2 Soil
Date samples received	27/10/2020
Date completed instructions received	27/10/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

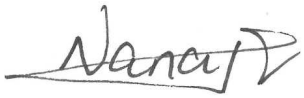
Date results requested by	03/11/2020
Date of Issue	02/11/2020

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Client Reference: 104148.00, Proposed New Residence, Pearl Beach

Chromium Suite			
Our Reference		254347-1	254347-2
Your Reference	UNITS	2	2
Depth		0.5	1.1
Date Sampled		19/10/2020	19/10/2020
Type of sample		Soil	Soil
Date prepared	-	29/10/2020	29/10/2020
Date analysed	-	29/10/2020	29/10/2020
pH $_{kcl}$	pH units	6.1	5.3
s-TAA pH 6.5	%w/w S	<0.01	<0.01
TAA pH 6.5	moles H^+ /t	<5	<5
Chromium Reducible Sulfur	%w/w	<0.005	<0.005
a-Chromium Reducible Sulfur	moles H^+ /t	<3	<3
S_{HCl}	%w/w S	NA	NA
S_{KCl}	%w/w S	<0.005	<0.005
S_{NAS}	%w/w S	NA	NA
ANC_{BT}	% $CaCO_3$	NA	NA
s-ANC_{BT}	%w/w S	NA	NA
s-Net Acidity	%w/w S	<0.005	<0.005
a-Net Acidity	moles H^+ /t	<5	<5
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75
a-Net Acidity without ANCE	moles H^+ /t	<5	<5
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75
s-Net Acidity without ANCE	%w/w S	<0.005	<0.005

Client Reference: 104148.00, Proposed New Residence, Pearl Beach

Method ID	Methodology Summary
Inorg-068	Chromium Reducible Sulfur - Hydrogen Sulfide is quantified by iodometric titration after distillation to determine potential acidity. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

Client Reference: 104148.00, Proposed New Residence, Pearl Beach

QUALITY CONTROL: Chromium Suite						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			29/10/2020	1	29/10/2020	29/10/2020		29/10/2020	[NT]
Date analysed	-			29/10/2020	1	29/10/2020	29/10/2020		29/10/2020	[NT]
pH $_{kcl}$	pH units		Inorg-068	[NT]	1	6.1	6.1	0	99	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	95	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-Chromium Reducible Sulfur	moles H^+ /t	3	Inorg-068	<3	1	<3	<3	0	111	[NT]
S_{HCl}	%w/w S	0.005	Inorg-068	<0.005	1	NA	NA		[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-068	<0.005	1	NA	NA		[NT]	[NT]
ANC_{BT}	% $CaCO_3$	0.05	Inorg-068	<0.05	1	NA	NA		[NT]	[NT]
s-ANC_{BT}	%w/w S	0.05	Inorg-068	<0.05	1	NA	NA		[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	<0.75	<0.75	0	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-068	<5	1	<5	<5	0	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-068	<0.75	1	<0.75	<0.75	0	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	1	<0.005	<0.005	0	[NT]	[NT]

Result Definitions	
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	104148.00	**Suburb:**	Pearl Beach	**To:**	Envirolab Services
Project Name:	Proposed New Residence	**Order Number**			12 Ashley Street, Chatswood NSW 2067
Project Manager:	James Rayner	**Sampler:**	MVB	**Attn:**	Sample Receipt / Aileen Hie
Emails:	james.rayner@douglaspartners.com.au			**Phone:**	9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑			**Email:**	ahie@envirolab.com.au
Prior Storage:	☑ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☑ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Chromium Reducible Sulfur Suite	Aggressivity Cl, SO4, pH & EC	Combo 8A	Notes/preservation
2/0.5	1	19/10/20	S	P							X			Hold
2/1.1	2	19/10/20	S	P							X			Hold
PQL (S) mg/kg													**ANZECC PQLs req'd for all water analytes** ☐	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 254347
Date Received: 27/10/2020
Time Received: 1045
Received By: AH
Temp: Cool/Ambient 12.3
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 254347

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: 2 **Relinquished by:** JBR **Transported to laboratory by:** TNT

Send Results to: Douglas Partners Pty Ltd **Address** Unit 5, 3 Teamster Close Tuggerah NSW 2259 **Phone:** 02 4351 1422 **Fax:**

Signed: **Received by:** Ming Yan Zo **Date & Time:** 27/10/2020 1045

Michael Leavey Consulting
Planning & Development Services
ABN 63 279 339 494

Statement of Environmental Effects

Proposed Dwelling House and Swimming Pool,
and Demolition of Existing Structures

36 Coral Crescent, Pearl Beach

Prepared for Trish Affleck

January 2021

0449 536 694
michael@michaelleaveyconsulting.com.au
www.michaelleaveyconsulting.com.au

Table of Contents

Vers 1.2 Final for Submission 15.01.2021

1. INTRODUCTION

This Statement of Environmental Effects has been prepared on behalf of Trish Affleck in support of a development application to Central Coast Council for a new dwelling house and swimming pool on 36 Coral Crescent, Pearl Beach, and demolition of the existing dwelling house and structures.

The proposal is for a two-storey dwelling house, with has been designed in response to the site's coastal location and setting, and having regard to existing development in the locality.

The site is zoned R2 Low Density Residential under Gosford LEP 2014, and the proposal is permissible with the consent of Council.

This assessment considers the proposal against the provisions of relevant planning instruments, including Gosford LEP 2014, Gosford DCP 2013, draft Central Coast LEP 2018, and relevant state planning controls. The assessment also addresses the matters identified in Council's Development Application Guide and the matters for consideration under Section 4.15 of the *Environmental Planning & Assessment Act, 1979*.

The assessment of the proposal against Gosford LEP 2014, Gosford DCP 2013, other planning controls and the heads of consideration under Section 4.15 of the *Environmental Planning & Assessment Act, 1979* concludes that the proposal is permissible, meets the intent and objectives of relevant planning controls and standards, will not adversely impact on surrounding properties or the environment and should be supported by Council.

This Statement should be read in conjunction with the supporting information submitted with the development application, and in particular the architectural plans prepared by Archibon Building Design Services.

2. THE SITE

2.1 Site Location and Description

The subject site is 36 Coral Crescent, Pearl Beach, and the real property description is Lot 273 DP 14817. The site has an area of 670.2m^2 and a street frontage of 15.24m.

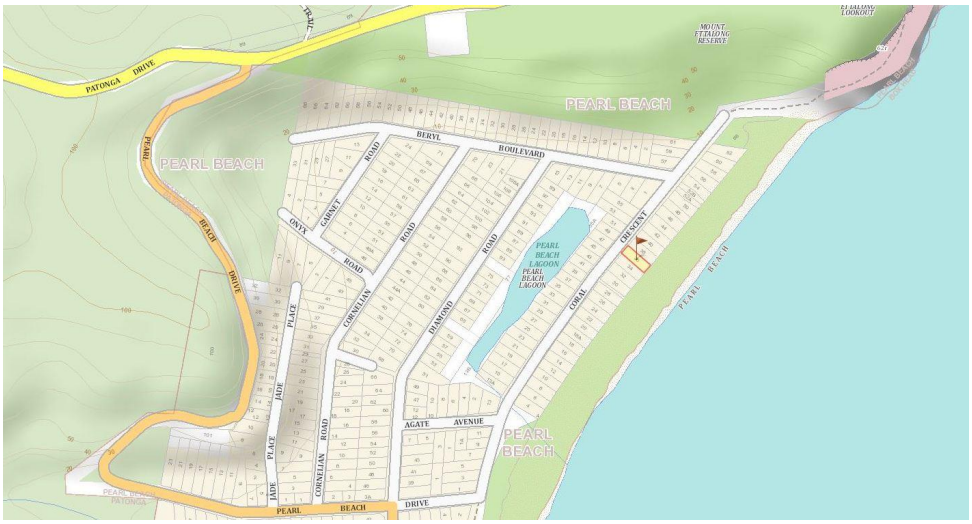


Figure 1 – Locality Source: SIX Maps

Figure 2 – Site Aerial Photograph Source: SIX Maps

2.2 Site Features and Existing Development

The site is a beachfront property, with frontages to both Coral Crescent and Pearl Beach. The site is relatively level, with a slope up from Coral Crescent and a slope at the rear down to Pearl Beach. There are two trees on the site in the front setback area to Coral Crescent, together with a street tree and landscaping in the footpath area, and there is dune vegetation on the rear of the site adjoining the beach.

The site contains an existing older-style dwelling house, which is single storey and oriented to the beach, similar to other houses in the locality. The site also contains a double garage built to the front boundary to Coral Crescent on the northern side, and with fencing along the remainder of the front boundary.

The existing dwelling house has panoramic ocean and beach views to the rear, including views of Pearl Beach and Box Head/ Bouddi National Park in the distance and views to the south-east of Green Point Headland and Lion Island.

The site is shown in the following photographs:

Figure 3 – Site Viewed from Coral Crescent, with existing double garage on the left

Figure 4 – Rear elevation of existing dwelling house, facing Pearl Beach

Figure 5 – Site viewed from Pearl Beach

Figure 6 – Front section of existing dwelling house

Figure 7 – Rear internal elevation of existing garage

2.3 Surrounding Land and Development

Surrounding land contains detached dwelling houses, with differences between dwellings on the eastern (beachside) and western sides of the street. Dwellings on the eastern side of Coral Crescent, and particularly newer dwellings, are generally larger and have garages and other structures built to the front boundary, and in some cases extending along the full frontage (refer Figures 15 – 22). Dwellings on the eastern side of the street are oriented away from the street, towards the beach and ocean views at the rear, and provide parking and access areas to the street.

The adjoining land to the south contains a two-storey dwelling house with an “L” shape, running along the southern boundary and along the rear elevation to the beach. This dwelling has a ground level terrace and first level balcony at the rear, facing the beach. The adjoining land to the north contains a two-storey dwelling house which is built close to each side boundary and has rear facing balconies at the ground and first levels, which extend the full width of the dwelling, and there is an inground swimming pool in the rear yard.

In the wider Coral Crescent area there are a range of dwelling types and designs, and with smaller and older dwelling houses giving way to larger new dwellings, such as the dwelling house under construction at 42 Coral Crescent to the north.

Adjoining and surrounding land is shown in the following photographs:

Figure 8 – Adjoining dwelling house to the south, from Coral Crescent

Figure 9 – Adjoining dwelling house to the south, from the rear/ beach

Figure 10 – Adjoining property to the north, from Coral Crescent

Figure 11 – Adjoining dwelling house to the north, from inside the subject site

Figure 12 – Adjoining dwelling house to the north, from the rear/ beach

Figure 13 – Rear/ beach context of the site, and dwellings on either side

Figure 14 – Development on the opposite side of Coral Crescent

Figure 15 – Street presentation – 40 Coral Crescent

Figure 16 – Street presentation – Dwelling under construction - 42 Coral Crescent

Figure 17 – Street presentation – 52A/B Coral Crescent

Figure 18 – Street presentation – 54 Coral Crescent

Figure 19 - Street presentation – 58 Coral Crescent

Figure 20 – Street presentation – 60 Coral Crescent

Figure 21 – Street presentation – 32 Coral Crescent

Figure 22 – Street presentation – 28 Coral Crescent

Figure 22 – Street presentation – 26 Coral Crescent

Figure 22 – Street presentation – 8 Coral Crescent

3. ZONING AND PLANNING CONTROLS

3.1 Zoning

The land is zoned R2 Low Density Residential under Gosford LEP 2014, as is surrounding land, and Pearl Beach at the rear is zoned RE1 Public Recreation.

The zoning of the site and surrounding land is shown in the following figure:

Figure 23 – Land zoning (NSW Planning Portal)

3.2 Height of Buildings

The allowed building height for the site is 8.5m.

Figure 24 – Height of Buildings (NSW Planning Portal)

3.3 Floor Space Ratio

The allowed floor space ratio for the site is 0.5:1.

Figure 25 – Floor Space Ratio (NSW Planning Portal)

3.4 Other

The site is not identified on the following LEP maps:

- Land Reservation Acquisition
- Heritage
- Additional Permitted Uses
- Urban Release Area

The site is mapped as being Class 4 for Acid Sulfate Soils.

The land is subject to the Coastal Management State Environmental Planning Policy, 2018, and is the mapped Coastal *Environment* and *Use* areas, and the land is subject to a coastal building line and coastal hazard considerations under Gosford DCP 2013.

The site is not mapped as being bushfire prone or flood prone.

Draft Central Coast LEP 2018

Under the draft Central Coast LEP 2018, which has been publicly exhibited, the site retains its R2 Low Density Residential zoning. The draft LEP, as recently adopted by Council, intends to retain the 8.5m building height applying to the site, and to move floor space ratio controls applying to the R2 zoned land to the draft Central Coast DCP 2018.

4. THE PROPOSAL

The proposal is for demolition of existing structures on the site and the erection of a new dwelling house, swimming pool, and associated car parking.

The proposed dwelling house is two-storey, and is partly located over a double garage toward the front of the site. The dwelling house is “L” shaped, similar to the adjoining dwelling house to the south, and has a two-storey presentation to Pearl Beach. The dwelling house has 5 bedrooms and associated living areas.

At the street level is a double garage on the southern side, setback 1m from the front boundary, as well as the entrance to the dwelling and a single garage on the northern side, which is setback 200mm from the front boundary. Internal lift access is provided from the double garage to the dwelling house above.

On the ground floor level there are bedrooms, kitchen and living areas, as well as a swimming pool and front and rear decks. On the first floor level are bedrooms and a rumpus/ bar area, together with front and rear balconies.

The proposal includes a landscaped front terrace along the street frontage, setback 200mm from the front boundary, and which is similar in appearance to the dwelling under construction at 42 Coral Crescent and the existing dwelling house at 8 Coral Crescent. The dwelling house has variable front setbacks due to its “L” shaped configuration, and is setback from Coral Crescent by between 5.55m and 19.19m on the ground floor and between 3.35m and 16.17m on the first floor. The rear setback to Pearl Beach is between 18.5m and 19.3m to the rear walls and 14.5m to the rear deck.

Landscaping on the site is proposed in accordance with the Landscape Plan submitted as part of the architectural plans, and this includes planting around the perimeter of deck area and terrace areas on the ground floor, as well as a replacement street tree and landscaping along the street frontage to replace the street tree to be removed.

The proposal has a gross floor area of 335.14m^2, which includes the additional single car garage, and the floor space ratio is 0.496:1. The proposal has a variable building height due to the underlying natural ground level and variations in roof slope, and the maximum building height is 8.4m.

5. PLANNING CONSIDERATIONS

5.1 Gosford Local Environmental Plan 2014

Compliance with relevant controls in Gosford LEP 2014 is set out in the following table:

LEP Control/ Standard	Proposed	Complies
Permissibility	The proposal is for a dwelling house, and an ancillary swimming pool and car parking, which is permissible with consent in the R2 zone.	**Yes**
R2 Zone objectives • To provide for the housing needs of the community within a low density residential environment. • To enable other land uses that provide facilities or services to meet the day to day needs of residents. • To ensure that development is compatible with the desired future character of the zone. • To encourage best practice in the design of low-density residential development. • To promote ecologically, socially and economically sustainable development and the need for, and value of, biodiversity in Gosford. • To ensure that non-residential land uses do not adversely affect residential amenity or place demands on services beyond the level reasonably required for low-density housing	The proposal will provide a renewal of housing on the site, and the nature of the use is consistent with existing development on the site and development in the surrounding area. An assessment of the proposal has been undertaken against the character requirements of Gosford DCP, and the proposal will be compatible with existing development in the street and the desired future character of the area. The design of the proposal responds to the coastal location and setting of the site, and will be compatible with development in the surrounding area. The application is supported by a BASIX certificate which demonstrates compliance with the NSW Government's sustainability targets.	**Yes**
Clause 4.3 Height of Buildings Maximum height 8.5m	The maximum building height is 8.4m, and building heights vary from 7.5m to 8.4m.	**Yes**
Clause 4.4 Floor Space Ratio Maximum floor space ratio 0.5:1	The proposal has a gross floor area of 335.14m^2, which is a floor space ratio of 0.496:1, which complies with the development standard.	**Yes**
Clause 7.1 Acid Sulfate Soils	The site is mapped as being Class 4 for Acid Sulfate Soils, and the maximum excavation that will occur is 2m, which is at the eastern side of the double garage. The application is supported by a Geotechnical Investigation from Douglas Partners, which included soil testing that did not find acid sulfate soils in the tested locations, and determines that an acid sulfate soils management plan is not required.	**Yes**

5.2 Gosford Development Control Plan 2013

In assessing the proposal against Gosford DCP 2013, Section 3.42 of the *Environmental Planning & Assessment Act 1979* provides that the purpose of a DCP is to provide guidance, which are not statutory requirements, and section 4.15(3A)(b) of the Act provides that DCP standards are to be flexibly applied and non-compliance can be addressed through alternative solutions or addressing how a proposal otherwise achieves the objectives of the standard.

Chapter 2 - Character

Chapter 2 of DCP 2013 contains Character Maps and Character Statements to be considered with development applications. The subject site is in the Pearl Beach *Ocean Beachfront* character area, and the DCP describes the desired future character for this area as:

> *"These should remain low-density residential foreshores where future development does not dominate the informal scenic quality of prominent backdrops to Gosford City's ocean beaches, and new dwellings are surrounded by leafy gardens that provide protection from storm surges and shoreline erosion.*
>
> *Ensure that new structures do not disrupt development patterns that are evident upon surrounding properties. Avoid disturbing natural slopes plus any existing trees that are visually-prominent foreshore features, and ensure a leafy character for these prominent backdrops to ocean beaches. Plant gardens and street verges with low hedges and salt-tolerant trees that are predominantly indigenous, clustered to maintain existing panoramic views. Facing beachfronts in particular, avoid tall retaining walls or fences, extensive terraces or driveways that would visibly compromise the desired leafy character. Plant low-growing "hedges" of indigenous shrubs and ground covers along boundaries and to stabilise dunes. Also, maintain the informal character of any existing wide street verges that are dotted with shady street trees.*
>
> *Avoid the appearance of a continuous wall of foreshore development by setting all building works back from exposed fore-dunes, and by surrounding buildings with leafy gardens. Incorporate waterfront and street setbacks that are similar to the surrounding properties, and provide at least one wide side setback or step the shape of front and rear facades.*
>
> *Minimise the scale and bulk of new buildings or additions to existing dwellings. Use irregular floorplans to create well-articulated forms, such as linked pavilions that are separated by courtyards and capped by individual roofs. All roofs should be gently-pitched to minimise the height of ridges, flanked by wide eaves and verandahs to disguise the scale of exterior walls. Facing the beach, disguise the impact of upper storeys by a combination of extra setbacks from the ground floor plus shady balconies and verandahs.*
>
> *Reflect elements of traditional coastal architecture and minimise the scale of prominent facades by using extensive windows and lightly-framed verandahs plus a variety of materials and finishes rather than expanses of plain masonry. All dwellings should display a "street address" with verandahs or decks, and living rooms or front doors that are visible from the roadway. Avoid wide garages that would visually-dominate any front façade or block views between the dwelling and the street. Locate and screen all balconies or decks*

to maintain existing levels of privacy and amenity that are enjoyed by neighbouring dwellings."

The proposal is for a new dwelling house on the land, which is consistent with the current use of the site, and the design, scale and appearance of the development will be consistent with other recent development in the locality, and in particular on the eastern side of Coral Crescent. The proposal is consistent with the objectives of the R2 Low Density Residential zone, complies with the allowed building height and floor space ratio applying to the land.

The existing character of Coral Crescent is low density residential in nature, with a range of different dwelling forms and designs in the street. On the eastern side of Coral Crescent, properties rise up from the street and are characterised by garages and car parking located either on or close to the front boundaries.

The proposal will retain a low density residential character, consistent with recent development on the eastern side of Coral Crescent. The rear yard area will continue to be turfed, with existing dune vegetation maintained, and additional landscaping is proposed in accordance with the landscape plan. Landscaping is proposed to the rear of the dwelling, around the rear deck, as well as on the side and front boundaries in planter boxes, and with a replacement street tree and landscaping proposed in the road reserve in front of the site.

The proposal will be consistent with the general development pattern established on the beachfront and surrounding properties and, as a backdrop to Pearl Beach, the proposal will have a two storey presentation consistent with existing development in the area and with open balcony areas provided on the immediate presentation to the beach.

Along the street the proposal will provide car parking and the residential entry, with a terrace area located above that will include planters and landscaping to soften the appearance of the street presentation. There is an established pattern in the street of car parking, fencing and structures built to the front boundary, and the proposal will be consistent with this, and landscaping is proposed in the footpath area similar to the existing development at 8 Coral Crescent (Figure 22), and similar dark colouring is proposed to that property.

The proposal will maintain setbacks of 1.2m either side facing the beach, and the width of the rear elevation is consistent with other nearby beachfront development. On the street side the proposal maintains a narrower building presentation at both the ground and first floors, which then widens on the beach side. The ground and first floors facing the street are setback behind the line of the front terrace, and the front of the dwelling setbacks reflect the setbacks of the dwelling houses either side.

The proposed dwelling has an irregular floor plan, being in an "L" shape, which is similar to the dwelling on the adjoining land to the south, and presents a narrower presentation to the street, which appears visually as the higher part of the building. The proposal uses a gently sloping roof, so as to reduce building bulk and height, and which adds architectural interest to the building. Facing the beach, the proposal provides rear balcony and deck areas along both the ground and first floor levels, which are largely open to the sides and rear, and which provide visual interest to the building.

The proposal has a contemporary coastal appearance, consistent with recent beachfront development at Pearl Beach, and uses different building materials and colours to reduce apparent building scale and to add architectural interest. Similar to other dwellings on the eastern side of Coral Crescent, living areas are oriented towards the beach, however the proposal also maintains terrace and balcony areas addressing the street, and which provide opportunities for passive surveillance.

Having regard to the design of the proposal and existing development on the eastern side of Coral Crescent, the proposal will be consistent with the future character of the surrounding area.

The proposal's compliance with relevant provisions of Chapter 3.1- Dwelling Houses, Secondary Dwellings and Ancillary Development and Chapter 5.10 Pearl Beach Residential Development under Gosford DCP 2013 is detailed in the table below. The proposed swimming pool and garages are relevantly defined as *ancillary development*.

DCP Requirement	Proposed	Consistent?
3.1.2.1 Building Height Maximum 8.5m (LEP 2014)	The proposal has a maximum building height of 8.4m, and complies with the requirement.	**Yes**
Not to exceed 2 storeys, however 3 storey allowed in some circumstances	The development is largely 2 storey, however due to the slope at the front of the site and minor excavation at the front boundary, the proposal has a 3 storey appearance from the street, consistent with other development on the eastern side of Coral Crescent, including the adjoining dwelling house to the south and the dwelling house under construction at 42 Coral Crescent. The DCP recognises that 3 storey dwellings can be supported on some sloping sites, where the 3-storey component extends for only a small section of the dwelling, and this is relevant to the subject site and proposal. The site is sloping at the front and the part 3 storey section only applies to a small part of the dwelling at the front, and with the balance providing a 2 storey presentation to the sides and rear.	**Yes**

DCP Requirement	Proposed	Consistent?
3.1.2.2 Site Coverage 50% for a lot of between 450m^2 and 900m^2	The proposal has a site coverage of 44.03%	**Yes**
3.1.2.3 Floor Space Ratio Maximum 0.5:1 (LEP 2014)	The proposal has a floor space ratio of 0.496:1, which complies with the LEP 0.5:1 standard.	**Yes**
3.1.3.1a Front Setback (i) Av setback of nearest 2 dwelling houses, and if none 4.5m	The proposal has variable front setbacks due to the "L" shape of the dwelling, and the front setbacks respond to the setback of adjoining dwellings on either side. On the southern side, the setback of the dwelling is consistent with the front alignment of the adjoining dwelling to the south, which has a similar shape, and on the northern side the front setback at both the ground and first floors is located behind the front alignment of the adjoining dwelling to the north. Given the alignments of adjoining dwellings on either side, the proposal provides a reasonable average front setback between the nearest 2 dwellings, and having regard to the shape of the proposed dwelling.	**Yes**
(iv) Garage minimum 1m behind the front boundary setback	The proposed garages are located close to the front boundary, which is consistent with the existing garage on the site and other garages on the eastern side of Coral Crescent, as shown on Figures 15 to 22 in this Statement. The location of garages either on, or close to the front boundary is an established pattern on the eastern side of the street and the proposal will be consistent with this streetscape. Additionally, the ground level terrace presentation to Coral Crescent is consistent with similar treatments in the street, including No's 42 and 8 Coral Crescent.	**Variation, consistent with existing development on the site and on nearby properties**
3.1.3.1b Rear Setback (iii) As per DCP Chapter 6.2 – Coastal Frontage, which identifies a coastal building line, and provides also that development can sited forward of this line in some circumstances, and where the setback does not exceed a line between the closest corners of the adjoining dwellings	The proposal has a rear setback of 15.6m to the balcony line and between 18.5m and 19.3m to the dwelling house walls, and is located seaward of the coastal building line, by 700mm for the rear walls of the dwelling and 4.9m to the ground level planters and between 3.07m and 3.73m for the first floor balconies. Those parts of the dwelling seaward of the coastal building line will be cantilevered, with footings entirely founded landward of the coastal building line, and as supported by Coastal Engineering Advice prepared by Horton Coastal Engineering. The rear alignment of the dwelling will be located outside of the average alignment between the closest corners of the two adjoining dwellings, as is the deck of the existing dwelling house, and this is addressed further below.	**Variation, as addressed below**
3.1.3.1c Side Setback (i) For lots greater than 12m width at the building line: 0.9m	The proposal has minimum setbacks of 1.2m to both side boundaries, and with an increased setback of 7.1m for the western part of the dwelling to the northern side	**Yes**

to a height of 4.5m and then at + 25%	boundary. The proposal is within the DCP side setback envelope, with very minor parts of the roof being outside the envelope (as shown on Sections 1 and 2 on the architectural plans), which is within the allowance for eaves under the DCP control, and is negligible in its impact.	
3.1.3.3 Articulation Zones Articulation zone variations to front setbacks and garage door articulation (max 6m or 60% of building width, whichever is greater).	A separate articulation zone is not proposed to vary the average building line, and front setbacks are addressed above. Building width at the street level is 13.6m, and the combined garage door widths is 7.9m, which is 58% of the building width, which complies with the maximum 60% requirement.	**Yes**
3.1.4.1 Views **3.1.4.2 Visual Privacy**	The proposal will not result in an unreasonable impact on views or privacy for adjoining properties, and separate assessment of these matters is provided.	**Yes**
3.1.4.3 Private Open Space Areas 24m^2 for lot with a width of greater than 10m at the building line	The proposal provides more than 24m^2 private open space with a minimum dimension of 3m and located behind the building line. Private open space is provided in the rear setback area facing the beach, as well as on decks and balconies on the ground and first floors.	**Yes**
3.1.4.4 Sunlight Access 50% of the required principal private open space on the site, and on adjoining land, to receive at least 3hrs sun mid-winter between 9am and 3pm	The principal private open space areas on the subject land face east and north, and will receive reasonable solar access mid-winter, consistent with the solar access for the existing dwelling house. Shadow diagrams are submitted with the architectural plans which show that the proposal maintains reasonable solar access to the rear private open space of the adjoining property.	**Yes**
3.1.5 Car Parking and Access Various requirements, including 2 spaces for 4 or more bedrooms in a dwelling	The proposal meets the minimum car parking requirements, with 3 spaces being provided. The additional garage space over the minimum requirement has been included in gross floor area calculations and is provided to ensure that reasonable off street parking is provided given the size of the dwelling, and to minimise the need for on street parking.	**Yes**
3.1.6 Earthworks, Structural Support and Drainage Various requirements	The proposal requires excavation at the front of the site, for the proposed garages and residential entry, and there will be some minor filling under the dwelling to ensure that minimum floor levels are met. All retaining walls will be designed by a qualified engineer and stormwater will be managed in accordance with the submitted stormwater plans prepared by ACOR Consultants.	**Yes**
3.1.7.4 Swimming Pools	The proposed swimming pool is elevated, and will be located behind the front alignment of the dwelling house. The pool will be located 1.6m from the northern side boundary, with planter landscaping provided, and all pump equipment will be located and/ or acoustically treated to minimise noise impact for surrounding properties.	**Yes**
3.1.7.5 Fencing Various requirements	The proposal includes timber fencing along the side boundaries, which will replace existing fencing.	**Yes**

5.10.5 Protection of Natural Vegetation and Fauna	The proposal is accompanied by an Erosion and Sediment Control Plan prepared by Acor Consultants and the proposal will not impact on koala habitat.	**Yes**
5.10.6 Tree Cover	The proposal does not involve the removal of any significant vegetation on the site. Removal of some minor trees on the site is proposed, and with Council's approval a street tree, which forms part of the application, and replacement planting and landscaping is proposed in accordance with the submitted Landscape Plan.	**Yes**
5.10.7 Site Development 40% Site Cover 50% Open Space FSR 0.4:1 Balance of open space areas 300m^2 site cover Site Disturbance Erosion Control	 Site cover is 44% Open Space areas of 485m^2 are provided in total, including areas free of structures as well as deck and recreation areas for the use and enjoyment of residents, which is 71.9% of the site area. The open space area excluding deck and recreation areas is 266.7m^2, or 39.5% of the site. FSR is 0.496:1, as allowed under GLEP 2014 The proposal provides a balance between hard surfaces and soft landscaping Site cover is 297.08m^2, which complies The extent of site disturbance is limited to excavation for the proposed garages and structures at the front of the site, and will be consistent with other development on the eastern side of Coral Crescent, including the recently constructed dwelling at 42 Coral Crescent Erosion control will be implemented in accordance with the submitted Erosion and Sediment Control Plan prepared by Acor Consultants.	**Part Compliance/ Part Variations, as addressed below**
5.10.8 Streetscape	The size and shape of the proposal is consistent with recent development on the eastern side of Coral Crescent. The proposal provides car parking and the residential entry along the street frontage, with a terrace area located above that will include planters and landscaping to soften the appearance of the street presentation. There is an established pattern in the street of car parking, fencing and structures built to the front boundary, and the proposal will be consistent with this, and landscaping is proposed in the footpath area similar to the existing development at 8 Coral Crescent (Figure 22), and similar dark colouring is proposed to that property.	**Yes**
5.10.9 Building Setbacks and Building Lines 6m Front and Rear 1m Side to 3.8m building height, and then additional 25% of building height over 3.8m	 The front setback of the dwelling walls, excluding garages, is between 4.5m on the southern side and 19.19m on the northern side. The proposal has minimum setbacks of 1.2m to both side boundaries, and with an increased setback of 7.1m for the western part of the dwelling to the northern side boundary. The proposal meets and provides more than the required side setbacks, apart from minor variations of between 200mm and 500mm on the very upper corners of the dwelling on both sides.	**Part Compliance/ Part Variations, as addressed below**

Development in front setback	The proposal provides garages in the front setback area, consistent with almost all development on the eastern side of Coral Crescent, as addressed below.	
5.10.10 Building Styles	The proposal employs a building style consistent with development on the adjoining land to the south, and has been assessed against the detailed character requirements under Chapter 2.1 of the DCP. Articulation is provided to the building, with variations in materials, setbacks and detailing, and on the beach frontage the proposal provides verandahs and outdoor living areas that are open in nature.	**Yes**
5.10.11 External Materials, Colours & Finishes	The proposal provides variation in external materials and colours, which balances both light and dark colours and presents a uniformed design response for the development overall. The use of darker elements along the immediate street frontage reduces the impact of car parking on the front alignment, as is common along the eastern side of Coral Crescent, and will be consistent with other development in the street, and particularly 8 Coral Crescent (Figure 22) and 54 Coral Crescent (Figure 18).	**Yes**
5.10.12 Privacy	The proposal has considered privacy impacts for adjoining properties, and separate assessment of these matters is provided in section 6.7 of this Statement.	**Yes**
5.10.13 Views	The proposal has considered view impacts for adjoining and surrounding properties, and separate assessment of these matters is provided in section 6.8 of this Statement.	**Yes**
5.10.14 Solar Access	Shadow diagrams have been prepared, and are submitted with the application, which show that that the proposal will result in some overshadowing of the adjoining dwelling to the south, which will not be unreasonable given the proposal remains below the allowed 8.5m building height and maintains a side setback of 1.2m to the adjoining property.	**Yes**
5.10.15 Noise	Noise from the proposal will be consistent with normal domestic residential use, and the type of noise generated from surrounding residential properties. Pump equipment for the proposed pool will be located and/ or acoustically treated to minimise noise impact for surrounding properties.	**Yes**
5.10.16 Construction Controls	Site preparation and construction will be undertaken in an orderly and environmentally sensitive manner, and in accordance with Council's requirements, which will be detailed through conditions of consent. The proposal also nominates tree removal and replacement landscaping, which form part of the application.	**Yes**
5.10.17 Landscaping & Stormwater	Landscaping is proposed in accordance with the submitted Landscape Plans, which provides planting to soften and complement the proposed dwelling house, as well as replacing minor vegetation to be removed. Stormwater plans have been prepared by Acor Consultants, including on-site rainwater collection and reuse, and the proposal maintains a large area on the	**Yes**

	eastern side for natural stormwater recharge of the dune areas.	
5.10.20 Supplementary Provisions	The site forms part of "b. Beachfront Properties in Coral Crescent". Controls for coastal building lines, and in relation to adjoining dwellings and coastal risks is provided in Chapter 6.2 of the DCP, which is addressed in detail below.	**Refer Chapter 6.2 Assessment below**

Chapter 5.10 Variations

The proposal seeks minor variations to the site cover, front setback and side setback envelope requirements of Chapter 5.10 of the DCP. With respect to the 0.4:1 FSR standard under the DCP, this provision appears to have no effect, as under section 3.43(5)(a) of the *Environmental Planning & Assessment Act*, 1979 it is the same as a provision in an environmental planning instrument (ie Gosford LEP 2014), and which otherwise allows a FSR of 0.5:1, which the proposal complies with.

The proposed site coverage of 44% is a variation of 10% to the DCP provision of 40% site coverage, which is a minor variation, and the proposal otherwise meets the allowed FSR for the site. The proposal is consistent with the average front setback of the 2 adjoining dwellings, as is Council's general requirement for residential development, and for the most part the side setbacks are larger than those required under Council's DCP, and where variations do occur they are negligible in the context of the development overall and are unlikely result in adverse impacts on adjoining properties. The provision of car parking and garages in the front setback area is consistent with the current arrangements on the site, and the established pattern for most development on the eastern side of Coral Crescent.

The objectives of Part 5.10 of the DCP are to maintain and improve the natural character of the area, and to ensure that development is consistent with the unique qualities and character of Pearl Beach. The proposal is supported by an assessment of character under Chapter 2.1 of the DCP, and the proposal will be consistent with the desired future character of the area, and will be compatible with existing development in Coral Crescent.

Chapter 6.2 – Coastal Frontage

A coastal engineering assessment has been prepared by Horton Coastal Engineering which addresses the coastal engineering requirements of Chapter 6.2 of the DCP, as well as the Coastal Management SEPP 2018, and is submitted with the application. The assessment concludes that the proposal meets the requirements of DCP 2013 from a coastal engineering perspective and the proposal also satisfies the requirements of *State Environmental Planning Policy (Coastal Management) 2018* for the matters considered therein.

All piling for the proposed dwelling house will be landward of the coastal building line, with a portion cantilevered in accordance with 6.2.8.2.e of the DCP.

With respect to established building lines and the provisions of 6.2.8.2.e.ii, the dwelling will be forward of the average rear setback of the 2 adjoining properties at the corners, as is part of the roofed rear deck area currently on the site, and a variation to the requirement is sought, as detailed below.

The rear walls of the dwelling will be located marginally forward of the coastal building line, by 700mm, and the southern part of the rear wall at the first floor is located on, or close to the coastal building line. The adjoining dwelling to the north is located behind the general rear building line of surrounding properties, between 32 and 40 Coral Crescent, and has a swimming pool located seaward of the coastal building line. The rear wall alignment of the proposed dwelling is located behind the rear alignment of the adjoining dwelling to the south and the rear balcony is located forward of the rear alignment.

Considering rear setbacks more broadly along the frontage to Pearl Beach, there are variations between adjoining properties, and also variations in setbacks along the length of the beach frontage. The result is that not all dwellings follow the same alignment as their neighbours, and not all dwellings are at the average rear setback compared to the adjoining properties, and this forms part of the character of the beachscape along this section of the beach.

The following figure shows the wider average rear setbacks of dwellings adjacent to Coral Crescent, relative to rear boundaries, and the properties at 34, 36 and 38 Coral Crescent are located behind the wider average rear alignment, relative to properties further to the north and to the south.

Figure 26 – Wider average rear setbacks facing Pearl Beach

The rear walls of the proposed dwelling have a setback behind the rear alignment of the adjoining dwelling to the south, and further forward than the adjoining dwelling to the north, and the rear balcony line at the first floor level steps in slightly in recognition of this. The proposed rear balconies and decks extend further to the rear, and these are framed elements, largely open to the sides and rear apart from some privacy screening, with glass balustrading on the first floor, which reduce the bulk of this part of the dwelling.

In support of the rear setback as proposed, those elements contributing to building bulk, being the rear walls, will be only slightly forward of the coastal building line, and behind the rear alignment of the adjoining dwelling to the south, and the balcony and deck elements are largely open structures that minimise bulk, and particularly on the northern side where the framing elements are reduced and the roof line steps in. There is variation in rear setbacks along the length of the beach, and while the proposal will provide variation to the setbacks to adjoining properties, the rear setback will not be out of place, and particularly considering the open design treatment of the rear of the dwelling.

In providing a rear setback that is forward of adjoining properties, the design is also able to reduce the extent of building adjacent to the northern side boundary, with the majority of the dwelling being setback more than 7m from the side boundary and the adjoining dwelling house, and which increases separation between development on the adjoining properties.

The objectives of the DCP controls are to provide equity in the redevelopment of coastal properties subject to coastal hazards, and applying consistent setbacks, and the DCP recognises that from a coastal hazard point of view development is able to build seaward of the coastal building line in some cases. The proposal is supported by a Coastal Engineering Assessment, which concludes the proposed development meets the DCP requirements from a coastal engineering perspective, and the proposal will not give rise to inequity other than in providing some variation to rear setbacks, which largely includes balcony and deck elements that contribute less to building bulk. A separate assessment is also provided on privacy, overshadowing and view impacts, and in particular the properties either side will maintain their primary beach and ocean views at the rear, and elements to be built forward of the coastal building line will be largely open at the sides and would still allow for cross views over the subject land.

On this basis, a variation is sought to the DCP coastal setback requirements, and the proposal will not be out of keeping with wider variations in rear alignments along the beach frontage, and will include appropriate design treatment for the rear of the dwelling house to reduce building bulk and any adverse visual impacts when viewed from the beach.

5.3 State Environmental Planning Policies

Relevant State Environmental Planning Policies (SEPPs) applying to the land are SEPP – Building Sustainability Index (BASIX), SEPP 55- Remediation of Land, the Coastal Management SEPP 2018, SEPP 19 - Bushland in Urban Areas and SEPP (Vegetation in Non-Rural Areas) 2017.

SEPP BASIX

A BASIX Certificate is submitted with the application that demonstrates that with the commitments contained in the certificate, the proposal will meet or exceed BASIX requirements, and is the proposal is BASIX compliant.

SEPP 55 – Remediation of Land

SEPP 55 applies to all development and requires consideration and management of site contamination issues as part of the development assessment process. The current use of the site is for domestic residential purposes, which will remain the same, and there are no known previous uses that would lead to the site being contaminated or unsuitable for the proposed development.

Coastal Management SEPP 2018

The site is subject to the Coastal Management SEPP 2018, and is located in mapped *coastal use* and *coastal environment* areas under the SEPP. The site is not mapped as containing *coastal wetlands* or *littoral rainforests*, or as being within a mapped proximity area. A table outlining compliance with the SEPP is provided below:

Consideration	Compliance
Clause 13 (1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:	
(a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,	The proposal will be connected to reticulated sewer and stormwater will be managed on-site in accordance with the submitted stormwater management plans. Erosion and sediment control will be in place during demolition and construction, and the proposal will not impact on the environment.
(b) coastal environmental values and natural coastal processes	The site is subject to a *coastal building line* under Gosford DCP 2013 and an assessment against the requirements of Chapter 6.2 is provided in the Coastal Assessment report prepared by Horton Coastal Engineering.
(c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,	The proposal will be connected to reticulated sewer and stormwater will be managed on-site in accordance with the submitted stormwater management plans. Erosion and sediment control will be in place during demolition and construction, and the proposal will not impact on any sensitive coastal lakes listed in Schedule 1.
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,	The proposal will not impact on these.
(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability	The proposal will not impact on public access to the foreshore.
(f) Aboriginal cultural heritage, practices and places,	An AHIMS search has been undertaken (**Attachment A**), and the subject land has not been identified as containing or being within 200m of any Aboriginal sites or places
(g) the use of the surf zone	The proposal will not impact on the surf zone
Clause 13 (2) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:	
(a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1)	The proposal is appropriately designed and sited having regard to LEP and DCP requirements, the location and characteristics of the site and existing development on surrounding properties. The proposal will maintain a similar presentation to Pearl Beach as other development along Coral Crescent and does not require the removal of any vegetation of significance and additional landscaping is proposed in accordance with the submitted Landscape Plan.
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact	N/A – no adverse impacts

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact	N/A – no adverse impacts
Clause 14 (1)(a) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:	
(i) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability	The proposal will not impact on public access to the foreshore.
(ii) overshadowing, wind funnelling and the loss of views from public places to foreshores	The proposal will not result in overshadowing of the foreshore, and will not impact views from public spaces to foreshores having regard to the slope of the land and existing development on the site.
(iii) the visual amenity and scenic qualities of the coast, including coastal headlands	The proposal will be visible from Pearl Beach and coastal areas and will maintain a similar presentation to the beach compared to existing development in the surrounding area.
(iv) Aboriginal cultural heritage, practices and places	An AHIMS search has been undertaken (**Attachment A**), and the subject land has not been identified as containing or being within 200m of any Aboriginal sites or places
(v) cultural and built environment heritage	The subject land is not identified as containing any items of heritage, archaeological or historic significance.
Clause 14 (1)(b) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority is satisfied that:	
(i) the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a)	The proposal is appropriately designed and sited having regard to LEP and DCP requirements, the location and characteristics of the site and existing development in the surrounding area. The proposal will maintain a presentation to Pearl Beach and coastal areas consistent with existing development in the area and the proposal does not require the removal of any vegetation of significance and additional landscaping is proposed in accordance with the submitted Landscape Plans.
(ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact	N/A – no adverse impacts
(iii) if that impact cannot be minimised—the development will be managed to mitigate that impact	N/A – no adverse impacts
Clause 14 (1)(c)	
Development consent must not be granted to development on land that is within the coastal use area unless the consent authority has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development:	The proposal is compatible with the location and visual setting of the site, as well as the zoning of the land, the zone objectives, permitted uses and allowed development standards in the zone. The proposal seeks a substantiated variation to the rear coastal setback, which is supported by Coastal Engineering Advice, and

	largely constitutes balcony and deck areas that are largely open at the rear and sides. The proposal is well designed and articulated and is of an appropriate bulk, scale and size having regard to the site and its location.
Clause 15 – Development within the coastal zone generally	
Development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land.	The site is subject to a *coastal building line* under Gosford DCP 2013 and an assessment against the requirements of Chapter 6.2 is provided in the Coastal Engineering Advice prepared by Horton Coastal Engineering.

SEPP 19 - Bushland in Urban Areas

SEPP 19 applies generally to all land in the former Gosford LGA and aims to protect and preserve remnant or representative natural vegetation within urban areas.

The proposal involves removal of some minor trees on the site, and with Council's approval a street tree, which forms part of the application, and replacement planting and landscaping is proposed in accordance with the submitted Landscape Plan.

The proposal will not involve the disturbance of any bushland zoned or reserved for open space (clauses 6 to 8) and does not involve development or works on land which adjoins, or will impact on bushland zoned or reserved for public open space purposes (clause 9), and the proposal will be consistent with the SEPP.

SEPP (Vegetation in Non-Rural Areas) 2017

The proposal involves removal of some minor trees on the site, and with Council's approval a street tree, which forms part of the application, and replacement planting and landscaping is proposed in accordance with the submitted Landscape Plan.

The removal of trees on the property is consistent with development of the land in accordance with the R2 zoning and relevant planning controls applying to the land, and replacement landscaping and planting is proposed both on the site and in the adjoining road reserve, consistent with other landscaping in the road reserve on the eastern side of Coral Crescent. Additionally, the subject land is not mapped as an area with biodiversity values under the NSW OEH Biodiversity Values Map.

6. ENVIRONMENTAL IMPACTS

The proposal involves a new dwelling house on the site, and a swimming pool, and environmental impacts have been considered in the assessment against planning controls and also as follows.

6.1 General Environmental Impacts

The proposal has considered a number of general environmental impacts including:

- Noise. The proposal will only generate noise normally associated with domestic living, consistent with the existing development on the site, and Council will impose conditions of consent relating to construction activities. All pool pump equipment will be suitably located or enclosed so as to not result in noise impacts for surrounding properties.
- Waste. The proposal will generate a domestic level of waste, the same as currently generated from the site, and all waste will be collected through Council's domestic waste service. Bin storage will be in the double garage and a Waste Management Plan is submitted with the application.

6.2 Site Suitability

The subject land is zoned residential, and dwelling houses and ancillary development are permitted with consent on the site, and will be consistent with the existing use and development on the land. The site has an area of 670.2m^2 and width of 15.24m, and has frontage to Pearl Beach, and the proposal has been designed in response to the characteristics of the site and the nature of development in the surrounding area, and the intensity of development complies with Council's floor space ratio requirements.

6.3 Previous Uses

The current use of the site is for domestic residential purposes, which will remain the same, and there are no known previous uses that would lead to the site being contaminated or unsuitable for the proposed use.

6.4 Stormwater Management

Stormwater management is proposed in accordance with the submitted Stormwater Management Plans prepared by ACOR Consultants, which include rainwater re-use and other treatment measures.

6.5 Tree Removal/ Landscaping

There are several minor trees on the site that will be removed, together with 1 street tree, and replacement landscaping and tree planting is proposed in accordance with the Landscape Plan which includes landscaping both on the site and in the road reserve area adjoining the site.

6.6 Coastal Impacts

The proposal is supported by a Coastal Engineering Advice, prepared by Horton Coastal Engineering, which addresses coastal hazards and the requirements of Chapter 6.2 of Gosford DCP 2013 and relevant requirements under the Coastal Management SEPP 2018.

6.7 Privacy

The design of the proposal has considered privacy impacts on adjoining properties, and includes treatments to reduce privacy impacts.

Along side boundaries windows are either highlight windows or are well setback from the boundary. On the southern side there are two highlight windows to a hallway on the first floor, and on the northern side, windows are setback at least 7m from the side boundary, and that part of the dwelling setback 1.2m from the boundary does not contain any windows.

Raised planters and landscaping are proposed along the northern boundary adjacent to the swimming pool, in order to reduce privacy impacts, and similar treatment is proposed on the street frontage and southern side boundary of the ground level terrace facing the Coral Crescent.

On the rear elevation at the ground level is a deck area, which will replace a similar deck that currently exists on the site, and landscaping is proposed at the side and rear of the deck. At the rear on the first floor are two balconies, one from the rumpus/ entertainment area on the southern side, which will be largely screened to the side from the swimming pool on the adjoining property to the north, and on the northern side is a smaller balcony to the master bedroom which is oriented to the beach and contains some privacy screening on the northern side to prevent overlooking of the swimming pool on the adjoining property.

6.8 View Impacts

Consideration has been given to the view impacts of the proposal, and having regard to the view sharing planning principle established by the Land and Environment Court in *Tenacity Consulting v Warringah Council [2004] NSWLEC 140 at 25-29* which establishes a 4 step process to determine the significance of potential view loss:

Step 1 - assessment of views to be affected. Water views are valued more highly than land views. Iconic views (eg of the Opera House, the Harbour Bridge or North Head) are valued more highly than views without icons. Whole views are valued more highly than partial views, eg a water view in which the interface between land and water is visible is more valuable than one in which it is obscured.

Step 2 - The second step is to consider from what part of the property the views are obtained. For example the protection of views across side boundaries is more difficult than the protection of views from front and rear boundaries. In addition, whether the view is enjoyed from a standing or

sitting position may also be relevant. Sitting views are more difficult to protect than standing views. The expectation to retain side views and sitting views is often unrealistic.

Step 3 - assess the extent of the impact. This should be done for the whole of the property, not just for the view that is affected. The impact on views from living areas is more significant than from bedrooms or service areas (though views from kitchens are highly valued because people spend so much time in them). The impact may be assessed quantitatively, but in many cases this can be meaningless. For example, it is unhelpful to say that the view loss is 20% if it includes one of the sails of the Opera House. It is usually more useful to assess the view loss qualitatively as negligible, minor, moderate, severe or devastating.

Step 4 - assess the reasonableness of the proposal that is causing the impact. A development that complies with all planning controls would be considered more reasonable than one that breaches them. Where an impact on views arises as a result of non-compliance with one or more planning controls, even a moderate impact may be considered unreasonable.

View Impact Assessment

In assessing view impacts, access has not been gained to surrounding dwelling houses however a reasonable assessment of view impacts is able to be made from within the subject land.

The existing dwelling house on the site enjoys expansive and complete panoramic ocean, beach and distant views over Pearl Beach, similar to adjoining dwellings on the eastern side of Coral Crescent. These views are primarily over individual rear boundaries, as well as side views over the rear of adjoining properties. The views gained from adjoining properties on either side include both rear and side views, which are from both a sitting and standing level at all floors, and with views being slightly lesser and more oblique at the ground floor levels. These views are highly valuable beach and ocean views.

One of the characteristics of Coral Crescent is that there are limited through views, if any, from the street and properties on the western side towards Pearl Beach and the ocean. This is as a result of the rise in land up from the street on the eastern side, and established development patterns including houses built close to side boundaries at the rear, and garages and other structures at the street level which further restrict through views. As a result, and noting the existing dwelling house on the site, the proposal is unlikely to impact on any views for properties on the western side of Coral Crescent.

The two properties considered for potential view impacts are the properties either side of the subject land, at 34 and 38 Coral Crescent. The dwellings on these properties have living areas and other rooms facing the beach at the rear, together with balcony and deck areas on the rear elevations. Views for these dwellings would be from both a sitting and standing position on the

rear balconies and decks, with views also likely from internal areas at the rear of the dwelling. Both dwellings also have limited side facing windows adjoining the subject land.

The primary views from the two adjoining dwellings are directly to the rear of those properties towards Pearl Beach, which will not be impacted by the proposed development. These dwellings also have side views over the rear of adjoining properties to either side, and including views over the rear of the subject land.

Relative to the adjoining dwelling to the south, the proposed rear wall line will be located behind the rear alignment of the adjoining dwelling house, and the building elements forward of the rear alignment has open sides to the ground floor deck and first floor balcony, which will retain some through views. The extent of impact to current views from this dwelling would be limited to a very minor impact on the periphery of a cross view of the beach and ocean, gained across the rear of the subject land, and would be negligible in the context of the wider views available for this dwelling.

Relative to the adjoining dwelling to the north, the proposal will be further forward at the rear walls compared to the adjoining dwelling, which is in itself located behind the alignment of existing dwellings on either side. Views would remain through the side of the rear deck area at the ground level, and at the first floor level the proposed privacy screening is likely to have minor impact on any views. Overall, the impact on views from the adjoining dwelling to the north would be limited to a minor impact on the periphery of a cross view of the beach and ocean, gained across the rear of the subject land, and would be minor in the context of the wider views available for this dwelling.

In terms of reasonableness, the rear walls of the dwelling are located 700mm inside the coastal building line, which dwellings can be built to, and the deck and balcony areas beyond that include open areas at the sides which will retain some cross views. The proposal also provides a 1.2m setback on either side, which exceeds the minimum 900mm that could be built to at the ground floor level.

In summary, the proposal will impact on some peripheral side views from the two adjoining dwellings which would be negligible to the south and minor to the north, and the extent of impact is not unreasonable having regard to the wider views that remain available from these dwellings.

6.9 Overshadowing

Shadow diagrams have been prepared, and are submitted with the application, which show that that the proposal will result in some overshadowing of the adjoining dwelling to the south, which will not be unreasonable given the proposal remains below the allowed 8.5m building height and maintains a side setback of 1.2m to the adjoining property.

7. SECTION 4.15 CONSIDERATIONS

The following assessment addresses the matters required to be considered under Section 4.15 of the *Environmental Planning & Assessment Act 1979*.

(1) Matters for consideration—general

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

(a) the provisions of:

(i) any environmental planning instrument

Comment: the proposal has been considered against both Gosford LEP 2014 and relevant State Environmental Planning Policies, and complies with relevant requirements;

(ii) any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the draft instrument has been deferred indefinitely or has not been approved)

Comment: The site is subject to a Planning Proposal for the draft Central Coast Local Environmental Plan (CCLEP) which applies to the entire LGA and has completed public exhibition. Under the draft LEP the subject land retains its R2 Low Density Residential zoning, and dwelling houses and ancillary development remain a permitted use with consent in the R2 Low Density Residential zone under the draft LEP. The proposal is consistent with the draft CCLEP and the objectives for the R2 Low Density Residential zone.

(iii) any development control plan

Comment: the proposal has been assessed against the Gosford DCP 2013, and is consistent with DCP requirements with some substantiated variations that are consistent with other development in the locality, and which are consistent with the objectives of the standards as addressed under the DCP assessment;

(iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F

Comment: There is no planning agreement relevant to the subject land or the proposal.

(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates

Comment: There are no matters prescribed in the regulations that impact on the proposal.

(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality

Comment: The proposal is unlikely to result in any adverse environmental impacts and will maintain a positive social and economic impact through the renewal of housing stock on the site. Coastal hazards have been addressed in a Coastal Engineering Advice prepared by Horton Coastal Engineering.

(c) the suitability of the site for the development

Comment: The site is suitable for the proposed development and the proposal has been designed in response to the site's setting and location and having regard to development in the surrounding area.

(d) any submissions made in accordance with this Act or the regulations

Comment: This is a matter for Council to consider once the application is notified.

(e) the public interest

Comment: the proposal will result in redevelopment of the site consistent with the zoning of the land, and will be generally consistent with the existing use of the land and development in the surrounding area. The proposal has design merit, and the privacy and view impacts of the development have been considered and addressed.

8. CONCLUSION

In conclusion, the proposal has been designed in response to the setting of the site in a beachfront location, and having regard to recent development along Pearl Beach. The proposal is consistent with the objectives of the R2 Low Density Residential zone, is permitted under Gosford Local Environmental Plan 2014 and complies with the required building height and floor space ratio standards under the LEP. The proposal is compatible with the general development pattern and character of the surrounding area and is consistent with Gosford Development Control Plan 2013, with some substantiated variations as addressed in the Statement.

An assessment of the proposal has been carried out pursuant to Section 4.15 of the *Environmental Planning & Assessment Act 1979*, which supports the proposal, and it is recommended that Council approve the application.

Attachment A – AHIMS Search Results

Office of Environment & Heritage NSW GOVERNMENT

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : 36 Coral Cres
Client Service ID : 536731

Michael Leavey Consulting

Date: 18 September 2020

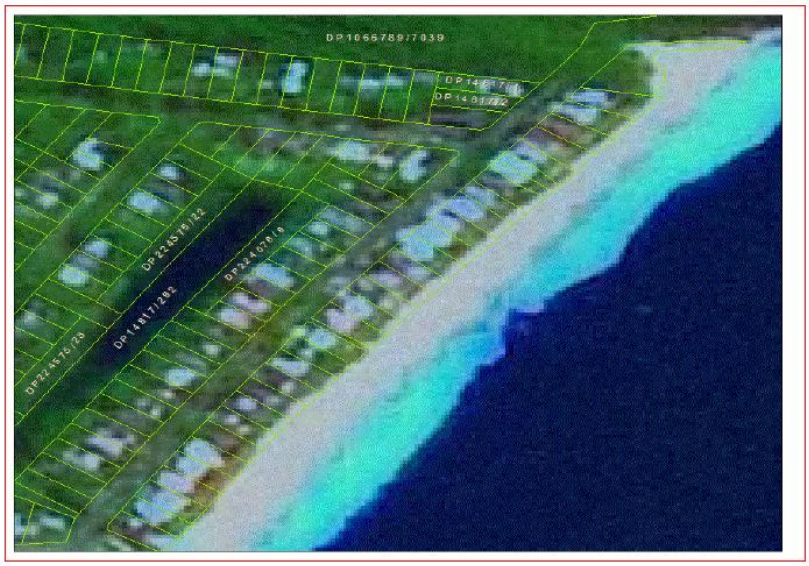
Suite 2.08 Platinum Building East 4 Ilya Ave
Erina New South Wales 2250
Attention: Michael Leavey

Email: michael@michaelleaveyconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 273, DP:DP14817 with a Buffer of 200 meters, conducted by Michael Leavey on 18 September 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

SRB Consulting Civil Engineers

83 Patrick Crescent
Saratoga NSW 2251
tel 0402 134 113
fax 02 4369 6525
email srbconsulting@bigpond.com

Proposed Residential Subdivision Development over Lot 33 in DP 20817, No.8 Ghersi Avenue, Wamberal

Water Cycle Management Report

Prepared for : Brad Lawrence

Date : May 2021

Project No : 22017

Issue No : 2

ABN 16 132 873 431

COMMERCIAL IN CONFIDENCE

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DOCUMENT CONTROL

Issue	Date	Issue Details	Author	Checked	Approved
1	08/12/20	Issued for Council DA Approval	SB	NB	SB
2	10/05/21	Re-Issued for Council DA Approval	SB	NB	SB

Executive Summary

SRB Consulting has been engaged to prepare a water cycle management plan on behalf of Mr Brad Lawrence as part of the Development Application submission for the proposed residential subdivision development over Lot 33 in DP 20817, 8 Ghersi Avenue, Wamberal.

The major area of interest was the determination of appropriate stormwater management measures to integrate water supply, water quality and runoff control in accordance with the requirements of Part 6.7 of Gosford City Council's DCP 2013.

The study concludes that the implementation of water sensitive urban design principles in a treatment train approach including leaf gutter guards, first-flush devices, rainwater harvesting tanks, gross pollutant traps, a bioretention facility and the use of water efficient appliances will ensure that the development meets Council's water quality, water retention and consumption reduction targets.

Stormwater quantity control will be provided in the form of an underground modular on-site detention facility located adjacent to the south-eastern corner of the site draining to a proposed interallotment drainage pipeline through HN38 Lucinda Avenue. DRAINS modelling undertaken indicates that a storage volume of approximately 11m^3 will be required to retard post-developed to flows to generally within pre-development limits for all events up to and including the 1% Annual Exceedance Probability event.

The active management of stormwater runoff from the site during construction and operational phases of the development will ensure that there are no unacceptable discharges from the site into the Council's stormwater drainage system.

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1.0 Introduction

This report has been prepared on behalf of Mr Brad Lawrence as part of the Development Application submission for the proposed residential subdivision development over Lot 33 in DP 20817, 8 Ghersi Avenue, Wamberal.

This report deals with the stormwater management objectives of the proposed subdivision and addresses the relevant requirements of Gosford City Council's Development Control Plan 2013 – Chapter 6.7 : Water Cycle Management, including the associated Water Cycle Management Guidelines. The proposed water quantity and quality measures detailed in this report are complimentary to the Water Cycle Management Plan No. 22017, which has been included in **Attachment C** of this report.

The primary water management objectives for the proposed development are as follows:

1. The integration of stormwater management measures to reduce runoff volumes and peaks and reduce the impact on Council's stormwater drainage system;
2. Demonstration of water use sustainability; and
3. The protection of the downstream receiving waters both during the construction phase of the project and once completed.

The design of the proposed stormwater management measures indicated on the accompanying plans has been undertaken in accordance with Central Coast Council's requirements and generally accepted practice.

This report has been prepared based on current survey and subdivision layout information prepared by Cahill & Cameron Surveyors. Any changes to the development layout will not dramatically alter the stormwater management philosophy but may impact on the detailing of the proposed stormwater drainage system.

2.0 Existing Site Investigation

2.1 Description

The subject site occupies Lot 33 in DP 20817, 8 Ghersi Avenue, Wamberal. The site is bound by residential units to the north, residential dwellings to the south and east and Ghersi Avenue to the west with residential properties beyond. The site, which has a total area of approximately 1083m^2, has an existing single-storey weatherboard dwelling with a concrete driveway running adjacent to the northern boundary. The site generally falls from north-west to south-east, with grades in the order of 14-19%. A locality map is provided within **Figure 1**.

Figure 1 – Locality Map for Development Site

3.0 Development Proposal

3.1 Description

The proposed works include the subdivision of the site into two allotments and the construction of a new access driveway running parallel with the southern boundary to service the proposed rear lot. The proposed development layout has been included in the submitted plans by Cahill & Cameron Surveyors.

The area of the proposed lot (Lot 332) is 610.5m^2, with the existing lot (Lot 331) not being subject to further development under the current DA, except for modifications to the existing drainage system as required to connect into the proposed easement through to Lucinda Avenue. For the remainder of this report the term 'development site' therefore refers to the proposed lot.

3.2 Potential Water Management Issues

The potential key water management issues associated with the proposed development are:

- Unless properly addressed, increased impervious areas associated with the proposed development could result in increases to the stormwater runoff volumes and peak flowrates that are conveyed into Council's stormwater system. It is proposed to implement on-site detention (OSD) and rainwater reuse measures for the development site with collected stormwater drained to the proposed interallotment drainage system through Lot 47 DP 25382 and into Lucinda Avenue, in accordance with Council's requirements to ensure flows from the developed site are adequately addressed;

- The development of the site could lead to increased nutrient loadings within the downstream receiving waters, which may cause siltation issues, habitat destruction and eutrophication. This could result from poor sediment and erosion control practices during construction, as well as spillages of oil and grease from vehicles and nutrients from vegetation / grass clippings once the development has been completed and is occupied. It is proposed to adopt Best Management Practices (BMP) during both the construction and post-construction phases, which will include the construction of measures to reduce the nutrient levels to within acceptable limits;

- The proposed development could result in an increase in the demand for water. In recent years there has been increasing recognition of the need to re-use stormwater in addition to controlling stormwater quantity and quality. It is proposed to provide a rainwater harvesting system on the proposed lot (to be constructed at time of new dwelling), which will be plumbed to all toilets,

cold water laundry taps as well as being used for irrigation of landscaped areas and other external uses.

It has been assumed that Council will only require water management measures to be provided for any new works associated with the development. Should the existing dwelling be replaced then stormwater quantity and quality control measures would also be required for the existing lot at that time.

Calculations have been undertaken as part of this report on the required pollution and nutrient control measures that would be required as part of the future development of the proposed lot. These have been provided to demonstrate that the development can meet Council's requirements only and are not based on any actual development proposal for a dwelling on proposed Lot 332.

4.0 Stormwater Quantity and Quality Targets

4.1 Water Conservation Target

Section 6.7.7.1 of Council's DCP 2013 requires any SEPP 2004 (Basix) affected development to demonstrate compliance with Basix. The intention is to reduce potable water demand by 40%. The successful completion of a Basix certificate is deemed to comply with Council's water conservation target requirements under the DCP. A Basix certificate will be prepared by others as part of the Development Application submission documentation for the project.

The measures required to achieve a 'deemed to comply' result include fittings and fixtures (based on the Water Efficiency Labelling and Standards Scheme – WELS) such as :

- 3 star dual-flush toilets;
- 3 star shower heads;
- 3 star taps;
- Water efficient washing machines and dishwashers; as well as the provision of
- Rainwater harvesting tanks for toilets, laundry and irrigation (see Section 4.2); and
- Landscaping with plant species that require minimal water and irrigating with appropriate systems to minimize water loss and evaporation. This includes using native plant species, using mulch deeply around garden beds, avoiding watering when it's windy, watering during the coolest parts of the day and using a drip irrigation system.

4.2 Retention Target

The intent of Section 6.7.7.2 of Council's DCP is to mimic the natural catchment hydrology from all development sites, in terms of:

- Quantity: the annual volume of stormwater reaching natural creeks and waterways;
- Rate: the peak flow rates leaving the site; and
- Response: the time it takes for rain to runoff the site.

The objective is to capture and retain runoff from impervious surfaces, and slowly release it elsewhere in the water cycle within 7 days. Council recommends that this be undertaken by capturing roof runoff in water tanks and diverting other 'non-roof' impervious surfaces such as driveways and paved areas into landscaped rain-gardens, bioretention systems or storage tanks, where it is slowly released via infiltration, percolation and evaporation. The required minimum retention volume has been determined using the deemed-to-comply formula in Section 6.7.7.2 (refer Section 5).

4.3 Stormwater Quality Target

Section 6.7.7.3 of Council's DCP specifies the following post-development pollutant treatment rates for development sites :

- Suspended Solids – 80% retention;
- Gross Pollutants – 80% retention;
- Total Phosphorus – 45% retention;
- Total Nitrogen – 45% retention;

Pollution retention relates to the percentage of the baseline annual pollutant load retained on the site through water quality measures. The baseline annual pollutant load is the expected post-development pollutant load that would be expected from the site over the course of an average year if no water quality measures were implemented. This performance standard is based on the stormwater treatment objectives recommended by the Gosford City Council Urban Stormwater Management Plan (1999).

The Site Discharge Index (SID) provides a very general indicator of the extent to which a development proposal will create unmanaged flows from impervious surfaces. If all runoff from impervious surfaces on a site will be managed by suitable stormwater source controls, the SID will be 0.0. The greater the area of impervious surface that is not managed by stormwater source controls, the higher the SID will be (up to a maximum of 1.0 on a site that is totally covered by impervious surfaces).

The SID is calculated by dividing the impervious area directly connected to the street drainage system (i.e. impervious area runoff which is not managed by an acceptable stormwater source control) by the total site.

Landscaping source control measures must be placed and sized according to the amount of impervious area being treated. For each 100m^2 of impervious area then the following treatment options are considered to achieve the targets :

- 2m^2 of engineered bioretention device/rain garden/ or proprietary system,
- 4m^2 of depressed soak area/rock basin/pond/ or wetland,
- 7m^2 of garden/lawn/grass swale/vegetated filter strip (at <1% slope), or
- 15m^2 of garden/lawn/grass swale/vegetated filter strip (at <5% slope).
- 25m^2 of garden/lawn/grass swale/vegetated filter strip (at <20% slope).

4.4 On-Site Detention Target

Section 6.7.7.4 of Council's DCP requires selected developments to provide on-site detention (OSD) measures to limit post-developed flows to less than or equal to pre-developed flows for all storm events up to and including the 1% AEP storm event.

The DCP states that OSD will not be required on alterations, additions, ancillary structures, second storey additions, single dwelling & dual occupancies, except where:

- the volume of total retention storage provided does not correspond to the requirements in Section 6.7.7.2, in such instances the OSD system shall meet the short fall of retention volume and have a Permissible Site Discharge (PSD) of 8L/s, or
- it is required under a specific Council Plan of Management or other Council Plan.

OSD is typically required on all other development types.

It is proposed to provide the required OSD storage volume in the form of an underground modular tank system located adjacent to the south-eastern corner of the site to maximise the area of the site that can be routed through the facility and facilitate the discharge of collected runoff to the proposed interallotment drainage system through HN38 Lucinda Avenue.

4.5 Local Overland Drainage Target

The main objective of Section 6.7.7.5 of Council's DCP is to effectively manage local overland drainage problems which may occur throughout urban areas that fall outside the definition of flooding. To adhere to the requirements with regard to overland drainage developments must :

- Ensure floor levels that are above the surrounding ground levels must comply with the minimum standards as set out in the Building Code of Australia (BCA) to protect against any shallow water depths;
- Cut and/or fill should be minimised;
- Overland runoff generated by rain is to be directed into flow paths that follow the natural land slope to mimic the pre-development state as much as possible, which poses the least threat to residents. The overland flow paths must not adversely affect adjoining properties. They must not be obstructed by parked cars, retaining walls, landscaping, and where side passages are used they are to be kept clear of obstructions such as hot water heaters, air conditioners, solid fencing, rainwater tanks or garbage bins;

- Driveways must not interfere with the function of longitudinal drainage, and must not provide a spillway for stormwater runoff (either into the property if the road is higher, or on to the road if the road is lower); and
- Minimum setbacks must be observed between buildings and watercourses

To ensure compliance with this section of the DCP all habitable floor levels will be constructed above the surrounding ground level and overland flowpaths will be provided through the development site to direct flows through the site towards the downslope interallotment drainage system. Where applicable external threshold levels will be designed to ensure runoff overtops into designated flowpaths and not into building areas.

4.6 Flooding Targets

Section 6.7.7.6 of Council's DCP aims to reduce the impact of flooding on flood prone property. If flood related development controls apply, then the Water Cycle Management Plan must demonstrate compliance with the relevant flood control targets as listed in the Tables 4 & 5 of this section of the DCP.

- Flood related development controls may apply for any development on flood prone land (up to the PMF) for the purposes of subdivision of land, earthworks, the erection of a building, the carrying out of a work, or flood mitigation works;
- Flood related development controls will not apply for development for the purposes of residential accommodation (other than group homes and seniors housing) on land that is flood prone but is not in the flood planning area. (i.e. land that is above 1% AEP flood level + 0.5m freeboard but below the PMF)

The subject site is not located within the extent of the 1% Annual Exceedance Probability (AEP) Flood as shown on Council's electronic mapping system and is therefore not subject to specific flood related development controls as identified in Table 4 – Flood Control Target Matrix.

5.0 Stormwater Quality Management Measures

5.1 Stormwater Management Measures

5.1.1 Stormwater Pollution Control Measures – Post Construction

5.1.1.1 Rainwater Harvesting Tank

As well as reducing potable water consumption, rainwater harvesting contributes to the control of pollutants exported in urban stormwater in a number of ways including:

- Leaf guard protection on all gutters, downpipes and inlets to the rainwater harvesting tank. This reduces the sediment and leaf/organic matter exported from the site;
- Proprietary first flush devices, or acceptable alternatives, designed to capture and divert the initial runoff from roof areas. The solid material captured in the first flush holding device accumulates over time and is periodically removed offsite thereby reducing potential pollution export to downstream receiving waters;
- Settling of sediments within the rainwater harvesting tank. Further settlement of sediments is provided within the tank. The solid material captured in the tank sump can then be periodically removed offsite;
- The retention of rainwater itself provides a reduction in pollutant export from the site. By reducing the volume of stormwater discharging from the site there is an associated reduction in pollutant export.

5.1.1.2 Bioretention Trenches

Bioretention trenches are systems that promote the filtration of stormwater through a prescribed filter medium, usually sand. The type of filter medium determines the effectiveness of the pollutant removal, with materials with a lower hydraulic conductivity achieving a higher pollutant removal.

Bioretention trenches provide both stormwater treatment and conveyance functions. The system consists of a landscaped swale situated directly above a sand-filled trench. The detention component of the aboveground swale provides pre-treatment of stormwater to remove coarse particulates and associated contaminants via settlement and screening, while the biofiltration media removes finer particulates and fixed contaminants via filtration and absorption. The bioretention trench will be located above the OSD facility to ensure post-developed flowrates from the site are controlled as required by Council. The use of these measures will ensure that the Site Discharge Index (SID) is kept under 10% as also required by Council (refer Section 6).

5.1.1.3 Gross Pollutant Traps

A Gross Pollutant Trap (GPT) is a stormwater treatment BMP designed to capture coarse sediment, trash and vegetation matter. GPT's play an important role in stormwater quality management as pre-treatment for other treatment measures, such as raingardens and bioretention systems, by removing coarse material and preventing downstream measures from being overloaded.

For this development the piping of runoff from hardstand areas to the vegetated swale above the bioretention trench will be implemented in conjunction with gutter leaf guards and a first-flush diverter for roof runoff adjacent to the inlet to the rainwater harvesting tank(s). A sediment sump and trash screen will also be provided within the discharge control pit section of the OSD facility.

6.0 Stormwater Retention & Water Quality Measure Calculations

6.1 Minimum Retention Volume

The retention volume for the development has been sized using Council's 'deemed to comply' formula in Section 6.7.7.2 of DCP 2013 :

- $V = 0.01A(0.02F)^2$; where :

  V= retention volume (m^3), A= development site area (m^2), F=fraction impervious (assumed to be 80%)

Using this formula on the development site equates to :

$V_{REQUIRED} = 0.01 \times 611 \times (0.02 \times 80)^2 = 15{,}642$Ltrs retention volume

It is proposed to provide this volume as a combination of rainwater harvesting tank(s) and a landscaped swale above the bioretention trench for non-roof impervious areas. Rainwater harvesting, also known as roof water harvesting, involves the collection, storage and re-use of rainwater from the roof areas of a development for internal and external uses. In relation to the proposed development site, harvested rainwater can be used for toilet flushing, laundry uses, washing cars and irrigation of landscaped areas.

6.2 Retention Volume Calculations

The final retention volume breakdown will be undertaken as part of the stormwater management plan prepared for the future dwelling on the proposed lot, however preliminary calculations have been undertaken on the estimated weekly rainwater reuse and the subsequent remaining runoff to be stored using additional rainwater tank storage in accordance with Section 6.7.7.2.5 of Council's DCP.

- Retention volume required = 15,642 Ltrs
- Adopted Roof Area = $180m^2$ (assumed)
- Adopted Weekly rainwater reuse = $35L/m^2 \times 180m^2 \times 50\%$ (Table 3)
  = 3,150 Ltrs
- Balance to be retained by additional rainwater tank storage / bioretention trench area
  = 15,642 – 10,000 (2 x 5,000Ltr rainwater tanks)
  = 5,642 Ltrs
- Infiltration volume during 30minute storm = 200mm/hr (infiltration rate adopted from Section 6.7.7.2.5) x 0.5hrs x $20m^2$ (adopted bioretention trench area) = 2,000 Ltrs
- Balance of retention to be stored and slowly released after storm = 5,642 – 2,000
  = 3,642 Ltrs
- Ponding depth within proposed soakaway areas = volume / area

= 3,642Ltrs / 20m^2
= 0.18m

6.3 Water Quality Calculations

The stormwater management strategy for this development requires the integration of a range of current best management Water Sensitive Urban Design (WSUD) principles, in a 'treatment train' approach, to achieve the objective of limiting pollutant export to the levels identified in Section 4.3. The proposed stormwater treatment train for the development is as follows:

1. Stormwater runoff collected from building roof areas will be collected by the gutter and downpipe system and conveyed to a rainwater tank (RWT), filtered through a first flush device. Leaf guards are to be provided on all gutters of the building. The recommended rainwater tank volume will be 10,000Ltrs to meet the weekly rainwater reuse requirements as well as supplementing the required retention volume requirements;

2. Runoff from 'non-roof' impervious areas will be conveyed to a bioretention trench;

3. Overflows from rainwater tanks and all other areas will be directed to the bioretention trench, which will infiltrate into the on-site detention facility below;

Water quality measures have been sized based on the deemed to comply formula identified in Section 6.7 of Council's DCP (SID less than 0.1). To ensure the SID is kept less than 0.1 landscaping measures will be provided to treat runoff from the majority of paved areas of the development. Council requires these to be placed and sized according to the amount of impervious area being treated (refer Section 4).

SID Calculations

- Development site area = 611m^2
- Adopted roof area = 180m^2
- Paved area = 309m^2 (assuming lot is 80% impervious)
- Directly connected impervious area = 0m^2 (assumed). All hardstand areas assumed to pass through a rainwater tank and/or bioretention trench prior to exiting the site)
- Site Discharge Index = 0 / 611 = 0.0 (less than 0.1 so meets Council criteria)

Section 6.7.7.3 of Council's policy requires a minimum of 2m^2 of engineered bioretention trench / 100m^2 of hardstand area to be provided to ensure a 'deemed to comply' for their stormwater quality target criteria. Based on an assumed 'non-roof' impervious area of 309m^2 being treated this equates to a

minimum required bioretention trench area of 6.2m^2. The proposed 20m^2 of bioretention trench area for rainwater retention will be adequate to also meet this requirement.

The implementation of water quality measures on the developed site in a 'treatment train' approach as described above will assist in reducing the post-developed pollutant loads into the downstream receiving waters to those required under Gosford City Council's DCP 2013.

7.0 On-Site Detention Assessment

7.1 ARR 2019 Requirements

ARR 2019 utilises two main terms to described design rainfalls :

- Exceedances per year (EY) : the number of times an event is likely to occur or be exceeded within any given year;
- Annual exceedance probability (AEP) : the probability or likelihood of an event occurring or being exceeded within any given year, usually expressed as a percentage

Generally, EY terminology is used for very frequent design rainfalls, AEP (%) terminology is used for frequent and infrequent design rainfalls, and AEP (1 in X) terminology is used for rare design rainfalls.

Rainfall intensities and temporal patterns are derived from Australian Rainfall and Runoff 2019 (ARR 2019). The 2019 procedure uses sets or ensembles of rainfall patterns. These are 'bursts' extracted from longer sequences of rainfalls, rather than complete storms. Overall, ARR 2019 recommends that ensembles be used, rather than single design storms, and ensembles of 10 patterns are the only temporal rainfall data supplied in ARR 2019. 10 storms are considered by the ARR 2019 authors to provide an appropriate balance between accuracy and amount of calculations. With ensembles of 10 storms, the events are equally likely for the given AEP and duration, so it is necessary to analyse or design for the 'average' storm, which might be the median or mean one.

Assessing results in this way is more complex than with the 1987 data, since more events must be examined, and the target or focus is the average event for each duration rather than one representative event. For each duration the system should fail in four out of 10 events, sometimes involving large exceedances of design requirements. It would be incorrect to design and analyse using the worst result from the 10 storms for a given duration.

Chapter 3 of Book 5 of ARR 2019 recommends the adoption of the Initial Loss – Continuing Loss hydrological urban loss model. The model and its parameters, which are based on research by Phillips et al. (2014) are set out in Section 3.5.3 of ARR 2019, where it is favoured over the ILSAX (Horton) and rational method models. It is based on the concept of an effective impervious area (EIA). The research indicates that runoff from urban areas is less than the runoff calculated by urban hydrological models using the total impervious area (TIA) or directly connected impervious area (DCIA). According to Table 5.3.2 of ARR 2019, the EIA is approximately 60% of the TIA and 70% of the DCIA. The recommended model identifies the three parts of a catchment described below:

Part of Sub-Catchment	Loss Parameters
Effective impervious Area (EIA) made up of part of the directly connected impervious area (DCIA) + possibly some of the indirectly connected impervious area (ICIA)	1-2 mm initial loss (IL), zero constant continuing loss (CL) (Section 3.5.3.2.1 of ARR 2016)
Indirectly Connected Areas, made up of indirectly connected impervious and pervious areas that interact with impervious areas)	IL is 60% to 80% of the rural IL for the location (Section 3.5.3.2.1) with some qualifications, CL is 1 - 4 mm/h, with typical values of 2.5 mm/h for South Eastern Australia. For some state or territory capitals, losses could be determined from Figures 5.3.21 and 5.3.22. (The ARR Data Hub cautions against using rural loss estimates in urban areas, but this conflicts with Section 3.5.3.2.1.)
Urban Pervious Areas (large, self-contained areas such as parks or bushland)	IL and Cl are the same as for a rural area at the same location (Section 3.5.3.2.3).

The last part is rarely encountered, so that most urban sub-catchments can be considered to consist of an EIA and a remaining area.

Working in conjunction with the IL-CL loss model, Table 9.6.5 of Chapter 6 Book 9 states that 60-minute duration pre-burst rainfall loss values should be adopted for all smaller durations less than 60-minutes. As of May 2019, if obtaining data for NSW, where good local initial loss data is not available and values are obtained from the ARR Data Hub, Probability Neutral Burst Initial Loss values must be used instead of Median pre-burst depths. Furthermore, continuing loss values must be multiplied by a factor of 0.4. In lieu of local site loss data, these loss values have been adopted from the ARR Data Hub for the subject site analysis.

7.2 Development Site Catchment Analysis

To establish the impact on the existing runoff patterns from the proposed development, a hydrological analysis of the site was undertaken. A computer model was developed for this purpose using the DRAINS Rainfall Runoff Routing computer model and a combination of parameters based on information collected from the ARR Data Hub, the Bureau of Meteorology (BOM) website, the NSW Government Spatial Services SIX Maps, Council's requirements and a review of the presented detail survey information.

For the purpose of analysing the development site catchment in the pre-development scenario, the site was modelled as a being 0% impervious (as required in Section 6.7.7.4.4 of DCP 2013). For the post-development case, the development site was modelled as being 80% impervious. Time of concentration for the pre-development scenario was calculated using the kinematic wave equation, whilst for the post-developed case a standard time of 5-minutes was adopted for each impervious sub-catchment and 10-minutes for pervious catchments.

For the subject site, loss information was obtained from the ARR Data Hub, which specifies a rural initial loss of 49mm and a continuing loss of 2.9mm. In the pre-developed case, the site was assumed to be 100% pervious and therefore the total site was adopted as being an Indirectly Connected Area with 100% of the rural IL being adopted for the site and 40% of the continuing loss (0.4 factor as required in NSW). In the post-developed case the Effective Impervious Area (EIA) was assumed to be 80% of the total site.

Storm durations ranging between 5 minutes and 180 minutes were investigated for each of the design storm events that were analysed. A comparison between the pre-development and post-development flows from the development site for each of the design storm events, up to and including the 1% AEP storm event is presented in **Table One.** A copy of the input data and results files for the pre-development DRAINS analysis has been included within **Attachment A**.

Table One – Comparison of Predevelopment and Post-Developed Peak Flows (No OSD)

AEP (%)	Predevelopment Flows	Post Development Flows (No OSD)
100 (1EY)	2 L/s	13 L/s
50 (0.5EY)	5 L/s	16 L/s
20 (0.2 EY)	16 L/s	21 L/s
10	21 L/s	25 L/s
5	27 L/s	30 L/s
2	37 L/s	38 L/s
1	42 L/s	45 L/s

7.3 On-Site Detention Assessment

In order to meet Council's requirement of maintaining flows to within existing limits for all design storm events up to and including the 1% AEP event, it will be necessary to provide on-site detention facilities as part of the development. It is proposed to provide the required storage volume in the form of an underground modular tank system within the landscaped area adjacent to the eastern boundary.

For the purpose of analysing the subject site catchment in the post-developed scenario, the DRAINS detention basin function was used with a single underground facility with an assumed surface area of 25m^2 and an available OSD storage depth of 0.88m (Atlantis cell Double Flo Tank). A 57mm diameter orifice outlet at the invert of the OSD facility was adopted with a 150mm diameter high-level pipeline to

be provided approximately 580mm up from the tank base. The modelling assumed the total development site would pass through the facility.

A comparison between the pre-developed and post-developed flows from the site with the implementation of OSD for each of the design storm events up to and including the 1% AEP event is presented below in **Table Two**. A full copy of the DRAINS schematic, input data and results files for the subject site in the post-developed scenario with OSD, has been provided in **Attachment B**.

Table Two – Comparison of Predevelopment and Post-Developed Peak Flows with OSD

AEP (%)	Predevelopment Flows	Post Development Flows (With OSD)
100 (1EY)	2 L/s	4 L/s
50 (0.5EY)	5 L/s	4 L/s
20 (0.2 EY)	16 L/s	15 L/s
10	21 L/s	19 L/s
5	27 L/s	23 L/s
2	37 L/s	28 L/s
1	42 L/s	33 L/s

As indicated in the above table, the provision of an OSD facility for the site would reduce the post-developed flowrates to below pre-developed levels for all storm events from the 0.5EY up to and including the 1% AEP event. The more frequent 1EY was estimated to be slightly higher than under natural conditions, however the increase is considered to be negligible. It should also be noted that the modelling assumes that any proposed rainwater reuse tank(s) would be full at the commencement of each storm event. It is likely, however that based on the volume of rainwater storage proposed and the anticipated internal and external rainwater reuse there would be additional rainwater storage volume available, which would reduce the post-developed flowrates even further, especially for more frequent, lower intensity storm events.

Based on the DRAINS modelling undertaken we have estimated that the development would require a total storage OSD volume of approximately 11m^3. The accompanying water cycle management plan includes a summary of the adopted OSD parameters for the facility. Section 6.7.7.4.4 of Council's DCP permits up to 50% of the volume of the rainwater retention tanks to be claimed as part of the OSD volume, however this has not been claimed as part of the current assessment.

8.0 Maintenance and Monitoring

8.1 Introduction

If a water quality facility is to function well, it must be managed effectively. The procedures identified in this section aim to:

- Ensure that the proposed water quality measures operate as designed and that the objectives are met;
- Extend the active lifespan of the provided facilities, delaying the need for a major refit or decommissioning;
- Allow owners to make informed decisions and ensure any future owners can effectively manage the facilities; and
- Save money by providing mechanisms through which problems such as blockages can be detected in the early stages.

The management of a water quality facility such as a rainwater tank or soakaway area generally consists of three tasks :

1. Monitoring;
2. Inspection of screens, pipes, pits, embankments etc.; and
3. Maintenance – Repairing damage to pits / structures and replacement of filtration media.

8.2 Rainwater Reuse Tanks

The following information has been extracted from the 'Rainwater Tank Design and Installation Handbook, First Edition, January 2006 (HB230 – 2006)' and supplied by NSW EnHealth. It outlines the potential health hazards, causes, preventative measures, monitoring and corrective action with respect to rainwater tanks.

Health Hazard	Cause	Preventative Measure	Monitoring	Corrective Action
Faecal contamination from birds and small animals	Overhanging branches on roof	Prune tree branches	Check tree growth every six months	Prune branches
	Animal access to tank	Protect all inlets, overflows and other openings to prevent entry by small animals and birds	Check access covers are closed. Check inlets, overflows and other openings every six months	Repair gaps. Secure access cover. If animal access is suspected disinfect tank using chlorine
		Maintain integrity of tank roof and body to prevent access points	Check structural integrity of the tank	If a dead animal is found, empty and clean tank. If this has to be delayed, remove remains and disinfect with chlorine

Mosquitoes	Access to stored water	Protect all inlets, overflows and other openings with mosquito proof mesh	Inspect water for presence of mosquito larvae at least every six months	Repair screening of inlets and openings to prevent access and if larvae present, to prevent escape of mosquitoes. Treat tanks with a small amount of kerosene or medicinal paraffin
Lead contamination	Lead based paints and primers on roofs	Do not collect rainwater from roofs painted with products containing high lead concentrations. When painting roof, check suitability with paint retailer		
	Lead flashing on roofs	Paint existing material or use pre-coated products	Inspect roof and gutters every six months	Paint if large amounts of uncoated flashing present
	Increased corrosion of metals due to low pH from long periods of contact between rainwater and leaves	Keep gutters clean. Install leaf protection devices on gutters	Inspect gutters every six months	Clean gutters. If large amounts of leaves are detected on regular inspections clean more often
Sulfide / rotten egg / sewage odours	Anaerobic growth in accumulated sediment at the bottom of tanks	Regularly clean tank to remove accumulated sediment	Inspect tank every 2-3 years	Clean tank if required. If cleaning not practical (i.e. in the middle of summer) disinfect tank with chlorine and flush chlorinated water through all pipe work
	Slimes and stagnant water in pipe work	Avoid U-bends or underground pipe work that can hold stagnant water, install drainage points on pipe work		
Musty or vegetable type taste and odours (no light penetration)	Accumulated on roofs and gutters. Possibly including pollen	Remove overhanging branches from trees. Keep gutters clean. Install leaf protection devices on gutters	Inspect gutters at least every six months	Clean gutters. If large amounts of leaves or pollen are detected on regular inspections clean more often
Musty, vegetable or fish type taste and odours (light penetration)	Algal growth due to light penetration into tank or pie work	Make sure tank is completely roofed and is impervious to light	Inspect water every six months	Repair roof
		Ensure pipe work including inlets to tank are impervious to light (white pipes can allow light penetration)		Paint pipe work with dark colour
Coloured water	Accumulated damp leaves in gutter	Keep gutters clean. Install leaf protection devices on gutters	Inspect gutters at least every six months	Clean gutters. If large amounts of leaves are detected on regular inspections clean more often
Coloured water, particularly after rain (tiled roof)	Coloured coating from tiles washed into tanks. Re-suspension from sediments when fresh intake	Use colour-through tiles	Inspect water after rainfall	Remove sediment by cleaning the tank
Insects / water boatmen etc.	Access to stored water	Protect all inlets, overflows and other	Inspect water for presence of insects	Repair screenings of inlets and openings to

		openings with insect proof mesh	and or larvae every six months	prevent further access
				Use simple coarse filter to remove remaining insects
Small white flakes in water	Microbial growth	Keep gutters clean. Growth encouraged by nutrients contained in plant and soil material accumulated in gutters or at the bottom of tanks. Install leaf protection devices on gutters	Inspect gutters at least every six months. Inspect tank every 2-3 years	Clean gutters and tank if necessary. Disinfect tank using chlorine
Slime on the inside of tank	Microbial growth	All containers that continuously hold water will develop bio-films on surfaces below the water level	None required	None required. These are naturally occurring and not harmful to the general population

8.3 Gross Pollutant Traps & Soak-away Areas

The following table summarises the elements that comprise the water quality treatment train, their function and the typical management / maintenance activities that will need to be undertaken to ensure the successful ongoing operation of the facility.

Component	***Function / Management Activity***
Gross Pollutant Trap (Silt Arrestor Pits / OSD Discharge Control Pit)	Litter, sediment & nutrient removal: maintain integrity of GPT by inspection and remove/cleaning out of litter, sediment and debris and ensure disposal in accordance with the Waste Minimisation and Management Act, 2008. Maintenance of the GPT will require removal of sediment and litter accumulated in the sump. Gross pollutants collected in the trash screen are accessed via the surface inlet pit access grate and are removed by hand. Persons entering pits are to have confined spaces accreditation. Inspect every week during construction period and after high flow events and clean out if required. Inspect every month for first six months after construction is completed and after high flow events and clean out if required. If sump of pit is full and observations indicate that the GPT is over loaded the inspection and clean out frequency should be more frequent. After six months reassess inspection and clean out rate based on past experience. Anticipated rate every two months.
Vegetated Swale above Bioretention Trench	Sediment removal: Provision of vegetated swale will enable runoff from rainwater tanks and other hardstand areas to pond and infiltrate into the bioretention trench below. Conveyance through vegetation will facilitate deposition of sediments from overland flows prior to entry to filtration trench. Maintenance includes weed and sediment removal, mowing grass, pruning of plants (assuming native grasses), and replacement of failed turf/plants. It is anticipated that maintenance would be by hand to undertake pruning and weeding tasks prior to disposal off-site using a tipper truck with an approved tarpaulin. Inspect every week during construction period until plants have become established and after high flow events and clean or rectify problems if encountered. Inspect every fortnight for first six months after construction is completed and after high flow events and clean or rectify problems if encountered. After six months reassess inspection and maintenance rate based on past experience. Anticipated rate every four weeks in Summer and every six weeks in Winter.
Bioretention Trench	Nutrient removal: maintain integrity of trench by inspection and replacement of filtration media and ensure disposal in accordance with the Waste Minimisation and Management Act, 2008.

	Maintenance tasks include visual inspection of swale above trench and OSD discharge control pit adjacent to the trench. If continuous water ponding is observed in either the swale or pit then a test hole should be dug to inspect the granular filtration media, which may require replacement. If this occurs, the frequency of inspections and clean out should be increased, including the OSD silt arrestor pit. If this occurs frequency of upslope silt arrestor pit inspections and clean out should be more frequent. Persons entering pits are to have confined spaces accreditation. Inspect every week during construction period and after high flow events and clean or rectify problems if encountered. Inspect every month for first six months after construction is completed and after high flow events and clean or rectify problems if encountered. After six months reassess inspection and clean/rectification rate based on past experience. Anticipated rate every three months. Retrofit time is typically 10-15years depending on maintenance frequency. The importance of adequate sediment and erosion control measures during construction and maintenance of GPT's during operational phase to ensure trench does not become blocked cannot be over-emphasised.

8.4 Monitoring

Monitoring is an essential part of the successful operation of any nutrient control facility. It is vital that ongoing monitoring is undertaken in order to determine whether the facility is meeting its objectives and can also be useful to:

- Help identify problems, for example, weed infestations and blockages;
- Provide data for improving treatment performance; and
- Document the accumulation of toxic substances.

Monitoring can be undertaken for maintenance, operational control, research activities and for compliance with regulatory requirements. The information collected will need to be interpreted and applied to upgrade operation and maintenance of the nutrient facility.

Inspections are required to check that all components within the facility are functioning properly. The inspection checklist will direct what maintenance is required and should be conducted at regular intervals as detailed previously. Inspections are also necessary following storm events or any other event that may damage the function of the facility, e.g. floods, fire and chemical spills.

Inspection checklists are lists of management activities that need to be undertaken for each nutrient facility component. The checklist can also be used to record work undertaken; its effectiveness and any actions that require follow up. Checklists provide a permanent record of maintenance activities performed and should be signed by persons undertaking the inspection and maintenance. These checklists can form part of quality assurance procedures to verify that maintenance is being performed in accordance with the owners' requirements.

9.0 Summary and Recommendations

This report has been prepared on behalf of Mr Brad Lawrence as part of the Development Application submission for the proposed residential subdivision development over Lot 33 in DP 20817, 8 Ghersi Avenue, Wamberal. The proposed water management measures identified in this report are complimentary to the Water Cycle Management Plan No. 22017, which has been included within **Attachment C**.

Calculations undertaken have determined that the introduction of the following measures will ensure that the development generally meets Council's requirements.

- Provision of a minimum 10,000Ltr rainwater harvesting tank(s), permanently plumbed to all toilets and for use with irrigation and other external uses. It is anticipated that the tank will be an aboveground style located within the western setback zone, however it could also be provided as underground tanks. This will be provided at the time of construction of a new dwelling on the proposed lot;
- The piping of runoff from the total roof area of the new dwelling to the rainwater tank(s);
- Provision of an underground modular tank style on-site detention facility adjacent to the south-eastern corner of the site (modelled as 0.88m deep Atlantis Double Flo Tank modules with a surface area of 15m^2 and volume of 10.9m^3 from the outlet level to the top of the modules);
- Provision of a discharge control pit with pipe connections to the OSD facility containing a sediment trap, and trash screen and multi-stage orifice outlet for quantity control;
- Provision of a 300mm deep bioretention trench above the OSD facility with a surface area of approximately 20m^2 and a ponding depth of 180mm and the routing of all 'non-roof' impervious areas to the area (maximum of 60m^2 impervious area permitted to bypass measures even though modelling assumes no impervious area bypass flows);
- Provision of an overflow pipeline to convey overflows from the rainwater tank to the OSD facility;
- Provision of surface inlet pits within the driveway and other areas with pipes draining to the OSD / bioretention facility;
- Routing of all downpipes and other impervious area runoff from existing lot into interallotment drainage system via new easement for drainage over the proposed lot;
- Provision of outlet pipeline from OSD facility into the proposed interallotment drainage (IAD) pipeline that traverses HN38 Lucinda Avenue. It is proposed to construct the IAD pipeline using directional boring methods, however this will be confirmed at detail design stage.

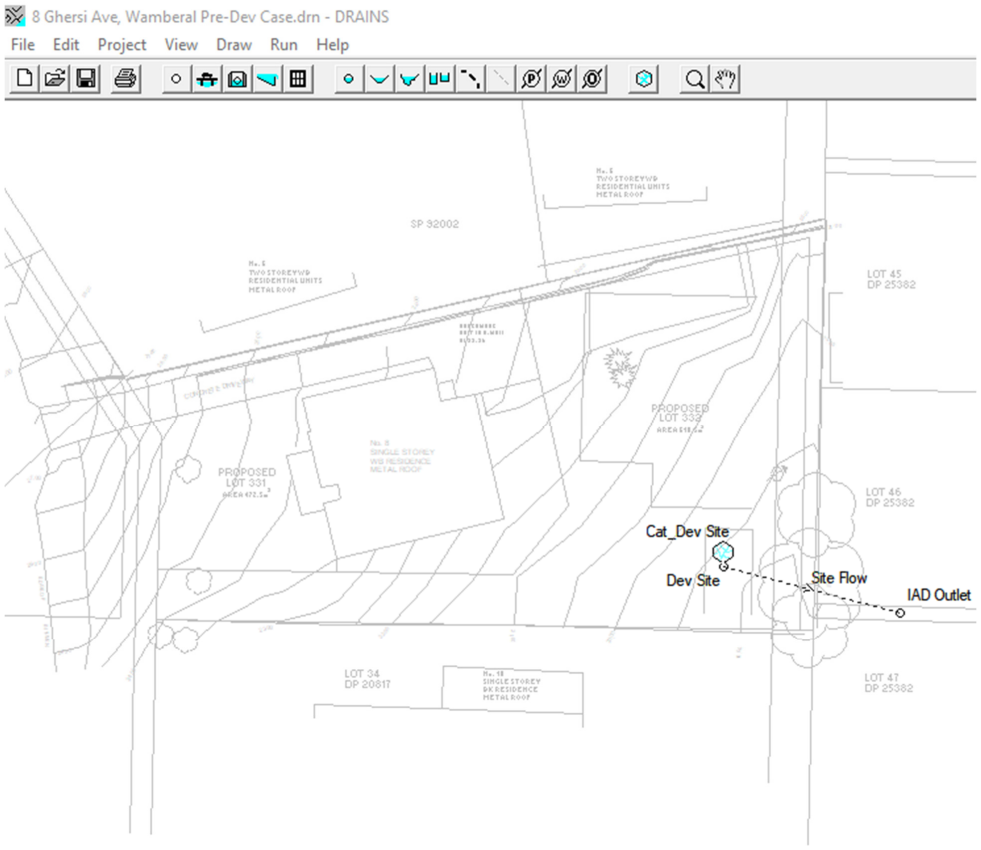
We recommend that the design philosophy detailed in this report and in the accompanying plans be accepted as an appropriate approach to addressing the stormwater management issues relevant to the proposed development.

Yours sincerely,
SRB Consulting Pty Ltd

Stuart Blyton (MIEAust, CPEng, NER, APEC Engineer IntPE (Aust))

APPENDIX A

DRAINS Pre-Development Schematic, Input Data & Results



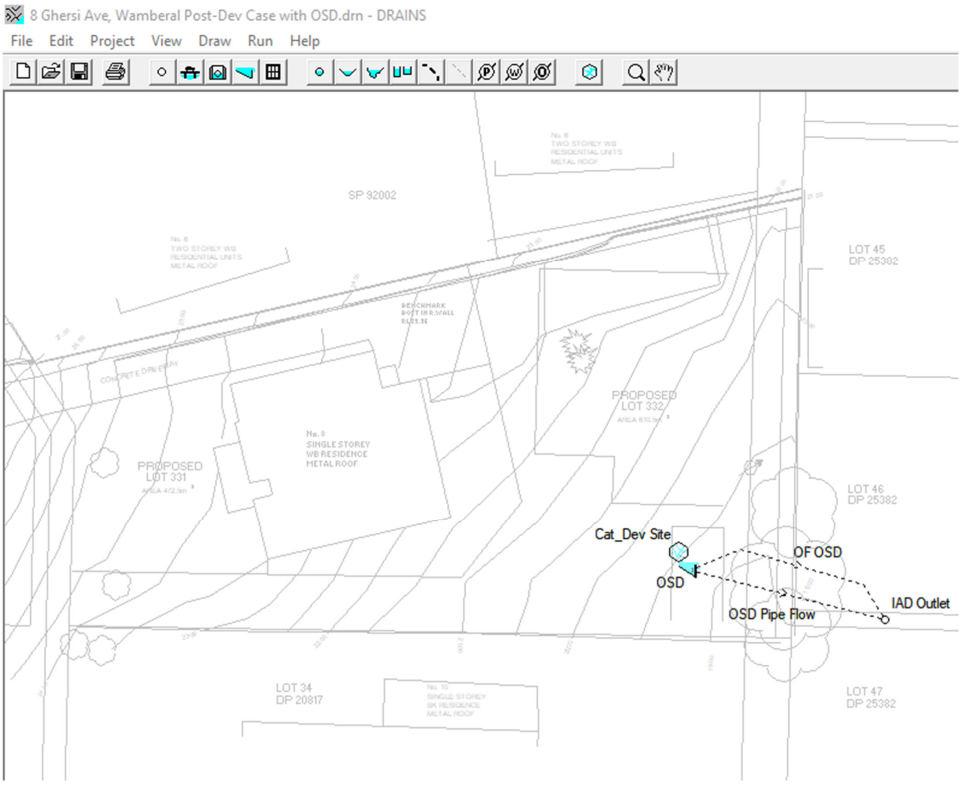
5 GHERSI AVENUE, WAMBERAL - DRAINS INPUT DATA : PRE-DEVELOPED CASE									
PIT / NODE DETAILS			Version 15						
Name	Type		Surface						
			Elev (m)						
IAD Outlet	Node		18						
Dev Site	Node		19.5						
SUB-CATCHMENT DETAILS									
Name	Pit or	Total	EIA	Perv	RIA	Perv	Perv	Perv	Perv
	Node	Area		Area		Time	Length	Slope	Rough
		(ha)	%	%	%	(min)	(m)	%	
Cat_Dev Site	Dev Site	0.0611	0	100	0	0	46	14.8	0.15

5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 1EY RESULTS								
DRAINS results prepared from Version 2020.05								
SUB-CATCHMENT DETAILS								
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm	
	Flow Q	Max Q	Max Q	Tc	Tc	Tc		
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat_Dev Site	0.002	0	0.002	0	0	13.78	1EY AEP, 3 hour burst, Storm 9	
5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 0.5EY RESULTS								
DRAINS results prepared from Version 2020.05								
SUB-CATCHMENT DETAILS								
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm	
	Flow Q	Max Q	Max Q	Tc	Tc	Tc		
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat_Dev Site	0.005	0	0.005	0	0	9.49	0.5EY AEP, 1 hour burst, Storm 5	
5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 0.2EY (20% AEP) RESULTS								
DRAINS results prepared from Version 2020.05								
SUB-CATCHMENT DETAILS								
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm	
	Flow Q	Max Q	Max Q	Tc	Tc	Tc		
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat_Dev Site	0.016	0	0.016	0	0	6.56	0.2EY AEP, 20 min burst, Storm 6	
5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 10% AEP RESULTS								
DRAINS results prepared from Version 2020.05								
SUB-CATCHMENT DETAILS								
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm	
	Flow Q	Max Q	Max Q	Tc	Tc	Tc		
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat_Dev Site	0.021	0	0.021	0	0	6.1	10% AEP, 20 min burst, Storm 3	
5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 5% AEP RESULTS								
DRAINS results prepared from Version 2020.05								
SUB-CATCHMENT DETAILS								
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm	
	Flow Q	Max Q	Max Q	Tc	Tc	Tc		
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat_Dev Site	0.027	0	0.027	0	0	5.36	5% AEP, 15 min burst, Storm 4	

5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 2% AEP RESULTS									
DRAINS results prepared from Version 2020.05									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.037	0	0.037	0	0	4.58	2% AEP, 10 min burst, Storm 7		
5 GHERSI AVENUE, WAMBERAL - DRAINS PRE-DEVELOPED CASE 1% AEP RESULTS									
DRAINS results prepared from Version 2020.05									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.042	0	0.042	0	0	4.32	1% AEP, 10 min burst, Storm 7		

APPENDIX B

DRAINS Post-Development Schematic, Input Data & Results


8 Ghersi Ave, Wamberal Post-Dev Case with OSD.drn - DRAINS
File Edit Project View Draw Run Help
SP 92002
LOT 45
DP 25382
PROPOSED
LOT 332
PROPOSED
LOT 331
LOT 46
DP 25382
Cat_Dev Site
OF OSD
OSD
IAD Outlet
OSD Pipe Flow
LOT 34
DP 20817
LOT 47
DP 25382

5 GHERSI AVENUE, WAMBERAL - DRAINS INPUT DATA : POST-DEVELOPED CASE							
PIT / NODE DETAILS			Version 15				
Name	Type		Surface				
			Elev (m)				
IAD Outlet	Node		18				
DETENTION BASIN DETAILS							
Name	Elev	Surf. Area	Outlet Type				
OSD	18.275	14.7		None			
	19.2	14.7					
	19.5	14.7					
SUB-CATCHMENT DETAILS							
Name	Pit or	Total	EIA	Perv	RIA	EIA	Perv
	Node	Area		Area		Time	Time
		(ha)	%	%	%	(min)	(min)
Cat_Dev Site	OSD	0.0611	80	20	0	5	10
OVERFLOW ROUTE DETAILS							
Name	From	To	Travel	Spill	Crest	Weir	
			Time	Level	Length	Coeff. C	
			(min)	(m)	(m)		
OF OSD	OSD	IAD Outlet	0.1	19.2	1.2	1.65	
OSD Pipe Flow	OSD	IAD Outlet	0.3	18.275			

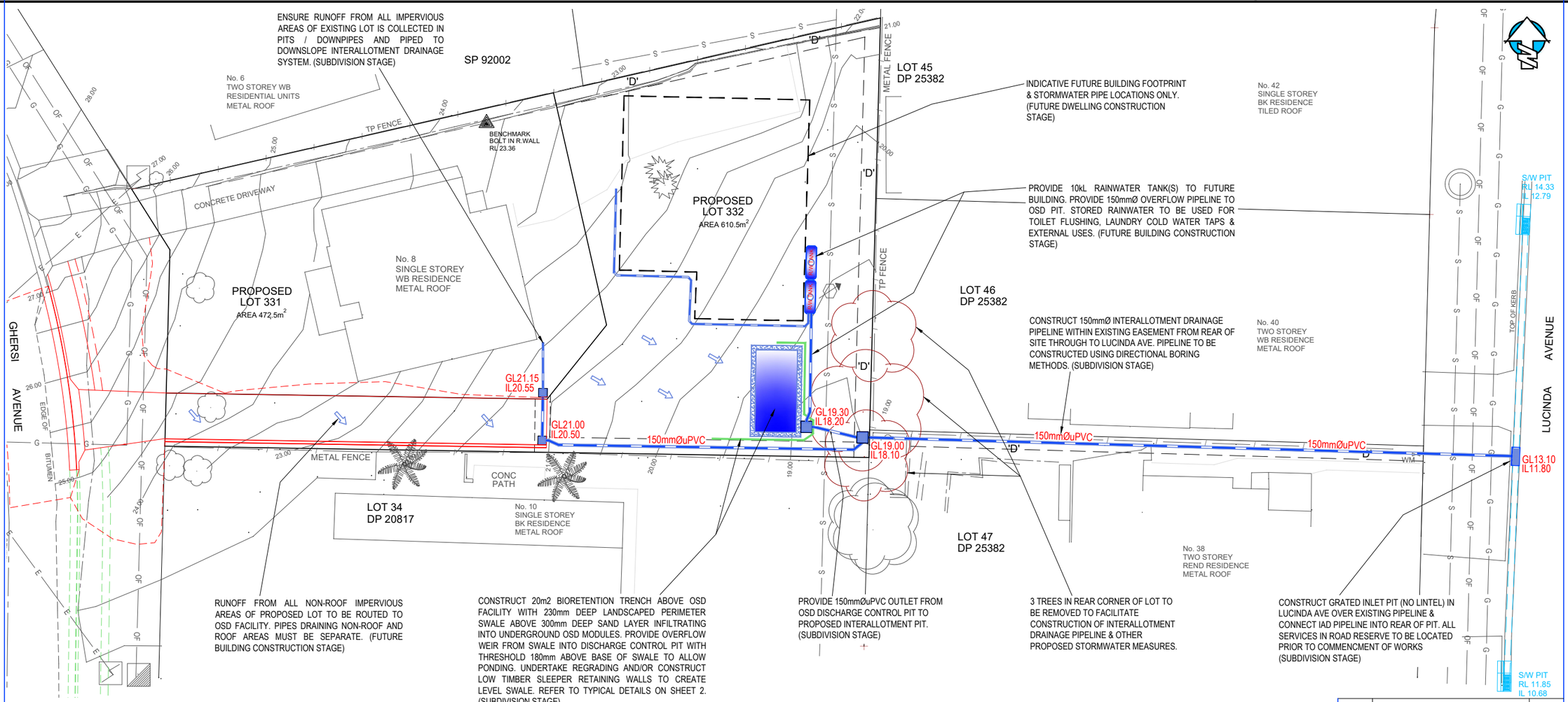
5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 1EY RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.013	0.013	0	5	0	10	1EY AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.004		1EY AEP, 45 min burst, Storm 10						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.63	5.3	0.004	0	0.004				
5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 0.5EY RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.016	0.016	0	5	0	10	0.5EY AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.004		0.5EY AEP, 45 min burst, Storm 8						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.77	7.3	0.004	0	0.004				
5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 0.2EY (20% AEP) RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.021	0.021	0	5	0	10	0.2EY AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.015		0.2EY AEP, 45 min burst, Storm 3						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.83	8.2	0.015	0	0.015				

5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 10% AEP RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.025	0.025	0	5	0	10	10% AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.019		10% AEP, 20 min burst, Storm 3						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.86	8.6	0.019	0	0.019				
5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 5% AEP RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.03	0.03	0	5	0	10	5% AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.023		5% AEP, 20 min burst, Storm 2						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.88	8.9	0.023	0	0.023				
5 GHERSI AVENUE, WAMBERAL - DRAINS POST-DEVELOPED CASE 2% AEP RESULTS									
SUB-CATCHMENT DETAILS									
Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.038	0.037	0.001	5	0	10	2% AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.028		2% AEP, 25 min burst, Storm 3						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	18.94	9.7	0.028	0	0.028				

Name	Max	EIA	Remaining	EIA	RIA	PA	Due to Storm		
	Flow Q	Max Q	Max Q	Tc	Tc	Tc			
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)		
Cat_Dev Site	0.045	0.043	0.002	5	0	10	1% AEP, 5 min burst, Storm 1		
OVERFLOW ROUTE DETAILS									
Name	Max Q U/S		Due to Storm						
OF OSD	0								
OSD Pipe Flow	0.033		1% AEP, 25 min burst, Storm 3						
DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD	19.0	10.7	0.033	0	0.033				

APPENDIX C

Water Cycle Management Plan No.22017



STORMWATER DRAINAGE NOTES

SW1. SUITABLE SUBSOIL DRAINAGE SYSTEMS WILL BE PROVIDED BEHIND ALL RETAINING WALLS AND BUILDING FOOTINGS AND SEEPAGE COLLECTED WILL BE DISCHARGED INTO THE NEAREST DOWNSTREAM STORMWATER PIPED SYSTEM.

SW2. SUBSOIL DRAINAGE PIPELINE IS A 100mm DIAMETER AGRICULTURE PIPE WITH A FABRIC STOCKING THAT WHEN LAID HAS 100mm OF 10mm AGGREGATE SURROUNDING IT FULLY WITH THE TRENCH.

SW3. NEW BUILDING DOWNPIPES ARE TO BE LOCATED BY ROOF PLUMBER AND ARCHITECT. ALL DOWNPIPES ARE TO BE COLLECTED IN PVC PIPELINES AND CONNECTED TO THE R/W TANK OR OSD.

SW4. ALL NON-ROOF IMPERVIOUS/PAVED AREAS ARE TO BE DRAINED IN PVC PIPELINES & CONVEYED TO THE RETENTION / DETENTION AREA.

SW5. ALL STORMWATER PIPELINES ARE TO BE LAID ON SAND EVENLY GRADED TO THE INVERT LEVEL AND ALL FITTINGS TO BE IN ACCORDANCE WITH AS1260. MIN PIPELINE GRADIENT IS TO BE 1:100.

SW6. WHERE ANY ISOLATED PROPOSED PIPELINE IS LOCATED WITHIN 2 METERS OF A TREE THAT IS TO BE RETAINED, THE PIPELINE WILL BE DUG BY HAND TO REDUCE THE IMPACT OF EXCAVATION ADJACENT TO THE TREE.

SW7. SURFACE INLET GRATES ARE TO BE H.D (CLASS D) GALVANISED STEEL FABRICATION AT THE SPECIFIED DIMENSIONS U.N.O.

SW8. FINAL SURFACE LEVELS ARE TO BE CONSTRUCTED TO ENSURE THAT STORMWATER RUNOFF WILL NOT POND, IMPACT ON DOWNSTREAM PROPERTIES OR DRAIN TOWARDS BUILDINGS.

SW9. SURVEY INFORMATION HAS BEEN EXTRACTED FROM BASE INFORMATION PREPARED BY CAHILL & CAMERON SURVEYORS.

STORMWATER MEASURES, INCUDING RAINWATER / OSD TANKS & BIORETENTION AREAS ARE INDICATIVE ONLY. FINAL LOCATION TO BE DETERMINED ON-SITE AT TIME OF CONSTRUCTION TO BEST SUIT SITE LEVELS.

REFER TO ACCOMPANYING WATER CYCLE MANAGEMENT REPORT FOR ADDITIONAL INFORMATION REGARDING STORMWATER STRATEGY FOR SITE & ADHERANCE TO COUNCIL'S DCP 2013

RAINWATER TANK NOTES

RWT 1. ALL WORK IS TO CONFORM TO AS 3500-2003.

RWT 2. HIGH LEVEL OVERFLOW PIPE IS TO BE PROVIDED & PIPED TO OSD TANK.

RWT 3. PROVIDE FIRST-FLUSH DIVERTER EITHER AT EACH DOWNPIPE OR WITHIN A FILTRATION PIT IMMEDIATELY UPSTREAM OF ALL TANK INLETS.

RWT 4. MOSQUITO SCREENING TO BE PLACED OVER ALL DOWNPIPES & ANY OTHER INLETS TO THE RAINWATER TANK.

RWT 5. LEAF GUARDS TO BE PROVIDED TO ALL DOWNPIPES.

RWT 6. TANK WATER IS TO BE USED FOR IRRIGATION OF LANDSCAPED AREAS AS WELL AS BEING PLUMBED TO ALL NEW INTERNAL TOILETS.

RWT 7. PROVIDE EXTERNAL TAP(S) PLUMBED TO TANK WHICH IS TO BE CLEARLY LABELLED "NOT TO BE USED FOR DRINKING PURPOSES."

RWT 8. PROVIDE DANGER SIGN AT ENTRANCE TO RAINWATER TANK LABELLED "DANGER. CONFINED SPACE. NO ENTRY WITHOUT CONFINED SPACE TRAINING."

LEGEND

- 450x450 / 600x600 GRATED INLET PIT
- PROPOSED 100-150Ø STORMWATER PIPELINE
- PROPOSED 5kL RAINWATER REUSE TANK (LOCATION / FOOTPRINT INDICATIVE ONLY)
- PROPOSED 11m3 ATLANTIS CELL OSD FACILITY WITH BIORETENTION TRENCH ABOVE (LOCATION / FOOTPRINT INDICATIVE ONLY)
- PROPOSED SLEEPER RETAINING WALL

www.1100.com.au DIAL 1100 BEFORE YOU DIG

"WARNING"
BEFORE ANY EXCAVATION IS UNDERTAKEN, "DIAL BEFORE YOU DIG" MUST BE CONTACTED FOR LOCATION OF UNDERGROUND SERVICES.

ISSUE	DESCRIPTION	DATE
A	ISSUED FOR DA APPROVAL	10.05.21

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a.b.n 16 132 873 431

CLIENT
BRAD LAWRENCE

PROJECT
PROPOSED RESIDENTIAL SUBDIVISION
LOT 33 IN DP 20817
8 GHERSI AVENUE, WAMBERAL

DRAWING TITLE
WATER CYCLE MANAGEMENT PLAN

SURVEYED	DATUM	SCALE
CAHILL CAMERON	A.H.D.	1 : 100 @ A1 1 : 200 @ A3
DRAWN	CHECKED	APPROVED
S.B	S.B	10.05.21

PROJECT No.	DRAWING No.	SHEET No.	ISSUE
22017	22017_DA07	7 OF 9	A

Retention Volume Calculations

The retention volume for the development has been sized using Council's 'deemed to comply' formula in Section 6.7.7.2 of DCP 2013:

$V = 0.01A(0.02F)^2$; where :

V= retention volume (m^3), A= development site area ($611m^2$), F=fraction impervious (%)

Using this formula on the development site equates to :

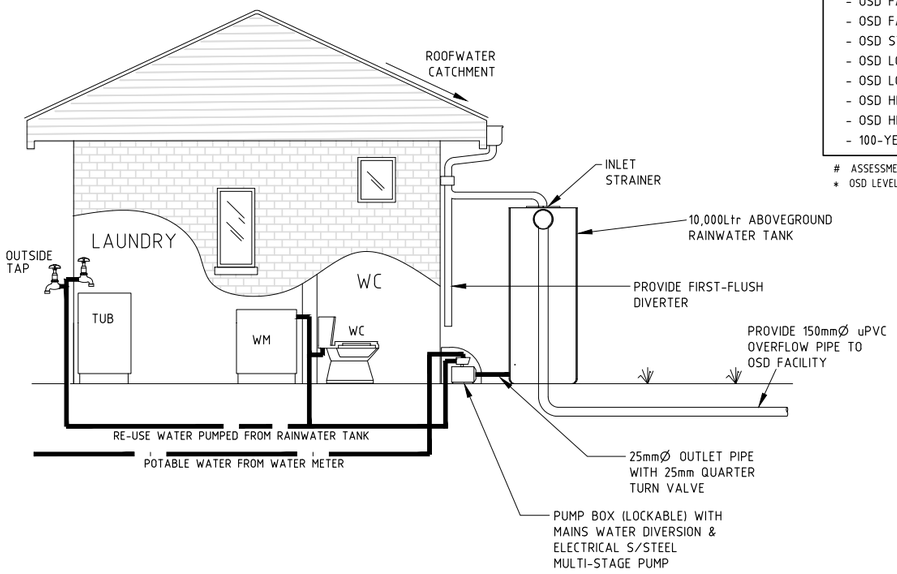
$V_{REQUIRED} = 0.01 \times 611 \times (0.02 \times 80)^2 = 15{,}642$Ltrs retention volume

Breakdown of Proposed Retention Volume

- Retention volume required = 15,642Ltrs
- Adopted Roof Area = $180m^2$
- Weekly rainwater reuse =$35L/m^2 \times 180m^2 \times 50\%$ (Table 3)
  = 3,150 Ltrs (Provide 10,000Ltr rainwater tank volume)
- Balance to be retained by soakaway area is
  = 15,642 - 10,000 = 5,642Ltrs
- Infiltration volume during 30minute storm = 200mm/hr (adopted infiltration rate) x 0.5hrs x 20m2 (adopted soakaway area) = 2,000Ltrs
- Balance to be stored and slowly released after storm =
  5,642 - 2,000 = 3,642Ltrs
- Ponding depth within infiltration trench = volume / area
  = 3,642 / 20 = 180mm (minimum soakaway area depth)

Site Discharge Index Calculations

- Development Site Area = $611m^2$
- Adopted roof area = $180m^2$
- Adopted Paved area = $309m^2$ (non-roof hardstand areas assuming 80% impervious site)
- Directly connected impervious area = $0m^2$ (assumed only)
- Remaining paved area to drain into retention facility = $309m^2$
- Section 6.7.7.3 requires $2m^2$of bioretention trench / $100m^2$ hardstand area
- Minimum area to be provided = $6.2m^2$ (proposed soakaway area = $20m^2$ to meet retention target)
- Site Discharge Index = 0 / 611 = 0.0 (less than 0.1 so meets Council's criteria)

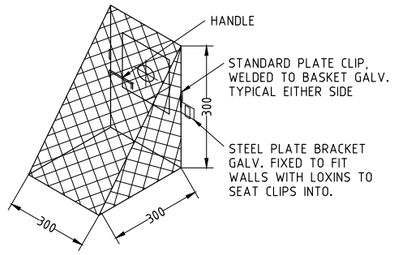


TYPICAL ABOVEGROUND RAINWATER TANK INSTALLATION
NTS

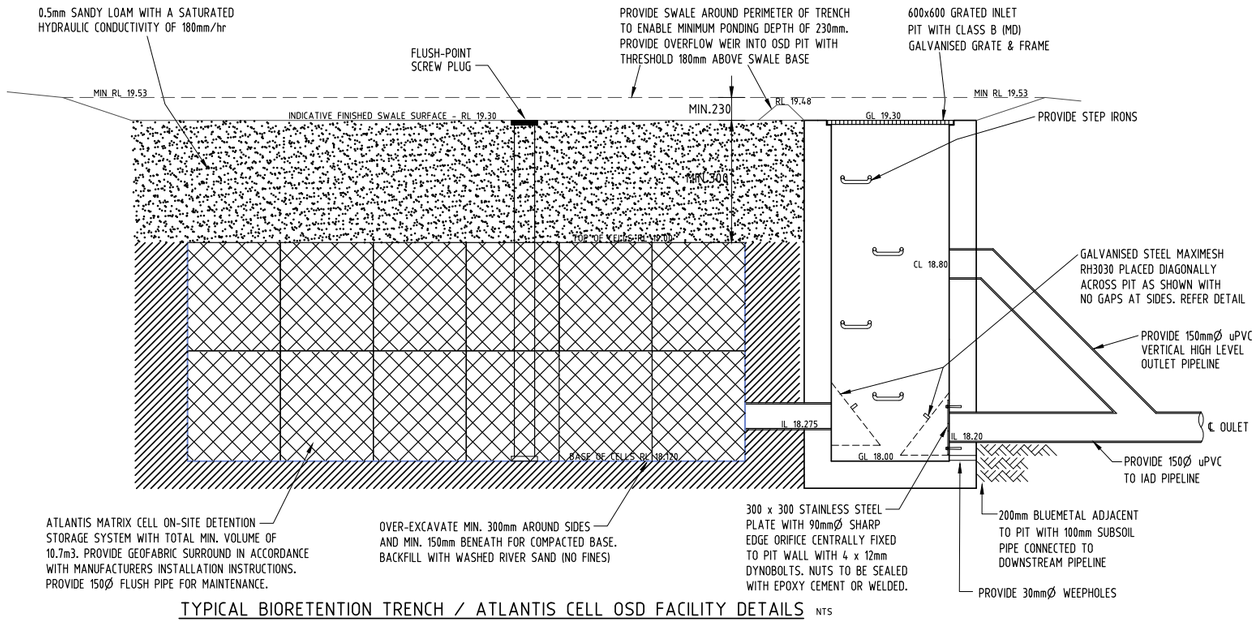
ON-SITE DETENTION SUMMARY

TOTAL DEVELOPMENT SITE AREA	611m²						
EXISTING IMPERVIOUS %	0% (ASSUMED)						
EXIST Q1, Q2, Q5, Q10, Q20, Q50 & Q100 PEAK FLOWS	2L/s	5L/s	16L/s	21L/s	27L/s	37L/s	42L/s
DEVEL Q1, Q2, Q5, Q10, Q20, Q50 & Q100 PEAK FLOWS (WITH OSD)	4L/s	4L/s	15L/s	19L/s	23L/s	28L/s	33L/s
OSD FACILITY DATA :	1-Yr	2-Yr	5-Yr	10-Yr	20-Yr	50-Yr	100-Yr
- OSD FACILITY IL	RL 18.12						
- OSD FACILITY DEPTH	0.88m (ATLANTIS DOUBLE FLO-TANK MODULE)						
- OSD FACILITY SURFACE AREA #	14.7m² (+ 0.3m WASHED RIVER SAND AROUND PERIMETER)						
- OSD STORAGE VOLUME USED *	5.3m³	7.3m³	8.2m³	8.6m³	8.9m³	9.7m³	10.7m³
- OSD LOW-LEVEL OUTLET CL	RL 18.275						
- OSD LOW-LEVEL OUTLET Ø	55mm Ø						
- OSD HIGH-LEVEL OUTLET CL	RL 18.800						
- OSD HIGH-LEVEL OUTLET Ø	150mm Ø						
- 100-YEAR ARI TWL	RL 19.00						

ASSESSMENT BASED ON DOUBLE FLO-TANK MODULES (14.7m2 x 0.88m DEEP) ON PROPOSED LOT 332.
* OSD LEVELS INDICATIVE ONLY & SUBJECT TO CONFIRMATION AT DETAIL DESIGN (CC) PHASE OF PROJECT.



MAXIMESH RH3030 SCREEN DETAIL
NTS



TYPICAL BIORETENTION TRENCH / ATLANTIS CELL OSD FACILITY DETAILS NTS

- OSD DETAIL ILLUSTRATIVE ONLY - REFER TO ATLANTIS INSTALLATION GUIDE FOR INSTALLATION INSTRUCTIONS
- DESIGN BASED ON DOUBLE FLO-TANK MODULES (14.7m2 x 0.88m DEEP).
- OSD / BIORETENTION LEVELS INDICATIVE ONLY & SUBJECT TO CONFIRMATION AT DETAIL DESIGN (CC) PHASE

STORMWATER MEASURES, INCUDING RAINWATER / OSD TANKS & BIORETENTION AREAS ARE INDICATIVE ONLY. FINAL LOCATION TO BE DETERMINED ON-SITE AT TIME OF CONSTRUCTION TO BEST SUIT SITE LEVELS.

ISSUE	DESCRIPTION	DATE
A	ISSUED FOR DA APPROVAL	10.05.21

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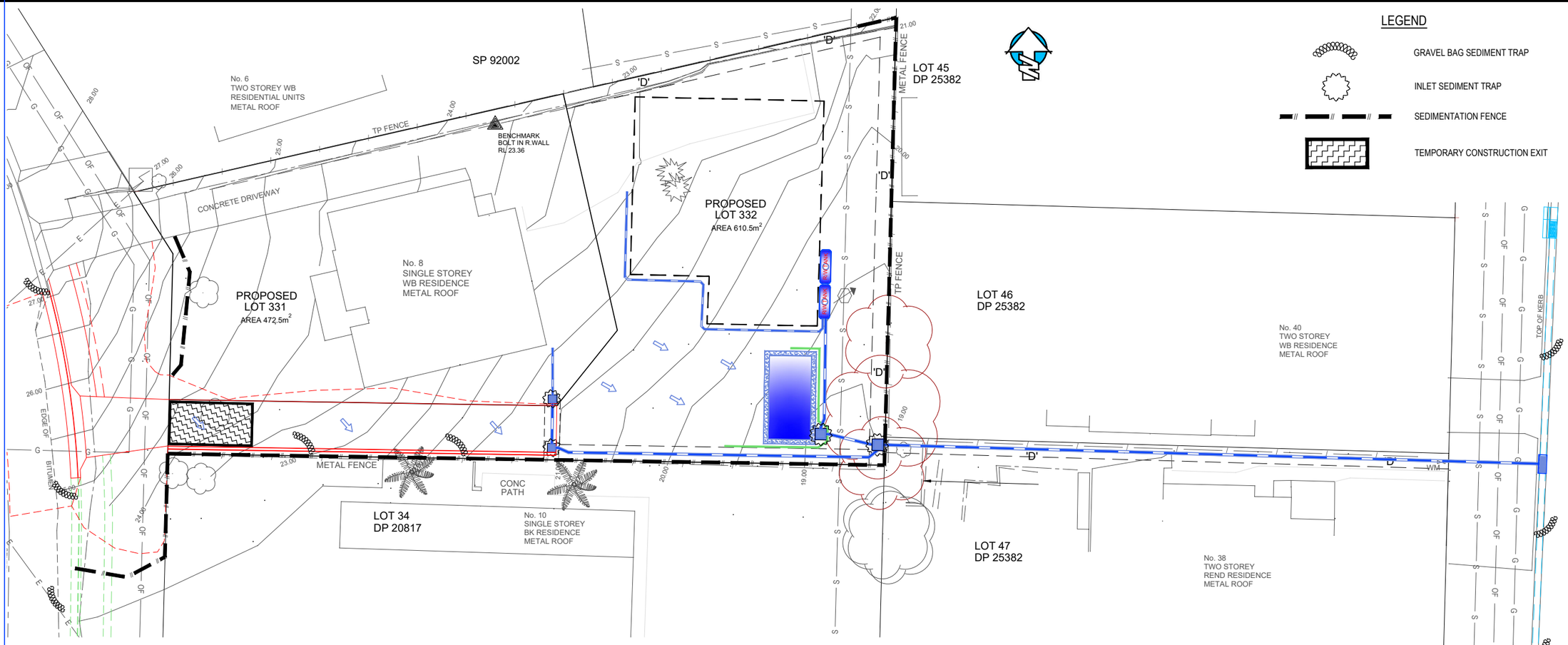
CLIENT
BRAD LAWRENCE

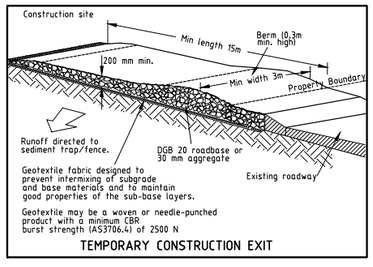
PROJECT
PROPOSED RESIDENTIAL SUBDIVISION
LOT 33 IN DP 20817
8 GHERSI AVENUE, WAMBERAL

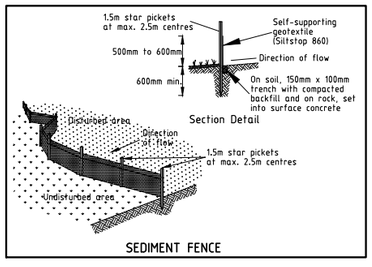
DRAWING TITLE
STORMWATER DETAILS PLAN

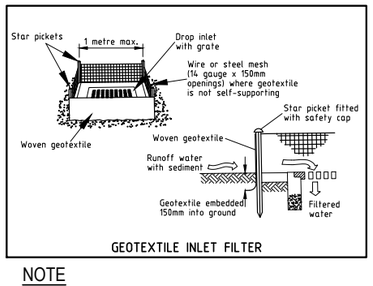
SURVEYED	DATUM	SCALE
CAHILL CAMERON	A.H.D.	1 : 100 @ A1 1 : 200 @ A3
DRAWN	CHECKED	APPROVED
S.B	S.B	10.05.21

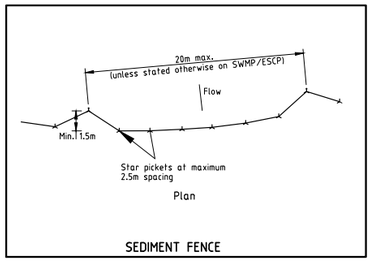
PROJECT No.	DRAWING No.	SHEET No.	ISSUE
22017	22017_DA08	8 OF 9	A











NOTE

THESE TYPICAL DETAILS ARE PROVIDED FOR THE ASSISTANCE OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR THEIR IMPLEMENTATION TO SUIT THE STAGING OF THE WORKS AND TO COMPLY WITH THE PROVISIONS OF THE SPECIFICATION AND DIRECTIVES OF THE EPA AND\OR SUPERINTENDANT.

EROSION AND SEDIMENT CONTROL.

ES 1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH:
MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, MARCH 2004.

ES 2. EROSION AND SEDIMENT DEVICES TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORK.

ES 3. MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH THE REQUIREMENTS IN THE NOMINATED DOCUMENTS TO THE SATISFACTION OF THE SUPERVISING ENGINEER.

ES 4. PREVENT SITE RUNOFF ENTERING ANY STORMWATER PITS THAT ARE NOT PROTECTED BY SATISFACTORY EROSION AND SEDIMENT CONTROL.

ES 5. MINIMISE THE AREA OF THE SITE BEING DISTURBED AT ANY ONE TIME. MAXIMUM LENGTH OF OPEN EXCAVATION SHOULD NOT EXCEED 40m.
1. PROVIDE SEDIMENT FENCES AT THE DOWNSTREAM END OF ALL DISTURBED AREAS.
2. SURROUND ALL CONSTRUCTION AREAS WITH SEDIMENT FENCES.
3. SURROUND ALL STOCKPILES WITH SEDIMENT FENCES.
4. TURF STRIPS SHALL BE PLACED ON THE DOWN SLOPE SIDE OF THE SEDIMENT FENCES WHERE THERE IS NO EXISTING VEGETATION COVER.

ES 6. ANY SOIL AND WATER CONTROL MEASURES AFFECTED DURING THE DAYS WORK ARE TO BE REINSTATED AT THE END OF EACH WORKING DAY.

ES 7. ALL AVAILABLE TOPSOIL FROM WITHIN THE AREA OF DISTURBANCE SHALL BE STOCKPILED FOR THE PURPOSE OF REVEGETATION.

ES 8. STOCKPILE OF SOIL MATERIALS SHALL NOT BE PLACED ON NATURE STRIPS, FOOTPATHS, ROADWAYS, KERBS, ACCESS CROSSING OR WITHIN WATERWAYS.

ES 9. SOIL AND WATER CONTROL MEASURES MAY BE MODIFIED TO BEST SUIT THE CONDITIONS APPLICABLE AT ANY ONE TIME. ANY MODIFICATION MUST BE IN ACCORDANCE WITH THE NOMINATED DOCUMENTS OR AS DIRECTED BY THE SUPERVISING ENGINEER. THE SOIL & WATER CONTROL MEASURES SHOWN ON THIS PLAN ARE INDICATIVE ONLY.

ES 10. CLEAN SURFACE WATER FROM UPSTREAM OF ANY WORKING AREA MUST BE CONTROLLED SO THAT IT DOES NOT ENTER THE DISTURBED AREA.

ES 11. THE UNDERBODY AND TYRES OF ANY VEHICLES LEAVING THE SITE MUST BE INSPECTED AND CLEANED AS NECESSARY.

ES 12. THE EROSION AND SEDIMENT CONTROL WORKS ARE TO BE PROVIDED OR MODIFIED IN THE SEQUENCE SPECIFIED IN THE NOMINATED DOCUMENTS.

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PROJECT
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LOT 33 IN DP 20817
8 GHERSI AVENUE, WAMBERAL

DRAWING TITLE
WATER CYCLE MANAGEMENT PLAN

SURVEYED	DATUM	SCALE
CAHILL CAMERON	A.H.D.	1 : 100 @ A1 1 : 200 @ A3
DRAWN	CHECKED	APPROVED
S.B	S.B	10.05.21

PROJECT No.	DRAWING No.	SHEET No.	ISSUE
22017	22017_DA09	9 OF 9	A

STATEMENT OF ENVIRONMENTAL EFFECTS

Proposed Two (2) Lot Residential Subdivision

Property:

Lot 33 DP 20817
No. 8 Ghersi Avenue, Wamberal

Applicant:

Tim Shelley Planning

Date:

December 2020

Prepared by:

tim shelley planning

phone: 0409 306186
email: tim@tsplanning.com.au
postal address: PO Box 3165 Erina NSW 2250

TABLE OF CONTENTS

APPENDICES

Plan of the Proposed Subdivision
Table Clause 4.6 Submission
Gosford DCP 2013 Chapter 3.5 Compliance Table
Water Cycle Management Plan

LIST OF FIGURES

DOCUMENT CONTROL SHEET

REVISION NO.	AMENDMENT	DATE
A	Initial Draft for Client	17th December 2020
B	Final for Lodgement with DA	30th December 2020

STATEMENT PREPARED BY:

Tim Shelley
Director – Tim Shelley Planning

Bachelor of Urban and Regional Planning, University of New England

1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Tim Shelley Planning has been engaged to prepare and lodge a development application with Central Coast Council (Council) for a two (2) lot residential subdivision of land at No. 8 Ghersi Avenue, Wamberal.

To assist Council in making a determination on the subject application, this Statement of Environmental Effects has been prepared by Tim Shelley Planning pursuant to the Environmental Planning and Assessment Act 1979 and accompanying regulations. This Statement will describe the proposed development; describe its impact on the local environment; identify the suitability of the site for the proposed development; identify the degree to which it complies with the relevant planning controls; and justify approval of the application.

The proposed development involves the subdivision of lot 33 in DP 20817 at No. 8 Ghersi Avenue, Wamberal into two (2) allotments, being proposed lots 331 and 332, with areas of 472.5m^2 and 610.5m^2 respectively. As part of the proposed subdivision, the existing dwelling-house on the site will be retained on proposed lot 331.

The subject site is predominantly cleared (other than for a limited number of trees along the rear boundary that will be retained) and poses no constraints to the future erection of a dwelling-house on proposed lot 332. In addition, all necessary infrastructure is available to service the new allotment, with vehicular access able to be provided via a driveway to be constructed within a short access handle off Ghersi Avenue.

The proposed subdivision complies with the provisions of Gosford Local Environmental Plan 2014 (the LEP) with the exception of the area of proposed lot 331, which is 77.5m^2 (or 14%) less than the minimum size of 550m^2 required for allotments in the R2 Low Density zone. However, as detailed in a Clause 4.6 submission accompanying the application, a variation to the lot size is considered to be justified and of no consequence in this instance given the undersized allotment will contain the existing dwelling-house such that the built form outcome is already known and satisfactory associated private open space and car parking is already provided, thereby satisfying the objective of the development standard.

The proposed subdivision complies with all relevant requirements of Gosford Development Control Plan 2013 (the DCP) other than for a minor variation to the area of proposed lot 332, which is 27m^2 (or 4.9%) less than the additional lot size requirement for battle-axe lots. In this regard, the DCP excludes the area of the access handle for the calculation of the total area of the allotment, meaning the total area of proposed lot 332 is deemed to be 523m^2 instead of 550m^2. However, the departure from the additional standard under the DCP is considered to be justified in this instance on the basis that the lot still complies with the overriding minimum lot size under the LEP; the variation is minor (at only 4.9%); and it does not constrain to any degree the ability to site a future dwelling-house on the new allotment. In this regard, proposed lot 332 will be of an appropriate size and of regular shape that will facilitate the construction of a new dwelling-house in a manner compatible with the surrounding residential area and in accordance with the requirements of Chapter 3.1 of the DCP.

The proposed subdivision represents a logical use of surplus land within an existing residential allotment and allows for greater utility and more efficient use of existing services.

On this basis, consent is sought from Council to the application.

1.2 APPLICATION DETAILS

PROJECT DETAILS:	
Applicant Name:	Tim Shelley Planning
Applicant Contact Details:	PO Box 3165 ERINA NSW 2250 Phone: 0409 306 186 Email: tim@tsplanning.com.au
Owners Details:	Brad and Leanne Lawrence
Property Description:	Lot 33 DP 20817 No. 8 Ghersi Avenue, Wamberal NSW 2260
Project Description:	Two (2) Residential Subdivision – one (1) lot into two (2) lots (including retention of existing dwelling-house on proposed lot 331)

1.3 SUMMARY OF KEY APPLICABLE PLANNING CONTROLS

PLANNING CONTROL	REQUIREMENT	COMPLIES/APPLICABLE?
GOSFORD LEP 2014		
Zoning	R2 Low Density Residential	**YES** **Subdivision Permissible under Clause 2.6**
Minimum Allotment Size (clause 4.1)	550m²	**Lot 331 containing existing dwelling – NO (472.5m²)** Variation of 77.5m² or 14% (see justification in 4.6 Submission) **Lot 332 – YES (610.5m²)**
Building Height (clause 4.3)		N/A
Floor Space Ratio (clause 4.4)		N/A
GOSFORD DCP 2014		
Chapter 2.1 – *Character*		**YES**
Chapter 2.2 – *Scenic Quality*		**YES**
Chapter 3.5 – *Residential Subdivision*	Section 3.5.3.2 Additional Area Req'ment for Battle-axe lots	**NO** Variation of 27m² or 4% to area of lot 332 exclusive of access handle (see justification in Section 4.5.3)
Chapter 6.7 – *Water Cycle Management*		**YES**
INTEGRATED DEVELOPMENT		
Any approvals required under Section 4.46 of EPAA?		NO
SEPPs		
SEPP (Coastal Management) 2018	Within "Coastal Environment" Area"	**YES** **Complies with Matters under Clauses 13, 15 & 16**
SEPP 19 – Urban Bushland		N/A
SEPP Infrastructure		N/A
SEPP State and Regional Development		N/A

2.0 THE SITE

2.1 LOCATION AND CONTEXT

The subject site is located on the eastern side of Ghersi Avenue at Wamberal, approximately 100m to the south of its intersection with The Entrance Road and diagonally opposite its intersection with Seaview Avenue.

The location of the site in the context of the surrounding area is identified on Figure 1 below.

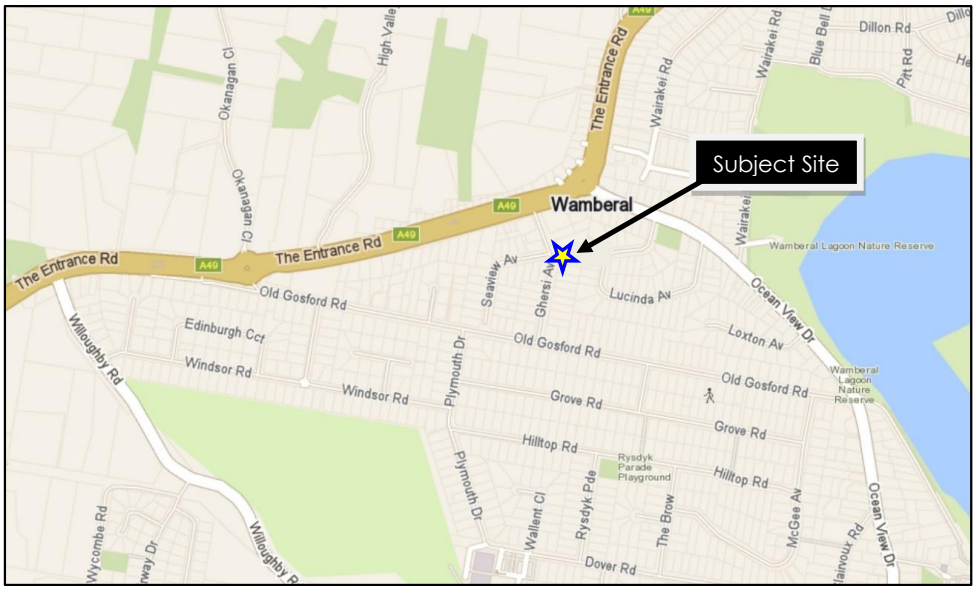


Figure 1 – Locality Plan

The property is bounded by R2-zoned residential allotments to the east and south – both of which contain single-storey dwelling-houses – and Ghersi Avenue and then a further residential property to the west, which also contains a single-storey dwelling-house. The adjoining property to the north is zoned B1 Local Centre and contains a recently constructed mixed-use development known as "*Seabreeze*" containing fourteen (14) two and three-storey townhouses and a small commercial premises on the ground floor facing Ghersi Avenue containing a café.

The area to the east, south and west in the vicinity of the site is predominantly low-density residential in nature, characterised by a mixture of one and two-storey dwelling-houses in a range of materials, including older homes constructed in the 1950's to the 1980's – many of which have been or are being renovated – as well as recently constructed dwellings of a more contemporary, coastal design. The B1 zone to the immediate north contains the Wamberal local shopping centre, comprised of a range of predominantly one-storey shops and commercial premises, a free-standing service station, and one and two-storey shop-top housing developments fronting both The Entrance Road and Ghersi Avenue.

Aerial photographs identifying the location of the subject site in the context of the surrounding area and nature of surrounding land uses are provided on the following pages.

Figure 2 – Aerial Photograph Showing Subject Site and Surrounding Area (Council Online Mapping System)

Figure 3 – Aerial Photograph Showing Subject Site (Council Online Mapping System)

2.2 LAND TITLE AND PROPERTY RESTRICTIONS

2.2.1 Property Description and Details

The property is currently identified as lot 33 in DP 20817 and has a total area of 1083m^2. The property is irregular in shape, with a skewed frontage to Ghersi Avenue of 14.15 metres and a rear boundary of approximately 28.95 metres which abuts properties that front Lucinda Avenue to the east. The depth of the property varies from 50.57 metres along its northern boundary to 46.35 metres along its southern boundary.

2.2.2 Rights of Carriageways, Easements or 88B/Title Restrictions

As indicated by the symbol "D" on the plan of subdivision, the site is both benefitted and burdened by an easement to drain stormwater to Lucinda Avenue to the east. In this regard, the subject site currently drains to the section of the easement running between lots 46 and 47 DP 25382 in the south-east corner of the property. Upon subdivision of the property as proposed, a new easement will need to be created over the access handle and along the southern boundary of proposed lot 332 to allow the existing dwelling-house on proposed lot 331 to continue to drain to this easement. Details of this new easement will be provided with the subdivision certificate application.

Conversely, the section of this easement within the subject site (i.e. along part of the northern boundary and along the full length of the rear boundary) benefits the mixed-use development on the adjoining property to the north. Upon registration of the proposed subdivision, this section of the easement will be wholly contained in proposed lot 332. However, due its location abutting the rear boundary and given its width of only 1.0 metre, this easement would pose no constraint to the construction of a future dwelling-house on proposed lot 332.

The land is not benefitted nor burdened by any rights of way, rights of access or rights of carriageway and is not affected by any known road widening.

2.2.3 Council Mapping or Planning Affectations

As indicated on the LEP mapping layers, the land is not affected by a foreshore building line, is not identified for any acquisition and is not subject to any land slip, flooding, bushfire, tidal inundation, coastal hazard, subsidence or any other risk. The land also does not contain any known contamination nor any potential acid sulphate soils.

The land does not contain any listed items of European heritage under Schedule 5 of the LEP. Similarly, a search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has also shown that there are no Aboriginal sites recorded on or in the vicinity of the site.

The land is located in the coastal zone as identified under SEPP (Coastal Management) 2018, although this classification has no implications on the proposed development as discussed in more detail later in this Statement.

2.3 OWNERSHIP

The owners of the land are Brad and Leanne Lawrence. The consent of the owners to the lodgement of the development application has been provided.

2.4 PHYSICAL DESCRIPTION

2.4.1 Slope and Topography

As shown by the contours overlaid on the subdivision plan, the land slopes down from the north-western corner to the south-eastern corner by approximately 7.5m, from a height of around 26.5m AHD to a height of around 18.95m AHD. The slope is slightly steeper immediately adjacent to Ghersi Avenue and then becomes gentler and generally consistent across the remainder of the site.

The vacant rear section of the property in which proposed lot 332 is to be contained drops by around 3.45m over a distance of approximately 32.0m, equating to a slope of approximately 1:9.3 or around 10.8%, which represents no constraint to the future construction of a dwelling-house.

2.4.2 Vegetation

As indicated by the photographs on the following pages, the site is essentially cleared, except for two (2) exotic trees within the front yard of the existing house and three (3) native trees located within 1.0 metre of the rear boundary in the south-east corner of the property.

As shown on the plan of proposed subdivision, the southern-most of the two exotic trees within the front yard would need to be removed for the future construction of the driveway within the access handle to lot 332. All the remaining trees are unaffected and hence not required to be removed as part of the proposed subdivision (and are unlikely to be required to be removed for the construction any future dwelling on proposed lot 332).

2.4.3 Existing Uses, Improvements and Structures

A single-storey weatherboard clad cottage with a pitched metal roof is currently erected on the land. A concrete driveway is constructed along the northern side of the cottage adjacent to the northern boundary of the property.

2.4.4 Access and Road Infrastructure

Vehicular access to the property is provided directly off Ghersi Avenue, which is a local street running roughly north-south between The Entrance Road to the north and Old Gosford Road to the south. Ghersi Avenue is not kerb and guttered across the frontage of the property, and has no footpaths on either side of the road at this location. The section of Ghersi Avenue immediately to the north is kerb and guttered and has a footpath on both sides up to The Entrance Road.

2.4.5 Services

Reticulated water and sewerage services, as well as gas and optic fibre services, are all currently provided to the site in the locations shown on the subdivision plan.

Electricity is available to the site from above ground power poles on the opposite side of Ghersi Avenue.

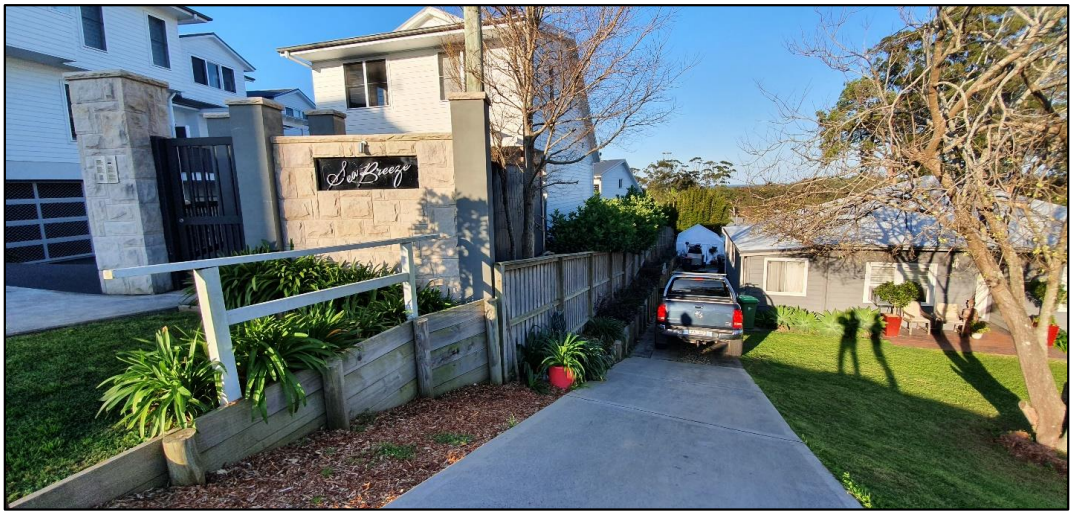
2.4.6 Survey and Photographs

Survey details of the property are provided as an overlay on the submitted plan of subdivision, whilst photographs showing a number of the features of the site as described above are provided on the following pages.

Photograph 1 – Looking east from Ghersi Avenue at the subject site. The existing dwelling is to be retained on proposed lot 331.

Photograph 2 – Looking south along the frontage of the property and down Ghersi Avenue.

Photograph 3 – Looking north from the north-west corner of the property up Ghersi Avenue and at the mixed-use development on the adjoining property to the north.



Photograph 4 – Looking east from Ghersi Avenue along the northern property boundary.

Photograph 5 – Looking north from the rear yard of the property towards the northern side boundary. This area will be contained within proposed lot 332. The section of driveway to the left of and beneath temporary marquee in the centre will be removed as part of the proposed subdivision.

Photograph 6 – Looking east from the rear yard of the property towards the rear property boundary. This area will be contained within proposed lot 332. The existing trees along the rear boundary are unaffected by the proposed subdivision and will also be contained within proposed lot 332.

Photograph 7– Looking west from the rear yard of the property along the southern facade of the dwelling-house and the southern property boundary. This area will be contained within the access handle to proposed lot 332.

Photograph 8 – Looking north-west from the rear yard of the property at the existing dwelling-house. The area to the immediate rear of the dwelling-house across to the clothes line will be contained within proposed lot 331.

Photograph 9 – Looking south along the rear boundary of the property. This area and the trees on the left will be contained within proposed lot 332.

Photograph 10 – Looking south-west from near the rear boundary of the property towards the dwelling-house. The concrete slab beneath the temporary marquee to the right will be removed as part of the proposed subdivision.

3.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 PROPOSED DEVELOPMENT

The proposed development comprises:

- A subdivision of existing lot 33 into two (2) residential allotments as follows:
    - Proposed lot 331 containing the existing dwelling – with an area of 472.5m^2; and
    - Proposed lot 332 – a new vacant lot with an area of 610.5m^2.
- Connection of the new lot to existing water, sewer, stormwater, gas, electricity and telecommunication (fibre-optic) services; and
- Removal of the existing section of driveway and the associated concrete pad within proposed lot 332.

As part of the proposed subdivision, the existing single-storey cottage on the site will be retained on proposed lot 331. This cottage is setback between 9.0 and 10.0 metres from Ghersi Avenue and further back than both the mixed-use development to the north and the existing dwelling-house on the adjoining property to the south, such that there is potential for the cottage to be extended towards the road in the future if required. The cottage is of a high-quality appearance, consistent with the character of the surrounding area and is surrounded by appropriate areas of private open space that allows its complete integration into the new lot layout.

A plan of the proposed subdivision prepared by Cahill and Cameron Surveyors has been provided as an appendix to this Statement.

4.0 PLANNING CONTROLS

4.1 GOSFORD LOCAL ENVIRONMENTAL PLAN 2014

4.1.1 Zoning and Permissibility

As shown on Figure 4 below, the subject site is zoned R2 Low Density Residential under Gosford Local Environmental Plan 2014 (the LEP), as gazetted on 11th February, 2014.

The proposed development, which is defined as "subdivision", is permissible with the consent of Council pursuant to Clause 2.6 of the LEP.

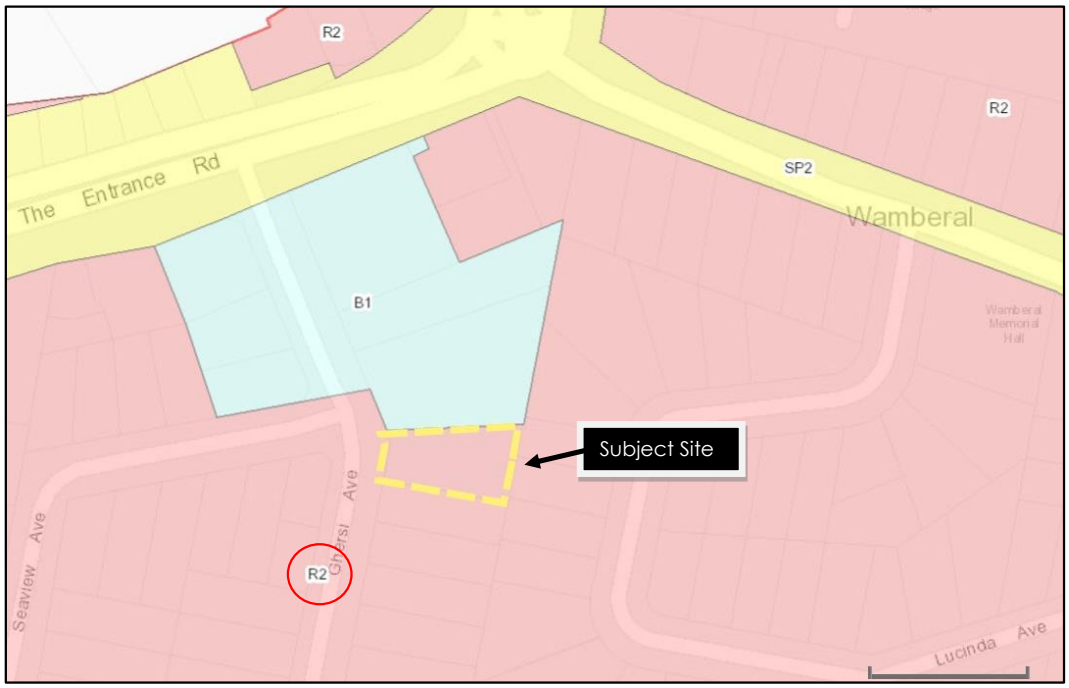


Figure 4 – Extract from Gosford LEP 2014 Zoning Map

4.1.2 Zone Objectives

Clause 2.3 of the LEP stipulates that the consent authority must have regard to the objectives for a development in a zone when determining a development application in respect of land within the zone. To this end, the objectives of the R2 Low Density zone are as follows:

- *To provide for the housing needs of the community within a low-density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
- *To ensure that development is compatible with the desired future character of the zone.*
- *To encourage best practice in the design of low-density residential development.*
- *To promote ecologically, socially and economically sustainable development and the need for, and value of, biodiversity in Gosford.*
- *To ensure that non-residential land uses do not adversely affect residential amenity or place demands on services beyond the level reasonably required for low-density housing.*

Bearing in mind the above objectives, the proposed subdivision will create two (2) residential allotments consistent with the low-density character and subdivision pattern of the surrounding area. Of particular note, the new vacant lot is of a suitable size and appropriate shape so as to accommodate a future dwelling-house on a standard setback with sufficient areas of open space and which can be sited in such a way that would minimise impact on surrounding residences. As such, the proposed subdivision is considered to be entirely consistent with the objectives of the R2 zone.

4.1.3 Clause 4.1 – Minimum Subdivision Lot Size

As shown on Figure 5 below, the subject site is located within area K under the Minimum Lot Size map of the LEP, which equates to a minimum allotment size of 550m^2. The new allotment (proposed lot 332) has an area of 610.5m^2 which is in excess of this requirement. Conversely, proposed lot 331 containing the existing dwelling-house has an area of 472.5m^2, which is 77.5m^2 less than the minimum allotment size, or a variation of 14%.

Pursuant to Clause 4.6 of the LEP and as discussed in the following section of this Statement, a formal submission requesting Council vary the minimum allotment size in this instance accompanies the application. A copy of this Clause 4.6 Submission is provided as an appendix to this Statement. In summary, the Submission indicates that a variation to the lot size is justified in this particular circumstance given the undersized allotment contains the existing dwelling-house such that the built form outcome is already known (as opposed to a vacant undersized lot) and satisfactory private open space and car parking is already provided, thereby satisfying the objective of the development standard.

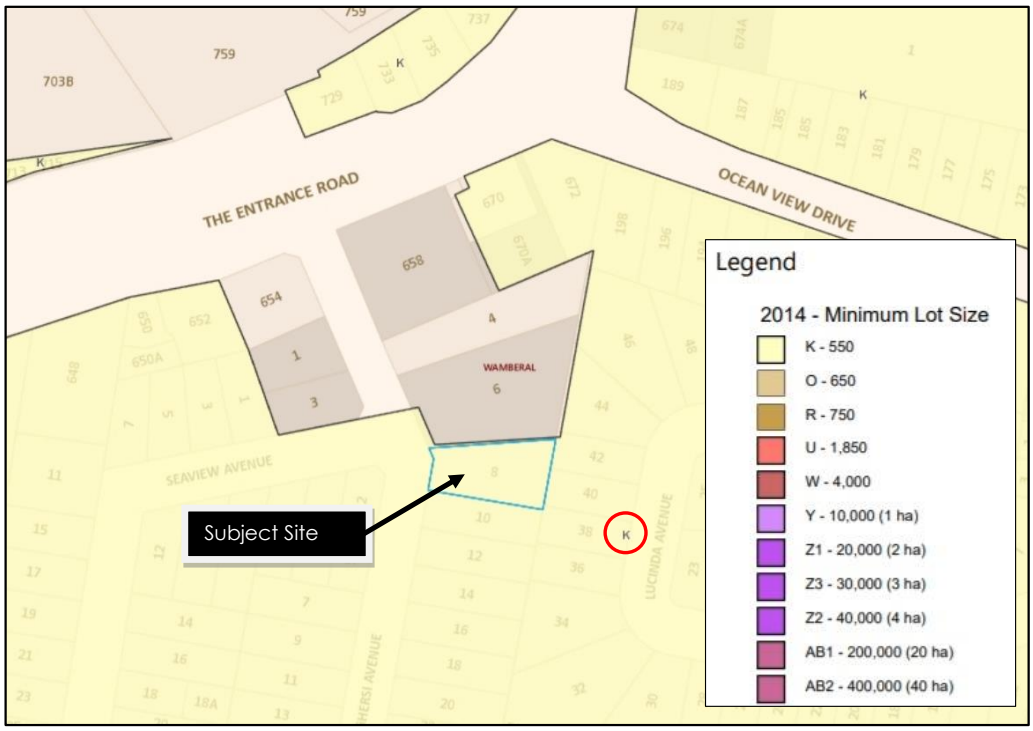


Figure 5 – Extract from Gosford LEP 2014 Lot Size Map

4.1.4 Clause 4.6 – Exceptions to Development Standards

Under Clause 4.6(3) of the LEP, development consent must not be granted for development that contravenes a development standard unless the Council is satisfied that the applicant's written request has adequately addressed the following matters:

(a) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and
(b) that there are sufficient environmental planning grounds to justify contravening the development standard

Further, under Clause 4.6(4), the proposed development must be shown to be "*in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out*".

As such, a detailed submission addressing the requirements of Clause 4.6(3) and (4) has been provided as an appendix to this Statement. In summary and further to the discussion above under Section 4.1.3, this submission provides suitable justification on environmental planning grounds to demonstrate that compliance with the minimum lot size standard is unnecessary in the circumstances of the case, as the proposed development would:

- satisfy the objective of the minimum lot size development standard;
- satisfactorily achieve the objectives of the R2 Low Density Residential zone; and
- be in the public interest.

On the basis of this submission, Council is requested to vary the minimum allotment size of 550m^2 in this instance to permit the proposed development.

It is also noted that Council can assume concurrence to the proposed variation and use of Clause 4.6 in this instance pursuant to the Department of Planning and Environment's Planning Circular PS 08-003 to determine the application.

4.1.5 Other Mapping Layers

The proposed subdivision is not affected by the remaining mapping layers of the LEP as follows:

- The land is not identified as being affected by acid sulphate soils or flooding;
- Heritage Map – the subject site is not identified as containing any items of archaeological or European heritage on the Heritage map nor contains any local heritage items listed under Schedule 5;
- Urban Release Area Map – the subject site is not identified as being located within an urban release area;
- Key Sites/Development Incentives Application Map – the land is not identified as being subject to development incentives;
- Additional Permitted Use Map – no additional uses are permitted on the subject site under Schedule 1 of the LEP;
- Land Reserve Acquisition Map – the subject site is not identified as – nor contains any – land required for acquisition by Council or any other authority; and
- Being a subdivision, the proposed development is not affected by the floor space ratio or building height maps.

4.2 STATE ENVIRONMENTAL PLANNING POLICIES (SEPPs)

4.2.1 SEPP (Coastal Management) 2018

Under SEPP (Coastal Management) 2018, the subject site is located within the "Coastal Environment" as shown shaded in blue on Figure 6 on the following page.

As such, in their assessment of the application, Council is required to have regard to the matters for consideration identified under clause 13, which relates specifically to development within the coastal environment area, as well as those additional matters identified under clauses 15 and 16 (development in the coastal zone generally).

Figure 6 – SEPP (Coastal Management) 2018 Map Showing "Coastal Environment" Area

Given the elevation of the site, its significant distance from the coastline (over 400m to Wamberal Lagoon and over 1.0km to Wamberal Beach) and the fact it comprises a developed residential parcel within an established residential area with no coastal features, the proposed development is consistent with each of the matters set out in clauses 13, 15 and 16. On this basis, Council is able to grant consent to the application.

4.2.2 SEPP No. 55 – Contaminated Lands

Clause 7(1) of SEPP No. 55 prevents the consent authority from consenting to a development unless:

(a) it has considered whether the land is contaminated, and
(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

As indicated on the Section 10.7 Planning Certificate obtained for the property, the land is not identified as being subject to any significant contamination, nor subject to a management order, approved voluntary management proposal, an ongoing maintenance order or a site audit statement. There is also no record of any previous hazardous land uses on this part of the site, with both parcels understood to only have been used for residential purposes in the past. As such, the requirements of SEPP 55 have been met and Council can issue consent to the development.

4.3 THE PROVISIONS OF ANY DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS

The draft Central Coast LEP 2018 (the DLEP) was exhibited between 6th December 2018 and 28th February, 2019. Under the DLEP, no changes were proposed to the zoning of the site. However, the minimum lot size map affecting the site – as part of the wider R2 zone across the former Gosford LGA – was proposed to be reduced to 450m^2 to match the existing minimum allotment size for the R2 zone in the former Wyong LGA under Wyong LEP 2013. The draft minimum lot size map as it affected the subject site is shown as Figure 7 on the following page. If the LEP was gazetted as most-recently exhibited, the area of proposed lot 331 would have been in excess of the new minimum allotment size to be adopted for this site and the surrounding R2 zone.

Figure 7 – Extract of Draft Central Coast LEP Minimum Lot Size Map as exhibited December 2018

However, in response to public submissions and Councillor input, it was resolved by Council on 9th March 2020 (in amongst other items) that the 550m² minimum lot size would be retained where it currently applied in the former Gosford LGA to the R2 Low Density Residential zone. Specifically, Council Resolution 170/20b stated as follows:

"That the CCLEP retain the Minimum Lot size of 550 sq m for lands currently zoned R2 in the former Gosford LGA with a minimum lot size of 550 sq m through the use of an overlay map."

As a result of this change, the minimum allotment size will be temporarily retained at 550m² in the former Gosford LGA upon gazettal of the upcoming Central Coast LEP 2018, meaning proposed lot 331 containing the existing house would remain undersized (but with no implications as discussed throughout this Statement). However, as per the further discussion by staff in the report to Council, the minimum lot size for residential development (i.e. subdivision) will be revisited in future stages of the Comprehensive LEP, where it may still revert to 450m² to ensure consistency across the entire Central Coast LGA. Should this be the case, proposed lot 331 would again be above the minimum allotment size as intended under the current draft LEP when originally exhibited.

4.4 INTEGRATED DEVELOPMENT

The application does not constitute "Integrated Development" under Section 4.46 of the Environmental Planning and Assessment Act, 1979 ("the Act") as it does not require the issue of a separate approval or licence from any other approval body.

4.5 GOSFORD DEVELOPMENT CONTROL PLAN 2013

Gosford DCP 2013 (the DCP) relates to that part of the Central Coast LGA formerly located within Gosford City, including this site. The following chapters of the DCP are applicable to the proposed development.

4.5.1 Chapter 2.1 – *Character*

The objectives of Part 2.1 of Gosford DCP 2013 are as follows:

a) *Protect and enhance environmental character that distinguishes Gosford City's identity, and*
b) *Enhance the City's identity by development that displays improved standards of scenic, urban and civic design quality.*

Based on these objectives, Section 2.1.4(c) of Chapter 2.1 then identifies a range of criteria that proposed developments are required to take into account in their design and which have informed the desired Character Statement for each locality within the former Gosford LGA. To this end, Chapter 2.1 contains desired character statements for individual "places" within each suburban locality. Within the Wamberal Character Statement, the site falls within "*Wamberal 6: Open Woodland Hillsides*", as shown on Figure 8 on the following page.

With respect to subdivisions, the existing character of this area is described (in part) as:

"In a number of separate locations, established residential subdivisions occur upon gentle to moderate slopes retain an open canopy of tall woodland remnants that provide scenically-distinctive backdrops to a coastal lagoon, major thoroughfares or beachfronts.

Regular subdivisions accommodate small-to-medium sized lots, facing grids of local streets, with filtered coastal views available from elevated lots through the canopy. Some areas include a major district thoroughfare flanked by wide unformed verges studded with tall woodland remnants that provide local landmarks. Local access streets, some with unformed edges, are flanked by very wide sloping grassed verges, often with scattered tall woodland remnants."

In turn, the desired character insofar as it relates to new subdivisions within this area is as follows:

"These should remain low-density residential areas where the existing scenic quality and amenity of prominent hillsides are enhanced substantially by further "greening" of gardens and street verges in order to screen new development and to complement the open bushland canopy that surrounds most dwellings.

Avoid disturbing natural slopes and trees by appropriate siting of structures plus low-impact construction such as suspended floors and decks, rather than extensive cut-and-fill."

The proposed subdivision will create two residential allotments of a size and shape consistent with the character and subdivision pattern of the surrounding area. Both lots are low-density in nature, with the new vacant allotment able to accommodate a variety of low-density housing types with appropriate side and rear setbacks, surrounded by extensive areas of open space, which will minimise impact on surrounding residences. In addition, the existing large mature trees along the rear boundary of the site will be retained within proposed lot 332 to maintain a vegetated backdrop, whilst the gently sloping level nature of proposed lot 332 will facilitate the use of suspended floors and bearer and joist construction, thereby minimising the extent of cut and fill required for any future dwelling.

As such, the proposed subdivision pattern (and the future dwelling-house it facilitates) is entirely consistent with the desired future character of the Wamberal Open Woodland Hillsides area.

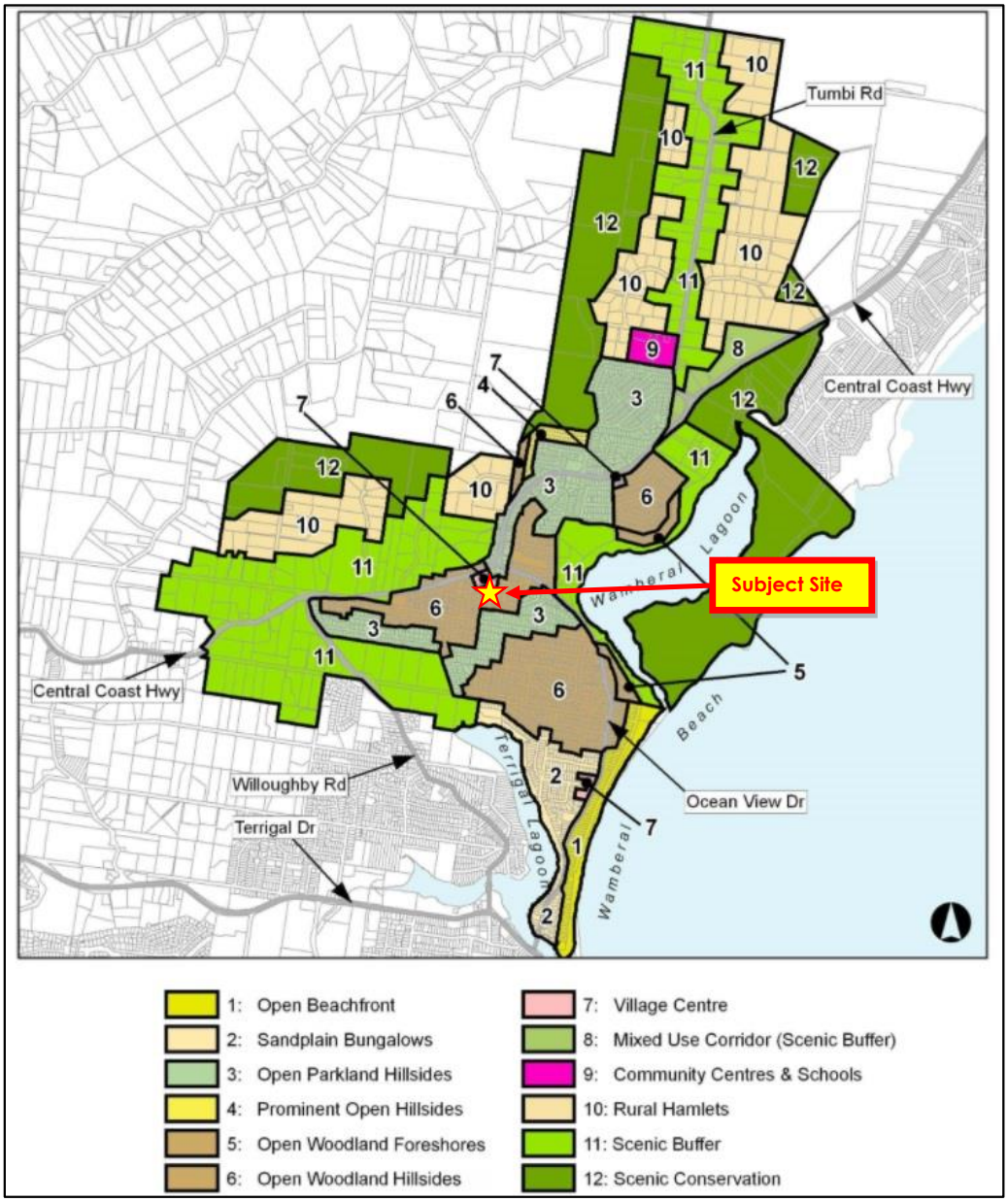


Figure 8 – Extract from DCP 2013 Chapter 2.1 showing Wamberal Character Statement Area

4.5.2 Chapter 2.2 – *Scenic Quality*

Given the proposed subdivision involves no building or construction works, nor the removal of any native trees or significant vegetation, there will be no adverse impacts on the existing scenic quality of the surrounding area, with the existing subdivision pattern and character of the surrounding area maintained. As a result, the proposed subdivision is consistent with this Chapter of the DCP.

4.5.3 Chapter 3.5 – *Residential Subdivision*

Chapter 3.5 – Residential Subdivision identifies a range of development standards and design criteria for the subdivision of residential land within the area contained with the former Gosford LGA. To this end, a detailed table has been prepared to indicate the extent to which the proposed development complies with these requirements. This table is provided as an appendix to this Statement.

From this table, it is apparent that the proposed development does – or can – meet all of the relevant requirements of Chapter 3.5 of DCP 2013 with the exception of a minor variation in the area of proposed lot 332 to the additional criteria under section 3.5.3.2 for battle-axe lots (i.e. over and above the minimum allotment size in the LEP), which requires lots to be a minimum of 550m^2 as per the LEP but excluding the area of the access handle.

In this regard, proposed lot 332 is 27m^2 (or 4.9%) less than the minimum lot size requirement of 550m^2 when excluding the area of the access handle from the calculation of the total area of the allotment. This means the total area of proposed lot 332 is deemed to be 523m^2 instead of 610.5m^2 for the purpose of this particular standard. However, the departure from the additional standard under the DCP is deemed is considered to be justified in this instance for the following reasons:

- the lot still complies with – and easily exceeds – the overriding minimum lot size of 550m^2 under the LEP;
- the lot is significantly larger – even when excluding the access handle under this additional clause of the DCP – than the minimum allotment size of 450m^2 originally identified for this site under the draft Central Coast LEP;
- the variation is minor at only 4.9% and is no consequence;
- the slight departure does not constrain to any degree the ability to site a future dwelling-house on the new allotment. In this regard, proposed lot 332 will be of an appropriate size and regular (essentially rectangular) shape that will facilitate the construction of a new dwelling-house in a manner compatible with the surrounding residential area and in accordance with the requirements of Chapter 3.1 of the DCP;
- the land is of considerable size, is fully serviced and is located within walking distance of Wamberal local centre and public transport routes on The Entrance Road such that it represents an ideal opportunity to assist in increasing the local supply of land and housing stock within an established residential area rather than on the urban-rural fringe; and
- the proposed subdivision complies with (and in many cases exceeds) all other requirements of the DCP.

As such, a minor variation to the DCP to permit the proposed subdivision is considered appropriate in this instance.

4.5.4 Chapter 6.7 – *Water Cycle Management*

As required by this Chapter, a Water Cycle Management Plan (WCMP) has been prepared by SRB Consulting. A copy of this WCMP is provided as an appendix to this Statement.

The WCMP for the proposed development meets all of the objectives and requirements outlined in Chapter 6.7 of DCP 2013 – Water Cycle Management and related documents, whilst providing an economical and safe stormwater disposal system. The proposed system will be designed in accordance with Council's *Civil Works Specification*, with full details to be provided with the construction certificate application.

5.0 ISSUES RELEVANT TO THE APPLICATION

In addition to the issues identified under the relevant planning controls in the preceding section, the following issues under Section 4.15 of the Environmental Planning and Assessment Act 1979 are also relevant to the application:

5.1 ACCESS

Vehicular access to the new allotment will be provided via a 3.0m driveway to be constructed within the access handle off Ghersi Avenue. At this location, Ghersi Avenue is of sufficient width and exhibits satisfactory sight distance in both directions to allow vehicles to safely turn into the new allotment. It is understood that the construction of this driveway will be covered by a condition of consent, with all works to be designed and constructed in accordance with Council's *Civil Works Specification*.

5.2 SERVICES

5.2.1 Water Supply and Sewer Servicing

Reticulated water and sewerage services are currently provided to the site in the locations shown on the submitted plan. These services will be extended to the new allotment as required in accordance with the relevant requirements of the water supply authority (Council). It is understood that sufficient capacity exists within Council's system to accommodate the minor additional loads generated by the proposed subdivision. Exact details of water and sewer servicing requirements (including contributions) will be identified in the Section 306 requirements letter to be issued with/following the consent, with all items to be completed prior to the issue of the Section 307 Certificate and release of the subdivision certificate.

5.2.2 Electricity/Gas/Telecommunications

Electricity, gas and optic fibre telecommunication services are available to the subject site in the locations identified on the submitted plan. These services will be connected to the new allotment as part of the construction of a future dwelling on proposed lot 332 in accordance with the relevant Authority's requirements.

5.3 ABORIGINAL HERITAGE

To confirm the possible existence of any items of Aboriginal significance on the site, a search of the Office of the Environment and Heritage's AHIMS (Aboriginal Heritage Information Management System) Web Services was undertaken on 21st December, 2020. This search indicated that no Aboriginal sites are recorded in or near the subject property, whilst no Aboriginal places have been declared in or near the property.

5.4 EROSION AND SEDIMENT CONTROL

Sediment and erosion controls would be put in place during the undertaking of any necessary ancillary works required in association with, or as a result of, the proposed subdivision, (e.g. construction of the driveway, provision of services etc). These controls have been designed and would be installed in accordance with Council's *Civil Works Specification*. Plans of the proposed sedimentation and erosion control measures form part of the submitted Water Cycle Management Plan by SRB Consulting.

6.0 CONCLUSION

From the preceding Statement it is apparent that:

- The proposed subdivision complies with all relevant provisions and clauses of Gosford LEP 2014 with the exception of the size of proposed lot 331, which is 77.5m^2 (or 14%) below the minimum allotment size of 550m^2 for the R2 zone. However, this non-compliance has been satisfactorily justified in the Clause 4.6 submission accompanying the application on the basis that the variation relates to the lot containing the existing dwelling (as opposed to the vacant lot) such that the built-form outcome is already known and satisfactory private open space and car parking is already provided, thereby satisfying the objective of the development standard.

- The proposed subdivision complies with the requirements of the relevant chapters of Gosford Development Control Plan 2013 and particularly Chapter 3.5 – *Residential Subdivision*, other than for a minor variation to the area of proposed lot 332, which is 27m^2 (or 4.9%) less than the additional lot size requirement for battle-axe lots under section 3.5.3.2, under which the access handle is excluded. However, a departure is considered to be justified in this instance on the basis that the lot still complies with the overriding minimum lot size under the LEP; the variation is minor (at only 4.9%); and the vacation does not constrain to any degree the ability to site a dwelling-house on the new allotment in the future.

- All necessary infrastructure is available to the new allotment, whilst satisfactory access can be provided via a new driveway within a short access-handle off Ghersi Avenue.

- The subdivision can be undertaken with minimal environmental impact due to the limited amount of works required and given the site is essentially cleared and requires no removal of any vegetation.

- The proposed subdivision represents a logical use of surplus land within an existing residential allotment and allows for greater utility and more efficient use of existing services.

- The proposed subdivision creates two (2) allotments of a size and shape which:
  - is consistent with the surrounding pattern of development;
  - allows for retention of the existing dwelling-house on proposed lot 331 in a logical position with satisfactory private open space and car parking; and
  - readily facilitates the future construction of a dwelling-house on proposed lot 332 in a manner consistent with the character of the surrounding area and in accordance with the requirements of DCP Chapter 3.1 – *Residential Development* such that it is unlikely to have any adverse impact on the amenity of adjoining or nearby residences.

Given the above, the proposed development is deemed to be reasonable and appropriate when assessed against the relevant heads of consideration in Section 4.15 of the Environmental Planning and Assessment Act, 1979.

On this basis, Council is requested to grant consent to the application.