

Central Coast

Local Planning Panel

Central Coast
Local Planning Panel Meeting
Business Paper
09 July 2020



Meeting Notice

**The Local Planning Panel Meeting
of Central Coast
will be held remotely - online,
Thursday 9 July 2020 at 2.00 pm,
for the transaction of the business listed below:**

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Donna Rygate
Chairperson

Item No: 1.1
Title: Disclosures of Interest
Department: Governance

9 July 2020 Local Planning Panel Meeting

Reference: F2020/00812 - D14052891

The NSW Local Planning Panel Code of Conduct states that all panel members must sign a declaration of interest in relation to each matter on the agenda before or at the beginning of each meeting.

Recommendation

That Panel Members now confirm that they have signed a declaration of interest in relation to each matter on the agenda for this meeting and will take any management measures identified.

Attachments

Nil

Item No: 2.1
Title: Confirmation of Minutes of Previous Meeting
Department: Governance

9 July 2020 Local Planning Panel Meeting

Reference: F2020/00812 - D14052687

Author: Rachel Callachor, Local Planning Panel Support Coordinator

Summary

Confirmation of minutes of the previous Local Planning Panel Meeting held on 11 June 2020.

Recommendation

That the Local Planning Panel confirm the minutes of the previous Meeting held on 11 June 2020.

Attachments

- 1 MINUTES - Local Planning Panel Meeting - 11 June 2020 D14022847

Central Coast
Local Planning Panel

Minutes of the
Central Coast
Local Planning Panel Meeting
Held remotely - online
on 11 June 2020

Panel Members

Chairperson	Donna Rygate
Panel Experts	Greg Flynn Stephen Leathley
Community Representative/s	Tony Tuxworth

Central Coast Council Staff Attendance

Andrew Roach	Unit Manager Development Assessment
Sali Pendergast	Section Manager Development Assessment North
Shannon Butler	Senior Development Planner
Alisa Pendergast	Section Manager Development Assessment South
Brian McCourt	Development Planner

Public Forum Attendance

Mr Michael Bell	Resident spoke against the recommendation for item 2.1
Mr Mark Cavanagh	Aurecon Group spoke on behalf of the applicant for item 2.1

The Chairperson, Donna Rygate, declared the meeting open at 2.01pm and advised in accordance with the Code of Meeting Practice that the meeting is being recorded.

The Chairperson, Donna Rygate read an acknowledgement of country statement.

Apologies

The Panel noted that no apologies had been received.

1.1 Disclosures of Interest

Item 2.1 DA 57859 – 103 Victoria Street, East Gosford – Telecommunications Tower

Mr Stephen Leathley declared a less than significant non pecuniary interest in the item as his current mobile phone provider is Telstra. Mr Stephen Leathley will manage the conflict as he has no financial interest in Telstra and the proposed communications facility will not be providing him with service as he does not live or work within the stations range. The Chair, Ms Donna Rygate acknowledged Telstra as her telephone etc service provider in the same context.

The Panel received the report on Disclosure of Interest and noted advice of disclosures.

The Panel moved into deliberation the time being 2.50pm

2.1 DA 57859/2020 - 103 Victoria Street, East Gosford - Telecommunications Tower

Site Inspected Yes

Relevant Considerations As per Council assessment report and addenda

Material Considered

- Council assessment report and addenda
- Documentation submitted with application
- 22 original and 6 additional submissions
- Two speakers

Council Recommendation Approval subject to conditions

Panel Decision

- 1** ***That the Local Planning Panel accepts that the Clause 4.6 request to vary the maximum height standard in Clause 4.3 of Gosford Local Environmental Plan 2014 has demonstrated that there are sufficient environmental planning grounds to justify the non-compliance with the development standard and that it is unreasonable and unnecessary to require compliance in this instance as the proposed development will be consistent with the objectives of the clause, the B2 Local Centre zone and the Environmental Planning and Assessment Act 1979.***
- 2** ***That the Local Planning Panel grant consent subject to conditions detailed in the schedule attached to the report and having regard to the matters for consideration detailed in Section 4.15 of the Environmental Planning and Assessment Act 1979 and other relevant issues subject to the amendment of condition 1.3 as detailed below;***

- **Pay to Council a contribution of \$5,995.00, that may require adjustment at the time of payment, for the loss of one (1) car parking space as a result of the proposed development, in accordance with Contribution Plan No 70 - Car Parking: East Gosford.**
 - **The total amount must be indexed each quarter in accordance with the Consumer Price Index (All Groups Index) for Sydney issued by the Australian Statistician as outlined in the contributions plan.**
 - **Contact Council's Contributions Planner on Tel 1300 463 954 for an up-to-date contribution payment amount.**
 - **Any Construction Certificate and physical works must not commence until the developer has provided the Accredited Certifier with a copy of a receipt issued by Council that verifies that the contributions have been paid. A copy of this receipt must accompany the documents submitted by the certifying authority to Council under Clause 104/Clause 160(2) of the Environmental Planning and Assessment Regulation 2000.**
 - **A copy of the Contribution Plan may be inspected at the office of Central Coast Council, 49 Mann Street Gosford or on Council's website:
[Development Contributions - former Gosford LGA](#)**
- 3 That the Local Planning Panel advise those who made written submissions of its decision.**

Reasons

- 1 The proposed development complies with the relevant State and Local Planning instruments and policies, with the exception of the tower height.
- 2 A variation to the development standard for tower height is supported.
- 3 Adjoining property owners were notified of the proposed development in accordance with Council's policy and concerns raised in submissions have been considered and addressed where applicable.
- 4 One of the carparking spaces will be impacted and consequently a contribution is required to compensate its loss.

- 5 The Panel accepts the applicant's verbal submission and report accompanying the development application that future EME levels will be well within the acceptable standard set by the relevant regulatory/health authorities.

Consent conditions are agreed subject to amendment in accordance with section 4.33(1)(b) of the Environmental Planning and Assessment Act 1979.

Votes Unanimous

2.2 DA/405/2020 - 261W Cresthaven Avenue, Bateau Bay - Storage (shipping containers)

Site Inspected Yes

Relevant Considerations As per Council assessment report and addendum

Material Considered Council assessment report and addendum
Documentation with application
Nil submissions
Nil speakers

Council Recommendation Approval subject to conditions

Panel Decision ***That the Local Planning Panel grant consent subject to the conditions detailed in the schedule attached to the report and having regard to the matters for consideration detailed in Section 4.15 of the Environmental Planning and Assessment Act 1979 and other relevant issues, subject to the amendment of condition 1.3 as detailed below;***

- 1.2** ***The shipping containers are permitted to remain on the site for up to five years from the date of this consent. Prior to the cessation of the five year period, the containers are to be removed at the expense of The Entrance Bateau Bay Football Club.***

Reasons The Panel supports the proposed development subject to the amendments made to condition 1.2. to give the football club adequate time to find alternative storage.

Consent conditions are agreed subject to amendment in accordance with section 4.33(1)(b) of the Environmental Planning and Assessment Act 1979.

Votes

Unanimous

The Meeting closed at 3.50 pm.

Item No: 3.1
Title: DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong
Department: Environment and Planning

9 July 2020 Local Planning Panel Meeting

Reference: F2020/00812 - D14030868
Author: Cade Tracey, Trainee Development Planner
Manager: Ailsa Prendergast, Section Manager, Development Assessment South
Executive: Andrew Roach, Unit Manager, Development Assessment

Summary

An application has been received for a telecommunications facility on Lot 111 DP1184661, Brisbane Water Drive, Koolewong. The facility is a 25 metre monopole structure (having a total height of 26.2 metres including antennas) as well as associated infrastructure (footings, ground based support infrastructure/communications cabinet and the like). The proposed location is within the rail corridor.

The application has been examined having regard to the matters for consideration detailed in section 4.15 of the *Environmental Planning and Assessment Act 1979* and other statutory requirements with the issues requiring consideration being addressed in the report.

The application is required to be reported to the Local Planning Panel for determination as a result of the number of submissions. There have been two notification periods for the proposal:

- The proposal was notified 6 June 2019 until close of business on 21 June 2019 and a total of 16 submissions were received and late submission of a petition with over 50 signatures.
- Following submission of amended plans a second notification period was undertaken with a wider notification area (200m radius). The second notification period (from 5 September until 19 September) resulted in a total of 12 submissions were recorded as well as a second petition, with excess of 50 signatures.

Applicant	Service Stream Network Construction
Owner	Rail Corp
Application No	DA56560/2019
Description of Land	Lot: 111 DP: 1184661
Proposed Development	Telecommunications Facility
Site Area	36,700m ²
Zoning	SP2 Infrastructure
Existing Use	Transport Infrastructure (Rail Corridor)
Employment Generation	No
Estimated Value	\$250,000.00

Recommendation

- 1 That Local Planning Panel grant consent subject to the conditions detailed in the schedule attached to the report and having regard to the matters for consideration detailed in Section 4.15 of the Environmental Planning and Assessment Act 1979 and other relevant issues.**
- 2 That Local Planning Panel advise those who made written submissions of its decision.**

Precis:

Proposed Development	Telecommunications Facility (25 metre Monopole telecommunications tower with antenna and infrastructure – total height of 26.2 metres incorporating headframe and communications infrastructure), ancillary ground based infrastructure including support services, security fencing and signage.
Permissibility and Zoning	<p>The land is zoned <i>SP2 Infrastructure</i> under the provisions of the <i>Gosford Local Environmental Plan 2014</i>.</p> <p><i>State Environmental Planning Policy (Infrastructure) 2007</i> states, at Clause 115(1) that:</p> <p><i>'Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under clause 20 or 116, may be carried out by any person with consent on any land.'</i></p> <p>The proposed telecommunications facility is permitted with development consent on the subject land by virtue of Clause 115(1) of <i>State Environmental Planning Policy (Infrastructure) 2007</i></p>
Relevant Legislation	<ul style="list-style-type: none"> • <i>Environmental Planning & Assessment Act 1979 – Section 4.15</i> • <i>Telecommunications Act 1997</i>

	<ul style="list-style-type: none"> • <i>Local Government Act 1993 – Section 89</i> • <i>State Environmental Planning Policy (Coastal Management) 2018</i> • <i>State Environmental Planning Policy (Infrastructure) 2007</i> • <i>Gosford Local Environmental Plan 2014</i> • <i>Gosford Development Control Plan 2013</i>
Current Use	Transport Infrastructure (Rail Corridor)
Integrated Development	No – not integrated development in accordance with <i>Clause 4.46</i> of the <i>Environmental Planning & Assessment Act 1979</i> .
Concurrence Required	<p>Yes – Consultation & Concurrence Required from the relevant Rail Authority under <i>Section 86</i> of <i>State Environmental Planning Policy (Infrastructure) 2007</i></p> <p>Concurrence received on 3 March 2020 (refer to attachment 4)</p>
Submissions	<p>The application was notified from 6 June 2019 until 21 June 2019. During the notification period 16 submissions were lodged and a petition received after the submission period.</p> <p>A second notification period was undertaken from 5 September until 19 September 2020 due to amended plans and a wider notification period. A total of 12 submissions were received and a second petition was received with more than 50 signatures.</p>

The Site

The site is legally known as Lot: 111 DP: 1184661 Brisbane Water Drive, Koolewong, located on the western side of Brisbane Water Drive and east of Glenrock Parade (see figure 1). The site is a long narrow portion of land currently used for the purposes of rail infrastructure, being approximately 960m long and 35m wide with a total site area of approximately 36,700m². The topography of the site is varied in order to accommodate existing rail infrastructure (on a level surface) adjacent to steep cuttings with height variations of between 10m-15m.

The site comprises two existing rail lines side by side and associated rail infrastructure including drainage, radio communications, electricity and security fencing. A thin line of vegetation also exists along the side boundary adjacent to Brisbane Water Drive and more

3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

prominent vegetation atop the cliff edge adjacent to Glenrock Parade. Some sections of the site involve a crossover of water and sewer utilities in east-west directions however the location of the proposal is a significant distance from any utilities.

The development is proposed to be situated on the eastern side of the railway line, between the existing rail line and Brisbane Water Drive (see figure 2).

The site is identified as "bushfire prone land" and is affected by the vegetation buffer overlay on Council's bushfire maps (see figure 3) this includes the immediate location of the proposal within the site.

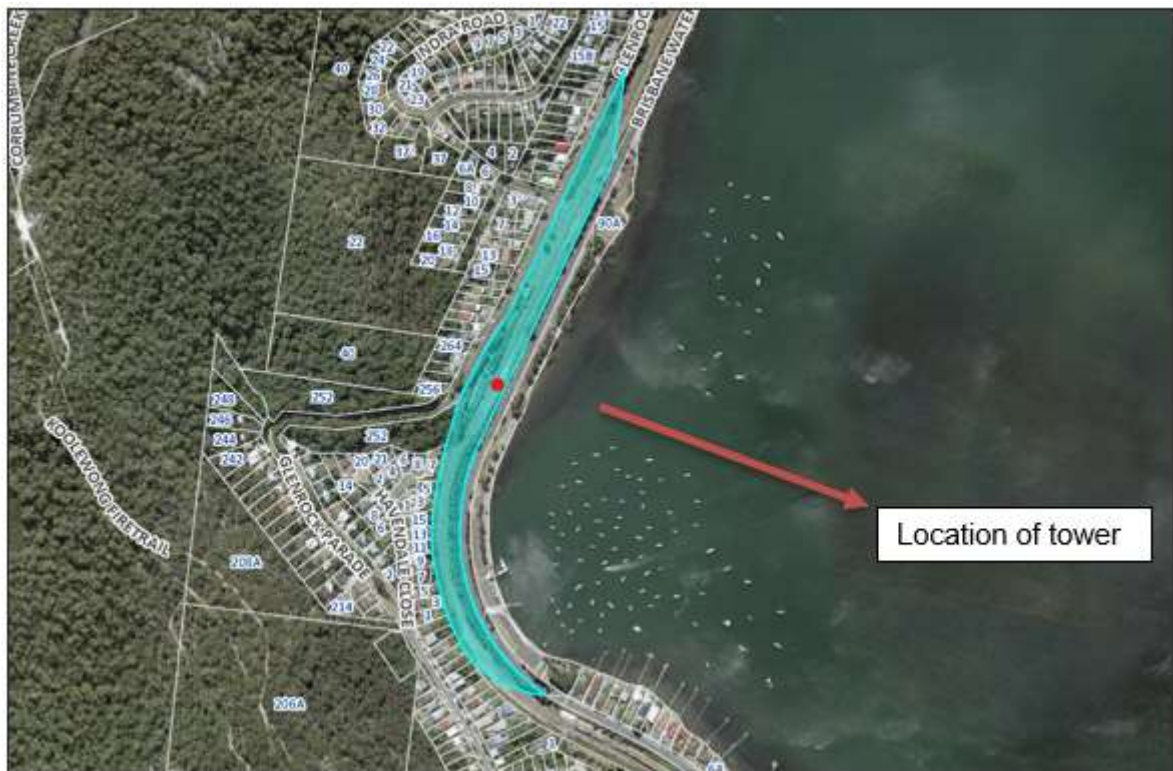


Figure 1 – Location of site

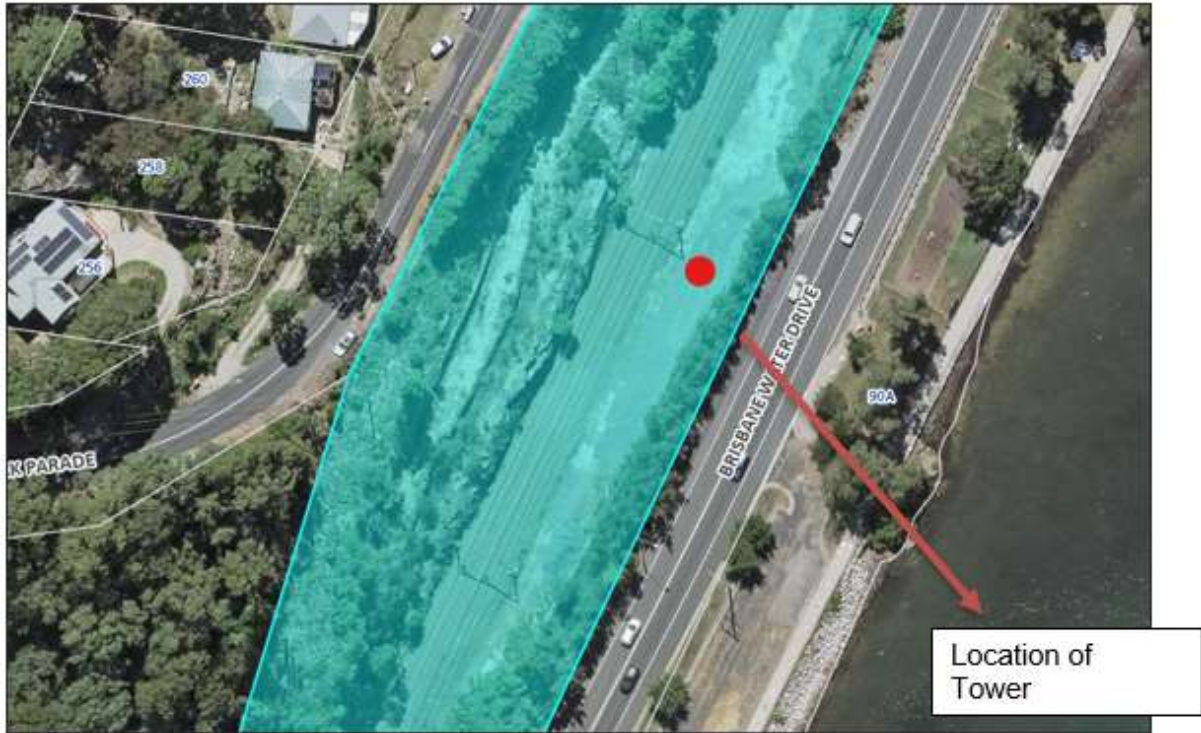


Figure 2 – Location of proposal



Figure 3 – Bushfire prone land mapping

Surrounding Development

Adjoining the proposed site to the west is residential dwellings – primarily detached dwellings fronting Glenrock Parade, Havendale Close and Moruya Close. Further to the west, beyond this residential development are steep uninhabited and vegetated hills which make up part of the Brisbane Water National Park.

Further to the east (on the eastern side of Brisbane Water Drive) is existing recreation and waterfront reserve areas with playground, toilet and picnic facilities and carparking to serve an existing boat launching area.

The rail corridor extends to the north and south of the site.

The Proposed Development

The proposal is for a new telecommunications facility (see figures 4-6) proposed to be constructed on the eastern side of the existing railway lines (between the railway lines and Brisbane Water Drive). The proposed development comprises:

- A 25m high monopole telecommunications structure with headframe and telecommunication equipment (overall height of 26.2m including headframe and equipment);
- Two panel antennas measuring 2533mm x 350mm x 208mm to be mounted to the headframe;
- The installation of associated ancillary equipment, including two tower mounted amplifiers, two remote radio units, combiners and feeder;
- One Outdoor Unit equipment cabinet measuring 1300mm x 700mm x 1450mm to be installed at ground level and adjacent to the proposed facility.

The aim of the proposal is to provide improved Telstra coverage to rail commuters and other users moving through the Koolewong area. The two antennas will be positioned to face north and south directions, the general direction of the train corridor.

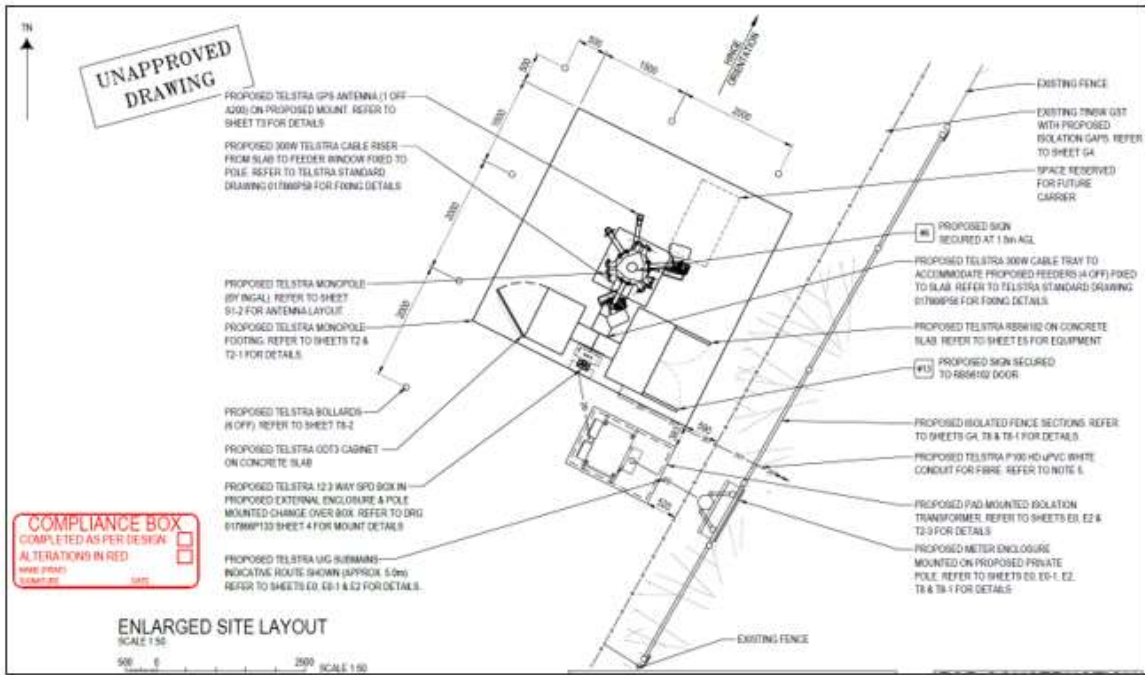


Figure 4 – Site layout

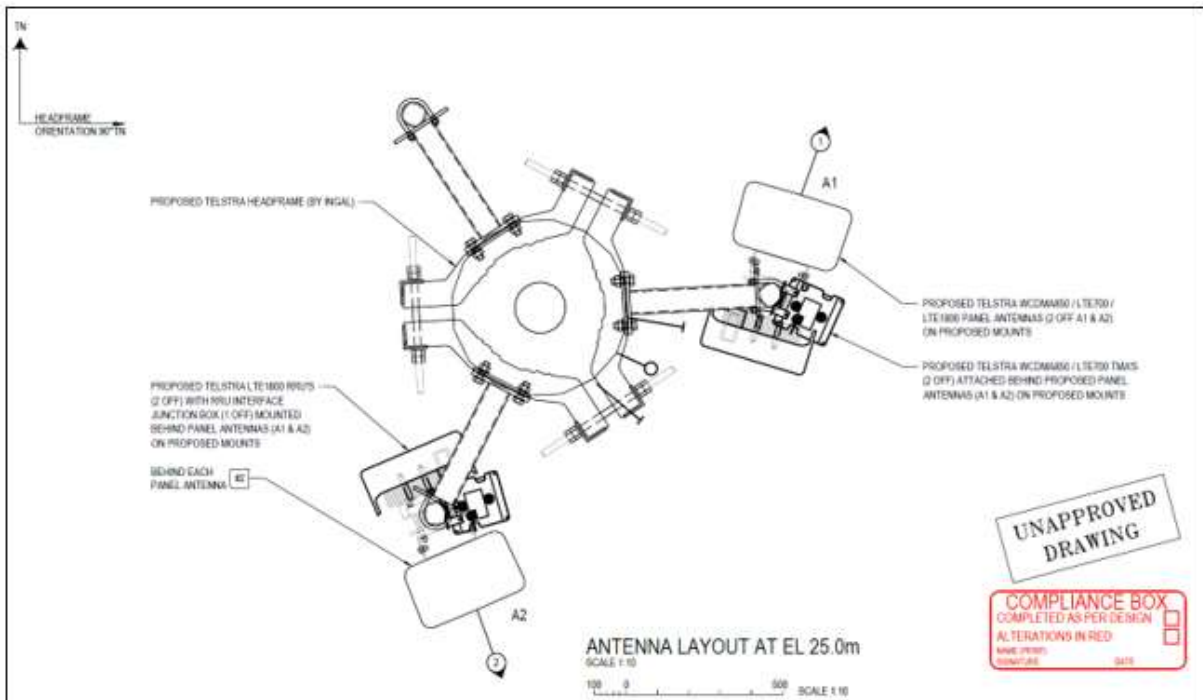


Figure 5 – Antenna Layout

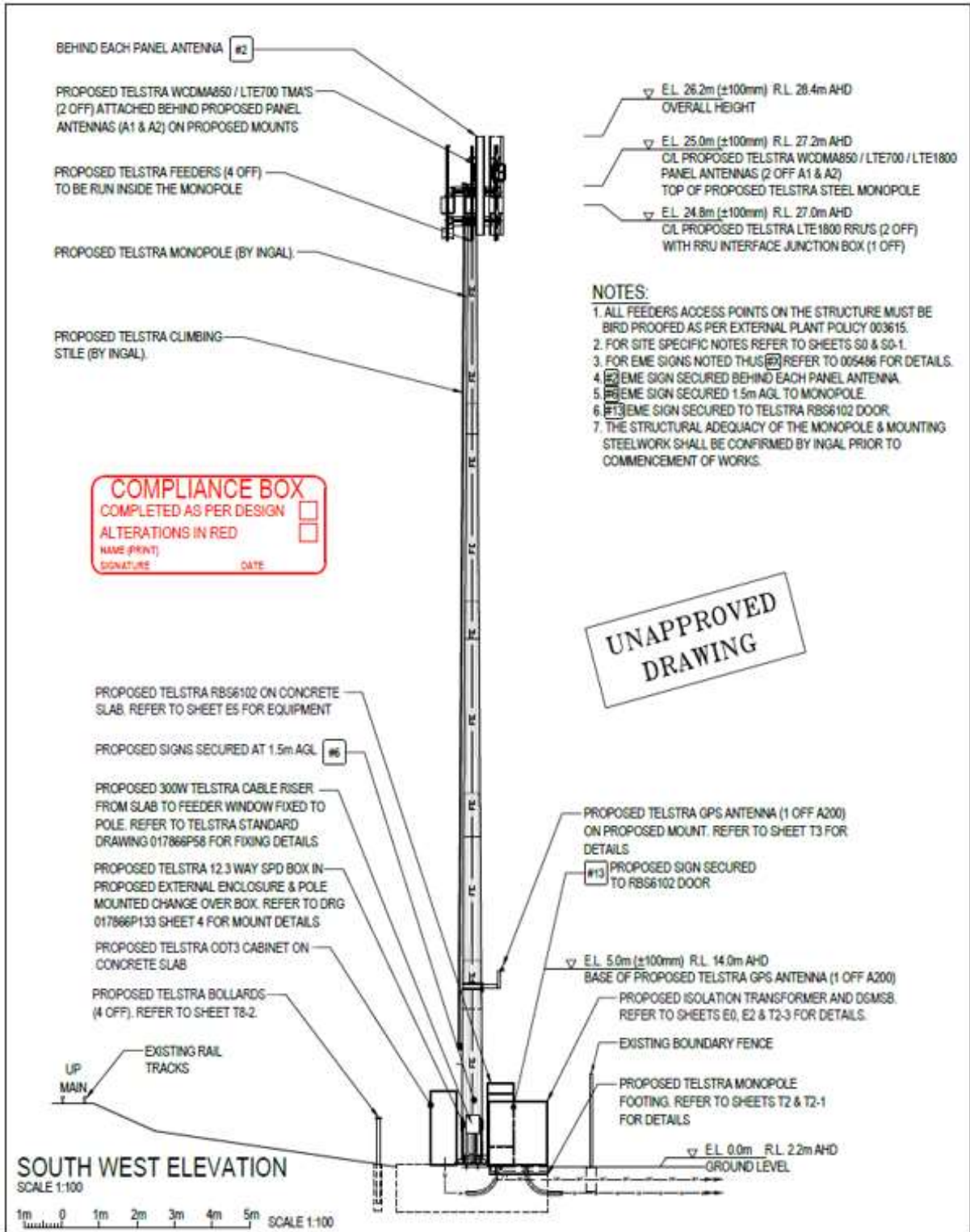


Figure 6 – Proposed tower

History

History Prior to Application

Both the Federal and NSW governments have allocated funding and conducted expressions of interest for tenders to improve mobile phone coverage for train commuters between Sydney and Newcastle. As part of this process Telstra was awarded the contract to carry out the project. The current application for a telecommunications tower which has been proposed is one of 15 towers received by Central Coast Council which together forms part of this project (note, the particular project relates to 15 communications towers within the rail corridor, there are other communications towers which have been proposed in addition to the 15 within the rail corridor).

Application History

The proposal (as originally submitted) proposed a telecommunications tower measuring 31.5m in total height and located approximately 44m southwest of the current proposed location (see figure 7). The application was notified from 6 June 2019 until 21 June 2019. During the notification period 16 submissions and a petition were received. Due the number of issues raised during notification of the proposal (including view loss), the applicant amended the proposed development to:

- Reduce the total height of the tower; and
- Alter the location of the tower to make better use of vegetation screening available (slightly north of the initial proposed location)

Following these amendments the application was notified a second time from 5 September until 19 September 2020. The second round of notification included additional properties to the north which were not part of the first round of notification due to the relocation of the tower further north. A total of 12 submissions were received and a petition with more than 50 signatures to this second notification period.

It is this second (revised) development proposal that this the subject of this assessment report.



Figure 7 – Altered tower location

Assessment:

Having regard for the matters for consideration detailed in Section 4.15 of the Environmental Planning and Assessment Act 1979 and other statutory requirements, the assessment has identified the following key issues, which are elaborated upon for the information of the Local Planning Panel:

Provisions of Relevant Instruments/Plans/Policies:

State Environmental Planning Policy (Infrastructure) 2007

The SEPP (Infrastructure 2007) provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process.

Infrastructure SEPP, Division 15 – Development in Rail Corridor

Division 15 of the *State Environmental Planning Policy (Infrastructure) 2007* applies to any development that is in or adjacent to rail corridors which includes the proposal. Under Division 15, clause 86 specifies that the consent authority must not grant consent to development involving penetration of ground within a rail corridor without the concurrence of the rail authority of the rail corridor to which the development relates. In this instance the application had been referred to Sydney Trains as the concurrence agency and concurrence was received on 3 March 2020 (refer to Attachment 4). The General Terms of Agreement is included in the draft conditions of consent.

Infrastructure SEPP, Division 21 – Telecommunications Facilities

Division 21 of the *Infrastructure SEPP* applies to telecommunications and other communication facilities, establishing the approval regimes for telecommunications in NSW.

Division 21 classifies certain telecommunications development that is permitted either without consent, with consent, or exempt from local environmental approvals. Reference is made to clause 115 (1), which states:

'Development for the purposes of telecommunications facilities, other than development in clause 114, may be carried out by any person with consent on any land.'

The Infrastructure SEPP defines a *'telecommunications facility'* (Clause 113) as:

'Telecommunications facility is defined to mean:

- (a) any part of the infrastructure of a telecommunications network, or*
- (b) any line, cable, optical fibre, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network.'*

The provisions of clauses 113 and 115 are being relied upon for permissibility of the proposed development at the subject location and are the basis for lodging and seeking Council consent for this development.

The proposed telecommunications tower is permitted with development consent by virtue of the provisions of *State Environmental Planning Policy (Infrastructure) 2007*.

Telecommunications Facility Guidelines

Under Division 21, clause 115 requires the consent authority to take into consideration any guidelines concerning site selection, design, construction or operating principles for telecommunications facilities that are issued by the Secretary for the purpose of the clause. In this instance the NSW Telecommunications Facilities Guideline Including Broadband 2010 is one such guideline that applies to the proposal and must be considered.

The aim of the NSW Telecommunications Facilities Guideline Including Broadband 2010 is to provide a guide to the State-wide planning provisions and development controls for telecommunication facilities in NSW contained in the *State Environmental Planning Policy (Infrastructure) 2007*.

The proposal has been considered for consistency with the relevant guideline principles as follows:

3.1

**DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

Assessment of the Telecommunications Facilities Guideline including Broadband (2010) Principles		
Principle 1: A telecommunications facility is to be designed and sited to minimise visual impact		
Specific Principles	Comment	Consistent
a. As far as practical, a telecommunications facility that is to be mounted on an existing building or structure should be integrated with the design and appearance of the building or structure.	This principle is not applicable to the application as the facility is not attached to an existing building.	NA
b. The visual impact of telecommunications facilities should be minimised, visual clutter is to be reduced particularly on tops of buildings, and their physical dimensions (including support mounts) should be sympathetic to the scale and height of the building to which it is to be attached, and sympathetic to adjacent buildings.	This principle is not applicable to the application as the facility is not attached to an existing building.	NA
c. Where telecommunications facilities protrude from a building or structure and are predominantly backgrounded against the sky, the facility and their support mounts should be either the same as the prevailing colour of the host building or structure, or a neutral colour such as grey should be used.	This principle is not applicable to the application as the facility is not attached to an existing building.	NA
d. Ancillary facilities associated with the telecommunications facility should be screened or housed, using the same colour as the prevailing background to reduce its visibility, including the use of existing vegetation where available, or new landscaping where possible and practical.	The ancillary facilities are to be colour matched with the existing background.	Yes
e. A telecommunications facility should be located and designed	This principle is not applicable to the application as the facility will not be in a rural setting.	NA

3.1

**DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

	to respond appropriately to its rural landscape setting.		
f.	A telecommunications facility located on, or adjacent to, a State or local heritage item or within a heritage conservation area, should be sited and designed with external colours, finishes and scale sympathetic to those of the heritage item or conservation area.	This principle is not applicable to the application as the facility is not located within or nearby to a heritage item.	NA
g.	A telecommunications facility should be located so as to minimise or avoid the obstruction of a significant view of a heritage item or place, a landmark, a streetscape, vista or a panorama, whether viewed from public or private land.	The location of the tower may have an impact on significant views however it has been reasonably designed and located to minimise any significant views. Through the assessment process the applicant sought to relocate the tower slightly and reduce it's height so as to minimise impact on views.	Yes
h.	The relevant local government authority must be consulted where the pruning, lopping, or removal of any tree or other vegetation would contravene a Tree Preservation Order applying to the land or where a permit or development consent is required.	Minimal vegetation may be removed as part of a recommended Asset Protection Zone made by the Rural Fire Service and adopted by Council. Council has assessed this and deemed the minimal vegetation removal as acceptable.	Yes
i.	A telecommunications facility that is no longer required is to be removed and the site restored, to a condition that is similar to its condition before the facility was constructed.	A condition has been included to remove the facility and restore the site to a condition similar to its condition before construction when the facility is no longer required.	Yes
j.	The siting and design of telecommunications facilities should be in accordance with any relevant Industry Design Guides.	The siting and design is considered to be in accordance with the relevant Industry Design Guides.	Yes
Principle 2: Telecommunications Facilities should be co-located wherever practical			
a.	Telecommunications lines are to be located, as far as practical, underground or within an existing underground conduit or duct.	The installation of telecommunications lines will be underground.	Yes

3.1

**DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

b. Overhead lines, antennas and ancillary telecommunications facilities should, where practical, be co-located or attached to existing structures such as buildings, public utility structures, poles, towers or other radiocommunications equipment to minimise the proliferation of telecommunication facilities and unnecessary clutter.	This principle is not applicable to the application as there are no possible co-location opportunities.	NA
c. Towers may be extended for the purposes of co-location.	The proposed development does not propose an extension to an existing tower.	NA
d. The extension of an existing tower must be considered as a practical co-location solution prior to building new towers.	The applicant has indicated that co-location is not available in this location, as there are no other suitably located towers/facilities	NA
e. If a facility is proposed not to be co-located the proponent must demonstrate that co-location is not practicable.	The application is accompanied by adequate reasoning explaining why co-location is not adequate.	Yes
f. If the development is for a co-location purpose, then any new telecommunications facility must be designed, installed and operated so that the resultant cumulative levels of radio frequency emissions of the co-located telecommunications facilities are within the maximum human exposure levels set out in the Radiation Protection Standard. Note: Co-location is 'not practicable' where there is no existing tower or other suitable telecommunications facility that can provide equivalent site technical specifications including meeting requirements for coverage objectives, radio traffic capacity demands and sufficient call quality.	This principle is not applicable to the application as there are no possible co-location opportunities.	NA
Principle 3: Health standards for exposure to radio emissions will be met.		
a. A telecommunications facility must be designed, installed and	The proposed telecommunications facility will be designed, installed	Yes

3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

<p>operated so that the maximum human exposure levels to radiofrequency emissions comply with Radiation Protection Standard.</p>	<p>and operated in a way which complies with the standard.</p>	
<p>b. An EME Environmental Report shall be produced by the proponent of development to which the Mobile Phone Network Code applies in terms of design, siting of facilities and notifications. The Report is to be in the format required by the Australian Radiation Protection Nuclear Safety Agency. It is to show the predicted levels of electromagnetic energy surrounding the development comply with the safety limits imposed by the Australian Communications and Media Authority and the Electromagnetic Radiation Standard, and demonstrate compliance with the Mobile Phone Networks Code.</p>	<p>The EME report has been produced in accordance with the format required by ARPANSA. The report has been reviewed by Council's environmental Health Officer who raises no objection.</p>	<p>Yes</p>
<p>Principle 4: Minimise disturbance and risk, and maximise compliance</p>		
<p>a. The siting and height of any telecommunications facility must comply with any relevant site and height requirements specified by the <i>Civil Aviation Regulations 1988</i> and the <i>Airports (Protection of Airspace) Regulations 1996</i> of the Commonwealth. It must not penetrate any obstacle limitation surface shown on any relevant Obstacle Limitation Surface Plan that has been prepared by the operator of an aerodrome or airport operating within 30 kilometres of the proposed development and reported to the Civil Aviation Safety Authority Australia.</p>	<p>The proposal is not within an area impacted by an airport or subject to obstacle height limitations.</p>	<p>NA</p>

3.1

**DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

b. The telecommunications facility is not to cause adverse radio frequency interference with any airport, port or Commonwealth Defence navigational or communications equipment, including the Morundah Communication Facility, Riverina.	The base station is designed to create no electrical interference problems with other radio based systems	Yes
c. The telecommunications facility and ancillary facilities are to be carried out in accordance with the applicable specifications (if any) of the manufacturers for the installation of such equipment.	The base station facilities are designed and will be installed in accordance with any relevant manufacturer specifications. The proposal will also comply with the requirements of all relevant AS.	Yes
d. The telecommunications facility is not to affect the structural integrity of any building on which it is erected.	The proposal will not be erected on any building.	NA
e. The telecommunications facility is to be erected wholly within the boundaries of a property where the landowner has agreed to the facility being located on the land.	The proposal will be located wholly within the site where owners consent has been given.	Yes
f. The carrying out of construction of the telecommunications facilities must be in accordance with all relevant regulations of the Blue Book – ‘Managing Urban Stormwater: Soils and Construction’ (Landcom 2004), or its replacement.	The carrying out of construction of the telecommunications facilities will be in accordance with all relevant regulations of the Blue Book	Yes
g. Obstruction or risks to pedestrians or vehicles caused by the location of the facility, construction activity or materials used in construction are to be mitigated.	The proposal will be located away from pedestrian or vehicle access.	Yes
h. Where practical, work is to be carried out during times that cause minimum disruption to adjoining properties and public access. Hours of work are to be restricted to between 7.00am and 5.00pm, Mondays to Saturdays, with no work on Sundays and public holidays.	Conditioned to comply.	Yes

3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

i. Traffic control measures are to be taken during construction in accordance with <i>Australian Standard AS1742.3-2002 Manual of uniform traffic control devices – Traffic control devices on roads.</i>	Conditioned to comply.	Yes
j. Open trenching should be guarded in accordance with <i>Australian Standard Section 93.080 – Road Engineering AS1165 – 1982 – Traffic hazard warning lamps.</i>	Conditioned to comply.	Yes
k. Disturbance to flora and fauna should be minimised and the land is to be restored to a condition that is similar to its condition before the work was carried out.	Minimal disturbance to flora and fauna is expected. No native flora or fauna will be impacted.	Yes
l. The likelihood of impacting on threatened species and communities should be identified in consultation with relevant state or local government authorities and disturbance to identified species and communities avoided wherever possible.	No native flora or fauna will be impacted.	Yes
m. The likelihood of harming an Aboriginal Place and / or Aboriginal object should be identified. Approvals from the Department of Environment, Climate Change and Water (DECCW) must be obtained where impact is likely, or Aboriginal objects are found.	A search of the AHIMS data base has been completed and it indicates that there are no items of Aboriginal archaeological heritage known to be located on, or in the vicinity of, the site	Yes
n. Street furniture, paving or other existing facilities removed or damaged during construction should be reinstated (at the telecommunications carrier's expense) to at least the same condition as that which existed prior to the telecommunications facility being installed.	Any damage to the area surrounding or associated with the facility will be reinstated to its prior condition.	Yes

It is the opinion of Council that the proposal is considered compatible with the principles outlined in the guideline and therefore deemed acceptable in this instance.

State Environmental Planning Policy (Coastal Management) 2018

The provisions of *State Environmental Planning Policy (Coastal Management) 2018* requires Council consider the aims and objectives of the SEPP when determining an application within the Coastal Management Area. The Coastal Management Area is an area defined on maps issued by the NSW Department of Planning & Environment and the subject property falls within this zone (see figure 8).



Figure 8 – Coastal Management Area

SEPP Coastal Management, Division 3 Coastal environment area

Clause 13 of the Coastal Management SEPP deals with land in the coastal environmental area

'13 Development on land within the coastal environment area

(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,*
- (b) *coastal environmental values and natural coastal processes,*

- (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,*
- (d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*
- (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,*
- (f) Aboriginal cultural heritage, practices and places,*
- (g) the use of the surf zone.*

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), or*
 - (b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
 - (c) if that impact cannot be minimised—the development will be managed to mitigate that impact.*
- (3) This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.'*

Council officers have made an assessment of these provisions as follows: The proposed development does not cause an adverse impact on the matters required to be considered under Clause 13 (1) (a) – (g) or Clause 13 (2) (a) – (c) of SEPP (Coastal Management) 2018, as follows:

- The proposed development has no adverse impact on the integrity or resilience of the biophysical, hydrological or ecological environment;
- The proposed development has no adverse impact upon coastal environmental values or natural coastal processes;
- The proposed development has no adverse impact on the water quality of the marine estate;
- The proposed development has no adverse impact on marine vegetation; native vegetation/fauna and their habitats; undeveloped headlands; or rock platforms;
- The proposed development has no adverse impact on the public amenity of any existing public open space or public access to the coastal foreshore;
- The proposed development has no adverse impact on Aboriginal cultural heritage, practices or places; and
- The proposed development is far removed from the “surf zone” and does not adversely impact its use by the public.

SEPP Coastal Management, Division 4 Coastal use area

Clause 14 of the Coastal Management SEPP deals with land in the 'coastal area'

14 Development on land within the coastal use area

(1) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority—

(a) 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,*
- (ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,*
- (iii) the visual amenity and scenic qualities of the coast, including coastal headlands,*
- (iv) Aboriginal cultural heritage, practices and places,*
- (v) cultural and built environment heritage, and*

(b) is satisfied that—

- (i) the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*
- (ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
- (iii) if that impact cannot be minimised—the development will be managed to mitigate that impact, and*

(c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.

(2) This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.'

The proposed development does not cause adverse impact on the matters required to be considered under Clause 14 (1) (a) – (b) or clause 2 of SEPP (Coastal Management) 2018, as follows:

- The proposed development will not cause an adverse impact to access along the foreshore, beach, headland or rock platform
- The proposed development will not cause overshadowing, wind funneling or loss of view from a public place

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- The proposal has been designed and located to minimize visual amenity and scenic qualities to the most maximum extent possible
- The proposal will not cause an adverse impact to Aboriginal cultural heritage or cultural and built environment heritage

SEPP Coastal Management. Division 5 – General

The following provisions of Division 5 of SEPP (Coastal Management) 2018 apply to the consent authority's consideration of a development application on the subject land:

15 Development in coastal zone generally—development not to increase risk of coastal hazards

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.

16 Development in coastal zone generally—coastal management programs to be considered

Development consent must not be granted to development on land within the coastal zone unless the consent authority has taken into consideration the relevant provisions of any certified coastal management program that applies to the land.

Due to its location which is not in close proximity to the coastal foreshore, the subject land is not subject to increased risk of coastal hazards and is not subject to any certified coastal management program. The proposed development will not therefore cause increased risk of coastal erosion.

Gosford Local Environmental Plan 2014

Zoning and Permissibility

The subject site is zoned SP2 Infrastructure under the *Gosford Local Environmental Plan 2014* (GLEP 2014) as shown in Figure 8.

As previously noted, the proposed development relies on the provisions of *State Environmental Planning Policy (Infrastructure) 2007* for permissibility. Clause 115(1) of the Infrastructure SEPP provides that:

Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under 20 or 116, may be carried out by any person with consent on any land.

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Telecommunications facilities are permissible in all zones within the Central Coast LGA with consent, by virtue of the Infrastructure SEPP.



Figure 9 – Zoning Map (Red dot = tower location)

Zone Objectives

Under the provisions of the Gosford LEP 2014, the objectives for the SP2 INFRASTRUCTURE are:

- *To provide for infrastructure and related uses.*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*
- *To ensure that development is compatible with the desired future character of the zone'*

The proposed development meets the objectives of the zone as detailed below:

The proposal comprises of a piece of infrastructure which provides an essential service to the area. The proposal is compatible with other infrastructure in the area as it is intended to support already existing infrastructure within the area. Although the proposal for a telecommunications tower is part of infrastructure considered essential, it is noted however that required designs for telecommunications towers that are needed for them to carry out their intended purpose makes them difficult to reflect the desired character of the zone. However, in this instance, reasonable effort has been made through the design and location

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of the tower to reduce detrimental impacts on the future desired character of the area where possible.

Gosford LEP 2014 – Clause 7.1 Acid Sulfate Soils

This land has been identified as being affected by the Acid Sulfate Soils Map and the matters contained in clause 7.1 of Gosford Local Environmental Plan 2014 have been considered. The site contains Class 5 Acid Sulfate Soils. In this instance, the proposal works are not considered to impact on Acid Sulfate Soils.

Draft Central Coast Local Environmental Plan

The application has been assessed under the provisions of the draft *Central Coast Local Environmental Plan* (draft CCLEP) publicly exhibited from 6 December 2018 to 28 February 2019 with respect to zoning, development standards and special provisions.

Under the draft CCLEP the subject land will remain to be zoned SP2 Infrastructure. Permissibility for development within this zone is to remain as per the current applicable Gosford Local Environmental Plan 2014 which permits the proposal with consent of Council.

The proposed development is considered consistent with the draft CCLEP.

Gosford Development Control Plan 2013

An assessment of the proposed development against the relevant chapters of the Gosford Development Control Plan (GDGP 2013) is provided below.

DCP 2.1 Character

The subject site is within the Koolewong 8: Transit Corridor.

The proposal is considered to meet the desired character objectives as follows:

- *This corridor should remain a primary regional and state transit link, where future infrastructure maintains the scenic qualities of frontages that are prominent backdrops to Gosford City's tourist and commuter routes, and where improved standards of scenic-and-urban design quality are achieved.*

Comment: The intention of the proposal is to create a piece of infrastructure which supports the transit corridor through enhancing network coverage of the rail commuter line. The proposed tower has been visually designed in a way that reduces impact to the fullest extent possible without compromising the essential operations of a telecommunications tower.

- *Maintain the informal scenic characters of verges and their surroundings by retaining existing slopes and trees wherever possible, or by contouring cuttings and*

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embankments to complement the landscape character of surrounding scenically-distinctive natural backdrops and revegetating cleared areas to recreate indigenous plant communities. Control noxious or environmental weeds along all road and railway reserves.

Comment: The proposal will be in an area which is accompanied by prominent existing slopes and substantial vegetation. It is acknowledged that the operating nature of the tower requires it to be unobstructed, effectively enabling it to be seen from various backgrounds.

However, it has been designed and located so to best maintain the scenic character of the area, it will also be expected to benefit from the existing slopes and vegetation which will act to mitigate the visual impact of the tower to the area.

- *Around station buildings, promote high levels of visible activity and safety by adopting elements of traditional "main street" shopping villages, with walls of windows and building entrances located to reveal indoor activity, adjoining carparks and set-down areas that are shaded by trees and have effective security lighting. Provide sheltered pedestrian access from surrounding streets and carparks to clearly-identified building entrances along footpaths and verandahs that contribute to the desirable concentration of outdoor activity.*

Comment: The proposal will be located in an area that is void of any station buildings as well as an area where any traditional 'main street' shopping villages of Koolewong could fall prone to any potential impacts as a result of the proposal.

- *Promote a local identity for new buildings by reflecting the modest scale and character of Gosford City's traditional mid-Twentieth Century houses, including walls of windows that are shaded by framed verandahs or exterior sunscreens, a variety of materials and finishes rather than extensive areas of plain masonry or metal cladding, and roofs that are gently-pitched with wide eaves or verandahs to disguise the scale of exterior walls.*

Comment: As the proposal is concerned with a telecommunication tower, application of the local character to the proposal is deemed impractical due to the relatively narrow design options available. However, where possible, reasonable effort has been made to reduce impact to the character of the area.

- *For Infrastructure compounds, provide a screen of shady trees wherever space is available.*

Comment: The proposal will be located on land beside existing rail tracks, in this instance there are no options to provide additional vegetation for screening as potential vegetation could interfere with existing rail infrastructure.

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- *Along significant pedestrian "desire lines", provide crossings above or below the transit corridor located and designed to minimise visual impact and to blend with natural surroundings, as well as providing safe all-weather and after-hours access.*

Comment: The proposal does not warrant inclusion of pedestrian crossings nor is the proposal located nearby to significant pedestrian "desire lines"

DCP 2.2 Scenic Quality

The subject site is located within the Gosford Central Geographic Unit and encompasses the East Gosford, Point Clare/Koolewong Landscape Unit of Chapter 2.2 Scenic Quality of GDCP 2013.

The development consists of older residential suburbs occupying flat to sloping land, urban form density varies according to slope constraints. Overall the proposal will be seen from some surrounding vantage points however the design has led to a reduced bulk and scale which contributes to allowing the proposed tower to have a lowered presence within the Brisbane Water Escarpment.

In this instance the proposal is considered acceptable in regard to the stated objectives of the GDCP 2013 Chapter 2.2 Scenic Quality.

DCP 6.3 Erosion Sedimentation Control

Appropriate siltation control is conditioned.

DCP 6.6 Preservation of Trees or Vegetation

The proposal does not require the removal of any significant native vegetation.

Likely Impacts of the Development:

Built Environment

The subject site is zoned SP2 Infrastructure under the GLEP 2014 which consists of a railway corridor and other associated infrastructure. The site adjoins residential development to the west which comprises of single dwelling developments.

The proposed built form is considered acceptable in the context of the site.

It is acknowledged there will be some impacts to amenity however due to the minimized design of the tower as well as the location of it, any impacts are expected to be at a reduced level.

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A thorough assessment of the impacts of the proposed development on the built environment has been undertaken in terms of the GLEP 2014, GDGP 2013 and applicable codes relevant to telecommunication facilities for compliance. The potential impacts are considered reasonable.

Access and Transport

Access to the proposed tower and all ancillary components will be via the existing Sydney Trains access track on site. This access track is utilised by other trucks and maintenance vehicles relating to the railway line. A truck delivering components of the facility as well as a crane to lift equipment into place will be utilised, any traffic impacts due to construction will be of a short-term duration. The telecommunications facility will be unmanned, of low maintenance and remotely operated, operational visits to the site will be approximately 2-6 times per year.

Context and Setting

The locality is made up of a thin stretch nestled between the Brisbane Water and the Brisbane Water National Park. It comprises of residential zoning made up of single dwelling allotments and infrastructure zoning made up of the train corridor. The zoning of the site is not associated with any specific height controls and allows for the construction of a telecommunications tower. The proposed development is deemed compatible and acceptable in terms of the future character of the area. Some views will be disturbed however a redesign and relocation of the proposal has resulted to ensure the disturbance does not amount to an unreasonable level. This will also result in reduced impacts to the character of the area.

The proposal has been designed to have a reduced impact to the most maximum extent possible and is considered similar to other existing pieces of infrastructure associated with the train corridor located nearby to the proposal. The proposal is an essential piece of infrastructure which will support the objectives of the zone through enhancing the transport corridor by increased network coverage.

Natural Environment

There are no provisions as part of the proposal which have been identified to negatively impact the natural environment.

Bushfire

Following advice from the NSW Rural Fire Service Council, requiring a condition for a minimum 10m asset protection zone to be located around the tower and ancillary equipment. Due to the unique and narrow dimensions of the site, the asset protection zone will be limited by property boundaries (**refer to condition 3.6**). Generally, the proposal meets the aims and objectives of the *Planning for Bushfire Protection 2006*.

Due to the nature of the proposal, further assessment under the *Planning for Bushfire Protection 2006* is not required.

Suitability of the Site for the Development:

A review of Council's records has identified no possible site constraints that could alter the suitability of the site. The location has also been assessed for consistency with the applicable Commonwealth and state planning policies which regulate site selection parameters.

Submissions

The proposed development has been the subject of notification of on two separate occasions:

First Notification Period

In accordance with *Gosford Development Control Plan 2013 (GDGP 2013): Chapter 7.3 Notification of Development Proposals*, the application was publicly exhibited for a period of 14 days from 6 June 2019 until close of business on 21 June 2019. A total of 16 submissions and a petition was received.

In addition to notifying adjoining properties, Council determined the application to be of a significant community interest and therefore elected to notify surrounding land owners in accordance with section 7.3.2.4 of the GDGP 2013. This resulted in the notification process being expanded from the usual practice (ie adjoining and adjacent properties) to include that properties within a 200m radius from the proposal. The decision of a 200m radius was based on the submitted Environmental EME Report that displayed residences up to 200m away as being the most affected by EME. EME was anticipated to be a key concern for the locality. During the notification period Council was made aware that some residents were experiencing difficulties in lodging a submission through the online portal. As a result, all late submissions were then also accepted for consideration.

Second Notification Period

Based on the issues raised during the initial notification period, the applicant amended the proposal (by reducing the overall height of the tower and adjusting the proposed location slightly). The amended proposal was re-notified from 5 September until 19 September in accordance with section 7.3.2.10 of GDGP 2013. Late submissions were also accepted and recorded. A total of 12 submissions were recorded and a second petition, with an excess of 50 signatures.

The issues in the submissions in relation to the proposal are detailed below.

- ***Phone reception existing in the area is adequate and therefore the proposal is not merited***

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Comment: It has been noted that some may not have encountered connection issues. However, the proposal is a result of federal and state governments being made aware that railway commuters have been experiencing mobile connectivity issues. Telstra has specifically identified the need to enhance coverage to rail commuters travelling through Koolewong and the surrounding area. It has also been noted that the proposal can also be viewed in part as a response to increased demand on the existing network as well as expected future demand. Additionally, the proposal is expected to enhance safety through additional network coverage of the Brisbane Water.

- ***The chosen site for the tower is not appropriate and a more suitable site be chosen instead.***

Comment: The application had been submitted with supporting information concerning the site selection which is a process also required under Federal and State regulation. Options for co-location, greenfield candidates and other opportunities that did not diverge from the intended purpose of the application were considered. Due to the recognizable site constraints of the narrow Koolewong stretch as well as the specific target coverage area the tower is set out to achieve, the chosen site has been recognized as most suitable. It is noted that should the location of the tower be altered to a less favorable location the target coverage may risk not being achieved which would require an additional tower to make up for any possible short comings in network coverage within the area.

- ***The proposal is not in keeping with the desired character of the area***

Comment: The proposal will be situated within the *Koolewong 8: Transit Corridor*. Compatibility with the desired character of the area is as follows:

- ***This corridor should remain a primary regional and state transit link, where future infrastructure maintains the scenic qualities of frontages that are prominent backdrops to Gosford City's tourist and commuter routes, and where improved standards of scenic-and-urban design quality are achieved.***

Comment: The intention of the proposal is to construct a piece of infrastructure that is considered essential and supports the transit corridor through enhancing network coverage of the rail commuter line. The proposed tower has been visually designed in a way that reduces impact to the fullest extent possible without compromising the essential operations required of a telecommunications tower.

- ***Maintain the informal scenic characters of verges and their surroundings by retaining existing slopes and trees wherever possible, or by contouring cuttings and embankments to complement the landscape character of surrounding scenically-distinctive natural backdrops and revegetating cleared areas to recreate indigenous plant communities. Control noxious or environmental weeds along all road and railway reserves.***

Comment: The proposal will be in an area which is accompanied by prominent existing slopes and substantial vegetation. It is acknowledged that the nature of operation of the tower requires it to be unobstructed, effectively enabling it to be seen from various backgrounds. However, it has been designed and located so to best maintain the scenic character of the area, it will also be expected to benefit from the existing slopes and vegetation which will act to mitigate the vertical visual impact of the tower to the area. While the proposal may have a presence in the backdrop to the Brisbane Water for residents living along Glenrock Parade, the tower will make use of vegetation which exists between Glenrock Parade and the proposal itself which screens the lower portions of the tower. Furthermore, the design of the tower 'crown' which is expected to remain visible in the backdrop from Glenrock Parade and will be above any vegetation is of a slender design and considered to be minimal in bulk and scale. In addition, the tower will consist of only two antennas mounted close to the pole. As a result, the tower is expected to achieve a minimal and reasonable impact to the natural backdrop of the Brisbane Water.

- ***Concern regarding the location and impact upon the character of the area.***

Comment: The proposal will be located in an area that is void of any station buildings as well as an area where any traditional 'main street' shopping villages of Koolewong could fall prone to any potential impacts as a result of the proposal.

As the proposal is concerned with a telecommunication tower, application of the local character to the proposal is deemed impractical due to the relatively narrow design options available for telecommunication towers and the specific character objectives of the area which restrict a direct and proper assessment of the proposal. However, where possible, reasonable effort has been made to reduce impact to the character of the area. Given that the area is already associated with a substantial amount of essential infrastructure that relates to the rail corridor, the proposal can be considered as in line with its surrounds. Specifically, when considering other similar structures already existing in the area including radio communication towers such as that in figure 10 which is located at a nearby site in the rail corridor in Koolewong. As a result, it can be reasonably concluded in this instance that the proposal does not unreasonably detract from the character of the area.



Figure 10 – Nearby Sydney Trains Radio Tower at Lot: 110 DP: 1184633

- ***Is it possible to provide a screen of shady trees wherever space is available.***

Comment: The proposal will be located on land beside existing rail tracks, in this instance there are no options available to provide additional vegetation for screening as potential vegetation could interfere with existing rail infrastructure.

- ***Possibility to provide pedestrian crossing?***

Comment: The proposal does not warrant inclusion of pedestrian crossings nor is the proposal located nearby to significant pedestrian “desire lines”.

Visual Impacts of the proposed tower

The proposal originally consisted of a telecommunications tower measuring 31.5m in total height and located approximately 44m southwest of the current proposed location (see figure 1). During the first round of notification impacts to view loss was raised as a key concern, it was noted that the properties between 256 and 272 Glenrock Parade enjoy varying levels of views of The Brisbane Water which would be interfered with by the proposal.

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The properties of 256, 258 and 260 Glenrock Parade however gained more specific attention due the location of the tower being directly in front of these properties and due to the location of these properties along Glenrock Parade also coinciding with a diminished level of vegetation between them and The Brisbane Water. This differs to the other properties along Glenrock Parade which are accompanied by more significant vegetation (see figures 11 and 12) and therefore a reduced view. The three properties were identified as enjoying a more pronounced view of The Brisbane Water but would also be the most impacted as a result of the proposal. Council received a drafted montage from an objector which displayed an example of how the tower could impact views when at the proposed location (see figure 13). Although acknowledged to not be the exact result of the proposal Council concluded the possible impact conveyed in the montage as well as the general concerns regarding views sustained by and unique to 256-260 Glenrock Parade as a result of the location of the proposal as unreasonable.

In response to community consultation and feedback as well as Council's request to explore additional options the proposal had been revised by the applicant and resulted in a relocation (see figure 1) to make better use of vegetation screening existing further north along Glenrock Parade. It was acknowledged that despite this the top of the tower would remain to be seen from various directions including from properties along Glenrock parade. However, in an effort to reduce view impacts the tower was also reduced in height by 5.3m to better accommodate concerns previously raised. These amendments were deemed as more acceptable by Council.

Notwithstanding, it is acknowledged that visual impacts of a telecommunications tower can be attributed to two characteristics, that are:

- They are structures which generally protrude above other structures; and
- They need to be located at a suitable height in order to operate effectively.

These characteristics are unavoidable and are not considered as reasons to warrant refusal of the application as per the case of *Telstra Corporation Limited v Palerang Council [2009] NSWLEC 1391*. It is concluded and recognised that one may still be able to see the tower from a distance, however at the same time the level of visual impact is not unreasonably visually intrusive.

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Figure 11 – View from Glenrock Parade in front of 258 Glenrock Parade looking south east.



Figure 12 – View from Glenrock Parade in front of 258 Glenrock Parade looking north east



Figure 13 – objector drafted montage of potential impact as result of proposal in original location

- **Health concerns relating to EME**

The applicant has submitted an Environmental Electromagnetic Energy report which provides a summary of levels of radiofrequency electromagnetic energy (RF EME) around the proposed telecommunications tower. The report states that the levels have been calculated via methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The report shows the maximum level of EME calculated to be 0.63% of the maximum 100% of the public exposure limit. The report has been reviewed by Council's Environmental Health Officer who is in support of the application subject to relevant conditioning.

The EME emissions from mobile phone base stations and other communications installations are regulated by the Australian Communications and Media Authority (ACMA). The ACMA's regulatory arrangements require base stations to comply with the exposure limits in the ARPANSA RF Standard. The ARPANSA Standard is designed to protect people of all ages and health status against all known adverse health effects from exposure to RF EME. The ARPANSA Standard is based on scientific research that shows the levels at which harmful effects occur and it sets limits, based on international guidelines, well below these harmful levels.

It is acknowledged that there is some community fear and perceptions surrounding health associated with EME as well as community questioning of the standards in place. It is not

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appropriate however for Council or for a court to question, aside or disregard the authoritative or credible standard set out by the ARPANSA, this is stated in the Land and Environment Court in the case of *Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133*. It is neither appropriate for new standards be set up by Council as the creation of new standards is the responsibility of other federal authorities that have the expertise such as the ARPANSA. In this instance, the proposal meets the standards set by the ARPANSA.

Internal Consultation

The development application was referred to the following internal officers for comment:

Environment

The objectives of the relevant policies, zoning objectives and potential environmental impacts associated with the proposal have been considered. Council's Environmental Assessment Officer has no objection to the proposal.

Environmental Health

Council's Environmental Health Officer has reviewed the applicant and provides the following comments:

Radio Frequency Electromagnetic Emissions (RF EME) Exposure

The proposed is located approximately 28m from a child's play park on Brisbane Water Drive and 68m to the nearest residential dwelling.

The PAR has been prepared generally in accordance with the requirements set out in the Industry Code C564:2018 Mobile Phone base Station Deployment ("the Code") (Communications Alliance Ltd) and NSW Telecommunications Facilities Guideline including Broadband ("the Guidelines") (NSW Government, 2010). The Code and Guidelines outline specific requirements for site selection, design, construction and operation, including providing an EME Environmental Report in the format provided by the Australian Radiation Protection and Nuclear Safety Agency (ARPNSA) to demonstrate predicted levels of electromagnetic energy surrounding the development comply with the safety limits imposed by the Australian Communications and Media Authority (ACMA) and the Electromagnetic Radiation Standard (2002).

The proposal includes an EME Environmental Report with the development application. The maximum EME level calculated for the proposed is 147m from the location is 0.63% out of 100% of the public exposure limit of the ARPNSA EME Standard.

The Environment and Public Health team met with the RF Engineers for the proposed to better understand the Environmental EME Report and has concluded the Environmental EME report provides sufficient calculations of potential EME exposure for the public living

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within close proximity to the proposed. The 'Calculated EME levels at other areas of interest' table provides calculations at specific residences that are elevated above the height of the base of the antenna structure. The RF Engineers explained the height range (0-6m) in this table is indicative of a 1-2 story dwelling, where 0m represents the ground level of a dwelling and 6m represents the top of the dwelling. Additionally, the project managers explained these telecommunications towers are designed to service customers in the rail corridor and as such the antennas will be positioned facing up and down the rail corridor, not towards the residential dwellings to the west of the proposed tower.

The maximum cumulative EME level calculated at specific location is at residence 264 Glenrock Parade being 0.66% out of 100% of the public exposure limit of the ARPNSA EME Standard. This is an acceptable calculation as it is well below the maximum exposure standard of the ARPNSA EME standard. Accordingly, the Environment and Public Health team has no concerns in relation to public exposure limits to EME.

The Environmental EME Report indicates the proposed will accommodate 3G and 4G systems. Any upgrading of the tower in the future to accommodate future systems (such as 5G) will require an amended Environmental EME Report to be submitted to Council. Condition applied.

The proposal also provides additional safeguards to limit EME exposure by limiting public access to the monopole and equipment cabinet by installation of anti-climbing devices on the tower and locking devices on the cabinet. The appropriate EME signage is also proposed to be displayed.

Conditions of consent for ongoing operation are limited as the ACMA regulates EME from mobile base stations by imposing conditions on the radiocommunications licences it issues to mobile telecommunications carriers. A licensee must satisfy all conditions of the licence, including those relating to EME.

- *Recreation Passive Parks*

Supported without Conditions.

External Consultation

- *Roads & Maritime Services*

Supported without Conditions

- *NSW Rural Fire Service*

Supported subject to Conditions

- *Sydney Trains*

Sydney Trains provided concurrence on 3 March 2020 (refer to attachment 4), in summary below:

'Council is advised that Sydney Trains, via Instruments of Delegation, has been delegated to act as the rail authority for the Central Coast and Newcastle rail corridor and to process the concurrence for this development application.

As such, Sydney Trains now advises that the proposed development has been assessed in accordance with the requirements of Clause 86(4) being:

a) the potential effects of the development (whether alone or cumulatively with other development or proposed development) on: i) the safety or structural integrity of existing or proposed rail infrastructure facilities in the rail corridor, and

ii) the safe and effective operation of existing or proposed rail infrastructure facilities in the rail corridor, and

b) what measures are proposed, or could reasonably be taken, to avoid or minimise those potential effects.

*In this regard, Sydney Trains has taken the above matters into consideration and has decided to grant its concurrence to the development proposed in development application **DA56560/2019** subject to Council imposing the operational conditions listed in Attachment A that will need to be complied with.'*

The conditions set out by Sydney Trains have been included in the recommended conditions of consent.

Any Submission made in Accordance with this Act or Regulations

Submissions received in relation to the proposal have been considered within this report and are outlined above.

The Public Interest:

The approval of the application is considered to be in the public interest.

The proposal is a piece of essential infrastructure aimed at providing enhanced network coverage for tens of thousands of train commuters travelling within the Central Coast area each day.

The proposal is designed to the most maximum extent possible that achieves consistency with the desired future character of the area and result in the lowest visual impact achievable to surrounding areas.

Ecologically Sustainable Principles:

The proposal has been assessed having regard to ecologically sustainable development principles and is considered to be consistent with the principles.

The proposed development is considered to incorporate satisfactory stormwater, drainage and erosion control and the retention of vegetation where possible and is unlikely to have any significant adverse impacts on the environment and will not decrease environmental quality for future generations. The proposal does not result in the disturbance of any endangered flora or fauna habitats and is unlikely to significantly affect fluvial environments.

Climate Change

The potential impacts of climate change on the proposed development have been considered by Council as part of its assessment of the application.

This assessment has included consideration of such matters as potential sea level; potential for more intense and/or frequent extreme weather conditions including storm events, bushfires, drought, flood and coastal erosion; as well as how the proposed development may cope, combat, withstand these potential impacts. The proposed development is considered satisfactory in relation to climate change.

Other Matters for Consideration:

Telecommunications Act 1997

The *Telecommunications Act 1997* sets up the framework for regulating the actions of telecommunications carriers which includes the installation of any telecommunications facilities. This is achieved through subclause 6(3) of schedule 3 of the act which gives authority to the Telecommunications (Low-impact Facilities) Determination 2018 (TD 2018). The TD 2018 is the instrument containing criteria which specifies when a telecommunications carrier is empowered to undertake any proposed works without approval. In this instance, the proposal is concerned with the installation of a monopole and does not satisfy the criteria specified in the TD 2018, therefore approval is required from the consent authority which in this case is Council.

Under the *Telecommunications Act 1997* the Federal Government established the Telecommunications Code of Practice 1997, which sets out the conditions under which a carrier must operate. Section 2.11 of the Telecommunications Code of Practice 1997 sets out the design, planning and installation requirements for the carriers to ensure the installation of the facilities is in accordance with 'industry best practice'. This is required to:

...minimise the potential degradation of the environment and the visual amenity associated with the facilities. [Section 2.11(3)]

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Best practice also involves the carrier complying with any relevant industry code or standard that is registered by the Australian Communications Authority (ACA) under Part 6 of the Act and includes the Mobile Phone Base Station Deployment Industry Code (C564:2018) (The Deployment Code).

The Deployment Code came into effect 17 December 2018, development of The code has been facilitated by the Communications Alliance through a working committee comprised of representatives from the telecommunications industry and government regulatory agencies and is an ultimate result of intentions of the Commonwealth Parliament as set out under Section 112 of the *Telecommunications Act 1997*. The Deployment Code is designed to:

- Allow the community and councils to have greater participation in decisions made by carriers when deploying mobile phone base stations; and
- Provide greater transparency to local community and councils when a carrier is planning, selecting site for, installing and operating mobile phone radio communications infrastructure.

The proposal has been considered for consistency with the relevant clauses of The Deployment Code as follows:

Assessment of the Mobile Phone Base Station Deployment Industry Code (C564:2018)		
Clause 4.1 Site Selection		
Subclause	Comment	Consistent
4.1.1 The Carrier must have written procedures for site selection for Mobile Phone Radiocommunications Infrastructure in relation to factors contained in clause 4.1.4 and make them available to the public on request.	Written procedures have been developed and will be made available to members of the public on request.	Yes
4.1.2 Once the preferred option has been selected, the Carrier must make available to the public on request, the summary of the sites considered and the reasons for the selection of the preferred option.	The site selection summary will be made available to members of the public on request.	Yes
4.1.3 The Carrier must comply with its procedures as per clause 4.1.1 above.	All procedures have been complied with.	Yes

<p>4.1.4 The Carrier must ensure that its written procedures for new site selection require it to have regard to:</p> <ul style="list-style-type: none"> a) the reasonable service objectives of the Carrier including: <ul style="list-style-type: none"> i. the area the planned service must cover; ii. power levels needed to provide quality of service; iii. the amount of usage the planned service must handle; b) minimisation of EME exposure to the public; c) the likelihood of an area being a community sensitive location; d) the objective of avoiding community sensitive locations; e) relevant state and local government telecommunications planning policies; f) the outcomes of consultation processes with Councils and Interested and Affected Parties as set out in clause 6.4; g) the heritage significance (built, cultural and natural); h) the physical characteristics of the locality including elevation and terrain; 	<p>a) The objective is for increased mobile coverage of the rail corridor through Koolewong.</p> <p>The power levels of Telstra's facilities will be set as low as possible to meet the required service objective. The facilities will also automate their power requirements in response to the demand and number of connections at any one time therefore maximising power efficiency.</p> <p>The proposed base station needs to ensure that long-term, consistent, high quality voice and mobile data services are provided to commuters and waterway users at Koolewong and the surrounding area.</p> <p>b) Antennas will face away from residential areas. The public exposure will be no greater than 0.63%</p> <p>c) Where existing restrictions allow, the proposal has been designed to respond to any community sensitive locations in terms of EME levels and Visual impact.</p> <p>d) Community sensitive locations have been avoided Where existing restrictions allow.</p> <p>e) The relevant State and Local government planning instruments have been considered in regards to the proposal.</p>	<p>Yes</p>
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3.1

**DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

<ul style="list-style-type: none"> i) the availability of land and public utilities; j) the availability of transmission to connect the Mobile Phone Radiocommunications Infrastructure with the rest of the network; k) the radiofrequency interference the planned service may cause to other services; l) the radiofrequency interference the planned service could experience at that location from other services or sources of radio emissions; m) any obligation and opportunities to co-locate facilities; and n) cost factors. 	<ul style="list-style-type: none"> f) All community consultation has been associated with Council's notification procedure as per the code. g) There is no heritage items nearby. h) The rail line is a dominant character of the immediate surrounds with some residential areas nearby which have been considered. i) The proposal is located in an area with access to adequate land and utilities. j) The facility will utilize fiber transmission to obtain connectivity to the surrounding network. k) The proposal is not expected to interfere with any existing services. l) The proposal is not expected to interfere with any existing services. m) there were no possible co-location opportunities found. n) Cost factors are within the normal scope of the proposed facility 	
<p align="center">Clause 4.2 Mobile Phone Radiocommunications Infrastructure Design</p>		
<p>4.2.1 The Carrier must have written procedures for designing Mobile Phone Radiocommunications Infrastructure.</p>	<p>Written procedures have been developed by Telstra.</p>	<p>Yes</p>
<p>4.2.2 The Carrier must comply with its procedures as per clause 4.2.1 above.</p>	<p>Carrier will comply.</p>	<p>Yes</p>
<p>4.2.3 With the objective of minimising unnecessary or incidental RF</p>	<p>a) The primary requirement for the proposal is to deliver 4G services</p>	<p>Yes</p>

3.1

DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

<p>emissions and exposure, the Carrier must ensure that its written procedures for designing Mobile Phone Radiocommunications Infrastructure, require it to have regard to:</p> <ul style="list-style-type: none"> a) the reason for the installation of the infrastructure, considering coverage, capacity and quality; b) the positioning of antennas to minimise obstruction of radio signals; c) the objective of restricting access to areas where RF exposure may exceed limits of the EME standard; d) the type and features of the infrastructure that are required to meet service needs including: <ul style="list-style-type: none"> i. the need for macro, or small scale infrastructure ii. the need for directional or non-directional antennas; e) the objective of minimising power whilst meeting service objectives; and f) whether the costs of achieving this objective are reasonable. 	<p>to rail commuters moving through the Koolewong area, as well as to people using Brisbane Water and the surrounding national park for recreational purposes. The proposal will ensure that Telstra is able to meet its customers' current and growing demand for mobile data devices.</p> <ul style="list-style-type: none"> b) The antennas have been positioned to minimise the obstruction of radio signals as required. c) The proposed monopole includes anti-climbing measures, preventing public access to this area. The equipment cabinet will be securely locked and appropriate EME signage will be placed on the site. The facility is located within the secure Sydney Trains railway corridor. d) (i)-(ii) The site requires 2 panel antennas to meet its coverage objectives. e) Telstra facilities automate power in response to the demand and number of connections. f) The cost of achieving the objectives are reasonable. 	
<p>4.2.4 The Carrier must make site EME assessments for Mobile Phone Radiocommunication Infrastructure in accordance with the ARPANSA prediction methodology and report format</p>	<p>Procedures to be complied with.</p>	<p>Yes</p>

3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

<p>4.2.5 The ACMA may request a copy of the site EME estimate, and the Carrier must provide the estimate to the ACMA within two weeks of the request being made.</p>	<p>Any requests will be complied with within two weeks of the request being made.</p>	<p>Yes</p>
<p>Clause 4.3 Site Operation</p>		
<p>4.3.1 The Carrier must operate their Mobile Phone Radiocommunications Infrastructure in a manner consistent with the objectives in clause 4.2.3.</p>	<p>Carrier is to comply.</p>	<p>Yes</p>
<p>4.3.2 The Carrier must be able to demonstrate compliance with the ACMA regulations regarding maximum human exposure limits for radiofrequency fields.</p>	<p>Carrier is to comply.</p>	<p>Yes</p>
<p>4.3.3 The Carrier must take appropriate measures to restrict general public access to RF hazard areas.</p>	<p>Carrier is to comply.</p>	<p>Yes</p>
<p>4.3.4 For each RF hazard area, the Carrier must ensure warning signs are in place in an appropriate location and manner so that they are clearly visible.</p>	<p>Carrier is to comply.</p>	<p>Yes</p>
<p>4.3.5 In assessing whether measures are appropriate, the Carrier must have regard to:</p> <ul style="list-style-type: none"> a) the kinds of people who may have access to the area; b) the need for physical barriers; c) relevant occupational health and safety requirements; d) the views of the property owner; e) any site changes that have been made; and 	<p>The site is managed by Sydney Trains. Sydney Trains has granted concurrence of the proposal.</p>	<p>Yes</p>

3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane Water Drive, Koolewong (contd)

f) any other matter which may be relevant to ensure site safety with regards to EME.		
4.3.6 The Carrier must ensure that technical staff of the Carrier who may be involved in activities on or adjacent to Mobile Phone Radiocommunications Infrastructure are trained in radio frequency exposure safety.	Carrier is to comply.	Yes
4.3.7 The Carrier must ensure that RF transmission equipment no longer in service does not transmit, or is removed.	Carrier is to comply.	Yes

Development Contributions

The proposed development is a development type that is not subject to section 7.11 development contributions under the Contribution Plan. Therefore, no contributions are applicable.

Water and Sewer Contributions

There are no water and sewer contributions applicable to the proposed development.

Conclusion:

This application has been assessed under the heads of consideration of section 4.15 of the Environmental Planning and Assessment Act 1979 and all relevant instruments and policies. The potential constraints of the site have been assessed and it is considered that the site is suitable for the proposed development. Subject to the imposition of appropriate conditions, the proposed development is not expected to have any adverse social or economic impact. It is considered that the proposed development will complement the locality and meet the desired future character of the area.

Accordingly, it is recommended that Council grant development consent approval to DA54622/2018.

Attachments

- | | |
|------------------------------|-----------|
| 1 Draft conditions | D13929809 |
| 2 Architectural Plans | D13929871 |

**3.1 DA 56560/2019 - Report for Telecommunications Tower, Brisbane
Water Drive, Koolewong (contd)**

3	Revised SEE_new location DA56560 L111 DP1184661 Brisbane Water Drive KOOLEWONG Part 1	ECMD25198647
4	Sydney Trains Concurrence Letter DA56560	D13929840
5	Environmental EME Report DA56560 L111 DP1184661 Brisbane Water Drive KOOLEWONG Part 1	ECMD25198597

DA56560/2019 – Telecommunications Facility
Description of Land – Lot: 111 DP: 1184661, Brisbane Water Drive KOOLEWONG

Draft Conditions of consent

1... PARAMETERS OF THIS CONSENT

1.1. Approved Plans and Supporting Documents

Implement the development substantially in accordance with the plans and supporting documents listed below as submitted by the applicant and to which is affixed a Council stamp "*Development Consent*" unless modified by any following condition.

Architectural Plans by Service Stream Essential Networks

Drawing	Description	Sheets	Issue	Date
N110930	Site Layout and Access	S1	1	18 February 2020
N110930	Enlarged Site Layout	S1-1	1	18 February 2020
N110930	Antenna Layout	S1-2	1	18 February 2020
N110930	South West Elevation	S3	1	18 February 2020

Supporting Documentation

Document	Title	Date
Statement of Environmental Effects	Service Stream Essential Networks	21 August 2019
Environmental EME Report	Telstra	16 August 2019

1.2. Comply with the requirements from the Authorities listed below:

Government Agency / Department / Authority	Title	Date
Sydney Trains	Concurrence including Attachment A (conditions)	3 March 2020

1.3. Carry out all building works in accordance with the Building Code of Australia.

2... PRIOR TO ISSUE OF ANY CONSTRUCTION CERTIFICATE

- 2.1. All conditions under this section must be met prior to the issue of any Construction Certificate.
- 2.2. No activity is to be carried out on-site until the Construction Certificate has been issued, other than:
 - a) Site investigation for the preparation of the construction, and / or
 - b) Implementation of environmental protection measures, such as erosion control and the like that are required by this consent
 - c) Demolition
- 2.3. Compliance with conditions of concurrence issued by Sydney Trains dated 3 March 2020.

3... PRIOR TO COMMENCEMENT OF ANY WORKS

- 3.1. All conditions under this section must be met prior to the commencement of any works.
- 3.2. Appoint a Principal Certifying Authority for the building work:
 - a) The Principal Certifying Authority (if not Council) is to notify Council of their appointment and notify the person having the benefit of the development consent of any critical stage inspections and other inspections that are to be carried out in respect of the building work no later than two (2) days before the building work commences.
 - b) Submit to Council a Notice of Commencement of Building Works or Notice of Commencement of Subdivision Works form giving at least two (2) days' notice of the intention to commence building or subdivision work. The forms can be found on Council's website: www.centralcoast.nsw.gov.au
- 3.3. Erect a sign in a prominent position on any work site on which building, subdivision or demolition work is being carried out. The sign must indicate:
 - a) The name, address and telephone number of the Principal Certifying Authority for the work; and
 - b) The name of the principal contractor and a telephone number at which that person can be contacted outside of working hours; and
 - c) That unauthorised entry to the work site is prohibited.
 - d) Remove the sign when the work has been completed.
- 3.4. Install run-off and erosion controls to prevent soil erosion, water pollution or the discharge of loose sediment on the surrounding land by:
 - a) erecting a silt fence and providing any other necessary sediment control measures that will prevent debris escaping into drainage systems, waterways or adjoining properties, and
 - b) diverting uncontaminated run-off around cleared or disturbed areas, and That unauthorised entry to the work site is prohibited.

- c) preventing the tracking of sediment by vehicles onto roads, and
 - d) stockpiling top soil, excavated materials, construction and landscaping supplies and debris within the lot
- 3.5. Proposed construction shall comply with Sections 3 and 8 (BAL 40) Australian Standard AS3959-2009 'Construction of buildings in bush fire-prone areas' or NASH Standard (1.7.14 updated) 'National Standard Steel Framed Construction in Bushfire Areas -2014' as appropriate and section A3.7 Addendum Appendix 3 of 'Planning for Bushfire Protection 2006'.
- 3.6. At the commencement of building works, and in perpetuity, the area around the facility shall be managed as outlined within section 4.1.3 and Appendix 5 of 'Planning for Bush Fire Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones' as follows:
- Inner Protection Area (IPA) for a distance of 10 metres or to the property boundaries, whichever is the lesser.
- 3.7. Compliance with conditions of concurrence issued by Sydney Trains dated 3 March 2020.

4... DURING WORKS

- 4.1. All conditions under this section must be met during works.
- 4.2. Carry out construction or demolition works during the construction phase of the development only between the hours as follows:
- Monday to Friday 7 am to 6 pm
 - Saturday 8 am to 1 pm
 - No work on Sundays or public holidays
- No construction or demolition works associated with the development are permitted to be carried out at any time on a Sunday or a public holiday.
- 4.3. During the construction phase of the development, if any Aboriginal object (including evidence of habitation or remains), is discovered during the course of the work:
- a) All excavation or disturbance of the area must stop immediately in that area, and
 - b) The Office of Environment and Heritage must be advised of the discovery in accordance with section 89A of the *National Parks and Wildlife Act 1974*.
- Note:** If an Aboriginal object is discovered, an Aboriginal heritage impact permit may be required under the *National Parks and Wildlife Act 1974*.
- 4.4. Implement erosion and sediment control measures and undertake works in accordance with the 'Blue Book' (Managing Urban Stormwater: Soils and Construction, Landcom, 2004).

- 4.5. Implement dust suppression measures on-site during bulk earthworks to suppress dust generated by vehicles and equipment. Dust must also be suppressed at all other stages of construction in order to comply with the Protection of the Environment Operations Act 1997.
- 4.6. Keep a copy of the stamped approved plans on-site for the duration of site works and make the plans available upon request to either the Principal Certifying Authority or an officer of Council.
- 4.7. Vehicles and other equipment to be used on site must be free of soil, seeds and plant material before entering/leaving the site to prevent the spread of exotic plant species and pathogens. Standard hygiene protocols will be used to clean tools and other equipment. All vehicles and machinery must be inspected prior to site entry and those failing inspection are to be sent away for cleaning. Appropriate records of inspections shall be maintained.
- 4.8. Place all building materials, plant and equipment on the site of the development during the construction phase of the development so as to ensure that pedestrian and vehicular access within adjoining public roads, footpaths and reserve areas, is not restricted and to prevent damage to public infrastructure. Further, no construction work is permitted to be carried out within the road reserve unless the works are associated with a separate approval issued under the provisions of the Roads Act 1993.
- 4.9. Any new fencing shall comply with New South Wales Rural Fire Service 'Fast Fact 2/06' for fences and Gates in Bushfire Prone Areas.
- 4.10. Compliance with conditions of concurrence issued by Sydney Trains dated 3 March 2020.
- 4.11. The facility is to be painted a non-reflective light green colour that matches surrounds.

5... PRIOR TO ISSUE OF ANY OCCUPATION CERTIFICATE

- 5.1. All conditions under this section must be met prior to the issue of any Occupation Certificate.
- 5.2. Prior to the occupation or use of the building/structure, an application for an Occupation Certificate for the development must be submitted to and approved by the Principal Certifying Authority. The Occupation Certificate application is to satisfy all of the requirements of the *Environmental Planning and Assessment Regulation 2000*.
- 5.3. Compliance with conditions of concurrence issued by Sydney Trains dated 3 March 2020.

6.. ONGOING OPERATION

- 6.1. Maintain the telecommunications structure in a proper and safe condition at all times.
- 6.2. Maintain the external finishes of the building(s), structures, walls and fences for the life of the development and remove any graffiti within seven (7) days.
- 6.3. Do not give rise to electromagnetic energy emissions greater than the maximum amount specified in the Radiation Protection Series No. 3 Standard by the Australian Radiation Protection and Nuclear Safety Agency.
- 6.4. Any upgrades to the Telecommunications Facility will require an Environmental (EME) report to be submitted and approved by Council.
- 6.5. Compliance with conditions of concurrence issued by Sydney Trains 23 October 2019.

7.. PENALTIES

Failure to comply with this development consent and any condition of this consent may be a **criminal offence**. Failure to comply with other environmental laws may also be a **criminal offence**.

Where there is any breach Council may without any further warning:

- Issue Penalty Infringement Notices (On-the-spot fines);
- Issue notices and orders;
- Prosecute any person breaching this consent, and/or
- Seek injunctions/orders before the courts to retain and remedy any breach.

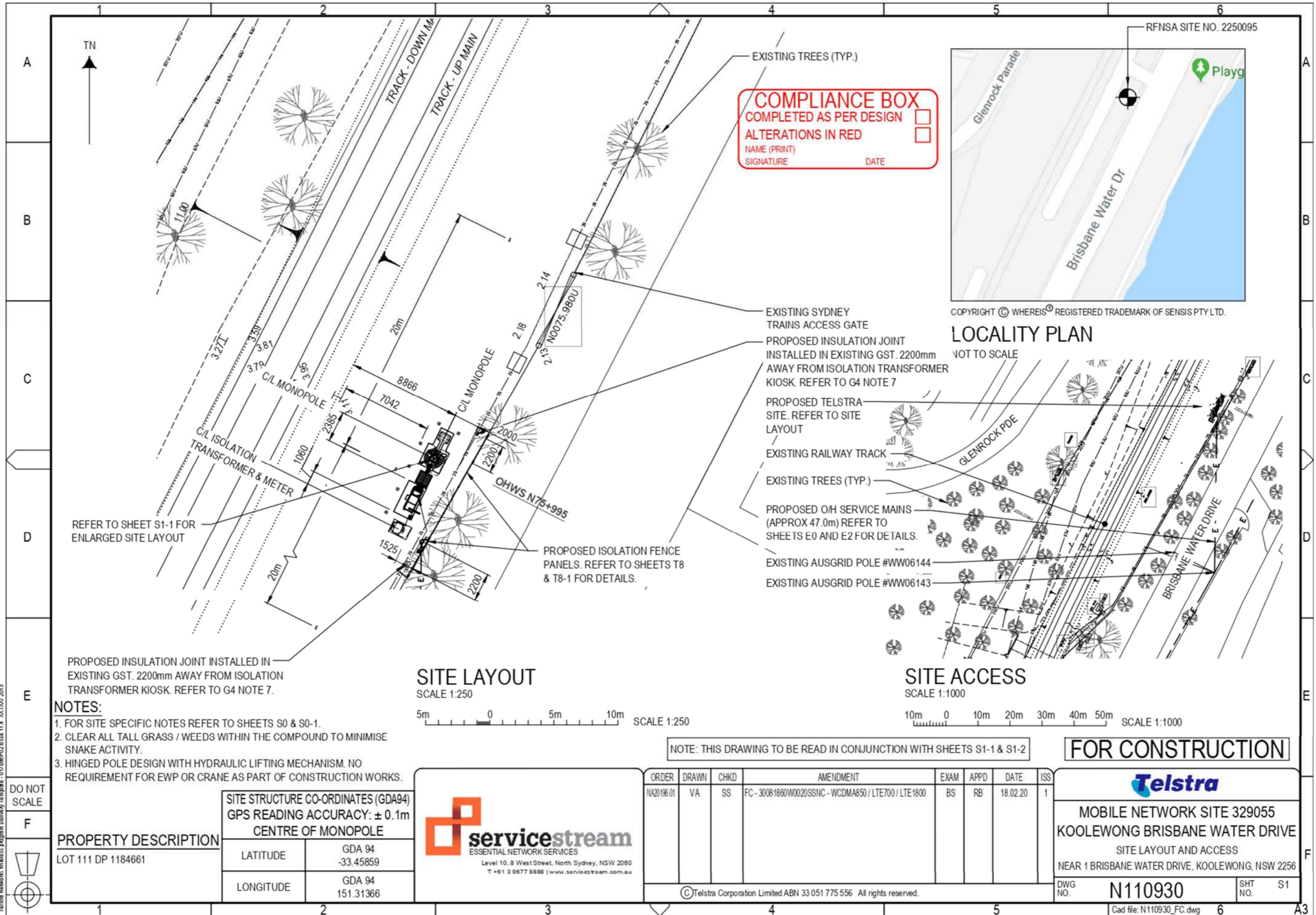
Warnings as to Potential Maximum Penalties

Maximum Penalties under NSW Environmental Laws include fines up to \$1.1 Million and/or custodial sentences for serious offences.

ADVISORY NOTES

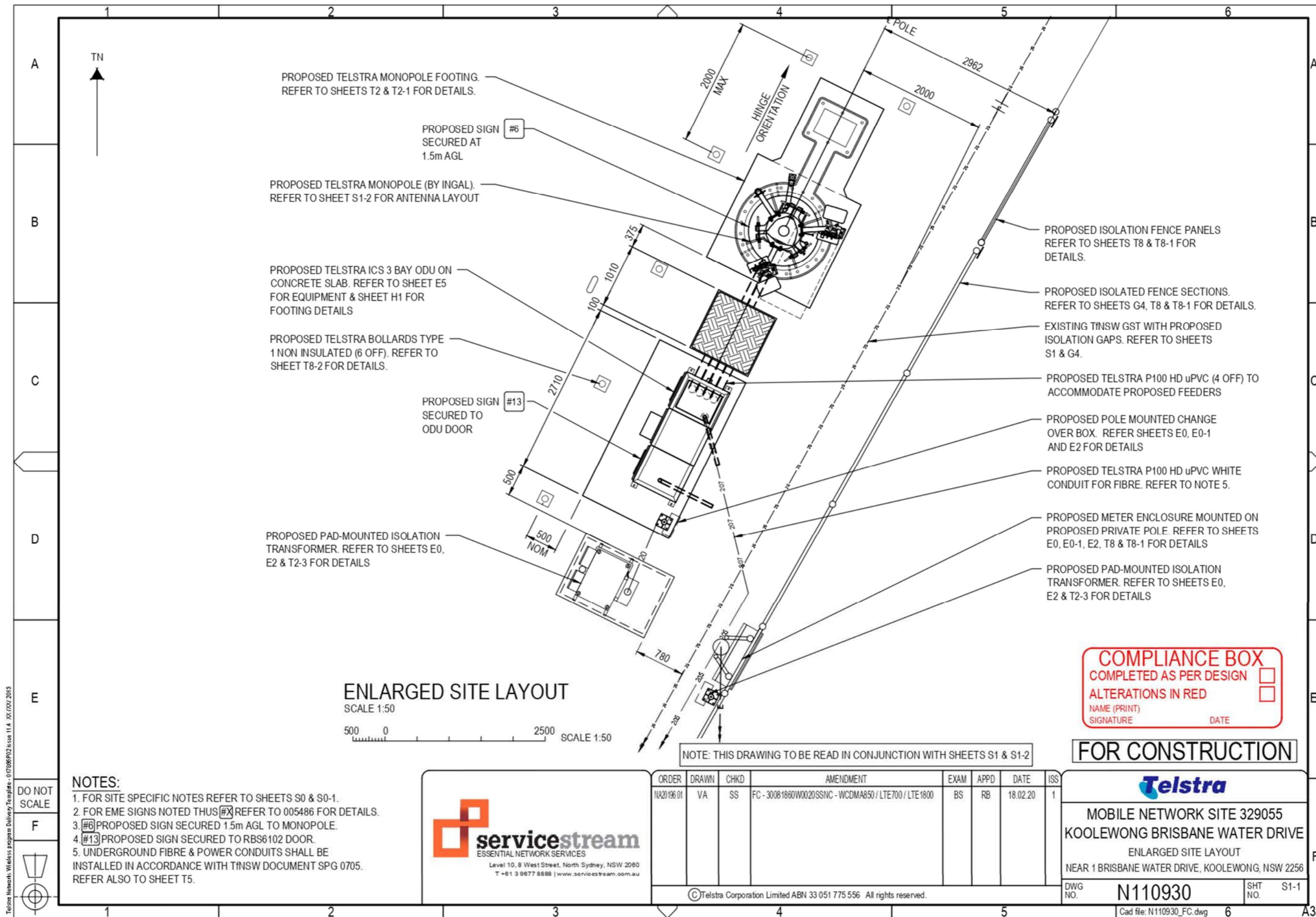
- Discharge of sediment from a site may be determined to be a pollution event under provisions of the *Protection of the Environment Operations Act 1997*. Enforcement action may commence where sediment movement produces a pollution event.
- The following public authorities may have separate requirements in the following aspects:
 - a) Australia Post for the positioning and dimensions of mail boxes in new commercial and residential developments
 - b) Jemena Asset Management for any change or alteration to the gas line infrastructure
 - c) Ausgrid for any change or alteration to electricity infrastructure or encroachment within transmission line easements

- d) Telstra, Optus or other telecommunication carriers for access to their telecommunications infrastructure
 - e) Central Coast Council in respect to the location of water, sewerage and drainage services.
- Carry out all work under this Consent in accordance with SafeWork NSW requirements including the *Workplace Health and Safety Act 2011 No 10* and subordinate regulations, codes of practice and guidelines that control and regulate the development industry.
 - Dial Before You Dig
Underground assets may exist in the area that is subject to your application. In the interests of health and safety and in order to protect damage to third party assets please contact Dial Before You Dig at www.1100.com.au or telephone on 1100 before excavating or erecting structures. (This is the law in NSW). If alterations are required to the configuration, size, form or design of the development upon contacting the Dial Before You Dig service, an amendment to the development consent (or a new development application) may be necessary. Individuals owe asset owners a duty of care that must be observed when working in the vicinity of plant or assets. It is the individual's responsibility to anticipate and request the nominal location of plant or assets on the relevant property via contacting the Dial Before You Dig service in advance of any construction or planning activities.
 - Telecommunications Act 1997 (Commonwealth)
Telstra (and its authorised contractors) are the only companies that are permitted to conduct works on Telstra's network and assets. Any person interfering with a facility or installation owned by Telstra is committing an offence under the *Criminal Code Act 1995 (Cth)* and is liable for prosecution. Furthermore, damage to Telstra's infrastructure may result in interruption to the provision of essential services and significant costs. If you are aware of any works or proposed works which may affect or impact on Telstra's assets in any way, you are required to contact: Telstra's Network Integrity Team on phone number 1800 810 443.

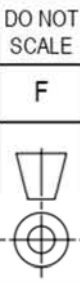


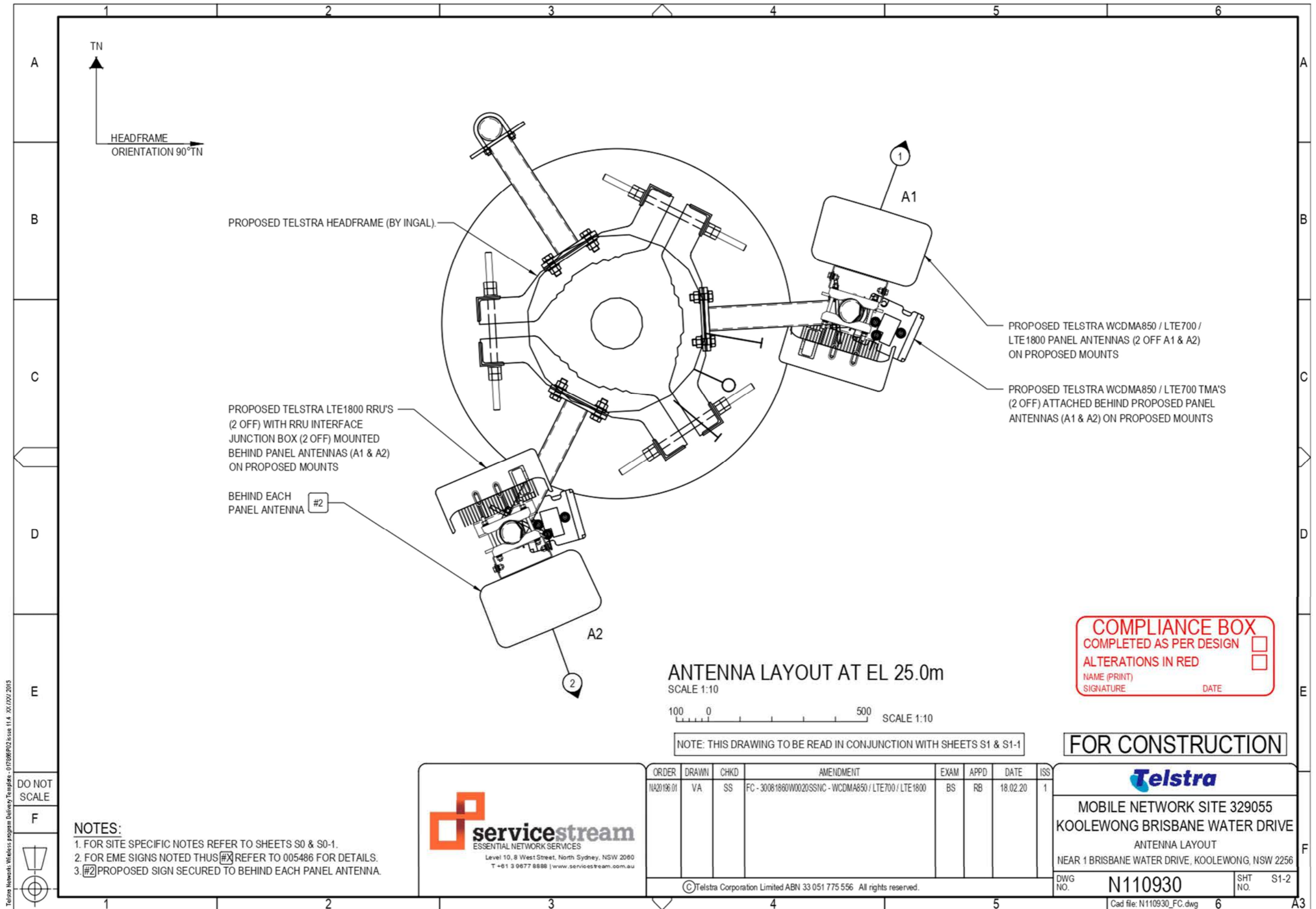
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COMPLIANCE BOX
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 ALTERATIONS IN RED
 NAME (PRINT) _____
 SIGNATURE _____ DATE _____

ANTENNA LAYOUT AT EL 25.0m

SCALE 1:10
 100 0 500 SCALE 1:10

NOTE: THIS DRAWING TO BE READ IN CONJUNCTION WITH SHEETS S1 & S1-1

FOR CONSTRUCTION

DO NOT SCALE

NOTES:

1. FOR SITE SPECIFIC NOTES REFER TO SHEETS S0 & S0-1.
2. FOR EME SIGNS NOTED THUS #X REFER TO 005486 FOR DETAILS.
3. #2 PROPOSED SIGN SECURED TO BEHIND EACH PANEL ANTENNA.



ORDER	DRAWN	CHKD	AMENDMENT	EXAM	APPD	DATE	ISS
NA20196.01	VA	SS	FC - 30081860W0020SSNC - WCDMA850 / LTE700 / LTE1800	BS	RB	18.02.20	1

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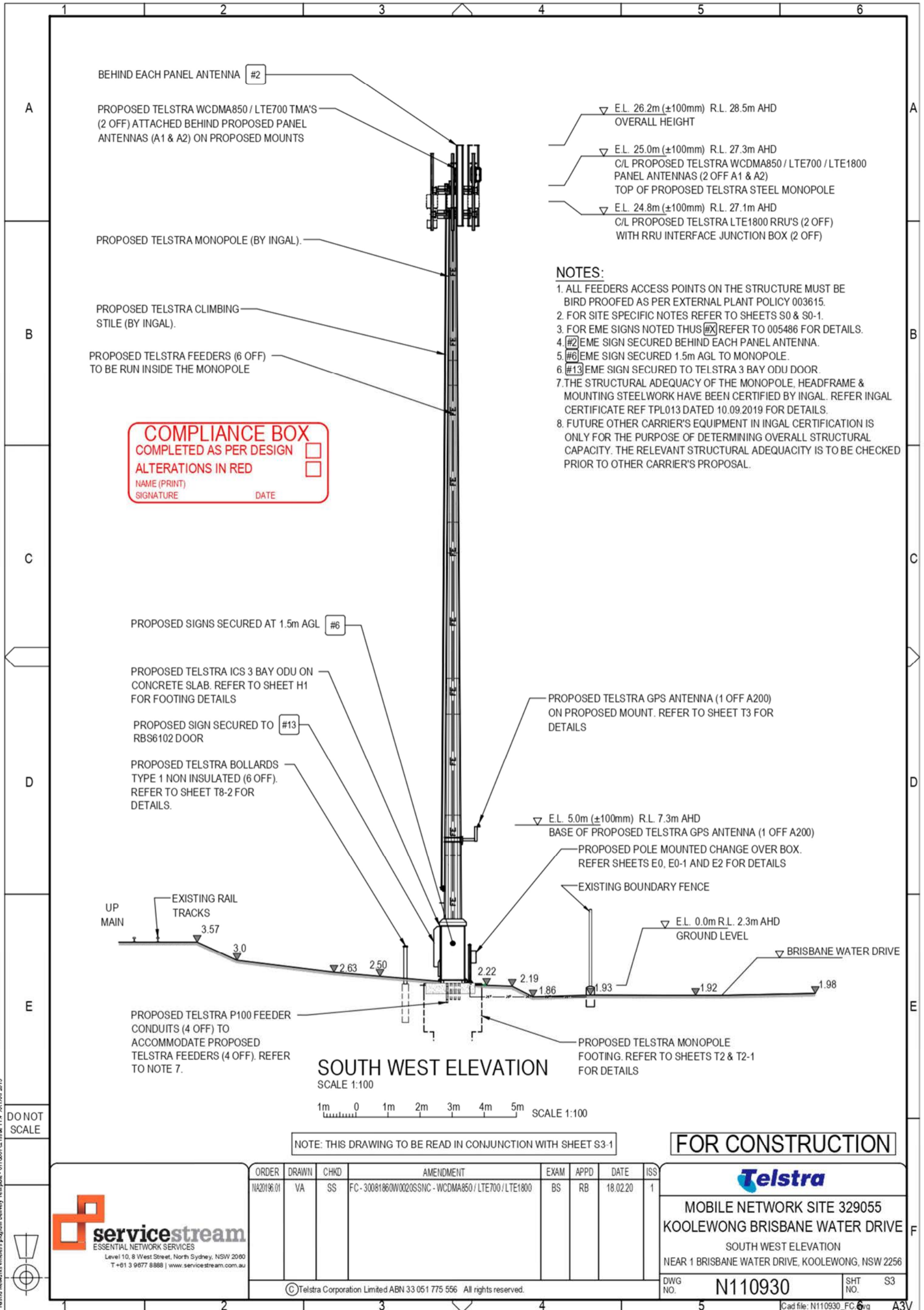
MOBILE NETWORK SITE 329055
 KOOLEWONG BRISBANE WATER DRIVE
 ANTENNA LAYOUT
 NEAR 1 BRISBANE WATER DRIVE, KOOLEWONG, NSW 2256

DWG NO. **N110930** SHT NO. S1-2

Cad file: N110930_FC.dwg

Telstra Network Wireless program Delivery Template - 017368P02 Issue 11.4 - X1/2007/2015

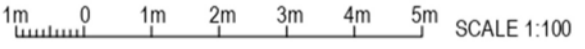
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COMPLIANCE BOX
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 NAME (PRINT) _____
 SIGNATURE _____ DATE _____

- NOTES:**
1. ALL FEEDERS ACCESS POINTS ON THE STRUCTURE MUST BE BIRD PROOFED AS PER EXTERNAL PLANT POLICY 003615.
 2. FOR SITE SPECIFIC NOTES REFER TO SHEETS S0 & S0-1.
 3. FOR EME SIGNS NOTED THUS REFER TO 005486 FOR DETAILS.
 4. EME SIGN SECURED BEHIND EACH PANEL ANTENNA.
 5. EME SIGN SECURED 1.5m AGL TO MONOPOLE.
 6. EME SIGN SECURED TO TELSTRA 3 BAY ODU DOOR.
 7. THE STRUCTURAL ADEQUACY OF THE MONOPOLE, HEADFRAME & MOUNTING STEELWORK HAVE BEEN CERTIFIED BY INGAL. REFER INGAL CERTIFICATE REF TPL013 DATED 10.09.2019 FOR DETAILS.
 8. FUTURE OTHER CARRIER'S EQUIPMENT IN INGAL CERTIFICATION IS ONLY FOR THE PURPOSE OF DETERMINING OVERALL STRUCTURAL CAPACITY. THE RELEVANT STRUCTURAL ADEQUACY IS TO BE CHECKED PRIOR TO OTHER CARRIER'S PROPOSAL.

SOUTH WEST ELEVATION
 SCALE 1:100



NOTE: THIS DRAWING TO BE READ IN CONJUNCTION WITH SHEET S3-1

FOR CONSTRUCTION

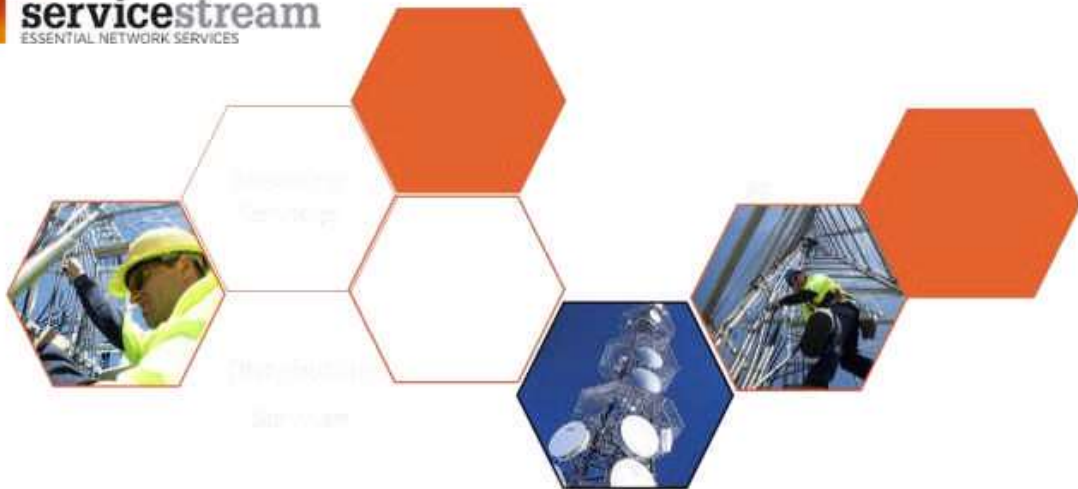
<p>servicestream ESSENTIAL NETWORK SERVICES Level 10, 8 West Street, North Sydney, NSW 2060 T+61 3 9677 8888 www.servicestream.com.au</p>	ORDER	DRAWN	CHKD	AMENDMENT	EXAM	APPD	DATE	ISS	<p>MOBILE NETWORK SITE 329055 KOOLEWONG BRISBANE WATER DRIVE SOUTH WEST ELEVATION NEAR 1 BRISBANE WATER DRIVE, KOOLEWONG, NSW 2256</p>
	NA20196.01	VA	SS	FC-30081860W0020SSNC-WCDMA850/LTE700/LTE1800	BS	RB	18.02.20	1	

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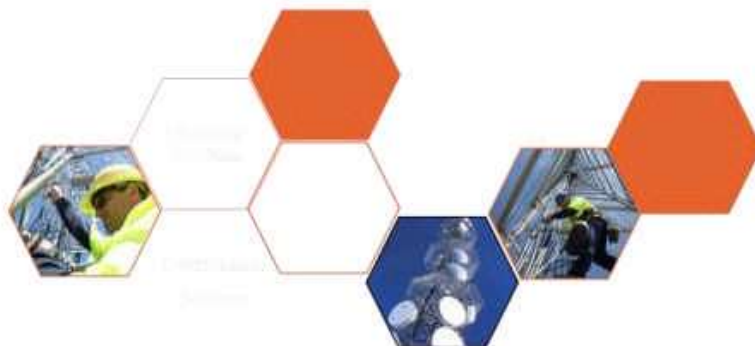
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Planning Assessment Report

*Proposed Telstra Mobile Telecommunications Facility
Koolewong NSW 2256*




Our Reference: NA20196 Koolewong

Prepared by: Service Stream Network Construction

On behalf of: Telstra Corporation Limited

Document Control Record

Document Description	Statement of Environmental Effects: Proposed Mobile Telecommunications Facility at Koolewong, NSW 2256.		
Site No.	NA20196	Site Name	Koolewong

	Name	Signed	Date
Prepared By	Joseph Mills		21 st August 2019

File Location	N:\Telstra_Sites\Koolewong - NA20196 - CCR\01 SAED\09. PLANNING
Document Status	Final

Prepared for	Prepared by:
Telstra Corporation Ltd	Joseph Mills Service Stream – Network Construction Level 1, 29-57 Christie St, St Leonards NSW 2065 02 9087 3104 Joseph.Mills@servicestream.com.au www.servicestream.com.au

This report has been prepared as a supporting document to the Development Application. The report relies upon data, surveys, measurements and results taken at or under particular times and conditions specified herein. Any findings and conclusions or recommendations only apply to the aforementioned circumstances. Service Stream does not accept any responsibility for the use of this report by any parties other than the Central Coast Council, without its prior written permission.

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1 Introduction

1.1 Executive Summary

PROPOSAL

Telstra propose to install a new mobile telecommunications facility along the railway line at Koolewong, comprised of the following:

- a new 25m high monopole with an overall height 26.2m including antennas;
- a slimline headframe at the top of the monopole to mount antennas and equipment;
- two (2) panel antennas, both with dimensions of 2533mm x 350mm x 208mm, mounted on the headframe;
- the installation of associated ancillary equipment, including two (2) Tower Mounted Amplifiers, two (2) Remote Radio Units, Combiners and Feeders; and
- one (1) Outdoor Unit (ODU) equipment cabinet (1300mm L x 700mm W x 1450mm H) at ground level, adjacent to the proposed facility.

The proposed facility described above is 5.3 shorter than the previously proposed facility, and is located approximately 43.6m further northeast of the original proposed location. These changes to the proposal were made by Telstra following community consultation for the original proposal.

PURPOSE

Telstra is proposing to install a new telecommunications facility along the railway line at Koolewong. The proposed facility is to provide improved Telstra 4G coverage to rail commuters and other users moving through the Koolewong area, and also to the surrounding area. The proposed facility will provide enhanced in-building coverage and mobile services to the community, businesses, emergency services and travellers in the area, and will form an integral part of Telstra's mobile telecommunications network along the rail corridor between Woy Woy and West Gosford.

PROPERTY DETAILS

Lot and Plan: Lot 111 DP1184661

Address: Koolewong NSW 2256

Facility coordinates: -33.45859, 151.31367

Property Owner: Transport for New South Wales

PLANNING INSTRUMENT

Planning Instrument: Gosford LEP 2014

Zone: SP2 – Infrastructure: Rail Infrastructure Facility

Proposed Use: Mobile telecommunications facility

APPLICABLE PLANNING SCHEME POLICIES

Table 1: Proposal compliance with relevant planning instruments	Complies
State Environmental Planning Policy (Infrastructure) 2007	Yes
NSW Telecommunications Facilities Guideline including Broadband (2010)	Yes
Gosford LEP 2014	Yes

APPLICATION

Use and development of the land for the purposes of construction & operation of a mobile telecommunications facility.

OBJECTIVES OF THIS REPORT

This Statement of Environmental Effects (SEE) has been prepared by Service Stream Network Construction (SSNC) on behalf of Telstra Corporation Limited (Telstra), following feedback from community consultation for a 30m high facility on the same property approximately 43.6m southwest from the location proposed in this report.

The SEE accompanies the Development Application for the installation of a new mobile telecommunications facility along the railway line at Koolewong NSW 2256 (Lot 111 DP 1184661) at coordinates -33.45859, 151.31367.

In response to increased demand on the existing network due to increased use of data from smart phones, tablets and other mobile devices, Telstra continually upgrades its existing telecommunications network in the most practical way, taking into consideration the demand on existing infrastructure. Telstra achieves this by upgrading existing facilities (known as base stations), or deploying new base stations across Australia.

To support the network upgrade, Telstra has identified the need to enhance coverage to rail commuters travelling through Koolewong and the surrounding area and improve in-building coverage and network capacity for the community living in that area.

A site assessment and feasibility review process was undertaken to consider a range of issues, including:

- Co-location on existing telecommunications facilities or structures wherever possible;
- Compliance with applicable legislation, regulations and policies;
- Minimising environmental and heritage impacts;
- Radio frequency objectives to provide the required coverage to Koolewong and surrounds; and
- Landowner agreement to the proposal.

This development application seeks planning consent for:

- a new 25m high monopole with an overall height 26.2m including antennas;
- a slimline headframe at the top of the monopole to mount antennas and equipment;
- two (2) panel antennas, both with dimensions of 2533mm x 350mm x 208mm, mounted on the headframe;

- the installation of associated ancillary equipment, including two (2) Tower Mounted Amplifiers, two (2) Remote Radio Units, Combiners and Feeders; and
- one (1) Outdoor Unit (ODU) equipment cabinet (1300mm L x 700mm W x 1450mm H) at ground level, adjacent to the proposed facility.

The proposed facility described above is 5.3 shorter than the previously proposed facility, and is located approximately 43.6m further northeast of the original proposed location. These changes to the proposal were made by Telstra following community consultation for the original proposal.

1.2 Purpose of the Development Application

The proposed Koolewong facility is located at Lot 111 DP 1184661, described as the railway line at Koolewong NSW 2256, at coordinates -33.45859, 151.31367.

This submission will provide an assessment in respect of the relevant planning guidelines, and demonstrates site selection on the basis of:

- The site is designed and located so as to minimise visual impact on the immediate and surrounding area. This includes a 5.3 reduction in the facility height, and relocation to a new position approximately 43.6m to the northeast that makes better use of visual screening offered by trees along the edge of Glenrock Parade to the west;
- The proposal is designed to comply with the principles of the NSW Telecommunications Facilities Guideline including Broadband (2010);
- The site is designed to achieve the required coverage objectives for the area, specifically for rail commuters as they pass through the area;
- The proposal is designed to operate within the regulatory framework of the Commonwealth, NSW State and Central Coast Council local governments; and
- The facility is designed to operate within all current and relevant standards and is regulated by the Australian Communications and Media Authority.

1.3 Mobile Base Stations and How They Work

A Mobile Phone Base Station is essentially a radio transmitter/transceiver and an antenna, which transmits and receives radio frequency (RF) or electromagnetic energy (EME) signals from mobile phones.

A base station typically consists of an equipment shelter or cabinet that houses all the electronics required to send and receive mobile phone calls and data; a series of mobile phone antennas that transmit and receive signals to and from the handset; and either a fibre optic connection or a radio transmission dish that links the base station to the main public telephone network.

When a call is made from a mobile phone, the first step in the process is for the phone to check that there is coverage in the area that the call is made. Once the phone has verified that there is sufficient signal strength to make the call, the phone establishes a connection with a nearby mobile phone base station. The base station then establishes the call and holds the call as long as the phone user remains on the call and in the range of that base station.

A mobile phone base station provides coverage to a geographic area, known as a cell. Cells are aligned next to each other in a similar pattern to individual cells within a beehive, and it is for this reason that mobile phone networks are sometimes referred to as cellular networks. The location of the base station within the cell is determined by a number of factors, including topography and other physical constraints such as trees and buildings, the cell 'capacity' or amount of calls and mobile data expected to be accessed in the cell, and the radio frequency at which the base station will operate.

Mobile phone base station antennas need to be located clear of obstructions like trees and tall buildings to ensure good signal quality. In essence, a mobile phone needs to have direct line of sight to a mobile phone base station. Hills, trees and tall buildings can obscure this line of sight and so base stations need to be very carefully located to maximise the coverage available.

Each base station can only carry a finite volume of calls and mobile data simultaneously. In areas of high mobile phone use, such as central business districts and high density areas, more base stations are required to handle the level of call traffic. In high use areas, there are often a range of base stations, from very specific in-building solutions – designed to give quality coverage within a specific building – to very small base stations known as microcells. Microcells cover only a small geographic area and are often found at intersections and in heavy pedestrian traffic areas. In rural areas, or areas where mobile phone use is not as high, base stations will often be located on hills or tall structures to maximise the coverage area. (Source: MCF Fact Sheet - How the mobile phone network operates).

2 The Proposed Facility

2.1 Site Location and Surrounds

The proposed telecommunications facility is to be located at Lot 111 DP 1184661, described as the railway line at Koolewong NSW 2256, at coordinates -33.45859, 151.31367.

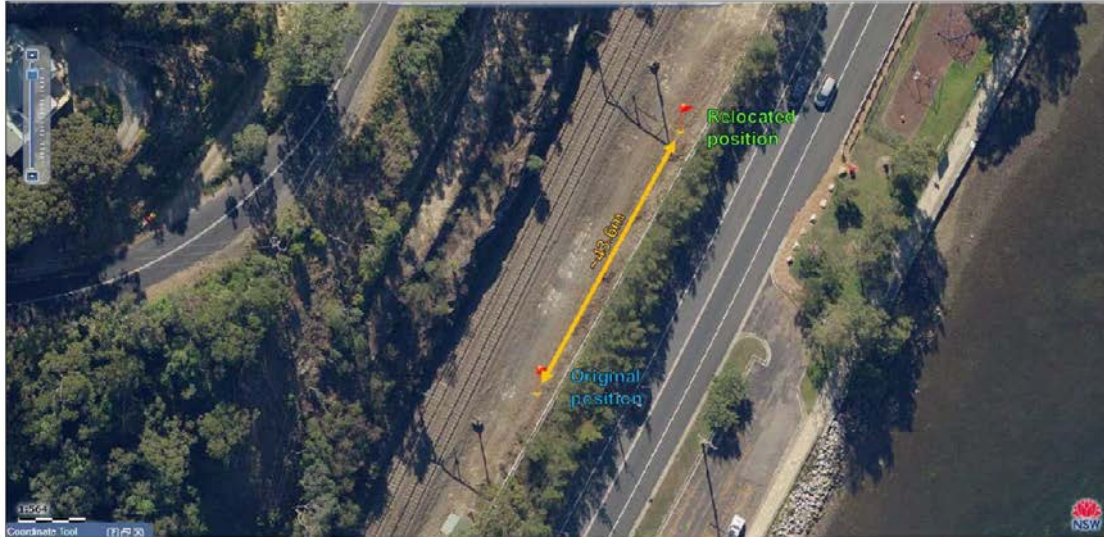
The Local Government Authority for the proposal is Central Coast Council and the site is zoned as SP2 – Infrastructure: Rail Infrastructure Facility under the *Gosford LEP 2014*.

Figures 1 and 2 identify the subject property within the context of the wider and local area, as well as the location of the proposed facility within the subject property.

Figure 1. Aerial view of the site with transparent street map overlay within the context of the wider area (Source: Six Maps)



Figure 2. Aerial view of the site within the context of the local area (Source: Six Maps)



The subject property runs generally southwest to northeast from Sydney, and includes the main railway line between Woy Woy, the Central Coast and Gosford; with the site location at the approximate midpoint of the property at coordinates -33.45893, 151.31344. The Lot is approximately 1 kilometre from end to end along the railway line, and approximately 30m wide at the location of the proposed facility. Figure 3 shows the land zonings of the area surrounding the proposed facility.

Figure 3. Zoning map of the area around the proposed facility. The proposed facility is marked with a red arrow. (Source: NSW Planning Portal)



Legend:**E1 - National Parks and Nature Reserves****RE1 - Public Recreation****R2 - Low Density Residential****SP2 - Infrastructure: Rail Infrastructure Facility****SP2 - Infrastructure: Road****W2 - Recreational Waterways**

The site location is neighboured to the west and north by R2 – Low Density Residential zoning abutting E1 – National Parks and Nature Reserves which comprises the steep uninhabited well vegetated hills of the Brisbane Water National Park. To the east across Brisbane Water Drive and abutting Brisbane Water there is a thin strip of land Zoned RE1 – Public Recreation. There is also additional RE1 – Public recreation to the immediate west, comprising undeveloped bushland. Further R2 – Low Density Residential is located 95m to the south west. Views are afforded to the east across the rail line and Brisbane Water Drive to Brisbane Water. The nearest residential dwelling is located 66 northwest of the facility

The proposed facility is located on a waterside strip between Brisbane Water and the National Park, with the primary activity for the area being Brisbane Water Drive and the railway line between Woy Woy and the Central Coast used by commuter and freight trains.

Figures 4 and 5 show the location of the proposed facility next to the railway line at Koolewong.

Figure 4. View northwest to site location across Brisbane Water Drive.



Figure 5. Site location near the railway line looking north.



2.2 Description of the Proposal

2.2.1 Facility and Equipment Details

The proposal seeks development consent for the installation of a new mobile telecommunications facility and consists of the following:

- a new 25m high monopole with an overall height 26.2m including antennas;
- a slimline headframe at the top of the monopole to mount antennas and equipment;
- two (2) panel antennas, both with dimensions of 2533mm x 350mm x 208mm, mounted on the headframe;
- the installation of associated ancillary equipment, including two (2) Tower Mounted Amplifiers, two (2) Remote Radio Units, Combiners and Feeders; and
- one (1) Outdoor Unit (ODU) equipment cabinet (1300mm L x 700mm W x 1450mm H) at ground level, adjacent to the proposed facility.

The proposed facility described above is 5.3 shorter than the previously proposed facility, and is located approximately 43.6m further northeast of the original proposed location. These changes to the proposal were made by Telstra following community consultation for the original proposal.

A monopole design was selected due to the site access limitations for construction, and the reduced visual impact of a single monopole when viewed against the backdrop of the wooded hillside behind it when viewed from Brisbane Water Road.

2.2.2 Access and Parking Details

The facility and all ancillary components will be constructed on the property at Koolewong, Lot 111 DP 1184661, at coordinates -33.45859, 151.31367. Access will be via the Sydney Trains access track through

gates from Brisbane Water Drive. This is the same access route taken by other trucks and maintenance vehicles relating to the railway line. A copy of the land title is provided in Appendix C

During the construction phase, a truck will be used to deliver the equipment and a crane will be utilised to lift most of the equipment into place. Any traffic impacts associated with construction will be of a short-term duration and are not anticipated to adversely impact on the surrounding road network. This site access is considered appropriate for the construction of the facility, given that the facility will not be a significant generator of traffic.

Mobile phone base stations are unmanned, of low maintenance and remotely operated. As such, operational visits to the site will be approximately 2 - 6 times per year for maintenance purposes. Access to antennas will be via cherry pickers. The equipment cabinet will be securely locked and the proposal will involve the installation of anti-climbing devices on the tower, preventing access to members of the public to in those areas.

2.2.3 Electricity Supply

Power to the proposed facility will be sourced from an existing power supply on site. The conditions of supply are indicative only and are subject to approval and final offer from the relevant power authority.

2.2.4 Plant and equipment to be used

The proposal will require the use of:

- one cherry picker
- one crane
- approximately four utility trucks.

2.2.5 Construction Process

Construction activities will involve the following:

- Excavation of the monopole and equipment cabinet foundation;
- Delivery and pouring of concrete on site for the monopole and equipment cabinet foundations;
- Installation of conduit within trenches, followed by installation of cables within conduits;
- Delivery of the monopole sections to site;
- Installation of the monopole;
- Attachment of antenna mount, cables, cable ladder to equipment cabinet and antenna;
- Installation of the earth grid and connection of the base station to the electrical supply and optical fibre cables;
- Installation and commissioning of the base station radio equipment.

The daily construction process will require approximately three to six workers on site and an average of four to six vehicle movements per day. The general construction timeframe, weather dependent, is approximately 5 weeks.

2.2.6 Working around rail and overhead power infrastructure

All of Sydney Trains' railway safety procedures will be strictly adhered to during the construction phase, and a rail protection officer will be on site at all times to ensure safe management of the rail corridor in relation to the facility construction.

2.2.7 Workforce and Working Hours

Construction will be undertaken in accordance with the landowner's and Council's recommended hours to ensure minimal disturbance to surrounding uses. Any necessary permits will be acquired prior to any works being undertaken.

2.2.8 Timing

It is anticipated that works would be completed approximately five (5) weeks after the commencement given ideal working conditions.

2.3 Consequences for not proceeding

The consequences of the proposal not proceeding would be:

- an erosion in the quality of telecommunications services on commuter trains and in the surrounding local area, including poor reception, interference, slow data download and upload speeds, and unexpected call drop outs. This is due to the demand for mobile data services approximately doubling every year, and base stations across the network reaching their maximum capacity for mobile traffic; and
- reduced competition in the telecommunications industry, potentially resulting in uncompetitive practices, increased costs to consumers and reduced levels of service to customers.

3 Site Selection and Justification

3.1 Site Selection Parameters

The site assessment and feasibility review was undertaken as part of this proposal with due consideration given to a range of issues including:

- consistency with the applicable Commonwealth and State and Local planning policies and regulatory instruments;
- minimal or no impact on the environment during the construction and operation of the facility;
- avoiding known Areas of Environmental Significance or heritage listed sites or any sites of heritage significance;
- meeting the radio frequency objectives of Telstra's 4G network, providing the required coverage to commuters and residents in the area around Koolewong, as part of a larger program focussed on improving mobile coverage along the Central Coast railway line between Woy Woy and the West Gosford;
- satisfactory agreement with the land owner and their agreement to the proposal; and
- opportunities for co-location with other existing telecommunications facilities/utility structures wherever possible. Upgrading of existing telecommunications equipment is considered as good industry practice and would result in a positive planning outcome. Telstra recognises this need and opts for co-location sites or sites with utility uses where possible.

3.2 Options Considered

3.2.1 Co-location Opportunities

In the first instance, Telstra seeks to co-locate on existing infrastructure available within a search area. A search of the Radio Frequency National Site Archive (RFNSA) indicates the potential colocation opportunities existing near the search area (**Figure 6**).

Figure 6. Radio Frequency National Site Archive map of nearby sites.



Option A.

985m from the proposed facility

RFNSA site: 2250062

Site name: DTRS 175 Tascott

Address: Rail Corridor near Glenrock Parade TASCOTT NSW 2250

Operator: Transport for NSW – train communications systems tower.

This option is not available to Telstra for Co-location due to the inability to secure tenure on the structure. The location is also too far from the target coverage and capacity area to offer a technically viable option. For these reasons the option was not pursued further.

Option B.

1.61km from the proposed facility

RFNSA site: 2250099

Address: 437 Glenrock Pde TASCOTT NSW 2250

Operator: Telstra

Option C.

1.68km from the proposed facility

RFNSA site: 2256009

Address: Koolewong Reservoir, Glenrock Parade KOOLEWONG NSW 2256

Operators: Telstra, Optus and Vodafone

Option D.

1.85km from the proposed facility

RFNSA site: 2250063

Site name: DTRS 176 Point Clare

Address: Rail Corridor near Kurrawa Avenue POINT CLARE NSW 2250

Operator: Transport for NSW – train communications systems tower.

Options B, C and D are all too far from the target coverage and capacity area to present viable options for co-location, and were not pursued any further.

It can be seen in Figure 6 that there are no suitable co-location options close to the location of the proposed facility. The radiofrequency coverage objectives for the proposed facility focus on providing coverage to commuter trains moving through Koolewong and the surrounding area, and represents just one site in a chain of sites along the railway line between Sydney and the Central Coast. Therefore, a greenfield candidate was investigated.

3.1.3 Greenfield Candidate

Due to the tight constraints around suitable space to use within the Sydney Trains rail corridor, and the prescribed radiofrequency coverage and capacity objectives that specifically target commuters moving through Koolewong, the site selection process was immediately narrowed down to a single candidate.

The selected location, as removed as far as possible from residential dwellings, on Lot 111 DP 1184661 at coordinates -33.45859, 151.31367, is considered to be suitable for the following reasons:

- the monopole height of 25m (total height 26.2m including antennas) can achieve the specific radiofrequency objectives;
- the monopole is a single, recessively coloured vertical pole, presenting a relatively unobtrusive visual effect to the railway corridor and immediate surrounding area;
- the location benefits from visual blending with the facility being obscured by the vegetation background from many viewpoints;
- the facility benefits from other nearby infrastructure, land uses and topography providing 'visual clutter', including the railway corridor overhead power lines and supporting poles, the railway tracks, commuter and freight trains moving through the area, and the steep forested hills, gullies, cuttings and embankments of the area; and
- land tenure could be secured with the landowner, Sydney Trains.

4 Legislation

Federal and State legislation and guidelines have been created to guide the development of telecommunications infrastructure in Australia.

4.1 Commonwealth Legislation

4.1.1 Telecommunications Act 1997

The *Telecommunications Act 1997* (TA) came into operation in July 1997. The TA sets up a framework for regulating the actions of telecommunications carriers and service providers. Telstra is a licensed carrier under the TA.

Schedule 3 – Carriers' powers and immunities, of the TA, specifies 'authorised activities' that a carrier is empowered to carry out without approval under NSW legislation. These activities include the inspection of land, and the installation and maintenance of certain facilities.

A Carrier's power to install a facility is contingent upon the facility being a 'low-impact facility' as defined by the *Telecommunications (Low-Impact Facilities) Determination 2018*.

In this case, the proposal involves the installation of a new monopole facility, which therefore does not constitute a low-impact facility under the *Telecommunications (Low-Impact Facilities) Determination 2018*. As the proposed facility does not meet the criteria mentioned above, Telstra is therefore not empowered to undertake the proposed works without approval under NSW legislation, and must obtain development consent from the consent authority.

The consent authority in this case is the Central Coast Council.

4.1.2 Telecommunications Code of Practice 2018

Under the *Telecommunications Act 1997* the Government has established the Telecommunications Code of Practice 2018, which sets out the conditions under which a carrier must operate. Section 2.11 of the Telecommunications Code of Practice 2018 sets out the design, planning and installation requirements for the carriers to ensure the installation of facilities is in accordance with industry 'best practice'. This is required to:

"... minimise the potential degradation of the environment and the visual amenity associated with the facilities."
[Section 2.11(3)]

Best practice also involves the carrier complying with any relevant industry code or standard that is registered by the Australian Communications Authority (ACA) under Part 6 of the Act.

4.1.3 Deployment Code

The 'Mobile Phone Base Station Deployment Code' Communications Alliance Ltd Industry Code (C564:2018) is a code developed by a working committee with representatives from carriers, various levels of government, an industry group and a community action group. The Code came into effect on the 17th December 2018. The Deployment Code is designed to:

- allow the community and councils to have greater participation in decisions made by carriers when deploying mobile phone base stations; and
- provide greater transparency to local community and councils when a carrier is planning, selecting sites for, installing and operating mobile phone radio communications infrastructure.

The carriers' activities are published on the internet based Radio Frequency National Site Archive (RFNSA) as well as information relevant to each site such as EME Reports.

In the site selection and design stages of this proposal the precautionary approach outlined in the Deployment Code has been considered (see **Table 2** below). No consultation external to that undertaken in the Development Application process is required under the Code.

Table 2: Application of the Industry Code C564:2018 precautionary approach to mobile phone radiocommunications infrastructure placement and design	
Clause 4.1 Site Selection	
Subclause	Response
4.1.1 Clause 4.1 applies if a Carrier proposes to select a new site for the deployment of mobile phone radiocommunications infrastructure.	Clause 4.1 Applies to this proposal.
4.1.2 A Carrier must have written procedures for site selection for mobile phone radiocommunications infrastructure in relation to factors contained in clause 4.1.5 and make them available to the public on request.	Written procedures have been developed and will be made available to members of the public on request.
4.1.3 For new sites, once the preferred option has been selected, the Carrier must make available to the public on request the summary of the sites considered and the reasons for the selection of the preferred option.	The site selection summary will be made available to members of the public on request.
4.1.4 The Carrier must comply with its procedures.	All procedures have been complied with.
4.1.5 The procedures must require, as a minimum, that for each site the Carrier have regard to: (a) the reasonable service objectives of the Carrier including: (i) The area the planned service must cover; (ii) Power levels needed to provide quality of service; (iii) The amount of usage the planned service must handle.	(i) The primary requirement for the proposal is to facilitate the delivery of 4G services to rail commuters moving through the Koolewong area, as well as improved maritime safety for people using Brisbane Water for recreation, fishing and other activities. The proposal will ensure that Telstra is able to meet its customers' current and growing demand for mobile phone and data devices. (ii) The power levels of Telstra's facilities are set as low as possible to meet the required service objective. The facilities also automate their power requirements in response to the demand and number of connections at any one time therefore maximising power efficiency. (iii) The proposed base station needs to ensure that long-term, consistent, high quality voice and mobile data services are provided to commuters and waterway users at Koolewong and the surrounding area.
(b) Minimisation of EMR exposure to the public.	(b) The proposed design and location of the facility means its antennas are excluded from direct public access. Telstra facility power levels are set as low as possible to meet the required service objective, while minimising EME emissions. Even at full power, exposure limits to the public are no greater than 0.63% of the ARPANSA EME Standard (refer to Appendix B).
(c) The likelihood of an area being a community sensitive location. (Examples of sites which sometimes have been considered to be sensitive include residential areas, childcare	The proposed facility has been designed and sited with regards to community sensitive locations. The facility has been sited close to the

centres, schools, aged care centres, hospitals and regional icons).	railway line, which allows for separation and visual screening/blending for people in the area as much as practicable without conflicting with existing practices on site. Residential dwellings and a playground are located in the vicinity. There are no other community sensitive locations including schools and child care centres within 500m of the proposed facility.
(d) The objective of avoiding community sensitive locations.	Community sensitive locations are avoided wherever possible when deploying base stations. However, in some cases, given the coverage objectives and topographical constraints of a proposal, it is sometimes difficult to avoid community sensitive locations. In such instances, these locations are identified and relevant members of the community are consulted with during the development application process.
(e) Relevant state and local government telecommunications planning policies.	All relevant state and local government planning policies have been considered regarding the proposal.
(f) The outcomes of consultation processes with Councils and Interested and Affected Parties as set out in clause 6.7.	No consultation external to that undertaken in the Development Application process is required under the Code. Following community consultation during the Development Application process, the proposed facility location has been relocated to a new position approximately 43.6m further northeast, at coordinates -33.45859, 151.31367. The facility height is also reduced by 5 metres. The revised location makes better use of the visual screening opportunity presented by the row of trees and vegetation along Glenrock Parade to the west and northwest.
(g) The heritage significance (built, cultural and natural)	The proposed area does not contain any heritage significance.
(h) The physical characteristics of the locality including elevation and terrain.	The built form of the area immediately surrounding the proposed facility is characterised by the railway line and the Brisbane Water National Park along the flat low lying lakeside bank, and residential areas spread through the hilly foothills of the Brisbane Water National Park.
(i) The availability of land and public utilities.	The proposal is located in an area with ready access to adequate land, power and communications connections.
(j) The availability of transmission to connect the mobile phone radiocommunications infrastructure with the rest of the network, e.g. line of sight for microwave transmission.	The facility will utilise fibre transmission to obtain connectivity to the surrounding network.
(k) The radiofrequency interference the planned service may cause to other services.	The proposal will not interfere with any existing services.

(l) The radiofrequency interference the planned service could experience at that location from other services or sources of radio emissions.	The proposal will not interfere with any existing services.
(m) Any obligations and opportunities to co-locate facilities.	Co-location options were investigated, however there were no suitable options that could provide mobile coverage for commuter trains moving through the Koolewong area.
(n) Cost factors.	The cost factors are within the normal scope of a standard facility of similar design, location and scale.
Clause 4.2 Mobile phone radiocommunications infrastructure Design	
Subclause	Response
4.2.1 Clause 4.2 applies if a Carrier proposes to design Mobile phone radiocommunications infrastructure.	Clause 4.2 applies to this proposal.
4.2.2 A Carrier must have written procedures for designing Mobile phone radiocommunications infrastructure.	Written procedures have been developed by Telstra.
4.2.3 With the objective of minimising unnecessary or incidental RF emissions and exposure, the procedures must require that, in designing mobile phone radiocommunications infrastructure, the Carrier have regard to: (a) The reason for the installation of the infrastructure, considering – coverage, capacity and quality; (b) The positioning of antennas to minimise obstruction of radio signals; (c) The objective of restricting access to areas where RF exposure may exceed limits of the EMR standard; (d) The type and features of the infrastructure that are required to meet service needs including: (i) The need for macro, micro or pico cells; (ii) The need for directional or non-directional antennas. (e) The objective of minimising power whilst meeting service objectives; and (f) Whether the costs of achieving this objective are reasonable.	(a) The primary requirement for the proposal is to deliver 4G services to rail commuters moving through the Koolewong area, as well as to people using Brisbane Water and the surrounding national park for recreational purposes. The proposal will ensure that Telstra is able to meet its customers' current and growing demand for mobile data devices. (b) The antennas have been positioned to minimise the obstruction of radio signals as required. (c) The proposed monopole includes anti-climbing measures, preventing public access to this area. The equipment cabinet will be securely locked and appropriate EME signage will be placed on the site. The facility is located within the secure Sydney Trains railway corridor. (d) (i)-(ii) The site requires 2 panel antennas to meet its coverage objectives. (e) Telstra facilities automate power in response to the demand and number of connections. (f) The cost of achieving the objectives are reasonable.
4.2.4 A Carrier must comply with those procedures.	All procedures have been complied with.
4.2.5 Site EMR assessments for mobile phone radiocommunications infrastructure must be made in accordance with the ARPANSA prediction methodology and	The supplied EME report (refer to Appendix B) meets the ARPANSA EME Report requirements.

report format (see Appendix A – Additional Design Information and Appendix B – ARPANSA EME Report Format).	
4.2.6 The ACMA may request a copy of the site EMR estimate, and the Carrier must provide the estimate to the ACMA within two weeks of the request being made.	Any requests will be complied with within two weeks of the request being made.

Telstra has applied the Precautionary Approach in the Selection and Design of the proposed site in accordance with Sections 4.1 and 4.2 of the Communications Alliance Limited's Mobile Phone Base Station Deployment Code.

4.2 State Legislation

4.2.1 New South Wales Planning Legislation

The proposal has been assessed having regard to the relevant Heads of Consideration under Section 79 C (1) of the Environmental Planning and Assessment Amendment Act, 1979. This provides that, 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.

4.2.1.1 State Environmental Planning Policies (SEPPs) and Regional Plans

The SEPP (Infrastructure 2007) was gazetted on 21 December 2007, providing a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. Division 21 of the SEPP applies to telecommunications and other communication facilities, establishing the approval regimes for telecommunications in NSW. Division 21 classifies certain telecommunications development that is permitted either without consent, with consent, or exempt from local environmental approvals. Reference is made to clause 115 (1), which states:

“Development for the purposes of telecommunications facilities, other than development in clause 114, may be carried out by any person with consent on any land.”

Telecommunications facility is defined to mean:

“(a) any part of the infrastructure of a telecommunications network, or

(b) any line, cable, optical fibre, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network.”

Clause 116 and 116A allow for greater flexibility in installing new towers and facilities. Under this amendment, new telecommunications towers required to deliver broadband or mobile phone access in certain rural or industrial zones would be allowed as complying development subject to amenity and safety issues like height limits and separation from residential areas.

This proposal does not meet the requirements of exempt or complying development under this SEPP and therefore development approval is required from the Central Coast Council.

The SEPP (Infrastructure) 2007 as amended by the SEPP (Infrastructure) Amendment (Telecommunications Facilities) 2010 is of specific relevance to the proposal, as the provisions of clauses 113 and 115 are being relied upon for permissibility of the proposed development at the subject location and are the basis for lodging and seeking Council consent for this development.

Clause 113 of the SEPP defines a “telecommunications facility” as:

- (a) any part of the infrastructure of a telecommunications network, or
- (b) any line, cable, optical fibre, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network.

Clause 115(1) provides that:

Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under 20 or 116, may be carried out by any person with consent on any land.

Telecommunications facilities are therefore permissible in all zones within the Central Coast LGA with the consent of the Council.

Clause 115(3) of the SEPP provides that:

Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines concerning site selection, design, construction or operating principles for telecommunications facilities that are issued by the Director-General for the purposes of this clause and published in the Gazette.

In this respect, the NSW Telecommunications Facilities Guideline including Broadband (July 2010) has been issued by the Director General.

4.2.1.1.1 State Environmental Planning Policy (Infrastructure) 2007 – Section 86, Development adjacent to rail corridors

Section 86 of the *State Environmental Planning Policy (Infrastructure) 2007* is relevant in this instance. Section 86 applies to:

86 Excavation in, above, below or adjacent to rail corridors

- Development that involves the penetration of ground to a depth of at least 2 metres below ground level (existing) on land:
 - (a) within, below or above a rail corridor, or
 - (b) (b1) or (c) within 25 metres (measured horizontally) from a rail corridor, below a rail corridor or above a rail corridor.

In this instance, item (a) above applies. Under section 86 clause (2), subsections (a) and (b), before determining a development application for development to which this clause applies, the consent authority being Central Coast Council must give written notice of this development application to Sydney Trains within 7 days of the development application being made. Concurrence from Sydney Trains is required for the proposed development.

Sydney Trains then has 21 days to consider and provide their response to the Central Coast Council. The Council must then take into consideration both the notice from Sydney Trains and any guidelines issued by the Secretary for the purposes of section 86 of the SEPP for Infrastructure and published in the Government Gazette.

The technical requirements or matters specified for consideration in section 86 are then specified for Sydney Trains in deciding whether to provide concurrence. Under section 86, subsection (4) in considering whether to provide concurrence (meaning their approval as the rail authority to Council), Sydney Trains must take into account:

- (a) the potential effects of the development on:
- (i) the safety or structural integrity of existing or proposed rail infrastructure facilities in the rail corridor, and
 - (ii) the safe and effective operation of existing or proposed rail infrastructure facilities in the rail corridor, and
- (b) what measures are proposed, or could reasonably be taken, to avoid or minimise those potential effects.

The applicant offers that all safety and construction related matters and plans will be provided for in the following documentation to ensure rail safety:

- Construction, maintenance and operation of the proposed telecommunications facility will occur in the accordance with the Koolewong Method of Procedure (MOP) Version 1, undated.

All relevant materials have been provided to Sydney Trains and Central Coast Council to allow consideration of the requirements in section 86 to occur, and Sydney Trains has since granted owner's consent.

4.2.1.2 NSW Telecommunications Facilities Guideline including Broadband (2010)

The proposal's consistency with the Guideline principles is addressed in **Table 3** below.

Table 3: Application of the Telecommunications Facilities Guideline including Broadband (2010)	
Principle 1: A Telecommunications Facility should be sited to minimise visual impact	
Specific Principles	Comment
<i>(a) As far as practical, a telecommunications facility that is to be mounted on an existing building or structure should be integrated with the design and appearance of the building or structure.</i>	(a) to (c) These principles relate to facilities that are located on an existing building or structure and are not directly applicable to new freestanding monopole elements such as those proposed in this instance.
<i>(b) The visual impact of telecommunications facilities should be minimised, visual clutter is to be reduced particularly on tops of buildings, and their physical dimensions (including support mounts) should be sympathetic to the scale and height of the building to which it is to be attached, and sympathetic to adjacent buildings.</i>	
<i>(c) Where telecommunications facilities protrude from a building or structure and are predominantly backgrounded against the sky, the facility and their support mounts should be either the same as the prevailing colour of the host building or structure, or a neutral colour such as grey should be used.</i>	
<i>(d) Ancillary facilities associated with the telecommunications facility should be screened or housed, using the same colour as the prevailing background to reduce its visibility, including the use of existing vegetation where available, or new landscaping where possible and practical</i>	
	(d) The ancillary facilities associated with the proposed telecommunication facility can be colour matched with the background to reduce its visibility. Notwithstanding, the proposed facility will be located in the rail corridor against the backdrop of forested hills. Existing mature vegetation along Brisbane Water Drive screens the rail lines and infrastructure therein.

<i>(e) A telecommunications facility should be located and designed to respond appropriately to its rural landscape setting.</i>	(e) N/A The proposed facility will be located in the rail corridor against the backdrop of forested hills. Existing mature vegetation along Brisbane Water Drive screens the rail lines and infrastructure therein.
<i>(f) A telecommunications facility located on, or adjacent to, a State or local heritage item or within a heritage conservation area, should be sited and designed with external colours, finishes and scale sympathetic to those of the heritage item or conservation area.</i>	(f) to (g) The proposed site is not within any heritage conservation area and is not in close proximity to any heritage items identified in the Gosford LEP 2014, and will not obstruct any significant view.
<i>(g) A telecommunications facility should be located so as to minimise or avoid the obstruction of a significant view of a heritage item or place, a landmark, a streetscape, vista or a panorama, whether viewed from public or private land.</i>	
<i>(h) The relevant local government authority must be consulted where the pruning, lopping, or removal of any tree or other vegetation would contravene a Tree Preservation Order applying to the land or where a permit or development consent is required.</i>	(h) No trees need to be removed as part of this proposal.
<i>(i) A telecommunications facility that is no longer required is to be removed and the site restored, to a condition that is similar to its condition before the facility was constructed.</i>	(i) This aspect could be implemented by a condition of consent if the Council considers it appropriate.
<i>(j) The siting and design of telecommunications facilities should be in accordance with any relevant Industry Design Guides.</i>	(j) The design and siting approach is discussed in detail in section 8.1.
Principle 2: Telecommunications Facilities should be co-located wherever possible	
Specific Principles	Comment
<i>(a) Telecommunications lines are to be located, as far as practical, underground or within an existing underground conduit or duct.</i>	(a) The proposal involves the installation of new underground telecommunications lines.
<i>(b) Overhead lines, antennas and ancillary telecommunications facilities should, where practical, be co-located or attached to existing structures such as buildings, public utility structures, poles, towers or other radio communications equipment to minimise the proliferation of telecommunication facilities and unnecessary clutter</i>	(b)(c)(d)(e) There are currently no existing carrier telecommunications facilities located in the vicinity, with the required position and/or height that are potentially capable of providing the wireless radio services to the locality on which the proposed equipment can be co-located. (Refer to Section 3.0 Site Selection).
<i>(c) Towers may be extended for the purposes of colocation.</i>	
<i>(d) The extension of an existing tower must be considered as a practical co-location solution prior to building new towers.</i>	

<i>(e) If a facility is proposed not to be co-located the proponent must demonstrate that colocation is not practicable.</i>	
<i>(f) If the development is for a co-location purpose, then any new telecommunications facility must be designed, installed and operated so that the resultant cumulative levels of radio frequency emissions of the co-located telecommunications facilities are within the maximum human exposure levels set out in the Radiation Protection Standard.</i>	f) N/A – The proposal is not for co-location.
Principle 3: Health standards for exposure to radio emissions will be met.	
Specific Principles	Comment
<i>(a) A telecommunications facility must be designed, installed and operated so that the maximum human exposure levels to radiofrequency emissions comply with Radiation Protection Standard.</i>	(a) The proposed installation will comply with Australian Communications and Media Authority (ACMA) regulatory arrangements with respect to electromagnetic radiation exposure levels.
<i>(b) An EME Environmental Report shall be produced by the proponent of development to which the Mobile Phone Network Code applies in terms of design, siting of facilities and notifications. The Report is to be in the format required by the Australian Radiation Protection Nuclear Safety Agency. It is to show the predicted levels of electromagnetic energy surrounding the development comply with the safety limits imposed by the Australian Communications and Media Authority and the Electromagnetic Radiation Standard, and demonstrate compliance with the Mobile Phone Networks Code.</i>	(b) EME Exposure Levels from this site have been calculated in accordance with the ARPANSA prediction methodology and report format. This report has been provided in Appendix B. Please also refer to Section 5.10 – Public Safety. A copy of the EME Report is provided in Appendix B.
Principle 4: Minimise disturbance and risk, and maximise compliance	
Specific Principles	Comment
<i>(a) The siting and height of any telecommunications facility must comply with any relevant site and height requirements specified by the Civil Aviation Regulations 1988 and the Airports (Protection of Airspace) Regulations 1996 of the Commonwealth. It must not penetrate any obstacle limitation surface shown on any relevant Obstacle Limitation Surface Plan that has been prepared by the operator of an aerodrome or airport operating within 30 kilometres of the proposed development and reported to the Civil Aviation Safety Authority Australia.</i>	(a) The proposed facility does not penetrate the obstacle limitation surface of any aerodrome or airport.
<i>(b) The telecommunications facility is not to cause adverse radio frequency interference with any airport, port or Commonwealth Defence navigational or communications equipment.</i>	(b) The base station is designed to create no electrical interference problems with other radio based systems and complies with the requirements of relevant Australian standards in this regard.
<i>(c) The telecommunications facility and ancillary facilities are to be carried out in accordance with the applicable specifications</i>	(c) The base station facilities are designed and will be installed in accordance with any relevant manufacturer specifications. The proposal will

<i>(if any) of the manufacturers for the installation of such equipment.</i>	comply with the requirements of all relevant Australian Standards.
<i>(d) The telecommunications facility is not to affect the structural integrity of any building on which it is erected.</i>	(d) The facility is not being erected on any existing building or structure.
<i>(e) The telecommunications facility is to be erected wholly within the boundaries of a property where the landowner has agreed to the facility being located on the land.</i>	(e) The location and layout of the facility reflect discussions with the landowner, in a location that will not interfere with existing activities on site.
<i>(f) The carrying out of construction of the telecommunications facilities must be in accordance with all relevant regulations of the Blue Book – 'Managing Urban Stormwater: Soils and Construction' (Landcom 2004), or its replacement.</i>	(f) These matters can be appropriately addressed through the imposition of conditions of development consent where relevant.
<i>(g) Obstruction or risks to pedestrians or vehicles caused by the location of the facility, construction activity or materials used in construction are to be mitigated.</i>	(g) The proposed facility has been sited in a location that does not have any regular vehicle or pedestrian access. The facility will not put pedestrians or vehicles at risk.
<i>(h) Where practical, work is to be carried out during times that cause minimum disruption to adjoining properties and public access. Hours of work are to be restricted to between 7.00am and 5.00pm, Mondays to Saturdays, with no work on Sundays and public holidays.</i>	(h) (i) (j) These matters can be appropriately addressed through the imposition of conditions of development consent where relevant.
<i>(i) Traffic control measures are to be taken during construction in accordance with Australian Standard S1742.3-2002 Manual of uniform traffic control devices – Traffic control devices on roads.</i>	
<i>(j) Open trenching should be guarded in accordance with Australian Standard Section 93.080 – Road Engineering AS1165 – 1982 – Traffic hazard warning lamps.</i>	
<i>(k) Disturbance to flora and fauna should be minimised and the land is to be restored to a condition that is similar to its condition before the work was carried out.</i>	(k)(l) The proposed facility has been sited close to the railway line, and access will be via the existing Sydney Trains access track off Brisbane Water Drive, in a location that is considered to minimise the likelihood of impacts on flora and fauna and threatened communities and species.
<i>(l) The likelihood of impacting on threatened species and communities should be identified in consultation with relevant state or local government authorities and disturbance to identified species and communities avoided wherever possible.</i>	
<i>(m) The likelihood of harming an Aboriginal Place and / or Aboriginal object should be identified. Approvals from the Department of Environment, Climate Change and Water (DECCW) must be obtained where impact is likely, or Aboriginal objects are found.</i>	(m) A search of the AHIMS data base has been completed and it indicates that there are no items of Aboriginal archaeological heritage known to be located on, or in the vicinity of, the site (Please refer to Appendix E).

<p><i>(n) Street furniture, paving or other existing facilities removed or damaged during construction should be reinstated (at the telecommunications carrier's expense) to at least the same condition as that which existed prior to the telecommunications facility being installed.</i></p>	<p>(n) Any damage to the area surrounding or associated with the facility will be reinstated to its prior condition. This can also be addressed through the imposition of conditions of development consent where relevant.</p>
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4.3 Local Legislation

4.3.1 Gosford LEP 2014

The relevant local environmental plan applicable to the subject site is the Gosford Local Environmental Plan (LEP) 2014. The LEP aims to make local environmental planning provisions for land in the Central Coast Council local government area in accordance with the relevant standard environmental planning instrument under section 33A of the Act. The particular aims of this Plan are as follows:

- (a) to encourage a range of housing, employment, recreation and services to meet the needs of existing and future residents of Gosford,
- (b) to foster economic, environmental and social well being so that Gosford continues to develop as a sustainable and prosperous place to live, work and visit,
- (c) to provide community and recreation facilities, maintain suitable amenities and offer a variety of quality lifestyle opportunities to a diverse population,
- (d) to strengthen the regional position of Gosford City Centre as the service and employment centre for the Central Coast,
- (e) to concentrate intensive land uses and trip-generating activities in locations that are most accessible to transport and centres,
- (f) to promote the efficient and equitable provision of public services, infrastructure and amenities,
- (g) to conserve, protect and enhance the environmental and cultural heritage of Gosford,
- (h) to protect and enhance the natural environment in Gosford, incorporating ecologically sustainable development,
- (i) to minimise risk to the community in areas subject to environmental hazards, particularly flooding and bush fires,
- (j) to promote a high standard of urban design that responds appropriately to the existing or desired future character of areas,
- (k) to promote design principles in all development to improve the safety, accessibility, health and well being of residents and visitors,
- (l) to encourage the development of sustainable tourism that is compatible with the surrounding environment.

The proposal is considered to be consistent with the broad intent of the LEP. The relevant provisions of the Gosford LEP 2014 and the compliance of the proposed telecommunications facility is outlined in Table 4 below.

4.3.2 Zoning

As the proposed telecommunications facility is not classified as a 'low-impact facility' under the Telecommunications (Low-impact Facilities) Determination 2018, consent is required from the Central Coast Council. As shown in Figure 7 below, the site is zoned SP2 – Infrastructure: Rail Infrastructure Facility.

Clause 115(1) of the SEPP (Infrastructure) provides that:

Development for the purposes of telecommunications facilities, other than development in clause 114 or development that is exempt development under 20 or 116, may be carried out by any person with consent on any land.

The proposed telecommunications facility is therefore permissible in the SP2 – Infrastructure zoning within the Central Coast LGA with the consent of the Council.

Figure 7. Zoning map of the area around the proposed facility. The proposed facility is marked with a red arrow. (Source: NSW Planning Portal)



Legend:
 E1 - National Parks and Nature Reserves
 RE1 - Public Recreation
 R2 - Low Density Residential
 SP2 - Infrastructure: Rail Infrastructure Facility
 SP2 - Infrastructure: Road
 W2 - Recreational Waterways

As far as relevant to this application, a response to the objectives of this zone is provided in **Table 4** below.

Table 4 – Assessment of Objectives of the SP2 – Infrastructure zone

Objective	Response
To provide for infrastructure and related uses.	The proposed facility is an important piece of infrastructure that will provide a direct benefit to mobile phone users at Koolewong and travelling on commuter trains through the area. It is considered that a mobile phone base station at this location and within the SP2 – Infrastructure zoning is entirely appropriate.

To prevent development that is not compatible with or that may detract from the provision of infrastructure.	The proposed facility, while itself a piece of infrastructure, will not impede any current or future provision of infrastructure at the location. The location has been agreed on by Sydney Trains.
To ensure that development is compatible with the desired future character of the zone.	<p>The proposed facility is not out of place with the existing or likely future character of the railway corridor. The corridor contains other tall and utilitarian features including train tracks, overhead train power lines, or the forested hills of the national park.</p> <p>Following community consultation during the Development Application process, the proposed facility location has been relocated to a new position approximately 43.6m further northeast, at coordinates -33.45859, 151.31367. The facility height is also reduced by 5 metres. The revised location makes better use of the visual screening opportunity presented by the row of trees and vegetation along Glenrock Parade to the west and northwest.</p>

The proposed development is considered to be entirely appropriate for the zone. It is for the reasons above that the proposal to use the site for a telecommunications facility is considered acceptable within the SP2 – Infrastructure zone.

4.3.3 Development Control Plans

The Gosford LEP 2014 is supplemented by the various provisions of the Gosford DCP 2013.

The type of development proposed is such that the various provisions of the Gosford DCPs that apply to the subject property are not applicable to the proposed development of a telecommunications facility.

5 Environmental Impact Assessment

The following issues should be considered when assessing the potential impact of a proposal:

- Visual Impact
- Social and economic impacts
- Flora and Fauna
- Heritage and Cultural Values
- Traffic Generation
- Soil Erosion and Landscaping provision
- Fire Prone Land
- Utility Services
- Noise
- Health and Safety
- Electrical Interference

5.1 Visual Impact

5.1.1 Visual Amenity

In undertaking an assessment of the proposal, Telstra considered the visual impact and aesthetics of the facility on the surrounding environment. Telstra has endeavoured to find a balance between providing services and minimising visual impact on the community and local environment.

Following community consultation during the Development Application process, the proposed facility location has been relocated to a new position approximately 43.6m further northeast, at coordinates -33.45859, 151.31367. The facility height is also reduced by 5 metres. The revised location makes better use of the visual screening opportunity presented by the row of trees and vegetation along Glenrock Parade to the west and northwest.

The Koolewong area is predominantly suburban and transport corridor area characterised by the railway line connecting Sydney and the Central Coast and the Brisbane Water National Park, Brisbane Water Drive connecting Gosford and Woy Woy, and detached houses spread throughout the foothills of the Brisbane Water National Park. The main users of the area around the proposed facility include train commuters, local residents and recreational maritime users.

Due to the topography and technology constraints outlined earlier, the revised location for the site has been identified as a viable location within the search area capable of meeting coverage objectives, while minimising visual impact as much as possible.

Telstra seeks to propose facilities in locations that have the least amount of impact possible on a community, while being able to deliver a high quality service. However, it is recognised that, similar to all forms of development, telecommunications facilities may have a visual effect. This visual effect can be attributed to two unavoidable characteristics of mobile phone base stations:

- i) They are structures which generally protrude above other structures; and
- ii) They need to be located at suitable heights in order to operate effectively.

Notwithstanding, telecommunication facilities are now an accepted part of the modern landscape, much like power lines, light poles, illuminated road signs and other utilities, as they provide a necessary service and essentially contribute to the wellbeing of a community.

The proposed facility will be visible from some viewpoints within the surrounding area, mostly to people using Brisbane Water Road or living on the western side of Glenrock Parade, however it is considered that the facility will be viewed as a functional element on the subject site and within the wider environment, and will not significantly detract from the current amenity of the locality.

It is considered that the facility has been located and designed appropriately to minimise detrimental visual impacts. After deployment, the monopole is not likely to result in a significantly adverse impact on the scenic amenity of the surrounding area when considering the following reasons:

- the monopole height of 25m, with the facility total height of 26.2m including antennas can achieve the specific radiofrequency objectives;
- the monopole is a single, recessively coloured vertical pole, presenting a relatively unobtrusive visual effect to the railway corridor and immediate surrounding area;
- the location benefits from visual blending with the facility being obscured by the vegetation background from many viewpoints; and
- the facility benefits from other nearby infrastructure, land uses and topography providing 'visual clutter', including the railway corridor overhead power lines and supporting poles, the railway tracks, commuter and freight trains moving through the area, and the steep forested hills, gullies, cuttings and embankments of the area.

5.1.2 Design

A precautionary approach to site design has been undertaken. Telstra has designed the site to attain the minimum viable overall height possible to achieve the radiofrequency coverage and capacity objectives for the area.

In terms of the potential visual effects of the upper section of the proposed facility, it is important to note that the antennas need to have line of sight to the area and devices that they are servicing in order to function effectively. This is an inherent feature of cellular technology, and antennas cannot be placed below a topographical line, surrounding trees or tall buildings, otherwise they will not be effective in providing the service to the user. It is a characteristic of the technology that telecommunications facilities must be visible in order that they operate effectively.

A monopole design was selected due to the site access limitations for construction, and the reduced visual impact of a single monopole when viewed against the backdrop of the wooded hillside behind it when viewed from Brisbane Water Road.

5.1.3 Conclusion

From the discussion outlined above in 5.1 – Visual Amenity, a number of conclusions have been made apparent concerning the proposed facility:

- Following community consultation during the Development Application process, the proposed facility location has been relocated to a new position approximately 43.6m further northeast, at coordinates -33.45859, 151.31367.
 - The facility height is also reduced by 5 metres.
 - The revised location makes better use of the visual screening opportunity presented by the row of trees and vegetation along Glenrock Parade to the west and northwest.
- The proposed facility has been designed and located to have a minimal visual effect on the surrounding environment without undermining its viability to meet the radiofrequency coverage objectives of the Koolewong area, and of commuter trains moving through the area.
- Recessive colouring and design lessens the potential visual effect.
- Views of the proposed facility will be minimised through the siting of the facility in the rail corridor, amongst other visually mitigating features of the local landscape.
- The nature of the technology determines that telecommunications facilities require direct line of sight to the areas that they are servicing, subsequently the antennas need to be visible to these areas in order to provide effective service to the user.
- With the expectation of having mobile phone coverage, there is an acceptance that the facilities that provide the coverage will be visible. Over time these facilities become part of the background and are no longer noticed.

5.2 Socio – Economic Considerations

The proposed facility will upgrade and expand services in the Koolewong area, and improve mobile services to passengers on commuter trains moving through the area. This will ensure that local residents and commuters benefit from the access to a mobile network service that is comparable to that provided in major metropolitan centres.

These services allow communities to enjoy:

- greater business accessibility and flexibility, especially for commuters, tradespeople and remotely-managed businesses;
- improved convenience and entertainment options for commuters travelling through the Koolewong, including train timetabling and status updates for track works or delays; arranging a lift from the

station; downloading occupation-related resources like emails and documents; and accessing entertainment and informative content like music and video streaming services and video chat;

- reliable personal safety – maintaining a mobile phone for critical communications and emergencies, including maritime emergencies on Brisbane Water Road; and
- maintained quality of mobile services. Demand for mobile data is approximately doubling year on year, which necessitates the continual deployment and upgrading of mobile telecommunications infrastructure to prevent slow data speeds, call drop outs and a general erosion of network quality in the area.

The proposed development will enable mobile carriers to remain competitive and increase the choice of mobile telephone services available to consumers. Increased competition in the market brings direct economic benefits for individual consumers and the community as a whole. The development is consistent with the objectives of the TA 1997, namely:

- to promote “the efficiency and international competitiveness of the Australian telecommunications industry” (s.3(1)); and
- to ensure that telecommunications services “are supplied as efficiently and economically as practicable” (s.3(2)(a)(ii)).

The proposed facility will therefore have a positive impact on the social and economic environment of the locality.

5.2.1 Effect on Surrounding House Values

Although property values are not an area of consideration by a consent authority, local residents sometimes ask questions on this topic. To date, there is no evidence of any negative impact of telecommunications facilities on property prices. With the many thousands of facilities located all around the country, if an impact was likely it is expected that it would be apparent by now. With the increase in the number and use of wireless devices, including smart phones, tablets and mobile data devices the number of fixed line connections is decreasing, and are not practical for commuters using train services.

5.3 Flora and Fauna

Due to the small footprint of the works within a highly modified environment, and given that the removal of no vegetation is required, it is considered that the proposal will not have a significant impact on any flora or fauna species in the area.

5.4 Heritage and Cultural Values

Online searches were undertaken in order to determine any natural or cultural values of State or Commonwealth significance. The following databases were viewed:

- Australian Heritage Places Inventory;
- Register of the National Estate; and
- AHIMS database.

Searches of the above registers established that the subject site is not subject to nor has any recognised cultural significance. A Copy of the AHIMS database search is provided in Appendix E.

5.5 Traffic and Access – Parking and public transport

5.5.1 Construction Access

The facility and all ancillary components will be constructed on the property at Koolewong, Lot 111 DP 1184661. Access will be via the Sydney Trains access track. This is the same access route taken by other trucks and maintenance vehicles relating to the railway line. A copy of the title is provided in Appendix C

During the construction phase, a truck will be used to deliver the equipment and a crane will be utilised to lift most of the equipment into place. Any traffic impacts associated with construction will be of a short-term duration and are not anticipated to adversely impact on the surrounding road network. This site access is considered appropriate for the construction of the facility, given that the facility will not be a significant generator of traffic.

5.5.2 Operational Access

Mobile phone base stations are unmanned, of low maintenance and remotely operated. As such, operational visits to the site will be approximately 2 - 6 times per year for maintenance purposes. Access to antennas will be via cherry pickers. The equipment cabinet will be securely locked and the proposal will involve the installation of anti-climbing devices on the tower, preventing access to members of the public to in those areas.

5.6 Soil Erosion and Landscape Provision

5.6.1 Contaminated Land

The site is not known to contain any contaminated land.

5.6.2 Erosion and sediment control

The following soil and water management mitigation measures will be undertaken if/when required for the movement of equipment:

- Keeping ground disturbing activities to a minimum;
- Implementing appropriate sediment control measures as required, such as the installation of silt/sediment fences and/or sediment traps;
- Stabilisation of the site compound area with weed matting and gravel base;
- Erosion and sediment controls will be checked regularly;
- Any trenches will be filled in and compacted immediately after services have been laid; and
- Works will not occur during periods of heavy rainfall.

5.7 Bushfire Prone Land

The facility is located on bushfire prone land within the Vegetation Buffer overlay, however the location is within the rail corridor and is clear of trees and any other vegetation to pose a risk to the safe operation of the facility. The facility is pre-fabricated and compliant with the Building Code of Australia and Australian standards. A Fire Management Plan is not required for a telecommunication facility as they are unmanned, remotely operated and do not pose a risk to human life.

5.8 Utility Services

Further identification of utilities will be undertaken during the detailed design stage of the proposal, and any impacts assessed and necessary safeguards will implemented as required.

When operational, the site will be unmanned, and does not require utility services such as telephone, water and sewerage.

All services required for the ongoing operation of the base station are capable of being provided to the facility without impacting on the supply or reliability of these services to any existing consumers in the locality.

5.9 Noise and Vibration

Noise and vibration emissions associated with the proposed facility will be limited to the initial construction phase. There will be some low level noise from the ongoing operation of air conditioning equipment associated with the equipment shelter once installed. Noise emanating from the air conditioning equipment is at a comparable level to a domestic air conditioning installation, and will comply with the background noise levels prescribed by Australian Standard AS1055.

5.10 Health and Safety

The ACMA mandates exposure limits for continuous exposure of the general public to Radio Frequency Electro Magnetic Emissions (RF EME) from mobile base stations. These limits are specified in the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) 2002, *Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz*, *Radiation Protection Series Publication No.3 ARPANSA ("RPS 3")*.

Some community members perceive that there is a potential health risk associated with mobile phones and mobile phone base stations. RPS 3, which sets public and occupational limits of exposure to radiation, is designed to avoid any known adverse effects where people are exposed to RF EME. Compliance with these exposure limits is a condition of the radio communications licenses issued by the ACMA.

ARPANSA states:

"The weight of national and international scientific opinion is that there is no substantiated evidence that RF emissions associated with living near a mobile phone base station poses a health risk."

The World Health Organisation's current advice is:

"None of the recent reviews have concluded that exposure to RF fields from mobile phones and their base stations causes any health consequences."

In accordance with RPS 3, an estimate has been made of the maximum cumulative radiofrequency (RF) electromagnetic energy (EME) levels at ground level emitted from the proposed mobile base station. Estimates of RF EME levels are provided for 360° circular bands at 0-50, 50-100, 100-200, 200-300, 300-400 and 400-600m from the base of the antenna.

The EME report concludes that the estimated maximum cumulative EME level at the subject site is 0.63% out of 100% of the ACMA mandated exposure limit (refer to Appendix B – ARPANSA EME Report).

A fact sheet on *'Understanding the Revised EME Environmental Report'* and *'Reading the Australian Radiation Protection and Nuclear Safety Agency EME Report'* is also provided in Appendix B.

The predictions in the Environmental EME Report assume a worst-case scenario including:

- Base station transmitters are operating at maximum power (no automatic power reduction);
- Simultaneous telephone calls on all channels; and
- An unobstructed line of sight view to the antennas.

In practice a worst-case scenario is rarely the case. There are often trees and buildings in the immediate vicinity, and cellular networks automatically adjust transmit power to suit the actual telephone traffic. The level

of EME may also be affected where significant landscape features are present and predicted EME levels might not be the absolute maximum at all locations.

5.11 Other Impacts During Construction

5.11.1 Air Quality

Where there is potential for dust generation during construction or during the movement of construction vehicles, it is expected to be localised and any impacts minimal and of only a short duration. The compound site and surrounds would be appropriately restored after the completion of works, and work within and around the site is not expected to impact upon the surrounding land. Once installed the proposal will generate no particulate air pollution and is not expected to cause dust hazards.

5.11.2 Waste Minimisation and Management

Due to the minor nature of the works, the generation of waste resulting from construction of the proposed facility is expected to be minimal. All waste material will be disposed of at an approved waste disposal facility.

During the operational phase, the facility will be unmanned and will not generate any waste or odour emissions.

6 Conclusion

Telstra propose to install a new telecommunications facility next to the railway line at Koolewong, NSW 2256, at coordinates -33.45859, 151.31367. This report provides the necessary information to support the application for a development permit.

The proposal will form an integral part of the Telstra 4G network to meet the increasing demand for mobile communication services and improve the coverage and quality of mobile phone services to passengers on commuter trains moving through the Koolewong area.

The facility has been sited and designed to minimise visibility within the surrounding environment as much as practicable. The proposed facility is considered appropriate for the following reasons:

- The proposed facility described above is 5.3 shorter than the previously proposed facility, and is located approximately 43.6m further northeast of the original proposed location. These changes to the proposal were made by Telstra following community consultation for the original proposal.
- It is considered that the visual impact of the proposal is acceptable having had full regard to the context of the locality, the nature of the design employed, and the mobile coverage and capacity benefits of the installation.
- The proposal will provide improved telecommunication infrastructure to the Koolewong area, ensuring that commuters and other users moving through the region will continue to receive up to date modern telecommunication infrastructure and technology.
- The proposed development is expected to provide socio-economic benefits to the community, mobile or remotely-managed businesses, travellers and emergency services in the region.
- The proposed site was considered the most viable option for the area as it meets the required radio frequency objectives, construction, access and power requirements of the facility and meets planning and property assessment criteria as outlined in Section 3.
- The proposal is consistent with the stated objectives of the *Gosford LEP 2014*.

- The proposed facility has also been designed and sited in accordance with the principles outlined in the Mobile Phone Base Station Deployment Code.
- The facility will comply with all Government standards outlined by ARPANSA.

As such we respectfully request that a development permit be granted, subject to reasonable and relevant conditions.

Service Stream Network Construction

On behalf of Telstra Corporation

August 2019

Appendix A

Design Drawings



Appendix B

Environmental EME Report and Fact Sheet



Appendix C

Property Title Search



Appendix D

AHIMS Database Search





3 March 2020

The General Manager
Central Coast Council
P O Box 21
Gosford NSW 2250

ATTENTION: Cade Tracey

Dear Sir/Madam

**STATE ENVIRONMENTAL PLANNING POLICY (INFRASTRUCTURE) 2007
DEVELOPMENT APPLICATION 56560/2019 - Installation of a mobile
telecommunications tower and equipment cabinet at KOOLEWONG (PART LOT 111 DP
1184661)**

I refer to Council's letter requesting concurrence for the above development application in accordance with Clause 86 of the above SEPP.

Council is advised that Sydney Trains, via Instruments of Delegation, has been delegated to act as the rail authority for the Central Coast and Newcastle rail corridor and to process the concurrence for this development application.

As such, Sydney Trains now advises that the proposed development has been assessed in accordance with the requirements of Clause 86(4) being:

- a) the potential effects of the development (whether alone or cumulatively with other development or proposed development) on:
 - i) the safety or structural integrity of existing or proposed rail infrastructure facilities in the rail corridor, and
 - ii) the safe and effective operation of existing or proposed rail infrastructure facilities in the rail corridor, and
- b) what measures are proposed, or could reasonably be taken, to avoid or minimise those potential effects.

In this regard, Sydney Trains has taken the above matters into consideration and has decided to grant its concurrence to the development proposed in development application **DA56560/2019** subject to Council imposing the operational conditions listed in Attachment A that will need to be complied with.

Should Council choose not to impose the operational conditions provided in Attachment A (as written), then concurrence from Sydney Trains has not been granted to the proposed development.



In the event that this development proposal is the subject of a Land and Environment Court appeal, Council's attention is drawn to Section 8.12 of the Environmental Planning and Assessment Act 1979 which requires Council to give notice of that appeal to a concurrence authority. Sydney Trains therefore requests that Council comply with this requirements should such an event occur.

Council is also advised that the Sydney Trains concurrence is not to be amended, replaced or superseded by any concurrence issued by any other rail authority, without the further agreement from Sydney Trains.

Please contact Gurvinder Singh on 92191970 should you wish to discuss this matter. Finally, Sydney Trains requests that a copy of the Notice of Determination and conditions of consent be forwarded to Sydney Trains.

Yours sincerely

Anthony Moeller
Digitally signed by
Anthony Moeller
Date: 2020.03.03
10:54:24 +11'00'

Anthony Moeller
Associate Director, Property & Revenue
Future Direction, Growth & Performance
Customer Service Directorate



Attachment A

- Unless amendments are required in order to obtain approval/certification/compliance from Sydney Trains in relation to any of the Sydney Trains related conditions of consent, all excavation and construction works are to be undertaken in accordance with the details, methodology, advice, undertakings and recommendations detailed in the following documents:

a) Drawings as per the following table:

	Drawing Nos.
1	N110930 Sheet S0 prepared by Service Stream dated 18.02.20
2	N110930 Sheet S1 prepared by Service Stream dated 18.02.20
3	N110930 Sheet S1-1 prepared by Service Stream dated 18.02.20
4	N110930 Sheet S1-2 prepared by Service Stream dated 18.02.20
5	N110930 Sheet S3 prepared by Service Stream dated 18.02.20
6	N110930 Sheet G4 prepared by Service Stream dated 18.02.20
7	N110930 Sheet H1 prepared by Service Stream dated 18.02.20
8	N110930 Sheet T2 prepared by Service Stream dated 18.02.20
9	N110930 Sheet T2-1 prepared by Service Stream dated 18.02.20
10	N110930 Sheet T2-2 prepared by Service Stream dated 18.02.20
11	431936-177-DS01 Issue A dated 06.11.19 prepared by Veris

- b) Geotechnical Investigation Report Revision 2 prepared by Martens Consulting Engineers dated 25.02.20.
- c) Authorised Engineering Organisation (AEO) Structural Design Certification prepared by GHD dated 26.02.20.
- d) Intermodulation Study Report prepared by Radahz Report No. 23717-3 (ISSUE A) 21.06.19.



- e) *Electrical and Earthing Design Report Revision 2 prepared by Service Stream dated 16.01.20.*
- f) *Civil and Structural Design Report Revision 2 prepared by Service Stream dated 18.02.20.*
- g) *Authorised Engineering Organisation (AEO) Electrical Certification prepared by GHD dated 24.01.20.*

The Certifying Authority is not to issue the Construction Certificate until the measures detailed in the documents approved/certified by Sydney Trains under this Condition are incorporated into the construction drawings and specifications prior to the issuing of the Construction Certificate. Prior to the commencement of works the Principal Certifying Authority is to provide verification to Sydney Trains that this condition has been complied with.

Supervision

- *Unless advised by Sydney Trains in writing, all excavation, shoring and piling works in and within 25m of the rail corridor are to be supervised by a geotechnical engineer experienced with such excavation projects and who holds current professional indemnity insurance.*

Services Search

- *Prior to the issue of a Construction Certificate, the Applicant shall undertake a services search to establish the existence and location of any rail services. Persons performing the service search shall use equipment that will not have any impact on rail services and signalling. Should rail services be identified within the subject development site, the Applicant must discuss with Sydney Trains as to whether these services are to be relocated or incorporated within the development site.*

Electrolysis

- *Prior to the issue of a Construction Certificate the Applicant must incorporate in the development all measures to control Electrolysis risk to the development. The Certifying Authority must ensure that the recommendations of an electrolysis report or any other document prepared by a suitably qualified person are incorporated in the construction drawings and documentation prior to the issuing of the relevant Construction Certificate.*



Design

- *The Applicant is to ensure that the development incorporates appropriate anti-graffiti measures. It is the responsibility of the applicant to remove graffiti immediately in case graffiti is applied.*
- *The design, installation and use of lights, signs and reflective materials, whether permanent or temporary, which are (or from which reflected light might be) visible from the rail corridor must limit glare and reflectivity to the satisfaction of Sydney Trains. The Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from Sydney Trains confirming that this condition has been satisfied.*

Construction

- *No metal ladders, tapes, and plant, machinery, or conductive material are to be used within 6 horizontal metres of any live electrical equipment. This applies to the train pantographs and catenary, contact and pull-off wires of the adjacent tracks, and to any aerial power supplies within or adjacent to the rail corridor. Prior to work commencing, the applicant must discuss with Sydney Trains and obtain electrical permits and/or other approvals in case any issue arise regarding compliance with this condition.*
- *No work is permitted within the rail corridor, or any easements which benefit Sydney Trains/RailCorp, at any time, unless the prior approval of, or an Agreement with, Sydney Trains/RailCorp has been obtained by the Applicant. The Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from Sydney Trains confirming that this condition has been satisfied.*
- *Prior to the issuing of a Construction Certificate, the following rail specific items are to be submitted to Sydney Trains for review and endorsement:*
 - *Machinery to be used during excavation/construction.*
 - *Demolition, excavation and construction methodology and staging*

The Certifying Authority is not to issue the Construction Certificate until it has received written confirmation from Sydney Trains that this condition has been complied with.

- *If required by Sydney Trains, prior to the issue of a Construction Certificate a Risk Assessment/Management Plan and detailed Safe Work Method Statements (SWMS) for the proposed works are to be submitted to Sydney Trains for review*

Sydney Trains is a NSW Government agency
Ground Floor - East, 36-46 George Street, Burwood NSW 2134 - PO Box 459 Burwood NSW 1805
Phone 8575 0780 Email DA_sydneytrains@transport.nsw.gov.au
www.transport.nsw.gov.au/sydneytrains ABN 38 284 779 682





and comment on the impacts on rail corridor. It is the responsibility of the applicant to be aware of any existing contamination on the site and work must be carried out in accordance with Safe Work NSW requirements. The Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from Sydney Trains confirming that this condition has been satisfied.

- *Prior to the issuing of a Construction Certificate the Applicant must submit to Sydney Trains a plan showing all craneage/lift methodology and other aerial operations for the development and must comply with all Sydney Trains requirements. If required by Sydney Trains, the Applicant must amend the plan showing all craneage/lift methodology and other aerial operations to comply with all Sydney Trains requirements. The Certifying Authority is not to issue the Construction Certificate until written confirmation has been received from the Sydney Trains confirming that this condition has been satisfied.*
- *No scaffolding is to be used in the rail corridor unless prior written approval has been obtained from Sydney Trains. To obtain approval the Applicant will be required to submit details of the scaffolding, the means of erecting and securing this scaffolding, the material to be used, and the type of screening to be installed to prevent objects falling onto the rail corridor. Unless agreed to by Sydney Trains in writing, scaffolding shall not be erected without isolation and protection panels.*
- *If required, prior to the issue of a Construction Certificate the Applicant is to contact Sydney Trains to determine the need for public liability insurance cover. If insurance cover is deemed necessary this insurance be for sum as determined by Sydney Trains and shall not contain any exclusion in relation to works on or near the rail corridor, rail infrastructure and must be maintained for the duration specified by Sydney Trains. The Applicant is to contact Sydney Trains Engineering Management Interfaces to obtain the level of insurance required for this particular proposal. Prior to issuing the Construction Certificate the Principal Certifying Authority must witness written proof of this insurance in conjunction with Sydney Trains written advice to the Applicant on the level of insurance required.*
- *Excess soil is not allowed to enter, be spread or stockpiled within the rail corridor (and its easements) and must be adequately managed/disposed of.*

Consultation

- *The Applicant must ensure that at all times they have a representative (which has been notified to Sydney Trains in writing), who:*
 - *oversees the carrying out of the Applicant's obligations under the conditions of this consent and in accordance with correspondence issued by Sydney Trains;*
 - *acts as the authorised representative of the Applicant; and*

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 Phone 8575 0780 Email DA_sydneytrains@transport.nsw.gov.au
 www.transport.nsw.gov.au/sydneytrains ABN 38 284 779 682





- *is available (or has a delegate notified in writing to Sydney Trains that is available) on a 7 day a week basis to liaise with the representative of Sydney Trains, as notified to the Applicant.*

- *Without in any way limiting the operation of any other condition of this consent, the Applicant must, during excavation and construction works, consult in good faith with Sydney Trains in relation to the carrying out of the development works and must respond or provide documentation as soon as practicable to any queries raised by Sydney Trains in relation to the works.*

- *Where a condition of consent requires consultation with Sydney Trains, the Applicant shall forward all requests and/or documentation to the relevant Sydney Trains external party interface team. In this instance the relevant interface team is Central Coast Project Team and they can be contacted via email on centralcoastmobilewifi@transport.nsw.gov.au.*

Documentation

- *Copies of any certificates, drawings, approvals/certification or documents endorsed by, given to or issued by Sydney Trains or RailCorp must be submitted to Council for its records prior to the issuing of the Construction Certificate*

Environmental Protection

- *During all stages of the development the Applicant must take extreme care to prevent any form of pollution entering the railway corridor. Any form of pollution that arises as a consequence of the development activities shall remain the full responsibility of the Applicant.*

Drainage

- *The Applicant must ensure that all drainage from the development is adequately disposed of and managed and not allowed to adversely impact on Rail Infrastructure.*

Inspections

- *If required by Sydney Trains, prior to the commencement of works or at any time during the excavation and construction period deemed necessary by Sydney Trains, a joint inspection of the rail infrastructure and property in the vicinity of the project is to be carried out by representatives from Sydney Trains and the Applicant. These dilapidation surveys will establish the extent of any existing*



damage and enable any deterioration during construction to be observed. The submission of a detailed dilapidation report will be required within 10 days following the undertaking of the inspection, unless otherwise notified by Sydney Trains.

- *If required by Sydney Trains, the Applicant must give Sydney Trains written notice at least 5 business days before any of the following events occur in or within 25 metres of the rail corridor land:*
 - *site investigations;*
 - *foundation, pile and anchor set out;*
 - *set out of any other structures below ground surface level or structures which will transfer any load or bearing;*
 - *foundation, pile and anchor excavation;*
 - *other excavation;*
 - *surveying of foundation, pile and anchor excavation and surveying of as-built excavations;*
 - *other concreting; or*
 - *any other event that Sydney Trains has notified to the Applicant.*

Other

- *Any conditions issued as part of Sydney Trains approval/certification of any documentation for compliance with the Sydney Trains conditions of consent, those approval/certification conditions will also form part of the consent conditions that the Applicant is required to comply with.*

--oOo--

Environmental EME Report

Location	1 Brisbane Water Dr, KOOLEWONG NSW 2256		
Date	16/08/2019	RFNSA No.	2250095

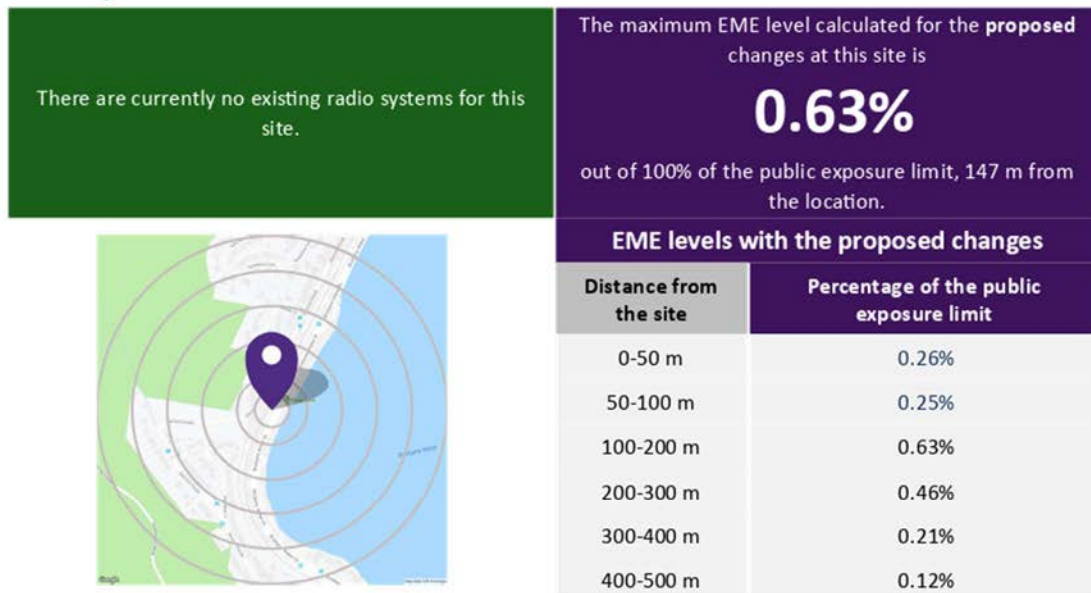
How does this report work?

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at 1 Brisbane Water Dr, KOOLEWONG NSW 2256. These levels have been calculated by Telstra using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

A document describing how to interpret this report is available at ARPANSA's website:

[A Guide to the Environmental Report.](#)

A snapshot of calculated EME levels at this site



For additional information please refer to the EME ARPANSA Report annexure for this site which can be found at <http://www.rfnsa.com.au/2250095>.

Radio systems at the site

This base station currently has equipment for transmitting the services listed under the existing configuration. The proposal would modify the base station to include all the services listed under the proposed configuration.

Carrier	Existing		Proposed	
	Systems	Configuration	Systems	Configuration
Telstra			3G, 4G	LTE700 (proposed), WCDMA850 (proposed), LTE1800 (proposed)

An in-depth look at calculated EME levels at this site

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined. All EME levels are relative to 1.5 m above ground and all distances from the site are in 360° circular bands.

Distance from the site	Existing configuration			Proposed configuration		
	Electric field (V/m)	Power density (mW/m ²)	Percentage of the public exposure limit	Electric field (V/m)	Power density (mW/m ²)	Percentage of the public exposure limit
0-50m				2.91	22.49	0.26%
50-100m				2.094	11.63	0.25%
100-200m				3.6	34.43	0.63%
200-300m				3.11	25.73	0.46%
300-400m				2.12	11.88	0.21%
400-500m				1.58	6.65	0.12%

Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest, identified through consultation requirements of the [Communications Alliance Ltd Deployment Code C564:2018](#) or other means. Calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Maximum cumulative EME level for the proposed configuration

Location	Height range	Electric field (V/m)	Power density (mW/m ²)	Percentage of the public exposure limit
Playground	0-2 m	0.49	0.65	0.013%
Residence on Glenrock Parade 2	0-6 m	2.3	14.043	0.28%
Residence on Glenrock Parade 2	0-6 m	2.3	14.043	0.28%
Residence on Glenrock Parade	0-6 m	0.45	0.54	0.011%
Residence on Moruya Close	0-6 m	1.34	4.73	0.09%

Item No: 3.2
Title: DA 54122/2018 - 34-36 Brisbane Water Drive,
Koolewong - Residential Flat Building and
Commercial Premises

Department: Environment and Planning

9 July 2020 Local Planning Panel Meeting

Reference: F2020/00812 - D14051752
Author: Robert Eyre, Principal Development Planner South
Manager: Ailsa Prendergast, Section Manager, Development Assessment South
Executive: Andrew Roach, Unit Manager, Development Assessment

Summary

An application has been received to demolish the existing dwelling houses and construct a shop and 15 residential apartments.

The application has been examined having regard to the matters for consideration detailed in section 4.15 of the *Environmental Planning and Assessment Act 1979* and other statutory requirements with the issues requiring attention and consideration being addressed in the report.

The application is required to be reported to the Local Planning Panel for determination due to:

- the height variation - the proposed development results a variation to the maximum height of buildings applicable to the site under the provisions of the *Gosford Local Environmental Plan 2014* (GLEP 2014) by more than 10%; and
- The number of submissions - The proposed development has been notified on two occasions. During the first notification period (19 April 2018 until 4 May 2018), 28 submissions were received. Amended plans were provided which were re-notified (8 August 2019 until 5 September 2019 - late submissions were also accepted) 45 submissions were received.

Property Lot and DP	LOT: 16 DP: 14946 LOT: 17 DP: 14946
Property Address	34–36 Brisbane Water Drive KOOLEWONG NSW 2256
Site Area	847 m ² 689 m ²
Zoning	B1 Neighbourhood Centre
Proposal	Commercial Premises and 15 units in a Residential Flat Building.

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

Application Type	Development Application - Local
Application Lodged	05/04/2018
Applicant	DFK Holdings Pty Ltd
Estimated Cost of Works	\$ 5,825,958
Advertised and Notified	First Exhibition -19 April 2018 to 4 May 2018 Second Exhibition - 8 August 2019 until 5 September 2019
Submissions	First exhibition-28 submissions. Second exhibition-45 submissions.

Recommendation

- 1 That the Central Coast Local Planning Panel assume the concurrence of the Secretary of Planning for the use of Clause 4.6 to vary the height and floor space ratio development standards of Clauses 4.3 and 4.4 of Gosford Local Environmental Plan 2014 to permit the proposed development.**
- 2 That the Central Coast Local Planning Panel Council grant consent subject to the conditions detailed in the schedule attached to the report and having regard to the matters for consideration detailed in Section 4.15 of the Environmental Planning and Assessment Act 1979 and other relevant issues.**
- 3 That the Central Coast Local Planning Panel advise those who made written submissions of its decision.**

Precis:

Proposed Development	Demolition existing dwelling houses and construct a shop and 15 residential apartments.
Permissibility and Zoning	B1 Neighbourhood Business zone
Relevant Legislation	<ul style="list-style-type: none"> • <i>Environmental Planning and Assessment Act 1979 – s. 4.15 (EP&A Act)</i> • <i>State Environmental Planning Policy No 55 - Remediation of Land (SEPP 55)</i> • <i>State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development (SEPP 65)</i> • <i>Gosford Local Environmental Plan 2014 (GLEP 2014)</i> • <i>Draft Central Coast Local Environmental Plan 2018 (Draft CCLEP 2018)</i> • <i>Gosford Development Control Plan 2013 (GDGP 2013)</i>

	<ul style="list-style-type: none"> • <i>Apartment Design Guide. Tools for improving the design of residential apartment development (ADG)</i> • <i>Gosford City Council Climate Change Policy.</i>
Current Use	Dwelling houses
Integrated Development	No

Variations to Policies

Policy	Clause / Description	Variation
Gosford Local Environmental Plan 2014	Clause 4.3(2) (Height of Buildings)	Maximum permitted building height: 8.5m. Proposed 9.81m. Variation 1.31m or 15.4% (lift overrun)
	Clause 4.4(2) FSR	Maximum 0.75:1 Proposed 0.82:1. Variation 0.07:1 or 9.3%
Gosford Development Control Plan 2013	Clause 3.3.3.1 Maximum height 8.5m. Proposed height 6.37m-9.81m	Nil-15.4%
	Maximum number storeys-2. Proposed 2-3 storeys.	Nil-33%
	External wall height maximum 7.5m. Proposed height 6m-9m.	Nil-20%
	Clause 3.3.3.2 Building setbacks.	
	Deep soil side setback-2m. Proposed 0m-3m.	Nil-100%
	Deep soil setback front and rear-6m. Proposed 0m-6m.	Nil-100%
	Side setbacks- 3.5m minimum, average 4m. Proposed 1.5m-5.354m.	Nil-57%

Policy	Clause / Description	Variation
	Front and rear setback-6m. Proposed 1.179m-6.04m.	Nil-80%
	3 rd storey additional 2.5m side setback.	100%
	Clause 3.3.3.4 Maximum building depth/width-25m	23%
	Clause 3.3.4.1 Housing Choice Mix maximum 33%	40%
State Environmental planning Policy No 65	Part 2F ADG 12m separation (6m setback up to 4 storeys	3m (or 50%) variation

Background

Council has received a Development Application for the construction of a mixed-use development consisting of a shop and a residential flat building containing 15 residential apartments. The application was initially received by Council on 5 April 2018 and public notification (first notification period) was undertaken from 19 April 2018 until 4 May 2018. 28 submissions were received during this notification period.

As a result of issues raised in public submissions and by Council's assessment staff to the original proposed development, the applicant submitted amended plans and supporting documentation on 1 August 2019. The amended plans did not result in a loss of units from the originally submitted proposal, but relocated the units removed from the centre of the site to the front and rear of the site. Amended plans re-notified (second notification period) from 8 August 2019 until 5 September 2019 (late submissions were also accepted) 45 submissions were received.

The changes essentially result in a reduction in floor area by 113.16m² and a reduction in height of about one storey or 4m. This is a significant improvement to the initially proposed development.

Compared to the previous proposed development, the amended plans altered the following aspects of the design:

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

- The basement entry driveway amended to be on southern side of site to accommodate potential road widening of Brisbane Water Drive.
- The commercial entry driveway and commercial car parking spaces were relocated to be on the northern side of the site to accommodate potential road widening of Brisbane Water Drive.
- The upper level of the residential flat building in the centre of the site has been removed, and the building footprint reduced to provide additional setback on both sides and to Brisbane Water Drive. This reduces the number of units in this part of the development from 15 to 6 units.
- The floor space removed from the centre of the site has been relocated to an additional two 2-storey units at the rear of the site, and the addition of 7 new 2-storey maisonette units located on the Brisbane Water Drive frontage of the site above the proposed shop.
- The basement car parking layout has been amended to delete the tandem spaces and provide 25 spaces including 2 accessible spaces.

The applicant submitted additional details and minor amendments on 24 April 2020. These additional details were minor and were not re-notified. As provided by Clause 7.3.2.10 of the *Gosford Development Control Plan 2013* which does not require re-notification of minor amendments, stating:

'...if in the opinion of Council or staff with the appropriate delegated authority the amendments are minor, or will result in no additional impacts, the amendments will not require re-advertisement or re-notification.'

The amended plans and details submitted on 1 August 2019 and 24 April 2020 are the subject of this assessment report.

The following figure 1 illustrates the difference between the initial and current proposed development.

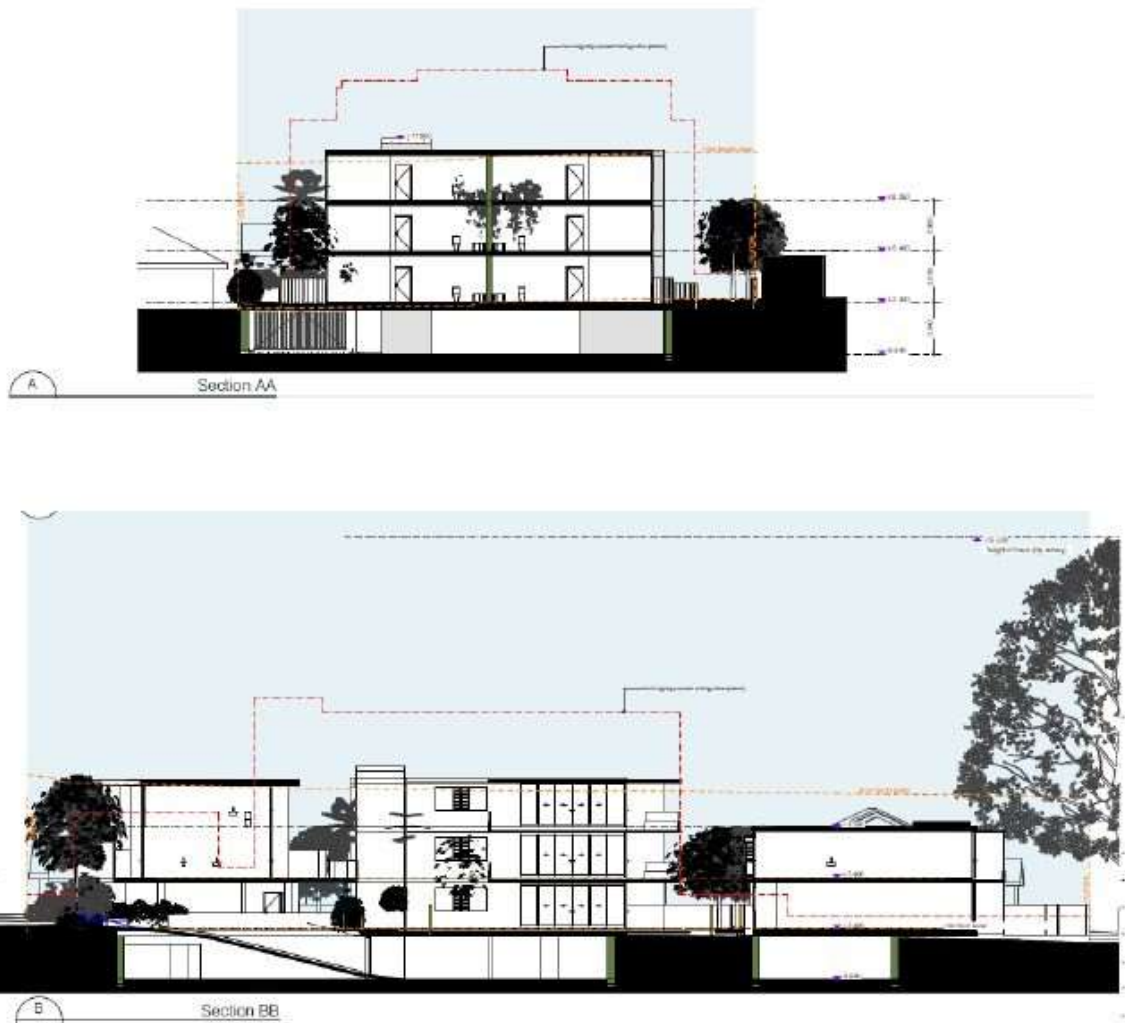


Figure 1 – Comparison between original and revised plans

W+D Architects

The Site

The subject site is commonly known as No's 34 – 36 Brisbane Water Drive, Koolewong and is legally described as Lot 16 and 17 DP 14946. The site has a frontage of 31.3m to Brisbane Water Drive, and the rear of No.34 has a frontage of 13m to Couche Park, and Brisbane Water beyond. The combined site area is approximately 1,536m².

The site falls gently from the front north-west corner to the rear south-east corner, with a slope of approximately 1.9%

There is one small tree on the boundary between No's 34 and 36, and this is proposed to be removed as part of the development. There are no other trees nor vegetation of significance. The site has views of Brisbane Water and areas beyond to the north-east and south-east, and direct views to the east are screened by existing trees in Couche Park at the rear.

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

The site contains existing dwelling houses on both properties, with a two-storey brick dwelling house on No. 36, with a rear garage and swimming pool, and a single storey brick dwelling house on No.34 located towards the rear of the property and Couche Park.

The subject site has also been identified as being partially flood prone in the 1% Annual Exceedance Probability (AEP) flood event.

The subject land, and those properties to the immediate north and south are zoned *B1 Neighbourhood Centre*, and aim to provide for neighbourhood business purposes with the following existing adjoining uses:

- The adjoining land to the north (No. 38 Brisbane Water Drive) contains a coffee roasting and café business, with a dwelling at the rear.
- The adjoining land to the south (No. 32 Brisbane Water Drive) contains a vacant commercial business and dwelling to the rear.
- Located to the rear of No. 32 Brisbane Water Drive is a separate lot with a two-storey dwelling house, known as No. 32A Brisbane Water Drive. This lot has a battle axe vehicular access and adjoining that is a pedestrian path that connects Brisbane Water Drive to Couche Park.
- Land adjoining the site to the immediate east is Couche Park, which is a public open space reserve adjoining Brisbane Water, and contains a number of mature trees (up to approximately 25m in height), a children's playground, amenities block and jetty.
- To the immediate west of the site, on the opposite side of Brisbane Water Drive, is Koolewong Railway Station, the Sydney to Newcastle rail line and associated facilities (including a commuter car park with access off Brisbane Water Drive).



Figure 2- Locality Plan



Figure 3 – Locality Plan



Figure 4 – Zoning Map

The Proposed Development

A development application has been lodged for a 'Mixed Use Development' which consists of a building of 2 to 3 storeys in height containing a shop at ground level and 15 residential units. The proposed development includes:

- Proposed shop (approx. 60m²);
- 15 residential units (7 x1 bedroom units and 8 x3 bedroom units);
- Partially underground carparking with access from Brisbane Water Drive for 25 cars, (including 2 accessible car spaces),
- 2 car parking spaces at ground level with separate access from Brisbane Water Drive (for the proposed shop);
- Ancillary/supporting elements (communal garden/open space, bin storage, landscaping and the like).

The proposed commercial component (shop) is located facing Brisbane Water Drive, located centrally on the street frontage, and has a gross floor area of 60m². The building has a 3m setback to Brisbane Water Drive, a setback of 12m to the northern side boundary, and 9m to the southern side boundary.

The building has a double height ceiling, and the building height is between 6.4m and 6.9m. Two car parking spaces are provided behind the commercial premises, with access via a driveway from Brisbane Water Drive.



Figure 5: Photomontage of proposal looking south along Brisbane Water Drive

Assessment

This application has been assessed using the heads of consideration specified under section 4.15 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and relevant Council policies. The assessment has identified the following key issues, which are elaborated upon for the Panel's information.

s. 4.15 (1)(a)(i) of the EP&A Act: Provisions of any environmental planning instruments/Plans/Policies

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

The application is supported by a BASIX certificate which confirms the proposal will meet the NSW government's requirements for sustainability, if built in accordance with the commitments in the certificate.

The proposal is considered to be consistent with the requirements of State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.

State Environmental Planning Policy (Coastal Management) 2018

The provisions of State Environmental Planning Policy (Coastal Management) 2018 require Council consider the aims and objectives of the SEPP when determining an application within the Coastal Management Areas. The Coastal Management Areas are areas defined on maps issued by the NSW Department of Planning and Environment and the subject property falls within the mapped coastal management areas.

The provisions of *State Environmental Planning Policy (Coastal Management) 2018* requires Council consider the aims and objectives of the SEPP when determining an application within the Coastal Management Area. The Coastal Management Area is an area defined on maps issued by the NSW Department of Planning Industry and Environment and the subject property falls within this zone (see figure 6).



Figure 6 – Coastal Management Area

Division 3 'Coastal environment area' of State Environmental Planning Policy (Coastal Management) 2018 states:

'13 Development on land within the coastal environment area

- (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,*
 - (b) *coastal environmental values and natural coastal processes,*
 - (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,*
 - (d) *marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*
 - (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,*
 - (f) *Aboriginal cultural heritage, practices and places,*
 - (g) *the use of the surf zone.*

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

- (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), or*
 - (b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
 - (c) if that impact cannot be minimised—the development will be managed to mitigate that impact.*
- (3) *This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.'*

Assessment: The proposed development does not cause an adverse impact on the matters required to be considered under Clause 13 (1) (a) – (g) or Clause 13 (2) (a) – (c) of *SEPP (Coastal Management) 2018*, as follows:

- The proposed development has no adverse impact on the integrity or resilience of the biophysical, hydrological or ecological environment;
- The proposed development has no adverse impact upon coastal environmental values or natural coastal processes;
- The proposed development has no adverse impact on the water quality of the marine estate;
- The proposed development has no adverse impact on marine vegetation; native vegetation/fauna and their habitats; undeveloped headlands; or rock platforms;
- The proposed development has no adverse impact on the public amenity of any existing public open space or public access to the coastal foreshore;
- The proposed development has no adverse impact on any known Aboriginal cultural heritage, practices or places;
- The proposed development is far removed from the "surf zone" and does not adversely impact its use by the public; and
- Drainage, nutrient and erosion control measures will be installed to protect the adjoining reserve and water way.

Division 4 'Coastal use area' of State Environmental Planning Policy (Coastal Management) 2018 states:

'14 Development on land within the coastal use area

- (1) *Development consent must not be granted to development on land that is within the coastal use area unless the consent authority—*
- (a) 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,*
 - (ii) *overshadowing, wind funnelling and the loss of views from public places to foreshores,*
 - (iii) *the visual amenity and scenic qualities of the coast, including coastal headlands,*
 - (iv) *Aboriginal cultural heritage, practices and places,*
 - (v) *cultural and built environment heritage, and*
- (b) *is satisfied that—*
- (i) *the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*
 - (ii) *if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
 - (iii) *if that impact cannot be minimised—the development will be managed to mitigate that impact, and*
- (c) *has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*
- (2) *This clause does not apply to land within the Foreshores and Waterways Area within the meaning of [Sydney Regional Environmental Plan \(Sydney Harbour Catchment\) 2005](#).*

Assessment: The proposed development does not cause adverse impact on the matters required to be considered under Clause 14 (1) (a) – (b) or clause 2 of *SEPP (Coastal Management) 2018*, as follows:

- The proposed development will not cause an adverse impact to access along the foreshore and public reserve;
- The proposed development will not cause overshadowing, wind funneling or loss of view from a public place;
- The proposal has been designed and located to minimize visual amenity and scenic qualities to the most maximum extent possible; and
- The proposal will not cause an adverse impact to and known Aboriginal cultural heritage or cultural and built environment heritage

The following provisions of Division 5 of *SEPP (Coastal Management) 2018* apply to the consent authority's consideration of a development application on the subject land:

15 Development in coastal zone generally—development not to increase risk of coastal hazards

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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.

And:

16 Development in coastal zone generally—coastal management programs to be considered

Development consent must not be granted to development on land within the coastal zone unless the consent authority has taken into consideration the relevant provisions of any certified coastal management program that applies to the land.

Assessment: Due to its location which is not in close proximity to the coastal foreshore, the subject land is not subject to increased risk of coastal hazards and is not subject to any certified coastal management program. The proposed development will not therefore cause increased risk of coastal erosion.

The relevant matters have been considered in the assessment of this application. The application is considered consistent with the stated aims and objectives.

State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development.

The development application has been lodged for a 'mixed use development' consisting of a separate commercial building and residential flat building. The application due to the number of floors of the residential component must be assessed against SEPP 65 as the proposed development is 3 storeys and more than 4 residential units.

The Residential Flat Building component of Gosford DCP 2013 also applies (as it applies to buildings up to 4 storeys).

SEPP 65 applies to the residential component and is the planning instrument that will be used along with the Gosford LEP 2014 height and floor space provisions to assess the residential component of the application.

Council's Architect has assessed the application against SEPP 65 and provides the following comments:

The proposal is subject to SEPP 65 and has been assessed against the nine Design Quality Principles in the SEPP and the Apartment Design Guide (ADG).

Context

The site is located on Brisbane Waters Drive and is zoned B1 Neighbourhood Centre. A medium density commercial and residential development is appropriate in this main road location opposite the station. Adjoining sites to the north and south are commercial uses and are likely to be redeveloped in the future.

The amended application includes a small commercial space at the front of the site (60m² or 4.9% of the total floor area) but there is concern that while the commercial space occupies 26% of the frontage, driveways and garbage collection area occupy 38% of the street frontage.

Built Form and Scale

The ADG requires 6 metre side setbacks to habitable rooms including balconies for buildings up to 12 metres or 4 storeys in height and 12 metres separation between habitable rooms and balconies within a development and lists the following as objectives of building separation and setbacks.

- *ensure that new development is scaled to support the desired future character with appropriate massing and spaces between buildings*
- *assist in providing residential amenity including visual and acoustic privacy, natural ventilation, sunlight and daylight access and outlook*
- *provide suitable areas for communal open spaces, deep soil zones and landscaping.*

The application proposes 3 metre setbacks or 50% non-compliance on the north and south boundaries

It is expected that the adjoining sites to the north and south will be redeveloped in a similar manner and non-complying building separation will reduce the development potential for both these. Detrimental impacts on adjoining sites resulting from non-compliance are not supported.

The problems resulting from non-complying setbacks are exacerbated by the location of the underground carpark on the southern boundary which restricts the area of deep soil and significant landscaping necessary to provide screening to and from adjoining sites.

The application also proposes 4 metres separation or 66% non-compliance between the balconies of G.02 and 1.02 and the units directly to the east.

The amended application exceeds the 8.5 metre height control by approximately

800mm on the east. This is considered minor and does not have any detrimental impacts on adjoining sites.

Density

The density is non-compliant by 9.3%. When combined with non-complying setbacks and building separation it indicates the application is an overdevelopment of the site.

Sustainability

NatHERS certificate supplied indicating compliance with mandatory energy efficiency standards. The use of solar hot water and photovoltaic cells or other energy saving options should also be considered.

Landscape

Because of the location of the underground carpark there is inadequate deep soil and landscaping to screen the non-complying side setbacks to and from adjoining sites to the south. The location of the sewer line on the eastern boundary further reduces the opportunity for significant planting.

It is doubtful that the proposed planting will survive under the 4m overhang of the front units. In other respects the landscaping is acceptable.

Amenity

Non-complying setbacks and building separation result in privacy impacts between units and with future developments on adjoining sites.

Apart from this amenity within the development is generally acceptable with all units achieving acceptable solar access, being well planned and with living areas opening directly to terraces or outdoor areas.

Safety

Balconies and windows overlook the street and common areas to provide surveillance.

Housing Diversity and Social Interaction

The application provides 1 and 3 bedroom units to cater for a variety of occupants.

Aesthetics

The aesthetics are generally acceptable. The building is articulated and uses variations in material to disguise bulk and scale.

Recommendations

The amended application has significantly reduced the extent of non-compliance but there continues to be non-compliance with setbacks, internal building separation, FSR and deep soil zones.

The application is not supported but it is considered that if internal separation non-compliance was significantly reduced the approval could be considered.'

Planning Comment: Despite the objection raised by Councils architect, the proposed development is worth of support for the following reasons:

The side setbacks on the northern side to the middle units is 3.245m to the edge of balconies, and 5.35m/5.493m to the walls of the building above ground level. Balconies are provided on both the northern and eastern sides of the middle units in a "L" shape.

Similarly, on the southern side boundary, the middle units are setback 3m to the edge of the balconies, and 5.351m to the walls of the middle units.

The application proposes to provide privacy screens along the length of the side balconies to preserve amenity and privacy of the adjoining sites. Such side balconies may be deleted as they are not essential for the units. The adjoining sites are also zoned B1 and may be developed in a similar manner in the future, albeit they would require consolidation of two or more lots to achieve a similar development.

Gosford Local Environmental Plan 2014 - Permissibility

The subject sites (Lots 16 and 17 DP 14946) are zoned B1 Neighbourhood Centre, under the provisions of the *Gosford Local Environmental Plan 2014* (Gosford LEP 2014).

The proposed development is best defined as a *mixed-use development* comprising:

- neighbourhood shop; and
- residential flat building.

The Gosford LEP 2014 defines these uses as follows:

neighbourhood shop means premises used for the purposes of selling general merchandise such as foodstuffs, personal care products, newspapers and the like to provide for the day-to-day needs of people who live or work in the local area, and

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may include ancillary services such as a post office, bank or dry cleaning, but does not include neighbourhood supermarkets or restricted premises.

And:

residential flat building means a building containing 3 or more dwellings, but does not include an attached dwelling or multi dwelling housing.

Both a 'neighbourhood shop' and 'residential flat building' permitted with development consent within the current B1 Neighbourhood Centre zone.

Gosford Local Environmental Plan 2014 – Clause 5.4 (7)

It is noted that Clause 5.4 (7) provides that

If development for the purposes of a neighbourhood shop is permitted under this Plan, the retail floor area must not exceed 100 square metres.

The proposed development includes a neighbourhood shop with a gross floor area of 60 sq metres, and so complies with this standard.

Gosford Local Environmental Plan 2014 – Zone Objectives

The objectives of the B1 zone are:

- To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood.
- To allow for an increased residential population in neighbourhood centres where land is not required to serve local needs.
- To ensure that development is compatible with the desired future character of the zone. To promote ecologically, socially and economically sustainable development.
- To ensure that local nodes and neighbourhood centres are recognised as small-scale centres that provide a range of services and facilities commensurate with their local population catchments and that development is of a scale that is appropriate to meet local needs.
- To encourage residential development as either stand alone development or as part of mixed use development in local nodes and neighbourhood centres, while retaining opportunities for retail and service activities to serve the population in the immediate locality.

The proposed development complies with the objectives of the B1 zone as it:

- Contains a small shop to serve the local needs of residents and users of the public reserve.

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- Increases the residential population in a location with good public access and transport which will support the local shops.
- Is not high rise and in character with desired future character with the higher parts of the development located in the centre of the site to mitigate impacts on adjoining sites and the public reserve.

In this instance, it is considered that the proposed development is consistent with the stated objectives of the zone.

Gosford Local Environmental Plan 2014 – Non Compliances and 4.6 Submission

The proposed development contains non-compliances to development standards contained within the Gosford LEP 2014 (height and floor space ratio) as set out below:

Development Standard	Required	Proposed	Compliance with Controls	Variation %	Compliance with Objectives
4.3 - Height of buildings	8.5m	9.81m	No - see comments below	Max 15.4%	Yes- see comments below
4.4 - Floor space ratio	0.75:1	0.82:1	No - see comments below	9.3%	Yes- see comments below

Gosford Local Environmental Plan 2014 – Clause 4.3: Height of buildings

The objectives of clause 4.3 are:

- (a) to establish maximum height limits for buildings,
- (b) to permit building heights that encourage high quality urban form,
- (c) to ensure that buildings and public areas continue to receive satisfactory exposure to sky and sunlight,
- (d) to nominate heights that will provide an appropriate transition in built form and land use intensity,
- (e) to ensure that taller buildings are located appropriately in relation to view corridors and view impacts and in a manner that is complementary to the natural topography of the area,
- (f) to protect public open space from excessive overshadowing and to allow views to identify natural topographical features.

The amended plans have reduced the height about 4m. The variation to height is now 1.31m at the lift overrun, 0.52m for the RFB at the front of the site, and 0.89m for the central RFB. The rear units facing the reserve have a height of up to 6.59m and are below the 8.5m height limit.

The applicant has provided the following diagram showing the non-compliances (refer to Figure 7) and the following table which shows in more detail the extent of variation over the proposed development.



Figure 7: Render indicating height non-compliances

The proposed building heights and extent of variations are:

Building element	LEP Standard	Max Height	% Variation
Front RFB (Maisonette) Units	8.5m	8.25m-9.02m	Nil-0.52m or 6.1%
Central RFB units	8.5m	8.55m-9.39m	0.05m-0.89m Or 0.59%-10.47%
Central Lift Overrun	8.5m	9.76m-9.81m	1.26m-1.31m or 14.8%- 15.4%
Rear RFB units	8.5m	6.37m-6.59m	Nil

Gosford Local Environmental Plan 2014 – Clause 4.4: Floor Space Ratio

The objectives of clause 4.4 are:

- (a) to establish standards for the maximum development density and intensity of land use,
- (b) to control building density and bulk in relation to site area in order to achieve the desired future character for different locations,
- (c) to minimise adverse environmental effects on the use or enjoyment of adjoining properties and the public domain,
- (d) to maintain an appropriate visual relationship between new development and the existing character of areas or locations that are not undergoing, and are not likely to undergo, a substantial transformation,
- (e) to provide an appropriate correlation between the size of a site and the extent of any development on that site,
- (f) to facilitate design excellence by ensuring the extent of floor space in building envelopes leaves generous space for the articulation and modulation of design,

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- (g) to ensure that the floor space ratio of buildings on land in Zone R1 General Residential reflects Council's desired building envelope,
- (h) to encourage lot amalgamation and new development forms in Zone R1 General Residential with car parking below ground level.

The development application involves a total floor space of 1,275.91 m². The resultant floor space ratio will be 0.82:1.

The *Gosford Local Environmental Plan 2014* (GLEP 2014) provides that the maximum floor space ratio for this land is 0.75:1. The variation to the development standard is 9.3%.

A proposed communal open space area is located on the northern side of the central residential units with an area of 69.5m². and will be extensively landscaped.

GLEP 2014 contains a hierarchy of business centre development controls. The FSR proposed for the residential component of the proposal is compatible with the *B1 Neighbourhood Business zone*.

Submission under Gosford Local Environmental Plan 2014 - Clause 4.6

The applicant has provided justification for the development. The justification contains the following elements.

The application seeks a variation to building height as a design response to the site, in order to locate the residential units centrally within the site, and maximise the setbacks to both Brisbane Water Drive and Couche Park. By consolidating building height within the proposed building footprint, the proposal is able to maintain the rear of the site adjoining Couche Park as large open space rather than maintaining a lower height overall and also building on the rear part of the site as could occur under Council's planning controls.

Maintaining the rear open space area as proposed will provide a quality transition between the proposed units and Couche Park and will also improve the outlook and cross views from adjoining properties to the side over the rear of the site towards Couche Park and Brisbane Water compared to a scenario where the rear of the site was developed.

The site survey submitted with the application identifies that the trees to the rear of the site in Couche Park are between 18.5m and 24m tall, which is over 10m higher than the proposed development, and these trees provide an effective screening of the site from Brisbane Water, and frame the height of the development as viewed from Brisbane Water Drive and areas beyond, with development sitting below the height of the trees behind.

The building has variable setbacks, and in particular, the penthouse level has increased setbacks on all sides compared to the levels below so as to provide articulation to the building and to minimise visual impacts of the top-most level

The proposal also seeks a variation to floor space ratio on the basis of the high level of accessibility of the site to public transport services, both train and bus, which provides opportunity for a slightly increased density of development that takes advantage of the site's location, and provides additional housing and housing choice, and alternative transport

It is a well-established planning approach to allow for increased densities around public transport facilities, particularly railway stations, and this principle extends to regional planning documents such as the Central Coast Regional Plan 2036, which encourages growth in and around local centres with access to transport services.

The proposed additional floor area is able to be accommodated by an increase in the height of the building rather than requiring an expanded footprint or site coverage, and without compromising landscape or open space areas.

The planning controls for B1 zoned land also encourage a higher scale and density of development compared to surrounding residential zoned land, and it is likely that similar development will occur on other adjoining commercial zoned land due to the proximity of the land to Brisbane Water and foreshore areas and the high level of accessibility of the area to public transport.

In relation to the height non-compliance, the applicants submission under Clause 4.6 of the GLEP 2014 contends that adherence to the development standard is unnecessary or unreasonable for the following reasons:

- The variation to height is largely located in the centre of the site, with the variation along the street frontage very minor or below the height limit. The variation is not perceptible when viewed from Brisbane Water Drive or Couche Park.
- The additional height is in response to the minimum floor level required due to flooding and the degree of accessibility due to the close proximity to public transport.
- The variation in height provides a transition from the front, rear and sides to the centre of the site, without significant impacts of view loss or overshadowing on adjoining or surrounding developments.
- The development has been orientated to the front and rear so as to minimise privacy impacts on adjoining developments.
- The proposal exhibits a high standard of architectural design.
- The variation to the height complies with the zone and development standard objectives.

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Council's Architect has stated that:

the amended application exceeds the 8.5m height control by approximately 800mm on the east. This is considered minor and does not have any detrimental impacts on adjoining sites.

In relation to the Floor Space Ratio non-compliance, the applicants justification for the proposed non-compliance states that the proposal provides a high standard of architectural design and has capacity to absorb the additional floor space without causing external impacts, considering the location of the site adjoining other commercial zoned and its accessibility to public transport facilities.

The site is located in an area with a high level of access to public transport, being on a bus route and within about 80m from Koolewong railway station. The variation to height and FSR is minor and does not significantly impact adjoining sites or their development potential. The variation is supported.

Consideration of the Submission under Clause 4.6 of the Gosford Local Environmental Plan 2014 - Exceptions to Development Standards

Clause 4.6 of Gosford LEP 2014 requires consideration of the following:

- 1 *Has the applicant submitted a written request that seeks to justify the contravention of the development standards by demonstrating:*
 - 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?*

Comment - The applicant has submitted a written request to vary the height and FSR development standards. The applicant submission contends that the development standards should be varied for the following reasons;

- The variations are minor and can be accommodated within the consolidated site without any significant additional impacts on amenity or overshadowing of adjoining developments.
- The development is of a high standard of architectural design and quality finishes.
- The proposal is consistent with the objectives of the B1 zone to provide such development in close proximity to public transport and to encourage lot consolidation.
- The variation to height is only over part of the development and mostly located within the centre of the site which reduces visual impact or appearance of bulk and scale from the public areas of Brisbane Water Drive

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and the rear park.

- The proposed development does not result in any significant loss of views or overshadowing of adjoining land.
- The development is orientated to the east and west, (Brisbane Water Drive or Couche Park) to mitigate the privacy and amenity impacts on adjoining residential developments.

The applicant's written request has adequately justified that compliance with the development standards is unreasonable and unnecessary in this instance and there are sufficient environmental Planning grounds to justify contravening the development standard.

- 2 *Is the proposed development 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?*

Comment - The proposed development is considered to be in the public interest. It provides for a small neighbourhood shop supported by residential units in close proximity to public transport including both bus and rail transport. The proposed development has been designed having regard to the streetscape and visual impact from the adjoining Couche Park and Brisbane Waters.

The development will not have unreasonable impacts on the adjoining residents or character of the area and is consistent with the objectives of the development standards and objectives of the B1 Zone.

- 3 *Has the concurrence of the Secretary been obtained?*

Comment - *Planning Circular PS 18-003* issued 21 February 2018 states that Council may assume the concurrence of the Secretary when considering exceptions to development standards under clause 4.6. The Council is therefore empowered to approve the application.

The requests for variation has been assessed with consideration of relevant principles set out in various judgements applying to variations to development standards, including;

- *Wehbe v Pittwater Council [2007] NSWLEC 827;*
- *Four2Five Pty Ltd v Ashfield Council [2015] NSWLEC 90;*
- *Four2Five Pty Ltd v Ashfield Council [2015] NSWCA 248;*
- *Randwick City Council v Micaul Holdings Pty Ltd [2016] NSWLEC 7;*
- *Initial Action Pty Ltd v Woollahra Municipal Council [2018] NSWLEC 118.*

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The request for a variation under Clause 4.6 is considered to be well founded and is recommended for support.

Gosford Local Environmental Plan 2014 – Clause 7.1 Acid Sulfate Soils

This land has been identified as being affected by the Acid Sulfate Soils Map and the matters contained in Clause 7.1 of Gosford Local Environmental Plan 2014 have been considered. The site contains Class 2 Acid Sulfate Soils. In this instance, the proposed works are considered to impact on Acid Sulfate Soils. A geotechnical report and acid sulphate soil management plan has been submitted.

Gosford Local Environmental Plan 2014 – Clause 7.2 Flood Planning

This land has been classified as being under a "flood planning level" and subject to the imposition of a minimum floor level. The development is considered satisfactory in respect to Clause 7.2 of Gosford Local Environmental Plan 2014. Appropriate conditions of consent have been applied with respect to flooding, in particular requirement for the basement to be designed in order to prevent entry of flood waters of up to RL 2.4m AHD (See recommended condition 2.10).

Draft Central Coast Local Environmental Plan

The application has been assessed under the provisions of the draft *Central Coast Local Environment Plan 2018* (draft CCLEP) publicly exhibited from 6 December 2018 to 28 February 2019 with respect to zoning, development standards and special provisions.

Under the draft CCLEP the proposal is to be located on land zoned B1 Neighbourhood Centre with a maximum building height of 8.5m and maximum FSR of 0.75:1.

The assessment concluded the proposal is consistent with the draft *Central Coast Local Environment Plan*.

Gosford Development Control Plan 2013

The following table provides an assessment against numerical standards contained within the Gosford Development Control Plan 2013:

Development Standard	Description	Required	Proposed	Compliance with Controls	Compliance with Objectives
3.3.2 - Desired Character				Yes	Yes- see comments below
3.3.3.1 - Height	Building height maximum	8.5m	6.37m - 9.81m	No - see comments below	Yes- see comments below
	Number of storeys maximum	2	3	No - see comments below	Yes- see comments below
	Height of exterior wall maximum	7.5m	6m - 9m	No - see comments below	Yes- see comments below

3.2

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Development Standard	Description	Required	Proposed	Compliance with Controls	Compliance with Objectives
	Floor height of lowest occupied storey maximum	1m	0.1m	Yes	Yes
	Ceiling height of habitable rooms minimum	2.7m	2.7m	Yes	Yes
	Ceiling height non-habitable rooms minimum	2.2m	2.4m	Yes	Yes
	Excavated depth habitable room on sloping site maximum	1.5m		n/a	
3.3.3.2 - Setbacks	Deep soil along side boundaries minimum	2m	0 -3m	No - see comments below	Yes- see comments below
	Deep soil planting along front and rear boundaries minimum	6m	0 - 6m	No - see comments below	Yes- see comments below
	Side setback (up to 2 storeys) minimum	3.5m	1.5m - 5.354m	No - see comments below	Yes- see comments below
	Front setback (up to 2 storeys) minimum	6m	1.179m - 3.79m	No - see comments below	Yes- see comments below
	Rear setback (up to 2 storeys) minimum	6m	4.412mm - 6.04mm	No - see comments below	Yes- see comments below
	Additional setback for third storey or mezzanine minimum	2.5m	0m	No - see comments below	Yes- see comments below
3.3.3.3 - Car Parking	Number of resident car parking spaces minimum	15	20	Yes	Yes
	Min number of visitor car parking spaces required	5	5	Yes	Yes
	Width of driveway minimum	5.5m	5.5m	Yes	Yes
3.3.3.4 - Articulation	Width and depth of building maximum	25m	30.8m	No - see comments below	Yes- see comments below
	"Unarticulated length" of any exterior wall maximum	8m	8m	Yes	Yes
3.3.3.5.2 - Sunlight and Overshadowing	Sunlight to be received by each dwelling minimum	3 hours	3 hours	Yes	Yes
	Sunlight to existing neighbours minimum	3 hours	3 hours	Yes- see comments below	Yes- see comments below
3.3.3.5.3 - Site Planning				Yes- see comments below	Yes- see comments below
3.3.3.5.4 - Natural Cross-ventilation	Percentage of dwellings having suitable natural cross-ventilation floor	70%	100%	Yes	Yes
3.3.3.5.5 - Private Open Space	Open space minimum	8 sqm - 16 sqm	>8 sqm	Yes	Yes

Development Standard	Description	Required	Proposed	Compliance with Controls	Compliance with Objectives
3.3.3.5.6 - Communal Open Space				Yes	Yes- see comments below
3.3.4.1 - Housing Choice				No - see comments below	Yes- see comments below
3.3.4.2 - Residential Address	Height of front fencing maximum			n/a	n/a
3.3.4.3 - Facades				Yes- see comments below	Yes- see comments below
3.3.4.4 - Landscaped Areas				Yes	Yes
3.3.4.5 - Building Services	Dimensions of garbage bin enclosure minimum			Yes	Yes
	Storage provided for each dwelling minimum			Yes	Yes

Gosford Development Control Plan 2013 – Scenic Quality and Character

The subject land lies within the *Koolewong 2: Open Parkland Foreshores* character area as set out in the Gosford DCP 2014. The following is the desired future character statement for the subject land. The statement does not specifically refer to the B1 Neighbourhood Business zone. It is the difficult to apply the character statement to the development application:

Desired Character

These should remain low-density residential foreshores where the informal open but leafy character of prominent backdrops to Gosford City's coastal waterways are enhanced by new dwellings that are surrounded by shady gardens.

Ensure that new structures do not dominate these foreshore settings or disrupt development patterns that are evident upon their surrounding properties. Avoid disturbing natural slopes and on properties that are floodprone, use low-impact construction such as suspended floors and decks rather than extensive landfilling to elevate habitable floors. Ensure a leafy character for these prominent backdrops by conserving any existing trees that are visually-prominent foreshore features, as well as planting gardens with low hedges and trees that are predominantly indigenous, arranged in clusters to maintain existing panoramic views. Maintain the informal character of existing wide street verges that are dotted with shady street trees.

Facing waterfronts in particular, avoid retaining walls, tall fences or extensive terraces that would visibly compromise the desired leafy character. Use fences that are low or see-through, or plant low hedges to maintain glimpses of the waterfront from street frontages. For properties with a direct waterfrontage, ensure that new boatsheds are modestly-scaled and reflect the architectural features of traditional timber-framed sheds. New jetties should be compatible with the style and visual impact of traditional timber piers.

Avoid the appearance of a continuous wall of foreshore development by surrounding buildings with leafy gardens that maintain waterfront and street setbacks similar to the surrounding properties. 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 by reflecting elements of traditional foreshore bungalows. 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 waterfront, disguise the visual impact of upper storeys by a combination of extra setbacks from the ground floor plus shady balconies and verandahs.

Reflect 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 desired future character statement is mainly concerned with the appearance from the foreshore or eastern side of the site. The proposed development appears as a 3 storey development over the Brisbane Water Drive or western frontage of the site. This is not consistent with the traditional coastal architecture the scale of the façade or traditional housing designs that would be expected with a residential zone.

However, from the rear and water view of the proposed development is 2 storey and more in keeping with a low density residential development envisaged in the desired future character statement, albeit with a flat roof

The street address and pedestrian access from Brisbane Water Drive to the residential units is located between the proposed shop and the southern driveway access to the basement car parking area.

Such a development is one that would be expected on a site within a business or commercial area rather than on an isolated business zone surrounded by residences and residential zone.

The statement does not specifically refer to the B1 Neighbourhood Business zone and it is difficult to apply the scenic quality guidelines to the development application.

Desired Character

New developments shall be consistent with the statement of desired character that is specified for their surrounding area by Chapter 2.1 - Character in this development control plan:

- a Scenic settings shall be protected and enhanced.*
- b Existing natural features shall be conserved and enhanced.*
- c Siting of buildings and surrounding garden areas shall be consistent with predominant patterns across the surrounding neighbourhood.*
- d Height, size and scale of new buildings shall be compatible with the predominant pattern across the surrounding neighbourhood.*
- e Architectural form and design details shall be appropriate to existing scenic quality and streetscape character.*
- f Garden design and details shall be compatible with scenic quality and streetscape character.*
- g Street verges shall conserve visually-prominent landscape features.*

The proposed development is appropriate for the site being zoned B1 Neighbourhood Centre. Development on a business zone cannot be expected to have the same character as a residential zone.

The proposed design does not reduce the existing scenic quality or streetscape character and does not have excessive bulk or scale. The proposal is essentially a small-scale mix of business and residential on a main road frontage which conserves the visual appearance of surrounding development when viewed from the street or from Couche Park and Brisbane Water at the rear of the site.

Gosford Development Control Plan 2013 – 3.3.3.2 Setbacks

The proposed development has provided variable setbacks which contribute to the articulation of the building. This combined with the separation of the development into 3 separate components reduces the impact on the adjoining sites. The middle 3 storey units are located in the centre of the site which further reduces the impact on adjoining sites.

Gosford Development Control Plan 2013 – 3.3.3.3 and 7.1 Car Parking

The proposed development complies with the car parking required, including the provision of 2 accessible car parking spaces in the basement car parking area. In addition 3 bicycle spaces are provided.

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

Summary of parking is set out in the table below:

Development Type	Description	Required	Proposed	Compliance with Controls
RFB	Min car spaces	15	20	Yes
	Min visitor parking	3	5	Yes
Shops	Min car spaces	2	2	Yes

Gosford Development Control Plan 2013 – 3.3.3.4 Articulation

The maximum building depth of the front maisonette units exceeds the maximum 25m depth/width. The maisonette units are cantilevered over the ground level commercial premises which creates an architectural feature as well as a stepped building alignment. This provides an open area under the units as well as all maisonette units having cross ventilation.

The side elevations are articulated and broken up by recessed elements and different building materials.

Gosford Development Control Plan 2013 – 3.3.3.5 Sunlight and Overshadowing

The proposed development has been designed essentially into 3 components. The front 3 storey maisonette units, the middle 3 storey and the rear 2 storey residential units. Due to the east-west orientation of the lots and dwellings in this location, the shadow impacts are essentially on the southern side. The southern adjoining sites are impacted by their own shadows to a degree in the morning and in the afternoon.

No 32A Brisbane Water Drive will have sunlight to the park frontage of the site in the morning. The shadow impact from the adjoining proposed two storey units will mostly impact the side wall of the dwelling, as the units are of a lower height than the building on 32A. Of particular concern from

No 32A Brisbane Water Drive was the shadow impact on the roof of the building as it is intended in the future to place solar panels on the northern side roof area. The shadow diagrams submitted show the roof area of No 32A Brisbane Water Drive will have adequate sunlight to the roof area in the winter time.

Gosford Development Control Plan 2013 – 3.3.3.5 Site Planning

The proposed development and units have been orientated in an east-west direction to take advantage of the views to Brisbane Water and to mitigate the privacy and amenity impacts on the adjoining sites. For the middle units, privacy screens are proposed on the north and south balconies above ground level.

Gosford Development Control Plan 2013 – 3.3.3.5 Natural Cross Ventilation

The orientation of the units and separation into 3 components significantly improves natural cross ventilation. This combined with all living areas being located within 8m of large windows improves the internal amenity.

Gosford Development Control Plan 2013 – 3.3.3.5 Private Open Space

The proposed private open space in excess of the minimum required.

Gosford Development Control Plan 2013 – 3.3.3.5 Communal Open Space

The proposed development provides 69.45 sqm on the northern side of the site. This combined with access from all units to Couche Park provides good internal and external amenity for residents.

Gosford Development Control Plan 2013 – 3.3.4 Housing Choice

The provision of 7 one bedroom units or 47% of all units exceeds the desirable no greater than 33% of the same type of units. However, this is compensated for by the remainder being 3 bedroom units. This provides a reasonable mix of units in this location close to both public transport and recreational facilities.

Gosford Development Control Plan 2013 – 3.3.4 Facades

The proposal provides a varying front setback, with changes in building materials.

Gosford Development Control Plan 2013 – 6.3 Erosion Sediment Control

Appropriate siltation control to be conditioned.

Gosford Development Control Plan 2013 – 6.4 Geotechnical Requirements

A geotechnical report has been submitted with the application. The land is not steep but has a high- water table. The report identifies temporary or permanent retaining walls will be required to ensure the stability of the adjoining land during excavation for the basement car parking.

Gosford Development Control Plan 2013 –6.6 Tree and Vegetation Management

Only one tree is to be removed or affected by the proposed development. This is compensated for by the proposed landscaping of the site.

Gosford Development Control Plan 2013 – 6.7 Water Cycle Management

A water cycle management plan has been submitted and assessed by Council's Engineer as satisfactory.

Referrals

The following referrals have been undertaken during the assessment of the application:

Internal Referral Body	Comments
Architect	Not supported
Engineering	Supported, subject to conditions
Engineering Traffic/Transport	Supported, subject to conditions
Environment	Supported, subject to conditions
Recreation Passive Parks	Supported, subject to conditions
Waste Service (Garbage)	Supported, subject to conditions
Water and Sewer Assessment	Supported, subject to conditions
External Referral Body	Comments
Roads and Maritime Services - State and Regional Roads	Supported, subject to conditions

s. 4.15 (1)(d) of the EP&A Act: Any Submission Made in Accordance with this Act or Regulations

Section 4.15 (1)(d) of the EP&A Act requires consideration of any submissions received during notification of the proposal.

Public Submissions

The application has undergone notified in accordance with Chapter 7.3 of *Gosford Development Control Plan 2013* (GDGP 2013). There were two notification periods, as follows:

The application was initially received by Council on 5 April 2018 and public notification (first notification period) was undertaken from 19 April 2018 until 4 May 2018. 28 submissions were received during this notification period.

Amended plans and supporting documentation was submitted by the applicant on 1 August 2019. These amended details were re-notified (second notification period) from 8 August 2019 until 5 September 2019 (late submissions were also accepted) 45 submissions were received.

The applicant submitted additional details and minor amendments on 24 April 2020. These additional details were minor and were not re-notified. As provided by Clause 7.3.2.10 of the *Gosford Development Control Plan 2013* which does not require re-notification of minor amendments, stating:

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

...if in the opinion of Council or staff with the appropriate delegated authority the amendments are minor, or will result in no additional impacts, the amendments will not require re-advertisement or re-notification.

The issues raised in the submissions are detailed below.

Submission: *The development is an overdevelopment of the site.*

Council Comment: The development does not comply with the height and floor space ratio provisions for the B1 zone. The variation to FSR is 0.07:1 or 9.3%. The variation to height is up to 1.31m or 15.4% for the lift overrun which is only over 0.5% of the site area. As assessed under the relevant controls the variations do not result in any significant additional impacts on adjoining sites or the environment.

Submission: *The development will create traffic congestion and increase traffic problems and reduce safety.*

Council Comment: The Development Application was referred to the TfNSW (formerly RMS) and Council's Traffic Engineer and neither has identified that the development will result in a level of additional traffic congestion on Brisbane Water Drive that would not preclude the development from taking place.

Submission: *Concern as to safety issues (i.e. sight lines) associated with the turning of vehicles into and out of the development.*

Council Comment: This matter has been addressed by Council's Traffic Engineer who has recommended conditions of consent. TfNSW has not raised any issues in this regard. The proposal provides adequate sight distance for vehicles exiting the driveways.

Submission: *There will be overshadowing of southerly properties associated with the development.*

Council Comment: The southern adjoining properties will be impacted by overshadowing by the proposed development to a minor extent in March/September and greater in June each year. While the dwelling house at No 32A Brisbane Water Drive will have its northern side wall impacted by shadow in the winter time, the roof of the house will still receive sunlight as it is at a level above the proposed adjoining 2 storey building. This is not an unreasonable shadow impact for part of the year.

A similar situation exists for No. 32 Brisbane Water Drive, although the proposed development adjoining No 32 has a minor variation to height, the additional overshadowing is not significant.

Overshadowing of Couche Park is minor in the late afternoon and therefore unlikely to occur at critical times of the day as the park is located to the east and north of the

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

subject land (ie the directions from which the sun is located for most of the day)

Submission: *The development application is not in accordance with desired character/scenic quality components of Council's GDCP 2013.*

Council Comment: The character statements in the GDCP 2013 do not address the business zoned land and mainly relate to impact on the foreshore or eastern side of the site. Of concern is the extend of the 3 storey building along the Brisbane Water Drive frontage of the site and the façade and street address treatment proposed. However, Brisbane Water Drive in this location is a mix of small scale businesses and existing residential dwellings in transition to new and larger developments

Submission: *The proposal will impact upon the views of Brisbane Water from properties in Glenrock Parade.*

Council Comment: Properties in Glenrock Parade are located on sites well above the subject site. This combined with the reduction in height of the proposed development does not result in any significant view loss from properties on the opposite side of the railway line and Glenrock Parade. Such a claim has no merit.

Submission: *The 3 storey development in nearby Couche Cres should not be used as a precedent for development on this site as the Couche Cres. development was achieved as a result of a unique existing use rights.*

Council Comment: The applicant has indicated that the finished RL of the development in Couche Cres is greater than that proposed on the subject site. The circumstances of the Couche Cres development are considered not readily comparable to that being proposed on the subject site as the Couche Crescent development was approved using existing use rights provisions and does not sit within the planning provisions created under GLEP 2014.

Submission: *The use of large trees in Couche Park as a reference point to justify the height of the residential component is inappropriate.*

Council Comment: The applicant has used the large trees in Couche Park as a reference point for the height of the building point to point out that the trees are much taller than the building.

Submission: *Only the 8.5m height laid down in community agreed LEP should be used.*

Council Comment: Council's GLEP 2014 provided for a hierarchy of business zoned land. This hierarchy is reflected in the increasing height and floor space ratios that apply to the business zoned land. The B1 zone has the lowest height and floor space potential of all business zoned land. The proposal involves a height of 6.37m to 9.81m and a floor space ratio of 0.82:1. The proposed heights and floor space ratio variations are not

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

significant. The greatest variation to height is due to the lift overrun which is only over a small part of the site and the development.

Submission: *The area is low lying and it is not explained where stormwater is disposed of to. It is assumed it will be disposed of to the community open space along the foreshore.*

Council Comment: The applicant has submitted a water cycle management plan which has been assessed by Council's engineers. Stormwater will be disposed of to Council's drainage system.

Submission: *The B1 zone is inappropriate for this site. Previous businesses have failed.*

Council Comment: The commercial viability of a business is not a relevant matter for consideration in assessment of an application. The site is zoned B1 and a shop and residential units are a permissible use with consent.

Submission: *Couche Park is located nearby and contains native birds.*

Council Comment: The proposed development does not adversely impact the park or birdlife.

Submission: *The proposed development overshadows the adjoining eastern property.*

Council Comment: The adjoining eastern property is not significantly affected by overshadowing.

Submission: *Inadequate on-site car parking due to the up to 40 people may be housed, and the number of shop parking spaces*

Council Comment: The number of car parking spaces meets the DCP requirements. It is unreasonable to assume 40 people will have 40 cars, as car sharing within families is common and not all residents have a car. The shop parking complies with the number of spaces required and the shop will also serve people within walking distance from the site.

Submission: *Two separate driveways pose a traffic hazard, particularly with the pedestrian/cycle path along the eastern side of Brisbane Water Drive.*

Council Comment: The driveway to the shop parking will have very minor traffic movements and both driveways must provide adequate sight distance for vehicles crossing the pathway before entering the road. TfNSW and Council's engineers have considered the impacts and have not objected to the proposal.

18. Submission: *The potential flooding of the underground car park. The 1% flood underestimates the effects of climate change and tidal surges.*

Council Comment: The entry to the basement car park must be at a level above the 1% flood to prevent water entering the basement level. The 1% AEP floor level for the site is RL 1.9m AHD. Therefore, the minimum floor level is RL 2.4m AHD. The development complies with the minimum floor level required.

Submission: *If the units are used for short term accommodation, traffic and road congestion will be greater.*

Council Comment: The proposal is not for short term accommodation.

Submission: *The proposal will impact housing values and the appeal of the area.*

Council Comment: No evidence has been submitted to justify this claim. A number of factors affect housing values, including the location and interest rates.

Gosford Development Control Plan 2013 – Scenic Quality and Character

The subject land lies within the *Koolewong 2: Open Parkland Foreshores* character area as set out in the Gosford DCP 2014. The following is the desired future character statement for the subject land. The statement does not specifically refer to the B1 Neighbourhood Business zone. It is difficult to apply the character statement to the development application:

Desired Character

These should remain low-density residential foreshores where the informal open but leafy character of prominent backdrops to Gosford City's coastal waterways are enhanced by new dwellings that are surrounded by shady gardens.

Ensure that new structures do not dominate these foreshore settings or disrupt development patterns that are evident upon their surrounding properties. Avoid disturbing natural slopes and on properties that are floodprone, use low-impact construction such as suspended floors and decks rather than extensive landfilling to elevate habitable floors. Ensure a leafy character for these prominent backdrops by conserving any existing trees that are visually-prominent foreshore features, as well as planting gardens with low hedges and trees that are predominantly indigenous, arranged in clusters to maintain existing panoramic views. Maintain the informal character of existing wide street verges that are dotted with shady street trees.

Facing waterfronts in particular, avoid retaining walls, tall fences or extensive terraces that would visibly compromise the desired leafy character. Use fences that are low or see-through, or plant low hedges to maintain glimpses of the waterfront from street frontages. For properties with a direct waterfrontage, ensure that new boatsheds are modestly-scaled and reflect the architectural features of traditional

timber-framed sheds. New jetties should be compatible with the style and visual impact of traditional timber piers.

Avoid the appearance of a continuous wall of foreshore development by surrounding buildings with leafy gardens that maintain waterfront and street setbacks similar to the surrounding properties. 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 by reflecting elements of traditional foreshore bungalows. 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 waterfront, disguise the visual impact of upper storeys by a combination of extra setbacks from the ground floor plus shady balconies and verandahs.

Reflect 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 desired future character statement is mainly concerned with the appearance from the foreshore or eastern side of the site. The proposed development appears as a 3 storey development over the Brisbane Water Drive or western frontage of the site. This is not consistent with the traditional coastal architecture the scale of the façade or traditional housing designs that would be expected with a residential zone.

However, from the rear and water view of the proposed development is 2 storey and more in keeping with a low density residential development envisaged in the desired future character statement, albeit with a flat roof

The street address and pedestrian access from Brisbane Water Drive to the residential units is located between the proposed shop and the southern driveway access to the basement car parking area.

Such a development is one that would be expected on a site within a business or commercial area rather than on an isolated business zone surrounded by residences and residential zone.

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

The statement does not specifically refer to the B1 Neighbourhood Business zone and it is difficult to apply the scenic quality guidelines to the development application.

Desired Character

New developments shall be consistent with the statement of desired character that is specified for their surrounding area by Chapter 2.1 - Character in this development control plan:

- a. *Scenic settings shall be protected and enhanced.*
- b. *Existing natural features shall be conserved and enhanced.*
- c. *Siting of buildings and surrounding garden areas shall be consistent with predominant patterns across the surrounding neighbourhood.*
- d. *Height, size and scale of new buildings shall be compatible with the predominant pattern across the surrounding neighbourhood.*
- e. *Architectural form and design details shall be appropriate to existing scenic quality and streetscape character.*
- f. *Garden design and details shall be compatible with scenic quality and streetscape character.*
- g. *Street verges shall conserve visually-prominent landscape features.*

The proposed development is appropriate for the site being zoned B1 Neighbourhood Centre. Development on a business zone cannot be expected to have the same character as a residential zone.

The proposed design does not reduce the existing scenic quality or streetscape character and does not have excessive bulk or scale. The proposal is essentially a small-scale mix of business and residential on a main road frontage which conserves the visual appearance of surrounding development when viewed from the street or from Couche Park and Brisbane Water at the rear of the site.

Gosford Development Control Plan 2013 – 3.3.3.2 Setbacks

The proposed development has provided variable setbacks which contribute to the articulation of the building. This combined with the separation of the development into 3 separate components reduces the impact on the adjoining sites. The middle 3 storey units are located in the centre of the site which further reduces the impact on adjoining sites.

Gosford Development Control Plan 2013 – 3.3.3.3 and 7.1 Car Parking

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3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

Summary of parking is set out in the table below:

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The side elevations are articulated and broken up by recessed elements and different building materials.

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The proposed development has been designed essentially into 3 components. The front 3 storey maisonette units, the middle 3 storey and the rear 2 storey residential units. Due to the east-west orientation of the lots and dwellings in this location, the shadow impacts are essentially on the southern side. The southern adjoining sites are impacted by their own shadows to a degree in the morning and in the afternoon.

No 32A Brisbane Water Drive will have sunlight to the park frontage of the site in the morning. The shadow impact from the adjoining proposed two storey units will mostly impact the side wall of the dwelling, as the units are of a lower height than the building on 32A. Of particular concern from

No 32A Brisbane Water Drive was the shadow impact on the roof of the building as it is intended in the future to place solar panels on the northern side roof area. The shadow diagrams submitted show the roof area of No 32A Brisbane Water Drive will have adequate sunlight to the roof area in the winter time.

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The proposed private open space in excess of the minimum required.

Gosford Development Control Plan 2013 – 3.3.3.5 Communal Open Space

The proposed development provides 69.45 sqm on the northern side of the site. This combined with access from all units to Couche Park provides good internal and external amenity for residents.

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The proposal provides a varying front setback, with changes in building materials.

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Appropriate siltation control to be conditioned.

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3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

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Submission: *Only the 8.5m height laid down in community agreed LEP should be used.*

Council Comment: Council's GLEP 2014 provided for a hierarchy of business zoned land. This hierarchy is reflected in the increasing height and floor space ratios that apply to the business zoned land. The B1 zone has the lowest height and floor space potential of all business zoned land. The proposal involves a height of 6.37m to 9.81m and a floor space ratio of 0.82:1. The proposed heights and floor space ratio variations are not

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

significant. The greatest variation to height is due to the lift overrun which is only over a small part of the site and the development.

Submission: *The area is low lying and it is not explained where stormwater is disposed of to. It is assumed it will be disposed of to the community open space along the foreshore.*

Council Comment: The applicant has submitted a water cycle management plan which has been assessed by Council's engineers. Stormwater will be disposed of to Council's drainage system.

Submission: *The B1 zone is inappropriate for this site. Previous businesses have failed.*

Council Comment: The commercial viability of a business is not a relevant matter for consideration in assessment of an application. The site is zoned B1 and a shop and residential units are a permissible use with consent.

Submission: *Couche Park is located nearby and contains native birds.*

Council Comment: The proposed development does not adversely impact the park or birdlife.

Submission: *The proposed development overshadows the adjoining eastern property.*

Council Comment: The adjoining eastern property is not significantly affected by overshadowing.

Submission: *Inadequate on-site car parking due to the up to 40 people may be housed, and the number of shop parking spaces*

Council Comment: The number of car parking spaces meets the DCP requirements. It is unreasonable to assume 40 people will have 40 cars, as car sharing within families is common and not all residents have a car. The shop parking complies with the number of spaces required and the shop will also serve people within walking distance from the site.

Submission: *Two separate driveways pose a traffic hazard, particularly with the pedestrian/cycle path along the eastern side of Brisbane Water Drive.*

Council Comment: The driveway to the shop parking will have very minor traffic movements and both driveways must provide adequate sight distance for vehicles crossing the pathway before entering the road. TfNSW and Council's engineers have considered the impacts and have not objected to the proposal.

18. Submission: *The potential flooding of the underground car park. The 1% flood underestimates the effects of climate change and tidal surges.*

3.2 DA 54122/2018 - 34-36 Brisbane Water Drive, Koolewong - Residential Flat Building and Commercial Premises (contd)

Council Comment: The entry to the basement car park must be at a level above the 1% flood to prevent water entering the basement level. The 1% AEP floor level for the site is RL 1.9m AHD. Therefore, the minimum floor level is RL 2.4m AHD. The development complies with the minimum floor level required.

Submission: *If the units are used for short term accommodation, traffic and road congestion will be greater.*

Council Comment: The proposal is not for short term accommodation.

Submission: *The proposal will impact housing values and the appeal of the area.*

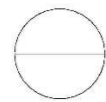
Council Comment: No evidence has been submitted to justify this claim. A number of factors affect housing values, including the location and interest rates.

Attachments

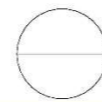
1	Updated D900 Shadow Diagrams Mar_Sept 21	D13941157
2	Updated D901 Shadow Diagrams Jun 22	D13941155
3	Updated Architectural Plans 34 Brisbane Water Drive, KOOLEWONG DA54122 Part 1	D13941158
4	DRAFT Conditions 34 Brisbane Water Drive, KOOLEWONG DA54122 Part 1	D14030370
5	Revised Basix Certificate DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD25148730
6	Revised Waste Management Plan DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD25148739
7	Revised Traffic Report DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD25148740
8	Addendum to Statement of Environmental Effects DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD25148738
9	Revised Traffic Report DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD23961194
10	DA54122 Photomontages	ECMD25341990
11	Revised Concept Stormwater Management Report DA54122 L16 DP14946 H34 Brisbane Water Drive KOOLEWONG Part 1	ECMD25148733

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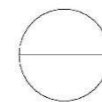
Rev.	Description	Date
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C	Revised DA Issue C	2/4/19
D	Revised DA Issue 'd'	19/3/20
E	Revised DA Issue 'e'	21/4/20



Mar 21 9am

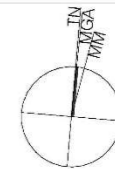


Mar 21 12pm



Mar 21 3pm

MGA - Map Grid NSW (by survey)
 TN - True (Solar) North



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 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RAA (Arch Registration No.7657)

Koolewong Residences

Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW
 Australia

Lots 16 + 17 in DP 14946

Shadow Diagrams Mar/Sept 21

Scale @ A3 1:400, 1:680.39 Project: 1708	Apr 2019 Plot Date: 21/4/20	Issue: E D900
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D	Revised DA issue 'd'	19/3/20
E	Revised DA issue 'v'	21/4/20



June 22 9am

June 22 12pm



June 22 3pm

MGA - Map Grid NSW (by survey)
 TN - True (Solar) North



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 Nominated Architect: Andrew Dickson RAA (Arch Registration No. 7697)

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Shadow Diagrams Jun 22

Scale @ A3 1:400	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D901

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C	Revised DA Issue 'c'	2/4/19
D	Revised DA Issue 'd'	19/3/20
E	Revised DA Issue 'e'	21/4/20

Koolewong Residences

PROPOSED MIXED USE DEVELOPMENT

For: DFK Holdings Pty Ltd

34-36 Brisbane Water Drive Koolewong NSW Australia
Lots 16 + 17 in DP 14946

Sheet Index		
ID	Sheet Name	Drawing Scales
D000	Cover Sheet	
D100	Site Plan + Site Analysis Plan	1:250
D200	Basement Floor Plan	1:200
D201	Ground Floor plan	1:200
D202	First Floor plan	1:200
D203	Second Floor plan	1:200
D204	Roof plan	1:200
D300	Sections	1:200
D400	Elevations	1:200
D401	Elevations	1:200
D900	Shadow Diagrams Mar/Sept 21	
D901	Shadow Diagrams Jun 22	



Basix Building Fabric Requirements: 34-36 Brisbane Water Drive, Koolewong

Element	Material Type	Detail
External walls	Metal Cladding + R2.0 Insulation + PB Concrete + R2.0 Insulation + PB	Medium colour
Internal walls	Plasterboard on studs	Intra-tenancy walls
	Hebel Powepanel	Inter-tenancy walls
Windows	ALM-002-04 A Aluminium B SG Low Solar Gain Low-E	NFRC Glazing System values: ⇒ U ≤ 5.60 and SHGC = 0.41 (± 5%)
Skylights	N/A	
Downlights		Sealed
Floor	Concrete slab	Tile (wet, kitchen & living) Carpet (bedrooms)
Ceiling + Roof	Plasterboard + R3.0 Insulation Concrete	Medium colour

Area Calculations

Site Area = 1,546.9m²
 Site Coverage = 35.0% (540.95m²)
 Deep Soil Planting = 23.0% (355.76m²) at 3m min width
 = 18.9% (292.16m²) at 6m min width

Floor Areas

Shop FS Area	- 60.01m ²	
Apt. G.01 FS Area	- 105.88m ²	(+181.4m ² POS)
Apt. G.02 FS Area	- 105.88m ²	(+84.92m ² POS)
Twnh. G.03 FS Area	- 115.23m ²	(+62.36m ² POS)
Twnh. G.04 FS Area	- 115.23m ²	(+58.28m ² POS)
Apt. 1.01 FS Area	- 105.88m ²	(+49.06m ² POS)
Apt. 1.02 FS Area	- 105.88m ²	(+49.06m ² POS)
Apt. 1.03 FS Area	- 50.01m ²	(+27.12m ² POS)
Apt. 1.04 FS Area	- 50.01m ²	(+20.33m ² POS)
Apt. 1.05 FS Area	- 50.01m ²	(+20.33m ² POS)
Apt. 1.06 FS Area	- 50.01m ²	(+20.33m ² POS)
Apt. 1.07 FS Area	- 50.01m ²	(+20.33m ² POS)
Apt. 1.08 FS Area	- 50.01m ²	(+20.33m ² POS)
Apt. 1.09 FS Area	- 50.01m ²	(+27.12m ² POS)
Apt. 2.01 FS Area	- 105.88m ²	(+49.06m ² POS)
Apt. 2.02 FS Area	- 105.88m ²	(+49.06m ² POS)

Floor Space Ratio = 0.82:1 (1,275.82m² FSA)
 = 9.97% over 0.75:1 FSR

Schedule of Materials

refer to image on this page

1. Core and slab edges - off form natural concrete
2. Panel Cladding - prefinished panels with 10mm expressed joints
3. Apartment wall cladding - vertical smooth profile prefinished anodised aluminium panels
4. Shop walls - anodised aluminium framed glazing with horizontal prefinished anodised aluminium boards and prefinished off white panels above
5. Murobond Bridge paint to metalwork
6. FC vertical louvre blades + screens
7. Frameless glass balustrades
8. Hardwood timber decking to balconies
9. Refer landscape plan for paving to common areas (non slip)
10. Satin dark bronze aluminium framing to glazing suites
11. Concrete roof and slab soffits to balconies and terraces
12. Colorbond rainwater goods and garage door - Night Sky



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 Nominated Architect: Andrew Dickson RAAIA (Arch Registration No. 7657)

Koolewong Residences

Shop and Residential Flat Building

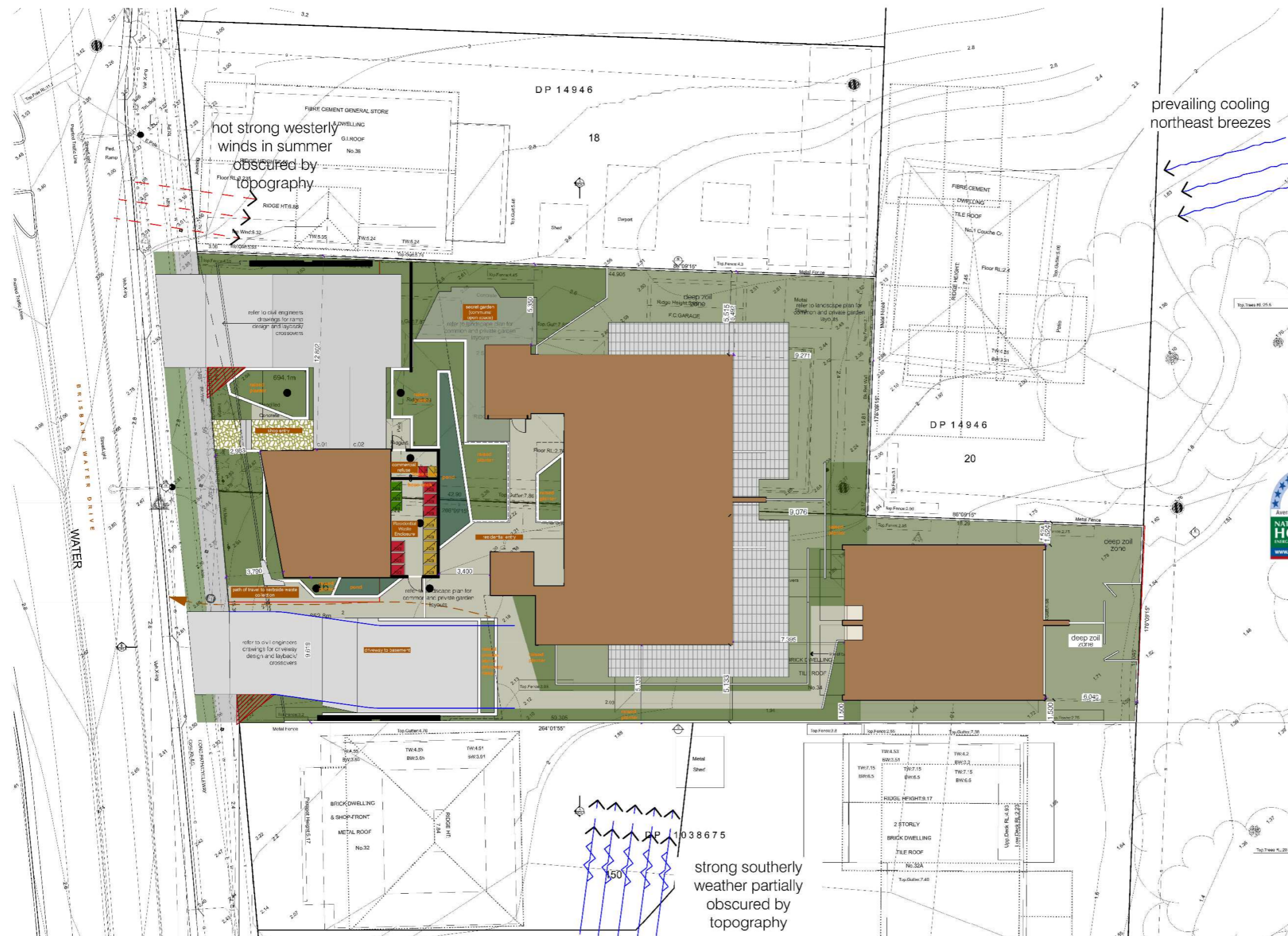
34-36 Brisbane Water Drive Koolewong NSW Australia

Lots 16 + 17 in DP 14946

Cover Sheet

Scale @ A3 1:1, 1:1.67 _i	Apr 2019	Issue: E
T:347.22 Project: 1708	Plot Date: 21/4/20	D000





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D	Revised DA Issue 'd'	19/3/20
E	Revised DA Issue 'e'	21/4/20

Certificate no.: 0003753340
 Assessor Name: Hamidul Islam
 Accreditation no.: 100982
 Certificate date: 05 April 2019
 Dwelling Address: 34-36 Brisbane Water Drive, Koolewong, NSW 2256
 www.nathers.gov.au

6.2
 Average star rating
NATIONWIDE HOUSE
 ENERGY RATING SCHEME
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MGA - Map Grid NSW (by survey)
 TN - True (Solar) North

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 34-36 Brisbane Water Drive Koolewong NSW Australia
 Lots 16 + 17 in DP 14946

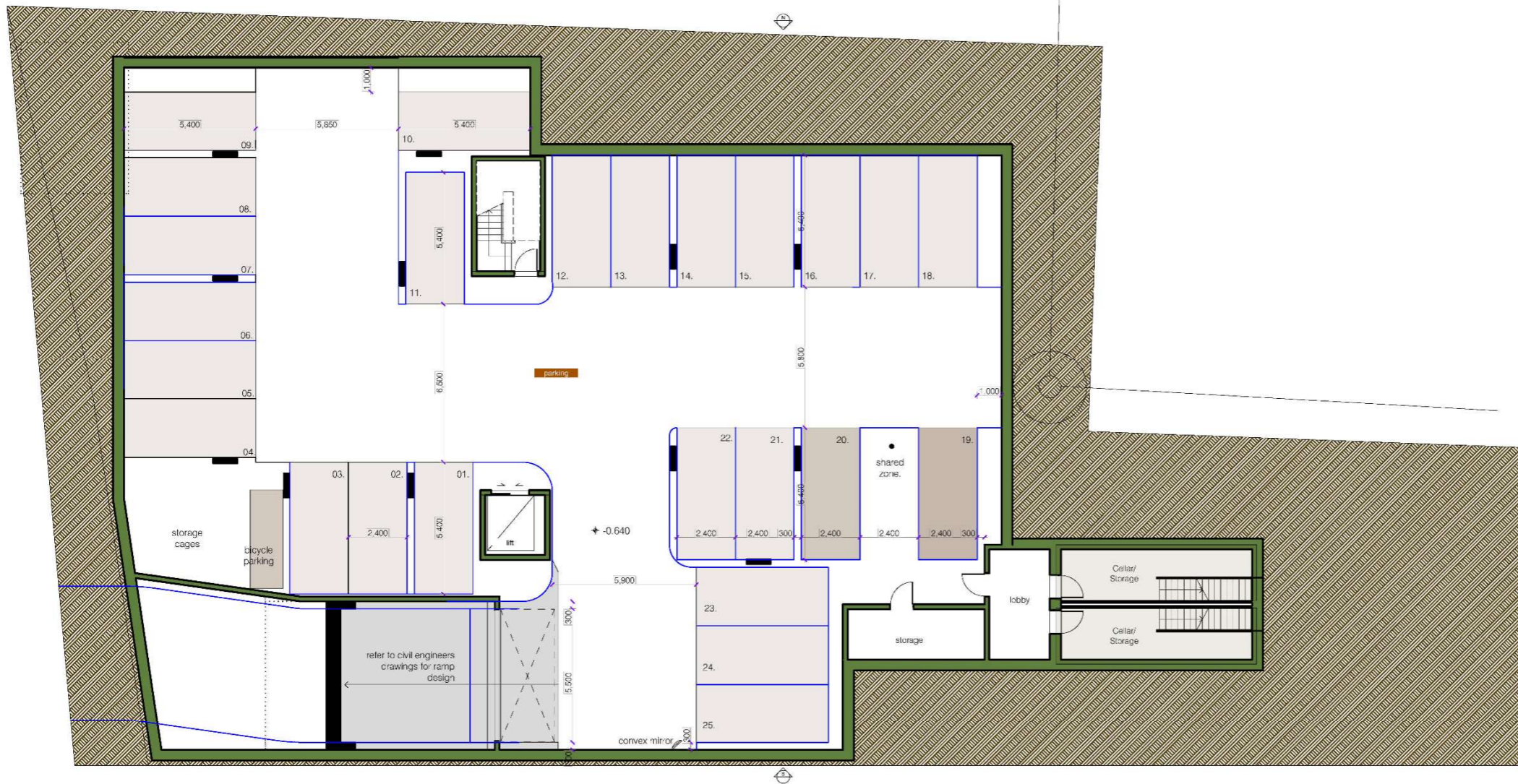
Site Plan + Site Analysis Plan

Scale @ A3 1:250	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D100

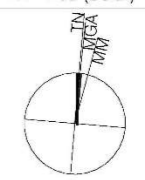
D100 Site Plan 1:250

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Koolewong Residences

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Lots 16 + 17 in DP 14946

Basement Floor Plan

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D200

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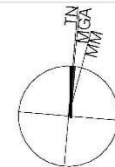
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Koolewong Residences

Shop and Residential Flat Building

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Lots 16 + 17 in DP 14946

Ground Floor plan

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D201

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ABSA
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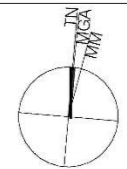
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First Floor Plan 1:200

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 Nominated Architect: Andrew Dickson RMA (Arch Registration No.7657)

Koolewong Residences

Shop and Residential Flat Building

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 Australia

Lots 16 + 17 in DP 14946

First Floor plan

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D202

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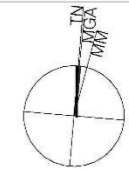
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Second Floor Plan 1:200

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Koolewong Residences

Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW Australia

Lots 16 + 17 in DP 14946

Second Floor plan

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D203

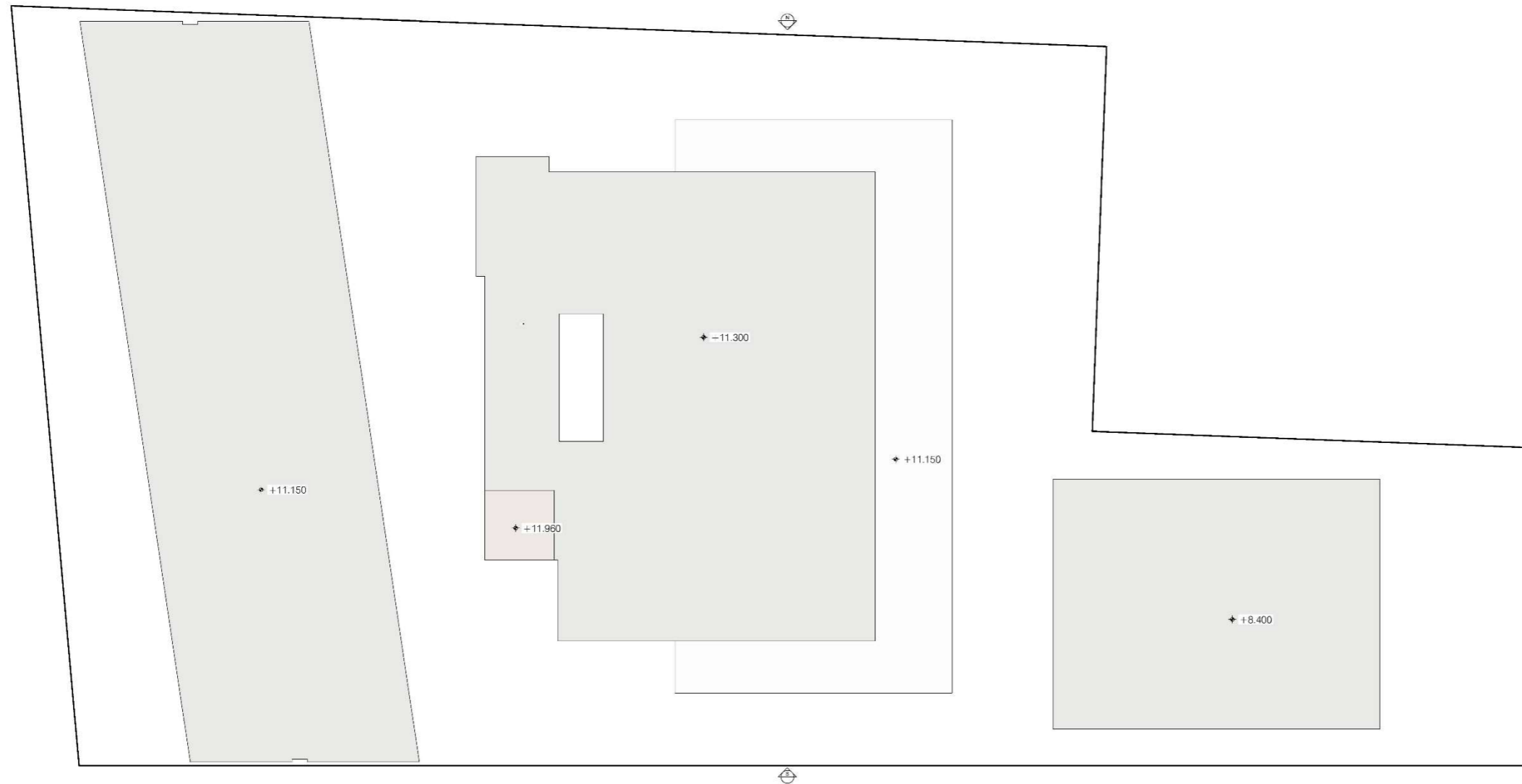


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 Accreditation no.: 100982
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 Dwelling Address:
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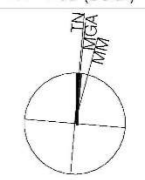
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Roof Plan 1:200

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 Nominated Arch/Arch: Andrew Dickson RIAA (Arch Registration No. 7657)

Koolewong Residences

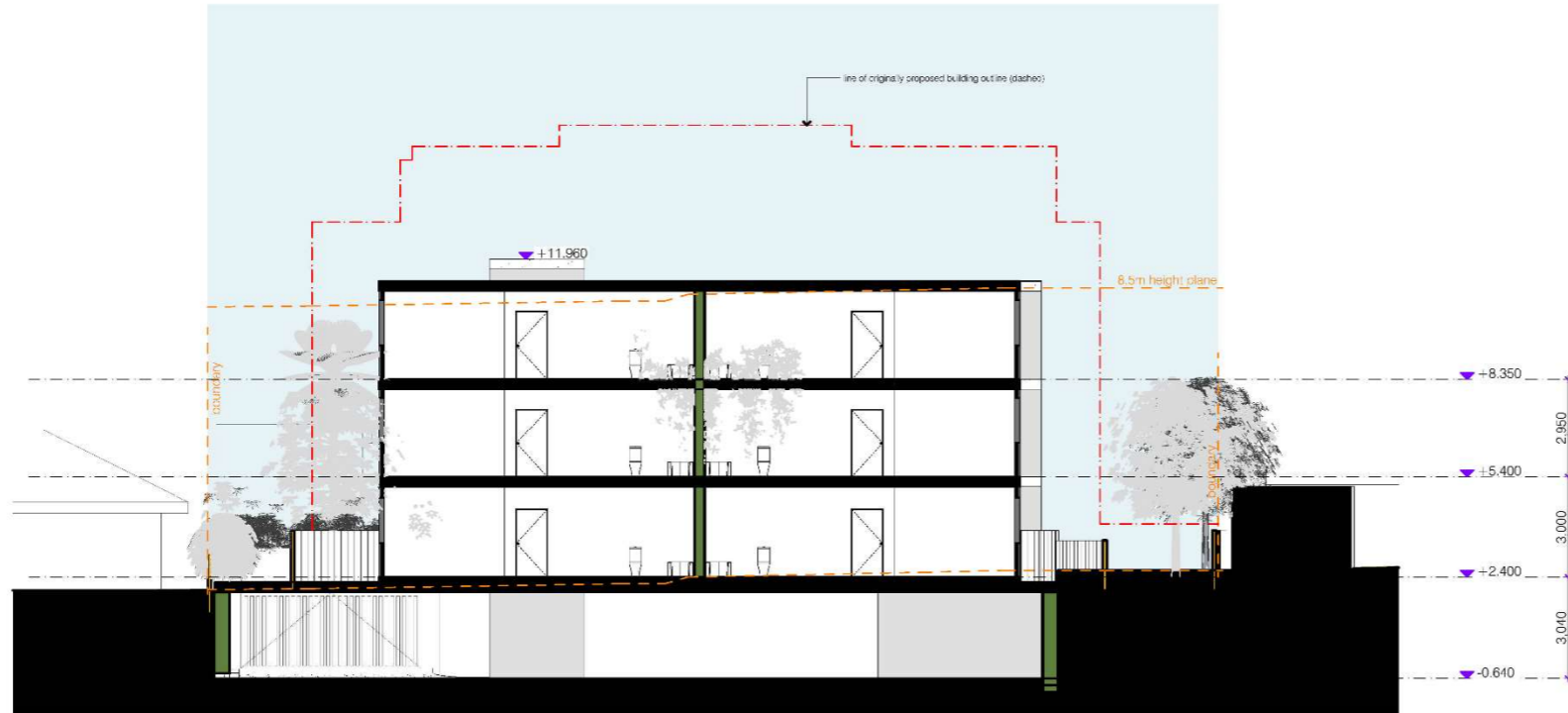
Shop and Residential Flat Building
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 Lots 16 + 17 in DP 14946

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D204

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 Accreditation no.: 100982
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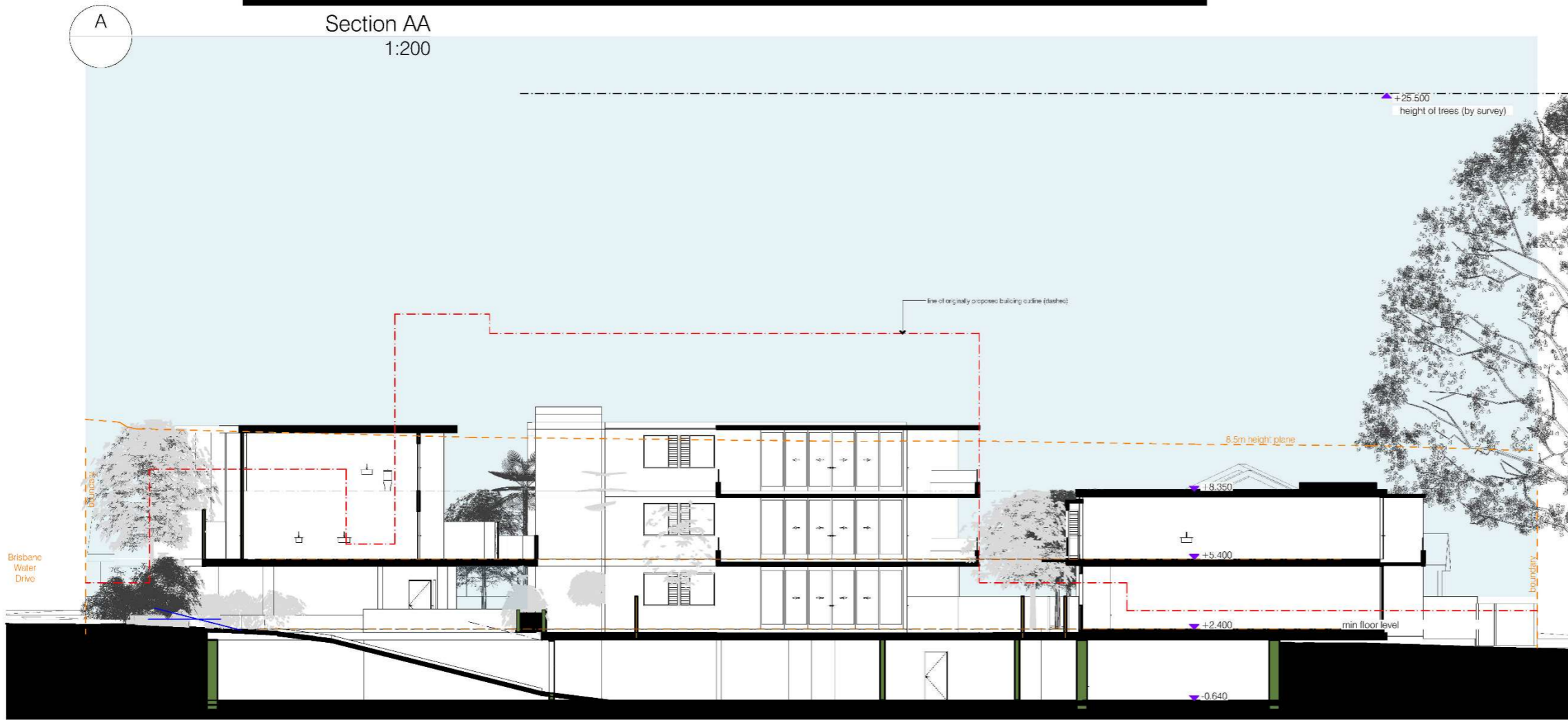
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Section AA
1:200

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 Assessor Name: Hamidul Islam
 Accreditation no.: 100982
 Certificate date: 05 April 2019
 Dwelling Address: 34-36 Brisbane Water Drive, Koolewong, NSW 2256
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Section BB
1:200

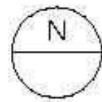
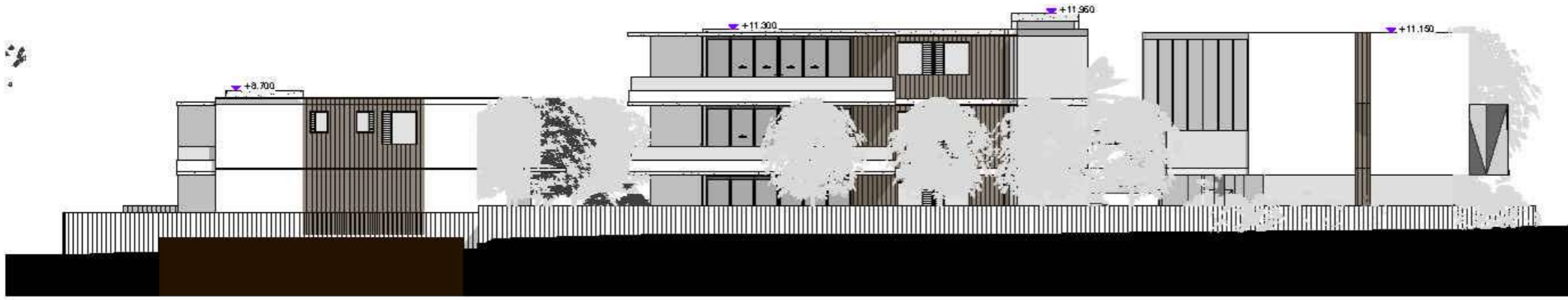
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 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RMA (Arch Registration No 7657)

Koolewong Residences
 Shop and Residential Flat Building
 34-36 Brisbane Water Drive Koolewong NSW Australia
 Lots 16 + 17 in DP 14946

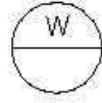
Sections		
Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D300

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D	Revised DA issue 'd'	19/3/20
E	Revised DA issue 'e'	21/4/20



North Elevation
1:200



West Elevation
1:200


 Continuation No: 2263783340
 Applicant Name: Hani and Kibari
 Accreditation No.: 1009852
 Certificate date: 05 April 2019
 Dwelling Address:
 34-36 Brisbane Water Drive
 Koolewong, NSW
 2250
www.rvatheta.gov.au



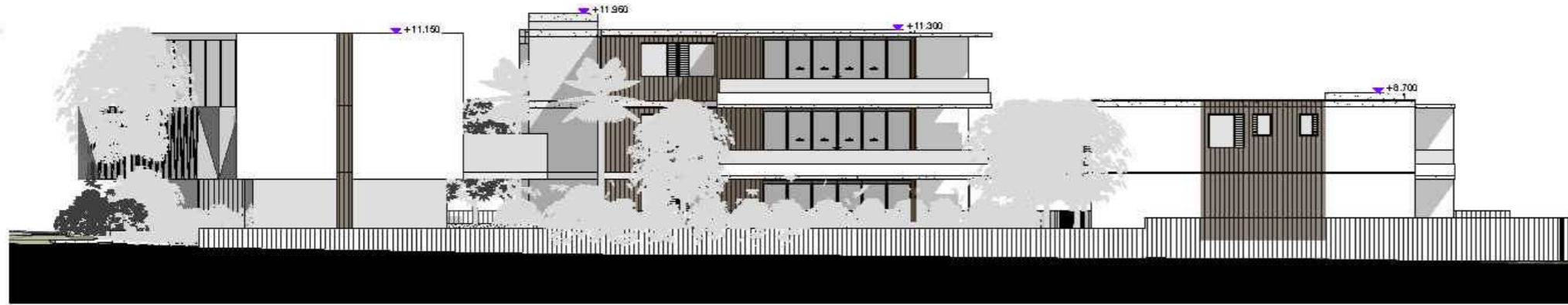

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 Architects.
 PO Box 4371 East Gosford NSW 2250
 Tel. +61 2 4324 3532
 Non-Registered Architect: Andrew Dickson RWA (Arch Registration No. 7957)

Koolewong Residences
 Shop and Residential Flat Building
 34-36 Brisbane Water Drive Koolewong NSW
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 Lots 16 + 17 in DP 14946

Elevations		
Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D400

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Rev.	Description	Date
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B	Revised DA Issue	4/5/18
C	Revised DA Issue 'a'	2/4/19
D	Revised DA Issue 'b'	19/9/20
E	Revised DA Issue 'c'	21/4/20



S South Elevation
1:200

Get a quote: 0038763340
 Assess Name: Hamidul Islam
 Accreditation: 100882
 Certificate date: 05 April 2019
 Working Address:
 54-56 Brisbane Water Drive
 Kooilewong, NSW
 2256
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E East Elevation
1:200

White + Dickson Architects.

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 Tel. +61 2 4324 3632
 Nominated Architect: Andrew Dickson RMA (Arch Registration No. 7857)

Kooilewong Residences

Shop and Residential Flat Building

34-38 Brisbane Water Drive Kooilewong NSW Australia

Lots 16 + 17 in DP 14948

Elevations

Scale @ A3 1:200	Apr 2019	Issue: E
Project: 1708	Plot Date: 21/4/20	D401

1... PARAMETERS OF THIS CONSENT

1.1. Approved Plans and Supporting Documents

Implement the development substantially in accordance with the plans and supporting documents listed below as submitted by the applicant and to which is affixed a Council stamp "*Development Consent*" unless modified by any following condition.

Architectural Plans by: White & Dickson

Drawing	Description	Sheets	Issue	Date
D000	Cover Sheet	1	E	21/04/2020
D100	Site Plan = Site Analysis	1	E	21/04/2020
D200	Basement Floor Plan	1	E	21/04/2020
D201	Ground Floor Plan	1	E	21/04/2020
D202	First Floor Plan	1	E	21/04/2020
D203	Second Floor Plan	1	E	21/04/2020
D204	Roof Plan	1	E	21/04/2020
D300	Sections	1	E	21/04/2020
D400	Elevations	1	E	21/04/2020
D401	Elevations	1	E	21/04/2020
D900	Shadow Diagrams March/September	1	E	21/04/2020
D901	Shadow Diagrams June	1	E	21/04/2020

Supporting Documentation

Title	Prepared by	Date
Statement of Environmental Effects	Michael Leavey Consulting	April 2019
BASIX Certificate 899635M_2	SLR Consulting Pty Ltd	5 April 2019
Waste Management Plan	Michael Leavey Consulting	28 March 2019
Traffic & Parking Impact Assessment Ref 17215 Rev E	Transport & Traffic Planning Associates	April 2019
Landscape Plans	Mark Hill Garden Design -5 sheets	18 March 2019, 20 March 2019 and 29 March 2019
Geotechnical Information & Acid Sulphate Soil Assessment	Douglas Partners Project 83242.00	October 2017
Concept Stormwater management Report	Northrop Job No172238 Rev B	26 March 2019

- 1.2. Carry out all building works in accordance with the National Construction Code Series, Building Code of Australia Volume 1 and 2 as appropriate.

- 1.3. Comply with all commitments listed in the BASIX Certificate for the development as required under clause 97A of the Environmental Planning and Assessment Regulation 2000.

2... PRIOR TO ISSUE OF ANY CONSTRUCTION CERTIFICATE

- 2.1. All conditions under this section must be met prior to the issue of any Construction Certificate.
- 2.2. No activity is to be carried out on-site until the Construction Certificate has been issued, other than:
 - a) Site investigation for the preparation of the construction, and / or
 - b) Implementation of environmental protection measures, such as erosion control and the like that are required by this consent
 - c) Demolition
- 2.3. Retain the land where any excavation is required below the adjoining land level and preserve and protect from damage any improvements or buildings upon that land including public roads and utilities.

If necessary, the improvements or buildings must be designed by a suitably qualified Registered Structural Engineer. Any design proposals prepared to comply with this condition are to include geotechnical investigations, any excavation that impacts on public infrastructure, and are to be submitted for the approval of the Accredited Certifier.

- 2.4. Submit an application to Council under section 305 of the *Water Management Act 2000* to obtain a section 307 Certificate of Compliance. The *Application for a 307 Certificate under section 305 Water Management Act 2000* form can be found on Council's website www.centralcoast.nsw.gov. Early application is recommended.

A section 307 Certificate must be obtained prior to the issue of any Construction Certificate.

- 2.5. Submit engineering details prepared and certified by a practising structural engineer that comply with *Council's Building Over or Adjacent To Sewer and Water Main Guidelines* to the satisfaction of Council. Engineering details must be submitted to Council's Water Assessment Team for approval. Plan assessment fees apply.
- 2.6. Obtain a Roads Act Works Approval by submitting an application to Council for a Section 138 Roads Act Works Approval for all works required within the road reserve. The application is to be lodged using an Application for Subdivision Works Certificate or Construction Certificate, Roads Act Works Approval and other Development related Civil Works form.

The application is to be accompanied by detailed design drawings, reports and other documentation prepared by a suitably experienced qualified professional in accordance with Council's Civil Works Specifications.

Fees, in accordance with Council's Fees and Charges, will be invoiced to the applicant following lodgement of the application. Fees must be paid prior to Council commencing assessment of the application.

Design drawings, reports and documentation will be required to address the following works within the road reserve

- Construction of the road verge/footway formation at +2% from the rear of the existing concrete footpath/cycleway to the property boundary across the full frontage of the site in Brisbane Water Drive. Construction to include transitions to existing formation either side of the site.
 - Construction of Heavy duty vehicle crossing(s) that have a minimum width of 6m and to accommodate the largest vehicle to enter/exit the site and constructed with 200mm thick concrete reinforced with SL72 steel fabric top and bottom including construction of a heavy-duty gutter crossing and road pavement adjacent to the gutter crossing. Concrete finish to match the existing cycle/pedestrian finish and markings.
 - Reconstruct existing concrete cycle/pedestrian to provide suitable transitions and concrete finish to match the new driveways and existing cycle/pedestrian alignments.
 - Removal of all redundant vehicle gutter crossings / laybacks and replacement with kerb.
 - Removal and replacement of all damaged kerb and gutter with new kerb and channel
 - Removal of all redundant vehicular access crossings. The road verge/footway formation is to be reinstated and stabilised with topsoil and turf from top of kerb to property boundary. Concrete path to be constructed if required.
 - The section 138 Roads Act Works Approval must be issued by Council and all conditions of that approval must be addressed prior to occupying and commencing any works in the road reserve.
- 2.7. Submit to Council a dilapidation report detailing the condition of all Council assets within the vicinity of the development. The report must document and provide photographs that clearly depict any existing damage to the road, kerb, gutter, footpath, driveways, street trees, street signs, street lights or any other Council assets in the vicinity of the development. The dilapidation report will be required to be submitted to Council prior to the issue of the Section 138 Roads Act Works approval or the issue of any construction certificate for works on the site. The dilapidation report may be updated with the approval of Council prior to the commencement of works. The report will be used by Council to establish damage to Council's assets resulting from the development works
- 2.8. Obtain a Section 68 Local Government Act Works Approval for Stormwater Drainage works by submitting an application to Council for a 'Section 68 Local Government Act Works Approval – stormwater drainage' for storm water drainage works connecting to or within Council's storm water system using an *Application for Subdivision Works Certificate or Construction Certificate, Roads Act Works Approval and other Development related Civil Works* form.

The application is to be accompanied by detailed design drawings, reports and other documentation prepared by a suitably experienced qualified professional in accordance with Council's *Civil Works Specifications*.

Fees, in accordance with Council's Fees and Charges, will be invoiced to the applicant following lodgement of the application. Fees must be paid prior to Council commencing assessment of the application.

Design drawings, reports and documentation will be required to address the following works:

- Construction the connection of all piped and collected stormwater runoff from within the development site to Council's piped stormwater system located in the adjoining public reserve.

The *Section 68 Local Government Act Works Approval – stormwater drainage* must be issued, and all conditions of that approval addressed prior to commencing any works that are the subject of the approval.

- 2.9. Submit to the Accredited Certifier responsible for issuing the construction certificate for works within the development site detailed design drawings and design reports for the following engineering works:
 - a. Construction of a stormwater detention system. Design in accordance with Chapter 6.7 - *Water Cycle Management* of the Gosford Development Control Plan 2013 and Council's *Civil Works Specifications*. The stormwater detention system must limit post development peak flows from the proposed development to less than or equal to predevelopment peak flows for all storms events up to and including the 1% Annual Exceedance Probability (AEP) storm event. A runoff routing model/method must be used. An on-site stormwater detention report including an operation and maintenance plan must accompany the design. On-site stormwater detention is not permitted within private courtyards, drainage easements, and / or secondary flow paths.
 - b. Construction of nutrient and pollution control measures. Design in accordance with Chapter 6.7 - *Water Cycle Management* of the Gosford Development Control Plan. A nutrient and pollution control report including an operation and maintenance plan must accompany the design. Stormwater infiltration to the soil and flow via level spreader to the adjoining public reserve are not permitted.
 - c. Construction of on-site stormwater retention measures. Design in accordance with Chapter 6.7 - *Water Cycle Management* of the Gosford Development Control Plan 2013. A report detailing the method of stormwater harvesting, sizing of retention tanks for re-use on the site and an operation and maintenance plan must accompany the design.

- d. Construction stormwater drainage collection and piping of all stormwater runoff from areas within the site via an on-site stormwater detention facility to the approved connection with Council's drainage system located in the adjoining public reserve.
- e. Construction of buildings with the minimum floor level of all habitable rooms in the development being Reduced Level (RL) 2.4m Australian Height Datum (AHD).
- f. Construction of buildings from materials that are used or located below Reduced Level (RL) 2.4m Australian Height Datum (AHD) must be of a type that is able to withstand the effects of immersion.
- g. Construction of retaining walls where indicated on development approval documentation. Retaining wall design must not conflict with existing or proposed services or utilities. Retaining walls designs for wall greater than 600mm in height must be certified by a registered practising Civil or Structural engineer as being in accordance with Australian Standards.
- h. Provide a 'No Right Turn' sign restriction on the combined northern commercial driveway for egress traffic entering Brisbane Water Drive
- i. Construction of driveways, ramps and car parking areas in accordance with the requirements of the current edition Australian Standard AS/NZS 2890: Parking Facilities and other applicable Australian Standards. Driveway locations to provide sight triangles in accord with Figure 3.3 AS2890 wholly within the site. Driveways and other structures (if required) shall be designed to prevent the entry of flood waters to basement up to the RL of 2.4m AHD.

Detailed design drawings and design reports acceptable to the Accredited Certifier must be included in the Construction Certificate documentation.

2.10. The submission of amended landscape plans to the accredited certifier to reflect the approved development plans, conditions of this consent, and provision of street trees.

3... PRIOR TO COMMENCEMENT OF ANY WORKS

- 3.1. All conditions under this section must be met prior to the commencement of any works.
- 3.2. Appoint a Principal Certifying Authority for the building work:
 - a) The Principal Certifying Authority (if not Council) is to notify Council of their appointment and notify the person having the benefit of the development consent of any critical stage inspections and other inspections that are to be carried out in respect of the building work no later than two (2) days before the building work commences.
 - b) Submit to Council a Notice of Commencement of Building Works or Notice of Commencement of Subdivision Works form giving at least two (2) days' notice of

the intention to commence building or subdivision work. The forms can be found on Council's website: www.centralcoast.nsw.gov.au

- 3.3. Erect a sign in a prominent position on any work site on which building, subdivision or demolition work is being carried out. The sign must indicate:
 - a) The name, address and telephone number of the Principal Certifying Authority for the work; and
 - b) The name of the principal contractor and a telephone number at which that person can be contacted outside of working hours; and
 - c) That unauthorised entry to the work site is prohibited.
 - d) Remove the sign when the work has been completed.
- 3.4. Submit both a Plumbing and Drainage Inspection Application, with the relevant fee, and a Plumbing and Drainage Notice of Work in accordance with the *Plumbing and Drainage Act 2011* (to be provided by licensed plumber). These documents can be found on Council's website at: www.centralcoast.nsw.gov.au

Contact Council prior to submitting these forms to confirm the relevant fees.

This condition only applies if installation / alteration of plumbing and / or drainage works proposed (excludes stormwater drainage). This condition does not apply to swimming pool plumbing that does not physically connect / break into the sewer system.

- 3.5. Install run-off and erosion controls to prevent soil erosion, water pollution or the discharge of loose sediment on the surrounding land by:
 - a. erecting a silt fence and providing any other necessary sediment control measures that will prevent debris escaping into drainage systems, waterways or adjoining properties, and
 - b. diverting uncontaminated run-off around cleared or disturbed areas, and
 - c. preventing the tracking of sediment by vehicles onto roads, and
 - d. stockpiling top soil, excavated materials, construction and landscaping supplies and debris within the lot
- 3.6. Notify the intention to commence works by giving written notice to the owner of the adjoining property affected by the proposed excavation and/or structural protective works. The required notice must be accompanied by details of the proposed work at least seven (7) days prior to the commencement of proposed excavation and/or structural protection works.
- 3.7. Submit a dilapidation report to Council, the Accredited Certifier and relevant adjoining property owners. The report is to be prepared by a suitably qualified person detailing the structural characteristics of all buildings located on properties immediately adjoining the site boundaries and any council asset in the vicinity of the development. The report must document and provide photographs that clearly depict any existing damage to the improvements erected upon allotments immediately adjoining the development site and to

the road, kerb, footpath, driveways, water supply and sewer infrastructure, street trees and street signs or any other Council asset in the vicinity of the development.

In the event that access to an adjoining property(s) for the purpose of undertaking the dilapidation report is denied, submit evidence in writing demonstrating that all steps were taken to obtain access to the adjoining property(s).

- 3.8. Disconnect, seal and make safe all existing site services prior to the commencement of any demolition on the site. Sewer and water services must be disconnected by a licensed plumber and drainer with a Start Work Docket submitted to Council's Plumbing and Drainage Inspector as the Water and Sewer Authority.

- 3.9. Undertake any demolition involving asbestos in accordance with the *Work Health and Safety Act 2011*

The person having the benefit of this consent must ensure that the removal of:

- a. more than 10m² of non-friable asbestos or asbestos containing material is carried out by a licensed non-friable (Class B) or a friable (Class A) asbestos removalist, and
- b. friable asbestos of any quantity is removed by a licensed removalist with a friable (Class A) asbestos removal licence

The licensed asbestos removalist must give notice to the regulator before work commences in accordance with Clause 466 of the *Work Health and Safety Regulation 2011*.

- 3.10. Prepare a Construction Traffic and Pedestrian Management Plan (CTPMP) for all activities related to works within the site. The plan must be prepared and implemented only by persons with Roads and Maritime Service accreditation for preparing and implementing traffic management plans at work sites.

The CTPMP must describe the proposed construction works, the traffic impacts on the local area and how these impacts will be addressed.

The CTPMP must address, but not be limited to, the following matters:

- Ingress and egress of construction related vehicles to the development site.
- Details of the various vehicle lengths that will be used during construction and the frequency of these movement
- Use of swept path diagrams to demonstrate how heavy vehicles enter, circulate and exit the site or Works Zone in a forward direction.
- Deliveries to the site, including loading / unloading materials and requirements for work zones along the road frontage to the development site. A Plan is to be included that shows where vehicles stand to load and unload, where construction plant will stand, location of storage areas for equipment, materials and waste, locations of Work Zones (if required) and location of cranes (if required).
- Works Zones if heavy vehicles cannot enter or exit the site in a forward direction.
- Control of pedestrian and vehicular traffic where pre-construction routes are affected.

- Temporary Road Closures.

Where the plan identifies that the travel paths of pedestrians and vehicular traffic are proposed to be interrupted or diverted for any construction activity related to works inside the development site an application must be made to Council for a Road Occupancy Licence. Implementation of traffic management plans that address interruption or diversion of pedestrian and/or vehicular traffic must only take place following receipt of a Road Occupancy Licence from Council or the Roads and Maritime Service where on a classified road.

Where a dedicated delivery vehicle loading and unloading zone is required along the road frontage of the development site a Works Zone Application must be lodged and approved by Council. A minimum of 3 months is required to allow Traffic Committee endorsement and Council approval.

The Construction Traffic and Pedestrian Management Plan must be reviewed and updated during construction of the development to address any changing site conditions.

A copy of the Construction Traffic and Pedestrian Management Plan must be held on site at all times and be made available to Council upon request.

- 3.11. *Miscanthus sinensis* is considered to be an environmental weed in NSW and is shown on the boundary with the reserve. An alternative ornamental grass shall be selected for this garden bed that is not invasive and shown in the amended landscape plan.

- 3.12. Prepare a Construction Traffic and Pedestrian Management Plan (CTPMP) for all activities related to works within the site. The plan must be prepared and implemented only by persons with Roads and Maritime Service accreditation for preparing and implementing traffic management plans at work sites.

The CTPMP must describe the proposed construction works, the traffic impacts on the local area and how these impacts will be addressed.

The CTPMP must address, but not be limited to, the following matters:

- Ingress and egress of construction related vehicles to the development site.
- Details of the various vehicle lengths that will be used during construction and the frequency of these movement.
- Use of swept path diagrams to demonstrate how heavy vehicles enter, circulate and exit the site or Works Zone in a forward direction.
- Deliveries to the site, including loading / unloading materials and requirements for work zones along the road frontage to the development site. A Plan is to be included that shows where vehicles stand to load and unload, where construction plant will stand,

location of storage areas for equipment, materials and waste, locations of Work Zones (if required) and location of cranes (if required).

- Works Zones if heavy vehicles cannot enter or exit the site in a forward direction.
- Control of pedestrian and vehicular traffic where pre-construction routes are affected.
- Temporary Road Closures.

Where the plan identifies that the travel paths of pedestrians and vehicular traffic are proposed to be interrupted or diverted for any construction activity related to works inside the development site an application must be made to Council for a Road Occupancy Licence. Implementation of traffic management plans that address interruption or diversion of pedestrian and/or vehicular traffic must only take place following receipt of a Road Occupancy Licence from Council or the Roads and Maritime Service where on a classified road.

Where a dedicated delivery vehicle loading and unloading zone is required along the road frontage of the development site a Works Zone Application must be lodged and approved by Council. A minimum of 3 months is required to allow Traffic Committee endorsement and Council approval.

The Construction Traffic and Pedestrian Management Plan must be reviewed and updated during construction of the development to address any changing site conditions.

A copy of the Construction Traffic and Pedestrian Management Plan must be held on site at all times and be made available to Council upon request.

- 3.13. Submit to Council a completed *Notice of Intention to Commence Subdivision, Roads and Stormwater Drainage Works* form with supporting documentation prior to the commencement of any Subdivision Works Certificate works, Roads Act Works Approval works, or Section 68 Local Government Act Stormwater Drainage Works Approval works. These works are not to commence until a pre-commencement site meeting has been held with Council.

4... DURING WORKS

- 4.1. All conditions under this section must be met during works.
- 4.2. Carry out construction or demolition works during the construction phase of the development only between the hours as follows:
- 7.00am and 5.00pm Monday to Saturday

No construction or demolition works associated with the development are permitted to be carried out at any time on a Sunday or a public holiday.

- 4.3. During the construction phase of the development, if any Aboriginal object (including evidence of habitation or remains), is discovered during the course of the work:
- a) All excavation or disturbance of the area must stop immediately in that area, and
 - b) The Office of Environment and Heritage must be advised of the discovery in accordance with section 89A of the *National Parks and Wildlife Act 1974*.

Note: If an Aboriginal object is discovered, an Aboriginal heritage impact permit may be required under the *National Parks and Wildlife Act 1974*.

- 4.4. Implement and maintain all erosion and sediment control measures at or above design capacity for the duration of the construction works and until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.
- 4.5. Keep a copy of the stamped approved plans on-site for the duration of site works and make the plans available upon request to either the Principal Certifying Authority or an officer of Council.
- 4.6. Notify Council when plumbing and drainage work will be ready for inspection(s) and make the work accessible for inspection in accordance with the *Plumbing and Drainage Act 2011*.

This condition only applies if installation/alteration of plumbing and/or drainage works are proposed (excludes stormwater drainage)

- 4.7. Place all building materials, plant and equipment on the site of the development during the construction phase of the development so as to ensure that pedestrian and vehicular access within adjoining public roads, footpaths and reserve areas, is not restricted and to prevent damage to public infrastructure. Further, no construction work is permitted to be carried out within the road reserve unless the works are associated with a separate approval issued under the provisions of the *Roads Act 1993*.
- 4.8. Demolish all buildings and / or building components in a safe and systematic manner in accordance with Australian Standard AS 2601-2001: *The demolition of structures*. Waste materials must be disposed of at a waste management facility.
- 4.9. Do not access the development site through a public reserve unless approval for temporary access over the public reserve is obtained from the council as the Land Manager. A copy of the approval must be available for viewing on-site at all times during work.
- 4.10. Re-use, recycle or dispose of all building materials during the demolition and construction phase of the development in accordance with the Waste Management Plan signed by M Leavey dated 28 March 2019.
- 4.11. The extent of construction fencing and the access and storage footprint should not extend over rear boundary onto park at rear.

- 4.12. Complete the civil engineering works within the development site in accordance with the detailed design drawings and design reports plans within the construction certificate.

5... PRIOR TO ISSUE OF ANY OCCUPATION CERTIFICATE

- 5.1. All conditions under this section must be met prior to the issue of any Occupation Certificate.
- 5.2. Submit a Certificate of Compliance for all plumbing and drainage work and a Sewer Service Diagram showing sanitary drainage work (to be provided by licensed plumber) in accordance with the *Plumbing and Drainage Act 2011*.

This condition only applies if installation/alteration of plumbing and/or drainage works are proposed (excludes stormwater drainage)

- 5.3. Prior to the occupation or use of the building/structure, an application for an Occupation Certificate for the development must be submitted to and approved by the Principal Certifier. The Occupation Certificate application is to satisfy all of the requirements of the *Environmental Planning and Assessment Regulation 2000*.
- 5.4. Complete the landscaping works.
- 5.5. Erect a 1.8 metre high fence along the length of the side and rear boundaries behind the building line.
- 5.6. Provide mail receptacles appropriately numbered for each dwelling unit in the development, as well as for the managing body, in consultation with Australia Post.
- 5.7. The consolidation of Lots 16 and lot 17 DP 14946 into one lot by registered subdivision. Documentary evidence of the lodgement of the Consolidation Plan with NSW Land and Property Information can be accepted by the Principal Certifier as satisfying this requirement.
- 5.8. Complete construction of all works within the road reserve in accordance with the Roads Act Works Approval. Completion of works includes the submission and acceptance by Council of all work as executed drawings plus other construction compliance documentation and payment of a maintenance/defects bond to Council in accordance with Council's Fees and Charges.
- 5.9. Repair any damage to Council's infrastructure and road reserve as agreed with Council. Damage not shown in the dilapidation report submitted to Council before the development works had commenced will be assumed to have been caused by the development works unless the Developer can prove otherwise.
- 5.10. Complete construction of all works approved in the Local Government Act Section 68 Stormwater Drainage Works Approval. Completion include the submission and acceptance

by Council of all work as executed drawings plus other construction compliance documentation and payment of a maintenance/defects bond to Council in accordance with Council's adopted fees and charges.

5.11. Amend the Deposited Plan (DP) for the consolidated lot of lots 16 and 17 DP 14946 to:

1. Include an Instrument under the Conveyancing Act 1919 for the following restrictive covenants; with Council having the benefit of these covenants and having sole authority to release and modify. Wherever possible, the extent of land affected by these covenants must be defined by bearings and distances shown on the plan. The plan and instrument must:
 - Create a 'Restriction on the use of Land' over all lots containing an on-site stormwater detention system and / or a nutrient / pollution facility restricting any alteration to such facility or the erection of any structure over the facility or the placement of any obstruction over the facility
1. Include an instrument under the Conveyancing Act 1919 for the following positive covenants; with Council having the benefit of these covenants and having sole authority to release and modify. Covenant(s) required:
 - a. To ensure on any lot containing on-site stormwater detention system and / or a nutrient / pollution facility that:
 - i. the facility will remain in place and fully operational.
 - ii the facility is maintained in accordance with the operational and maintenance plan so that it operates in a safe and efficient manner.
 - iii Council's officers are permitted to enter the land to inspect and repair the facility at the owner's cost.
 - iv Council is indemnified against all claims of compensation caused by the facility.

Note: Standard wording, acceptable to Council, for covenants can be obtained by contacting Council Subdivision Certificate Officer.

Submit to the Principal Certifying Authority copies of registered title documents showing the restrictive and positive covenants.

6.. ONGOING OPERATION

- 6.1. Maintain the site landscaping for the life of the development.
- 6.2. Do not erect advertising sign(s) on or in conjunction with the use and / or development without development consent unless the advertisement is exempt development or otherwise permitted without development consent.

- 6.3. Operate and maintain all external lighting so as not to impact on any adjoining property.
- 6.4. Direct all lighting associated with the pontoon and/or walkway in such a manner that no nuisance or adverse impact will be caused to adjoining properties, or to vessels on nearby waterways.
- 6.5. Maintain all works associated with the approved Landscape Plans for a period of twelve (12) months from the date of the issue of any Occupation Certificate to ensure the survival and establishment of the landscaping.
- 6.6. Do not place or store waste material, waste product or waste packaging outside the approved waste storage enclosure.
- 6.7. Store all waste generated on the premises in a manner so that it does not pollute the environment.
- 6.8. Transport all waste generated on the premises to a facility which is licensed to receive that material.
- 6.9. Place the mobile garbage / recycling / green waste containers at a suitable location at the kerbside no earlier than the evening prior to the collection day and return to a screened area as soon as possible after service, no later than the evening on collection day. The residents, caretaker, owner, Owners Corporation are responsible for the placement and return of the mobile waste containers.
- 6.10. No obstructions to the wheel out of the waste bins are permitted including grills, speed humps, barrier kerbs, etc.
- 6.11. Comply with all commitments as detailed in the Waste Management Plan signed by M. Leavey, dated 28 March 2019
- 6.12. Locate all the approved waste storage enclosure / area as indicated on Project 1708/Dwg D100, Revision C, dated 2 April 2019 prepared by White & Dickson Architects.
- 6.13. Commercial bins to be serviced by a private commercial waste contractor with a side lift waste truck at the kerbside at times that do not conflict with residential waste servicing. No waste vehicle reversing from the site onto Brisbane Water Drive permitted.
- 6.14. Commercial waste bins to be wheeled out on arrival of the private commercial waste contractor for servicing and immediately returned to the approved commercial waste storage area after servicing.
- 6.15. Screen doors/gates to be provided to the Residential and Commercial waste bin storage enclosures.

7.. PENALTIES

- 7.1. Failure to comply with this development consent and any condition of this consent may be a **criminal offence**. Failure to comply with other environmental laws may also be a **criminal offence**.

Where there is any breach Council may without any further warning:

- Issue Penalty Infringement Notices (On-the-spot fines);
- Issue notices and orders;
- Prosecute any person breaching this consent, and/or
- Seek injunctions/orders before the courts to retain and remedy any breach.

Warnings as to Potential Maximum Penalties

Maximum Penalties under NSW Environmental Laws include fines up to \$1.1 Million and/or custodial sentences for serious offences.

ADVISORY NOTES

Discharge of sediment from a site may be determined to be a pollution event under provisions of the *Protection of the Environment Operations Act 1997*. Enforcement action may commence where sediment movement produces a pollution event.

- The following public authorities may have separate requirements in the following aspects:
 - a) Australia Post for the positioning and dimensions of mail boxes in new commercial and residential developments
 - b) Jemena Asset Management for any change or alteration to the gas line infrastructure
 - c) Ausgrid for any change or alteration to electricity infrastructure or encroachment within transmission line easements
 - d) Telstra, Optus or other telecommunication carriers for access to their telecommunications infrastructure
 - e) Central Coast Council in respect to the location of water, sewerage and drainage services.
- Carry out all work under this Consent in accordance with SafeWork NSW requirements including the *Workplace Health and Safety Act 2011 No 10* and subordinate regulations, codes of practice and guidelines that control and regulate the development industry.
- Dial Before You Dig
Underground assets may exist in the area that is subject to your application. In the interests of health and safety and in order to protect damage to third party assets please contact Dial Before You Dig at www.1100.com.au or telephone on 1100 before excavating or erecting structures. (This is the law in NSW). If alterations are required to the configuration, size, form or design of the development upon contacting the Dial Before You Dig service, an amendment to the development consent (or a new development application) may be necessary. Individuals owe asset owners a duty of

care that must be observed when working in the vicinity of plant or assets. It is the individual's responsibility to anticipate and request the nominal location of plant or assets on the relevant property via contacting the Dial Before You Dig service in advance of any construction or planning activities.

- Telecommunications Act 1997 (Commonwealth)
Telstra (and its authorised contractors) are the only companies that are permitted to conduct works on Telstra's network and assets. Any person interfering with a facility or installation owned by Telstra is committing an offence under the *Criminal Code Act 1995 (Cth)* and is liable for prosecution. Furthermore, damage to Telstra's infrastructure may result in interruption to the provision of essential services and significant costs. If you are aware of any works or proposed works which may affect or impact on Telstra's assets in any way, you are required to contact: Telstra's Network Integrity Team on phone number 1800 810 443.
- Install and maintain backflow prevention device(s) in accordance with Council's WS4.0 Backflow Prevention Containment Policy. This policy can be found on Council's website at: www.centralcoast.nsw.gov.au

This condition only applies if installation/alteration of plumbing and/or drainage works are proposed (excludes stormwater drainage)

BASIX[®]Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 899635M_02

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 06/10/2017 published by the Department. This document is available at www.basix.nsw.gov.au

This certificate is a revision of certificate number 899635M lodged with the consent authority or certifier on 05 April 2018 with application DA54122.

It is the responsibility of the applicant to verify with the consent authority that the original, or any revised certificate, complies with the requirements of Schedule 1 Clause 2A, 4A or 6A of the Environmental Planning and Assessment Regulation 2000

Secretary

Date of issue: Friday, 05 April 2019

To be valid, this certificate must be lodged within 3 months of the date of issue.



Project summary		
Project name	34-36 Brisbane Water Drive, Koolewong_02	
Street address	34-36 Brisbane Water Drive Koolewong 2256	
Local Government Area	Central Coast Council	
Plan type and plan number	deposited 14946	
Lot no.	17	
Section no.	-	
No. of residential flat buildings	1	
No. of units in residential flat buildings	15	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	✓ 51	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 46	Target 30

Certificate Prepared by

Name / Company Name: SLR Consulting Pty Ltd

ABN (if applicable): 29001584612

Description of project

Project address

Project name	34-36 Brisbane Water Drive, Koolewong_02
Street address	34-36 Brisbane Water Drive Koolewong 2256
Local Government Area	Central Coast Council
Plan type and plan number	deposited 14946
Lot no.	17
Section no.	-

Project type

No. of residential flat buildings	1
No. of units in residential flat buildings	15
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Site details

Site area (m ²)	1546
Roof area (m ²)	369
Non-residential floor area (m ²)	59.56
Residential car spaces	22
Non-residential car spaces	-

Common area landscape

Common area lawn (m ²)	50.0
Common area garden (m ²)	50.0
Area of indigenous or low water use species (m ²)	50.0

Assessor details

Assessor number	100982
Certificate number	0003753340
Climate zone	15

Project score

Water	✓ 51	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 46	Target 30

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - Building1, 15 dwellings, 4 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.01	3	115.6	0.0	0.0	0.0
1.05	1	63.1	0.0	0.0	0.0
1.09	1	63.1	0.0	0.0	0.0
G.02	3	115.6	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.02	3	115.6	0.0	0.0	0.0
1.06	1	56.8	0.0	0.0	0.0
2.01	3	115.6	0.0	0.0	0.0
G.03	3	120.4	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.03	1	56.8	0.0	0.0	0.0
1.07	1	63.1	0.0	0.0	0.0
2.02	3	115.6	0.0	0.0	0.0
G.04	3	120.4	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1.04	1	56.8	0.0	0.0	0.0
1.08	1	56.8	0.0	0.0	0.0
G.01	3	115.6	0.0	0.0	0.0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - Building1

Common area	Floor area (m ²)	Common area	Floor area (m ²)	Common area	Floor area (m ²)
Car park area (No. 1)	798.0	Garbage room (No. 1)	19.0	Ground floor lobby type (No. 1)	61.0
Hallway/lobby type (No. 1)	79.0				

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1

(a) Dwellings

- (i) Water
- (ii) Energy
- (iii) Thermal Comfort

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for multi-dwelling houses

3. Commitments for single dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

- (i) Water
- (ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - Building1

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✓	✓
(e) The applicant must install: <ul style="list-style-type: none"> (aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and (bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling. 		✓	✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓

Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 4.5 but <= 6 L/min)	4 star	4 star	4 star	no	4 star	4 star	-	-	-	-	-	-	-

Alternative water source								
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
All dwellings	central water tank (no. 1)	See central systems	See central systems	yes	no	no	no	no
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✓	✓	✓
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✓	✓
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✓	✓
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓ ✓	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓ ✓ ✓	✓
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	gas instantaneous 4 star	individual fan, ducted to façade or roof	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
1.03, 1.04, 1.05, 1.06, 1.07, 1.08, 1.09	ceiling fans + 3-phase airconditioning EER > 4.0 (zoned)	ceiling fans + 3-phase airconditioning EER > 4.0 (zoned)	3-phase airconditioning EER > 4.0 (zoned)	3-phase airconditioning EER > 4.0 (zoned)	0 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
All other dwellings	ceiling fans + 3-phase airconditioning EER > 4.0 (zoned)	ceiling fans + 3-phase airconditioning EER > 4.0 (zoned)	3-phase airconditioning EER > 4.0 (zoned)	3-phase airconditioning EER > 4.0 (zoned)	3 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	gas cooktop & electric oven	4 star (new rating)	yes	4 star	4 star	2.5 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✓		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✓	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

Thermal loads		
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
1.01	21.0	18.1
1.02	46.9	16.0
1.03	58.0	35.5
1.09	33.1	29.5
2.01	32.1	23.3
2.02	57.3	20.5
G.01	23.4	15.7
G.02	50.9	14.7
G.03	22.6	27.2

Dwelling no.	Thermal loads	
	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
G.04	33.8	25.1
1.05, 1.07	29.8	30.2
All other dwellings	48.2	35.5

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	no common facility	no common facility	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	5000.0	To collect run-off from at least: - 368.0 square metres of roof area of buildings in the development - 0.0 square metres of impervious area in the development - 0.0 square metres of garden/lawn area in the development - 0.0 square metres of planter box area in the development (excluding, in each case, any area which drains to, or supplies, any other alternative water supply system).	- irrigation of 100.0 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Common area	Common area ventilation system		Common area lighting		
	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Car park area (No. 1)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Garbage room (No. 1)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Ground floor lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes
Hallway/lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	motion sensors	Yes

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	no common facility	no common facility	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment is required to monitor in relation to the building or part, has been fulfilled).



REVISED WASTE MANAGEMENT PLAN

PROJECT DETAILS	
Address of Development	34 & 36 Brisbane Water Drive, Koolewong
Existing buildings and other structures currently on site	2 x dwelling houses, garage, swimming pool
Description of Proposed Development	Mixed Use Development (retail premises and residential flat building)
<i>This development achieves the waste objectives set out in the DCP. The details on this form are the provisions and intentions for minimising waste relating to this project. All records demonstrating lawful disposal of waste will be retained and kept readily accessible for inspection by regulatory authorities such as Council, OEH or Workcover NSW</i>	
Prepared By	Michael Leavey Consulting
Date	28 March 2019

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

DEMOLITION

Type of waste generated	Reuse	Recycle	Disposal	Comment
	Estimated volume	Estimated volume	Estimated volume	Method of onsite reuse, recycling outlet and/or waste depot to be used
Excavation Material		N/A		Excavation will be carried out at the construction stage
Timber		15m ³		Transfer to Material Recovery Facility
Concrete		8m ³	2m ³	Transfer to Material Recovery Facility/ Council Waste Facility
Bricks/Pavers		180m ³		Transfer to Material Recovery Facility
Tiles (roof)		20m ³		Transfer to Material Recovery Facility
Metal (Misc)		6m ³		Transfer to Material Recovery Facility
Gyprock		6m ³		Transfer to Material Recovery Facility
Glass -		4m ³		Transfer to Material Recovery Facility
Furniture		N/A		Will be removed by tenants
Fixtures & Fittings	2m ³	2m ³	2m ³	Reuse/ Transfer to Material Recovery Facility/ Council Waste Facility
Floor Coverings		4m ³		Transfer to Material Recovery Facility
Packaging (used pallets, pallet wrap)		N/A		
Garden Organics		4m ³		Transfer to Material Recovery Facility
Containers (Cans, plastic, glass)		N/A		
Residual Waste			6m ³	Transfer to Council Waste Facility
Asbestos (potential)			6m ³	Transfer to approved waste facility in accordance with legislative requirements

Note: if any other hazardous or special waste is found during demolition, measures will be put in place to ensure they are removed in accordance with relevant legislative requirements.

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

CONSTRUCTION

Type of waste generated	Reuse	Recycle	Disposal	Comment
	Estimated volume	Estimated volume	Estimated volume	Method of onsite reuse, recycling outlet and/or waste depot to be used
Excavation Material		2,000m ³		Transfer to Material Recovery Facility (and treatment in accordance with ASS Management Plan)
Timber		4m ³		Transfer to Material Recovery Facility
Concrete		6m ³	1.5m ³	Transfer to Material Recovery Facility/ Council Waste Facility
Bricks/Pavers		3m ³		Transfer to Material Recovery Facility
Tiles (bathroom)		2m ³		Transfer to Material Recovery Facility
Metal - Roofing, Guttering, Framing		4m ³		Transfer to Material Recovery Facility
Gyprock		4m ³		Transfer to Material Recovery Facility
Glass - Windows		2m ³		Transfer to Material Recovery Facility
Furniture		N/A		
Fixtures & Fittings		N/A		Will be made to order
Floor Coverings		2m ³		Transfer to Material Recovery Facility
Packaging (used pallets, pallet wrap)	4m ³	2m ³		For reuse and transfer to Material Recovery Facility
Garden Organics		2m ³		Transfer to Material Recovery Facility/ reuse for landscaping
Containers (Cans, plastic, glass)		3m ³		Transfer to Material Recovery Facility
Residual Waste			6m ³	Transfer to Council Waste Facility
Hazardous/special waste eg. Asbestos (specify)		N/A		No hazardous materials proposed
Other (specify)		N/A		

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

ONGOING OPERATION**Commercial (as 'shop' < 100m² as per Council's DCP)**

	Recyclables		Residual Waste	Compostable
	Paper/ cardboard/	Metal/ plastic/ glass		
Amount generated (L per day)	25L x (60m ² /100m ²) = 15L		50L x (60m ² /100m ²) = 30L	
Amount generated (L per development per week @ 6 days)	90L		180L	
Any reduction due to compaction equipment	Nil		Nil	
Frequency of collections (per week)	Weekly		Weekly	
Number and size of storage bins required	1 x 240L		1 x 240L	
Floor area required for storage bins (m ²)	0.5m ²		0.5m ²	
Floor area required for manoeuvrability (m ²)	All bins are able to be manoeuvred within the garbage storage area			
Height required for manoeuvrability (m)	Height exceeds 2m			

Note: green waste will be disposed of by the landscape maintenance contractor.

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

ONGOING OPERATION**Residential**

	Recyclables		Residual Waste	Compostable
	Paper/ cardboard/	Metal/ plastic/ glass		
Amount generated (L per day)				
Amount generated (L per development per week)	15 x 120L = 1,800L		15 x 140L = 2,100L	
Any reduction due to compaction equipment	Nil		Nil	
Frequency of collections (per week)	Weekly		Weekly	Fortnightly
Number and size of storage bins required	5 x 360L		6 x 360L	3 x 240L*
Floor area required for storage bins (m ²)	3m ²		4m ²	1.5m ²
Floor area required for manoeuvrability (m ²)	All bins are able to be manoeuvred within the garbage storage area			
Height required for manoeuvrability (m)	Height exceeds 2m			

* green waste will be disposed of by the landscape maintenance contractor, and 3 green waste bins are provided for the use of residents.

CONSTRUCTION DESIGN

<p>Outline how measures for waste avoidance have been incorporated into the design, material purchasing and construction techniques of the development (refer to section 7.2.14 of the DCP)</p>
<p>Materials Careful bill of quantities by builder to ensure that building materials are used or returned to the supplier for refund. Arrange for delivery of all materials to ensure that materials are used in an as needed basis. Any excess material will be recycled or reused in accordance with Part 3 of this Plan.</p>
<p>Lifecycle Selection of materials which will minimise replacement of substandard products in years to come. Selection of quality paints and finishes will reduce the need to re-apply and minimise maintenance to the proposed structure.</p>
<p>Detail the appropriate needs for the ongoing use of waste facilities including the transfer of waste between the residents or tenancy units, the servicing of waste location and frequent of waste transfer and collection. If truck access is required then engineering details are required.</p>
<p>Residents will transfer waste to bins located in the waste enclosure area, which has easy access from the residential lobby and foyer area. Bins will be transported to the roadside by the Building Manager for collection by the Council contracted waste service on a weekly basis. The path of travel is via the residential entry pathway to the south of the commercial premises. Upon collection the Building Manager will return bins to the waste enclosure area, as soon as practical following collection of the bins.</p> <p>Commercial tenants will transfer waste to bins located in a separate commercial waste enclosure area, located adjacent to the commercial parking spaces, and with easy access to the commercial premises. Bins will be collected on a weekly basis, or as otherwise required, by separate private contract arrangements. The path of travel to the roadside is via the sealed access driveway to the commercial parking spaces</p>

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

PLANS & DRAWINGS

The following checklists are designed to help ensure WMP are accompanied by sufficient information to allow assessment of the application.

Drawings are to be submitted to scale, clearly indicating the location of and provisions for the storage and collection of waste and recyclable during:

- Demolition – **to be provided at Construction Certificate stage**
- Construction – **to be provided at Construction Certificate stage**
- Ongoing operation.

DEMOLITION <i>Refer to Section 7.2.13 of the chapter for specific objectives and measures.</i> Do the site plans detail/indicate:	Y/N
Size & location of waste storage areas	Detail at CC stage
Access for waste collection vehicles	Detail at CC stage
Areas to be excavated	Detail at CC stage
Types and numbers of storage bins likely to be required	Detail at CC stage
Signage required to facilitate correct use of storage facilities	Detail at CC stage

CONSTRUCTION <i>Refer to Section 7.2.15 – 7.2.19 of the chapter for specific objectives and measures.</i> Do the site plans detail/indicate:	Y/N
Size & location of waste storage areas	Detail at CC stage
Access for waste collection vehicles	Detail at CC stage
Areas to be excavated	Detail at CC stage
Types and numbers of storage bins likely to be required	Detail at CC stage
Signage required to facilitate correct use of storage facilities	Detail at CC stage

Revised Waste Management Plan

34 & 36 Brisbane Water Drive, Koolewong

ONGOING OPERATION

	Comment
SPACE	
Size and location of waste storage areas	Shown on plans
Recycling bins placed next to residual waste bins	Shown on plans
Space provided for access to and the manoeuvring of bins/equipment	Adequate access and manoeuvring area is provided
Any additional facilities	Nil
ACCESS	
Access route to deposit waste in storage room/area	Suitable internal access route is available
Access route to collect waste from storage room/area	
Bin carting grade not to exceed 10% and travel distance not greater than 100m in length	N/A
Clearance, geometric design and strength of internal access driveways and roads	N/A – road side collection
Direction of traffic flow for internal access driveway and roads	
AMENITY	
Aesthetic design of waste storage areas, including being compatible with the main buildings and adequately screened and visually unobtrusive from the street	Storage areas are enclosed and screened, and are setback from the street
Signage type and location	Detail at CC stage as required
Construction details of storage rooms/areas (including floor, walls, doors, ceiling design, sewer connection, lighting, ventilation, security, wash down provisions, cross and longitudinal section showing clear internal dimensions between engaged pier and other obstructions etc	

NOTES REGARDING ASBESTOS

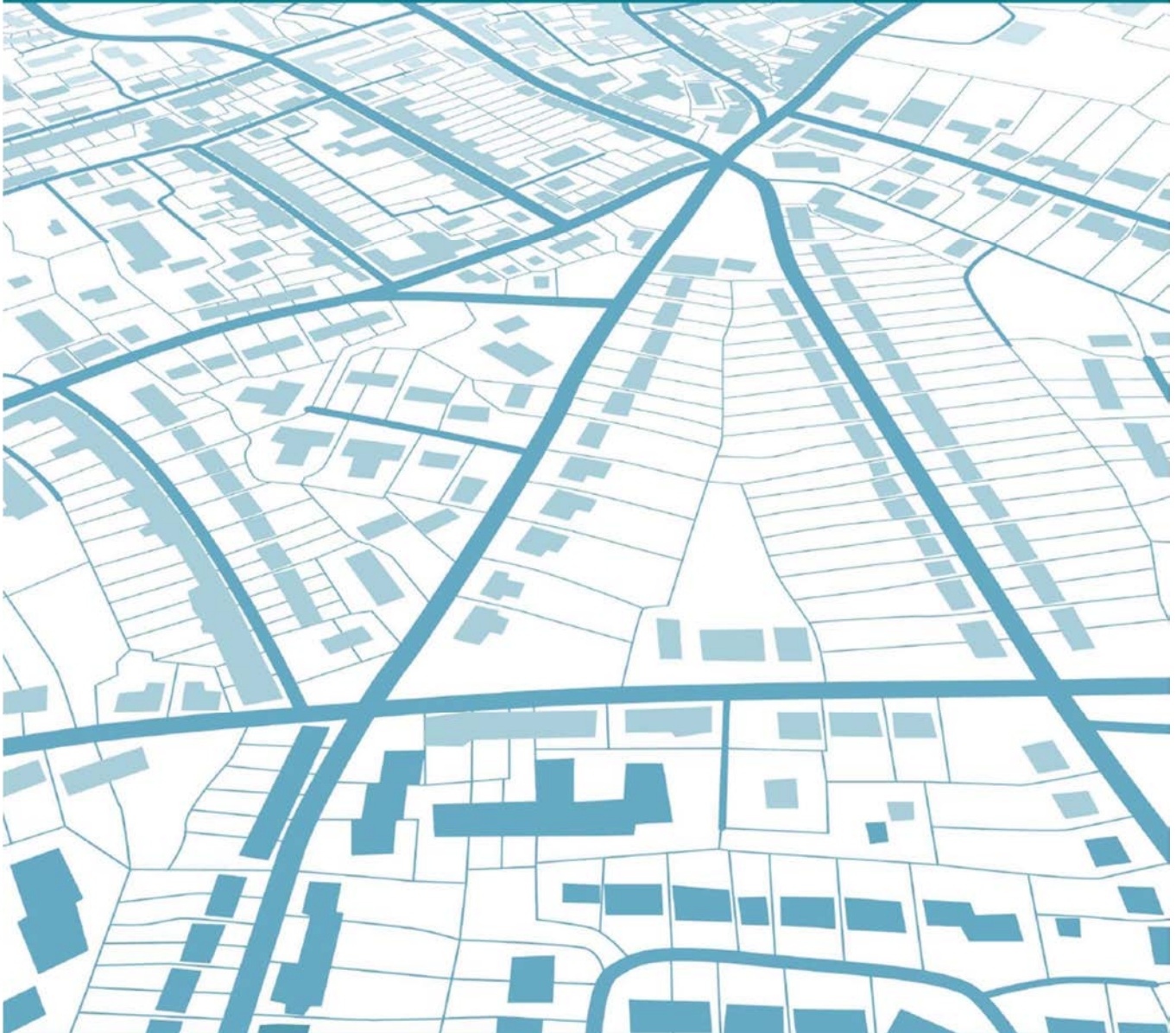
Buildings built before 1988 may contain asbestos in the form of flat or corrugated sheets ('fibro') used for walls, ceilings and roofing, or in products such as pipes, electrical conduit and eaves.

To prevent access to the area which may contain asbestos the site should be securely fenced. The site will need to be continually damped down so as not to cause runoff or sprayed with PVA to ensure that the asbestos cannot become airborne. This needs to continue until the site is cleaned up.

If asbestos is discovered during demolition, all work is to cease until the extent is determined and a suitably qualified and approved contractor is used to appropriately remove and dispose of all material.

ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
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34 – 26 Brisbane Water Drive, Koolewong Mixed Use Development

Traffic and Parking Impact Assessment

Ref: 17215
Date: April 2019
Issue: E

Transport and Traffic Planning Associates

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1.0 Introduction

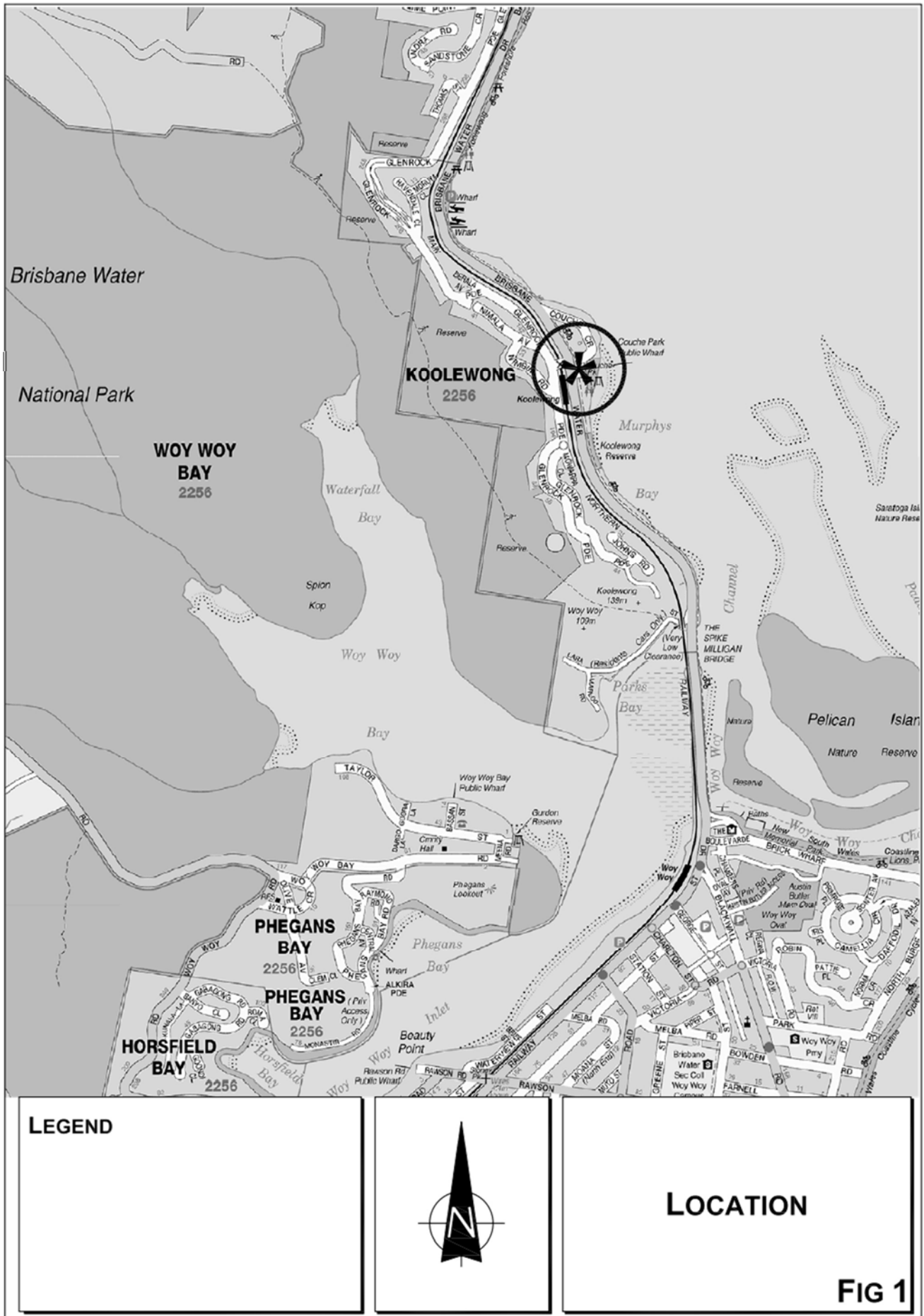
This report has been prepared to accompany a Development Application to Central Coast Council for a proposed mixed use development at 34 – 36 Brisbane Water Drive, Koolewong (Figure 1).

The development site adjoins the Couche Park waterfront reserve on the shore of Murphys Bay providing a scenic outlook over Brisbane Water. These scenic attributes together with the convenient access to railway station have acted to generate recent new residential apartment in the area and the proposed development scheme comprises:

- ❖ 14 residential apartments
- ❖ Retail unit (60m²)
- ❖ Basement parking

The purpose of this report is to:

- ❖ describe the site, its context and the proposed development
- ❖ describe the road network serving the site and the traffic circumstances
- ❖ assess the proposed vehicle access and traffic implications
- ❖ assess the adequacy of the proposed parking provision
- ❖ assess the suitability of the proposed internal circulation and servicing arrangements



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2.0 Proposed Development Scheme

2.1 Site, Context and Existing Use

The site (Figure 2) is a consolidation of Lots 16 and 17 in DP 14946 occupying an irregular shaped area of some 1,546.9m², located to the north of the Woy Woy town centre. The site has a frontage of some 31.3 metres to the eastern side of Brisbane Water Drive.

The surrounding uses include:

- ❖ the general store and residential dwelling which adjoin to the north
- ❖ the takeaway fast food and residential dwelling which adjoin to the south
- ❖ Couche Park which adjoins to the east
- ❖ the mixed residential uses in the Koolewong “enclave” including a new apartment complex on Couche Crescent

The existing uses on the site comprise an older style residential dwelling on the southern part and a modern 2-level dwelling on the northern part.

2.2 Proposed Development

It is proposed to demolish the existing buildings and excavate the site to provide for basement parking and a level building platform. A new 4-level building will be constructed comprising:

Residential Apartments	Retail Unit
5 x one-bedroom	60m ²
6 x two-bedroom	
4 x three-bedroom	
Total – 15 apartments	



LEGEND



SITE

FIG 2

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A total of 27 parking spaces will be provided in a basement and a small at-grade carpark accessed via 2 driveways on the Brisbane Water Drive frontage.

Details of the proposed development scheme are provided on the plans prepared by White Dickson Architects, which accompany the Development Application and are reproduced in part in Appendix A.

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3.0 Existing Road Network and Traffic Conditions

3.1 Road Network

The road network serving the site (Figure 3) comprises:

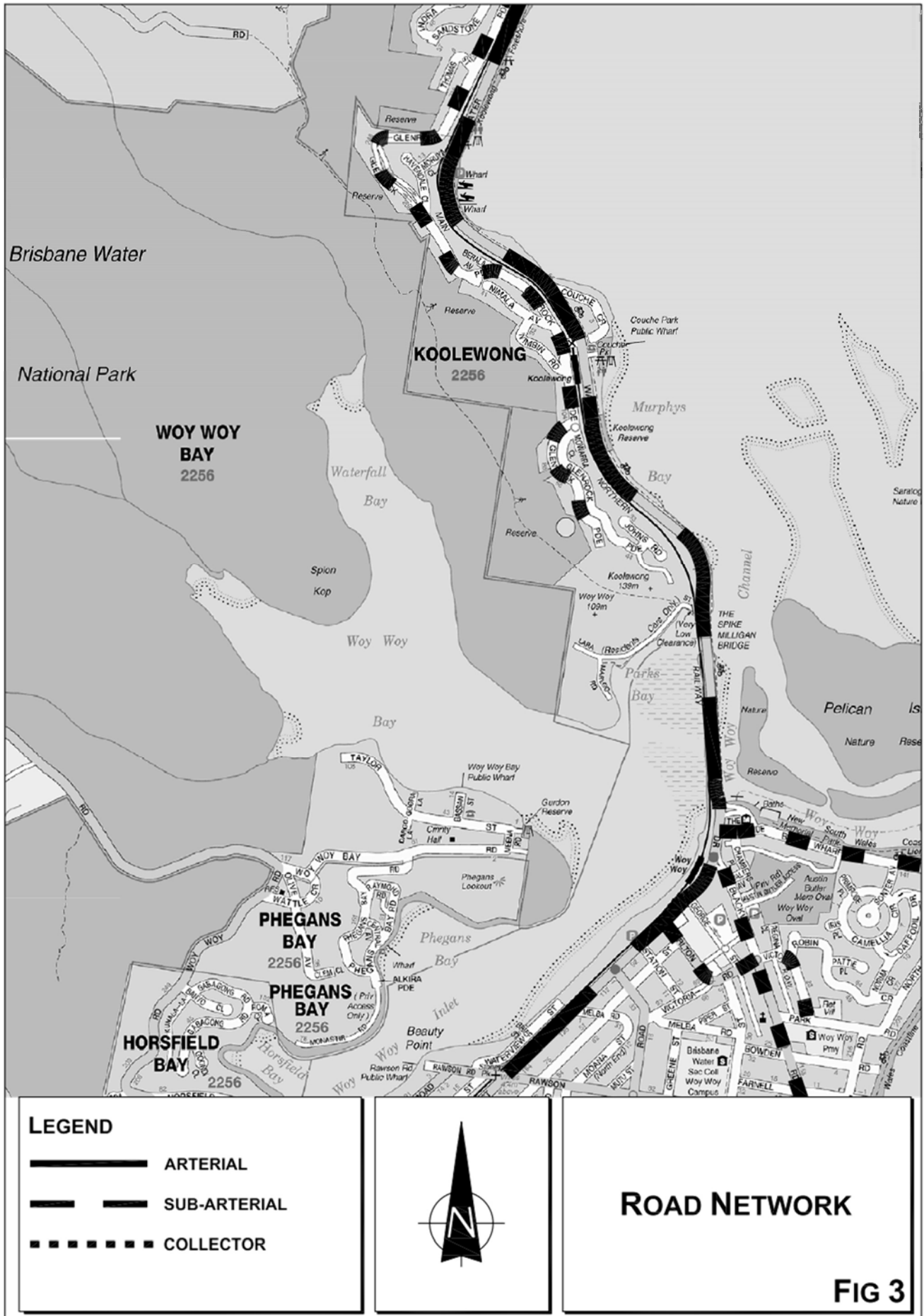
- ❖ *Brisbane Water Drive / Railway Street* – a State Road and sub-arterial route connecting between Gosford and Woy Woy
- ❖ *Glenrock Parade* – a collector route running parallel to Brisbane Water Drive connecting between Point Clare and Koolewong
- ❖ *Blackwell Road* – a collector road connecting southwards from Woy Woy

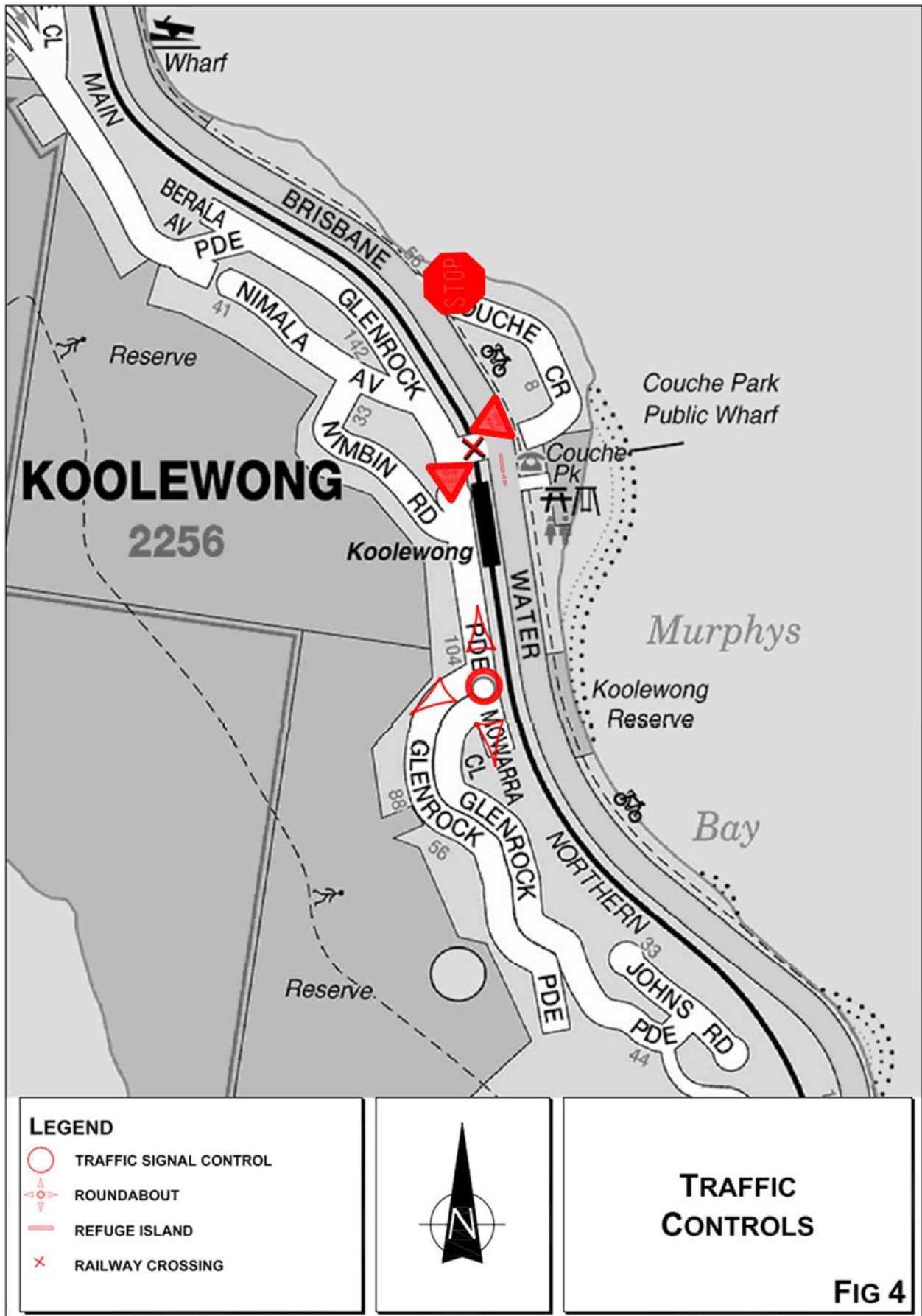
Brisbane Water Drive in the vicinity of the site has one lane in each direction with supplementary turning lanes at the level crossing intersection (which has a “seagull” arrangement) and a parking lane along the eastern side.

3.2 Traffic Controls

The few existing traffic and parking controls in the vicinity of the site (Figure 4) comprise:

- ❖ the railway level crossing with boom gates
- ❖ the GIVE WAY sign controls at the intersections each side of the level crossing
- ❖ the pedestrian refuge island in Brisbane Water Drive
- the 60 kmph speed restriction on Brisbane Water Drive
- ❖ the shared pedestrian / bicycle pathway along the eastern side of Brisbane Water Drive
- the BUS ZONE and Bus Bay on Brisbane Water Drive just to the north of the site





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3.3 Traffic Conditions

The RMS counting station located on Brisbane Water Drive indicates an Average Annual Daily Traffic (AADT) flow of some 19,000 vpd in the vicinity of the site.

A 7-day tube count undertaken at the railway crossing just to the north of the site indicates an AADT of some 1,593 vpd.

The traffic movements in the surrounding road network are moderate during the peak periods and access movements to and from the Brisbane Water Drive frontage are facilitated by gaps provided by the traffic signals to the south (Blackwell Point Road) and the roundabout and traffic signals to the north.

3.4 Transport Services

Public transport services in the vicinity of the site are provided by the:

- ❖ the rail services at the adjacent Koolewong Railway Station (50 metres north)
- ❖ the Routes 51CN, 54CN, 55, and 70 bus services which operate along the Bus Stop just to the north of the site at Brisbane Water Drive between Ettalong Beach and Gosford via Woy Woy

It is apparent that the site is conveniently located in relation to public transport services.

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4.0 Parking

Central Coast Council's DCP specifies the following parking criteria relative to the proposed development.

Residential Apartments (<400m of railway station)	1 space per dwelling
Visitor	1 space per 5 apartments
Retail	1 space per 30m ²
Commercial	1 space per 40m ²

Application of this criteria to the proposed development scheme elements would indicate the following:

Residential

14 x apartments	14 spaces
Visitors (14 apartments)	3 spaces
Retail 60m ²	2 spaces

Total 19 spaces

Accordingly, it is proposed to provide a total of 27 spaces in the development being composed of 25 in the basement and 2 retail spaces at-grade.

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5.0 Traffic

The RMS Development Guidelines specify a traffic generation rate for medium density apartments of 0.4 to 0.65 vtpd per apartment in the morning and afternoon peak periods. The criteria contained in the RMS Guidelines for retail use are not applicable to the subject circumstance because it is not a 'shopping centre' with supermarket and the traffic generation will solely reflect that of the 2 retail parking spaces provided plus some potential minor on-street movements.

Thus, the assessed traffic generation in the AM and PM peak periods is as follows:

	AM	PM
Apartments		
5 @ 0.4 vtpd	2.0	2.0
6 @ .05 vtpd	3.0	3.0
3 @ 0.65 vtpd	2.0	2.0
Retail	2.0	4.0
Total	9 vtpd	11 vtpd

The existing development on the site (i.e. 2 large dwellings would generate some 2 vtpd in the peak periods. Thus, the additional peak traffic generation would be some 10 vtpd or 1 vtpd each 6 minutes which will spread over the 2 driveways and will be largely imperceptible.

Council requires that the development's potential traffic implication on the railway crossing just to the north west of the site is assessed. The surveyed AADT and peak hourly traffic volumes (Appendix B) at the crossing are summarised as follows:

AADT	1,593 vpd
AM Peak	107 vpd
PM Peak	138 vpd

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The land uses on the enclave which is situated to the west of the crossing are primarily residential and there is no apparent employment or retail uses. As such, there is no "trip attractor" or "destination" venues which are traffic generators from Brisbane Water Drive westwards. For this reason, residents from the proposed development are unlikely to access the crossing during normal peak periods. Because there is a small retail component at the proposed development, a worst-case scenario would be the 2 retail employees living within this enclave and therefore use the crossing (and assuming they opt to drive the short distance) during the peak hours. This would equate up to 2 vtpm (2 retail carpark only).

Based on the above, it is assessed that the proposal will have no adverse or undue traffic implications on the exiting road network and operations.

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6.0 Access, Internal Circulation and Servicing

6.1 Access

The proposed vehicle access arrangements comprise:

- a 5.5m wide combined ingress/egress driveway located at the southern site boundary for the basement car park
- a 5.5m wide driveway located at the northern site boundary for retail access

The driveways are consistent with the design provisions of AS2890.1 and have particular regard for the frontage sightlines requirements.

6.2 Internal Circulation

The access, carpark and servicing arrangements will allow safe and efficient movement throughout the development with aisle width, column locations and parking space dimensions etc. in accordance with AS2890.1 and 6.

Details of turning path analyses indicating a satisfactory outcome are provided in Appendix C.

6.3 Servicing

Refuse will be collected from the street front by Councils service while small service vehicles (eg service personnel) will be able to use the visitor spaces. The small retail tenancy will only have very minor deliveries which can be made by small vehicles using the retail parking area or standing at the kerbside.

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7.0 Conclusion

The proposal represents a valuable opportunity for a residential apartment based mixed use development replacing the residential dwellings in the small Koolewong “enclave” taking advantage of the scenic outlook and adjacent railway station. The traffic, transport and parking assessment provided in this report indicates that the development will:

- ❖ not present any unsatisfactory traffic capacity, safety or environmental related implications
- ❖ incorporate a suitable and appropriate parking provision for the use
- ❖ incorporate suitable vehicle access, internal circulation and servicing arrangements

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Appendix A

Development Plans



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Rev.	Description	Date
A	Preliminary DA issue	27/3/18
B	Revised DA issue	4/5/18
draft	draft issue	26/2/19



Second Floor Plan 1:200

MGA - Map Grid NSW (by survey)
 TN - True (Solar) North



PO Box 4371 East Gosford NSW 2250
 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RAA (Arch Registration No. 7657)

Koolewong Residences

Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW
 Australia

Lots 16 + 17 in DP 14946

Second Floor plan

Scale @ A3 1:200	Feb 2019	Issue: draft
Project: 1708	Plot Date: 26/2/19	D203

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Rev.	Description	Date
A	Preliminary DA issue	27/3/18
B	Revised DA issue	4/5/18
draft	draft issue	26/2/19



First Floor Plan 1:200

MGA - Map Grid NSW (by survey)
 TN - True (Solar) North



PO Box 4371 East Gosford NSW 2250
 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RAA (Arch Registration No.7657)

Koolewong Residences

Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW
 Australia

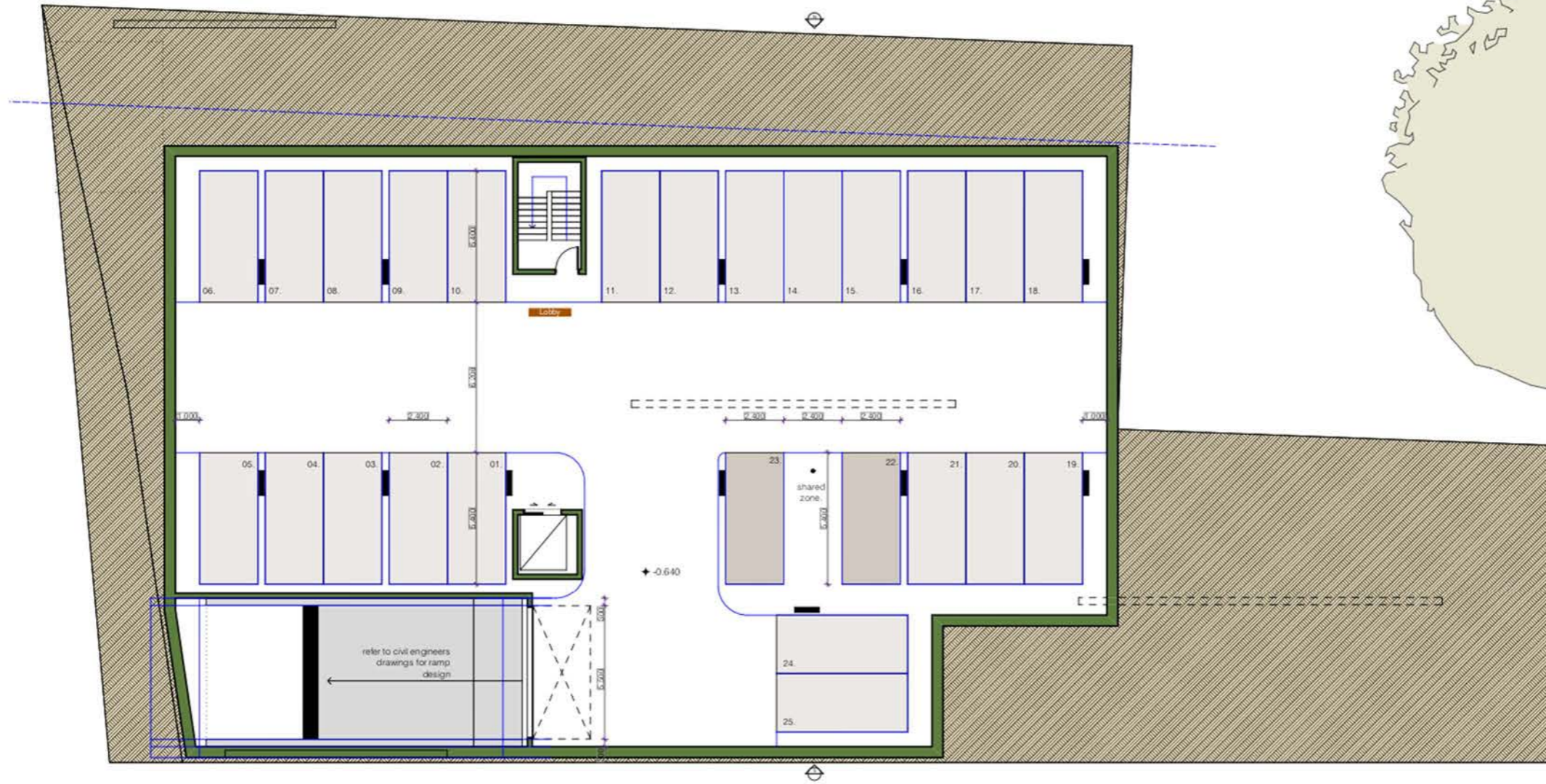
Lots 16 + 17 in DP 14946

First Floor plan

Scale @ A3 1:200	Feb 2019	Issue: draft
Project: 1708	Plot Date: 26/2/19	D202

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Rev.	Description	Date
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draft	draft issue	26/2/19



MGA - Map Grid NSW (by survey)
 TN - True (Solar) North

White + Dickson
 Architects.



PO Box 4371 East Gosford NSW 2250
 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RAA (Arch Registration No. 7697)

Koolewong Residences

Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW
 Australia

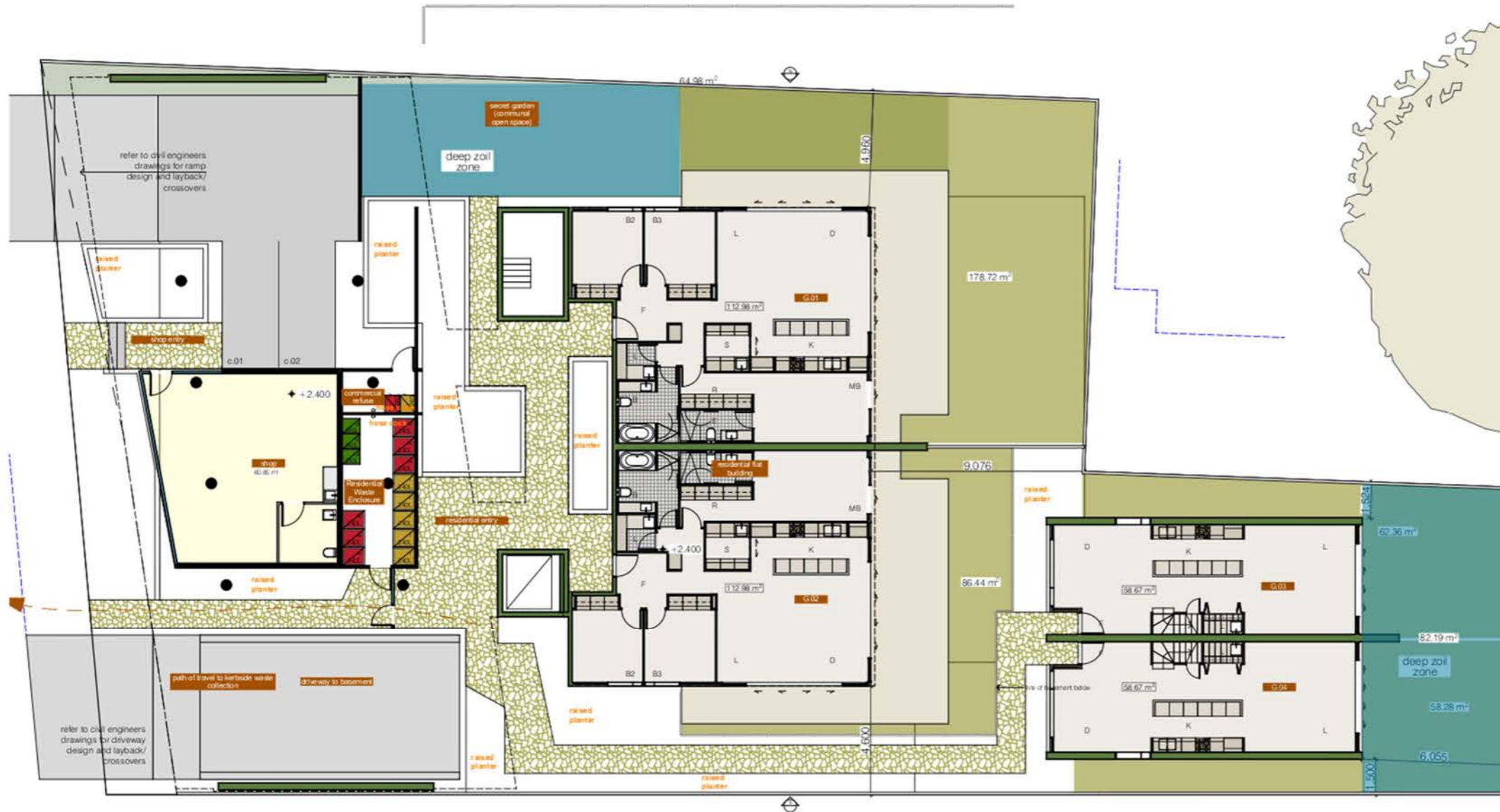
Lots 16 + 17 in DP 14946

Basement Floor Plan

Scale @ A3 1:200	Feb 2019	Issue: draft
Project: 1708	Plot Date: 26/2/19	D200

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Rev.	Description	Date
A	Preliminary DA issue	27/3/18
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draft	draft issue	26/2/19



MGA - Map Grid NSW (by survey)
 TN - True (Solar) North



PO Box 4371 East Gosford NSW 2250
 Tel: +61 2 4324 3632
 Nominated Architect: Andrew Dickson RAA (Arch Registration No. 7657)

Koolewong Residences

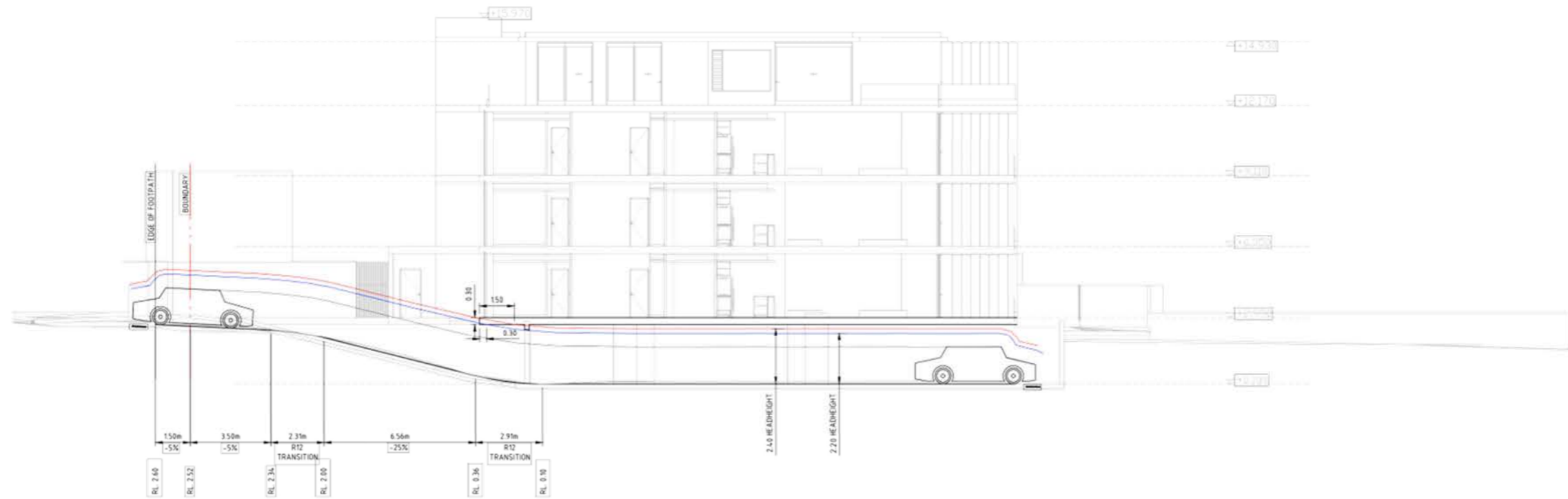
Shop and Residential Flat Building

34-36 Brisbane Water Drive Koolewong NSW
 Australia


Lots 16 + 17 in DP 14946

Ground Floor plan

Scale @ A3 1:200	Feb 2019	Issue: draft
Project: 1708	Plot Date: 26/2/19	D201



PROJECT: 34-36 BRISBANE WATER DRIVE, KOOLEWONG
JOB NUMBER: NL172238
TITLE: DRIVEWAY LONGSECTION
PAGE No: 1
DATE: 02/03/18
DRAWN: ROBERT SUCKLING



Central Coast
 Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
 Ph: (02) 4360 1600 Fax: (02) 4367 6556
 Email: centralcoast@northrop.com.au ABN: 61 094 433 100

- NOTES:**
1. THE STRUCTURAL THICKNESS OF THE SLAB IS ASSUMED TO BE 300mm.
 2. LONGSECTION IS BASED ON ADVICE PROVIDED BY TRAFFIC CONSULTANT & REQUIRED GROUND CLEARANCE.
 2. IT IS OUR RECOMMENDATION TO ALLOW FOR 2.4m HEADHEIGHT CLEARANCE (SHOWN IN RED). THIS WILL REQUIRE THE SLAB EXTENTS TO BE REDUCED BY 15m.
 3. THE MINIMUM CLEARANCE ALLOWED IS 2.2m (SHOWN IN BLUE). THE SLAB EXTENTS WILL NEED TO BE REDUCED BY 0.3m (OR HAVE A SLAB THICKNESS OF 250mm) TO PROVIDE ADEQUATE CLEARANCE. THIS WILL REQUIRE WARNING SIGNAGE FOR ALL AREAS THAT HAVE LESS THAN 2.3m CLEARANCE TO ANY OBSTRUCTION.
 4. A SUITABLE LOCATION WILL NEED TO BE FOUND FOR THE ROLLER DOOR HOUSING TO ENSURE IT DOES ENCRDACH ON THE HEADHEIGHT CLEARANCE.

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Appendix B

Tube Count Data



CfeIT bob.white@cfeit.com (02) 9740 8600

Traffic Count Summary Report

Count Number	6648	Ref : TTPA	Lat/Long : S33 27.963 / E151 19.090	GUBD 96 M-6
Street	KOOLEWONG RAILWAY CROSSING, TASCOTT : Between GLENROCK PARADE & BRISBANE WATER DRIVE (bidirectional) :			
Location	Combined Counts (6629,6630) immediately after railway racks on Keep Clear Sign			Carriageway

TOTAL COUNT MATRIX	Start Date	12-SEP-18	Weekly 50th Percentile Speed	21
	Start Time	100	Weekly 85th Percentile Speed	28
	Duration	7 DAYS	Five Day AADT	1620
	Interval	1 HOUR	Seven Day AADT	1594

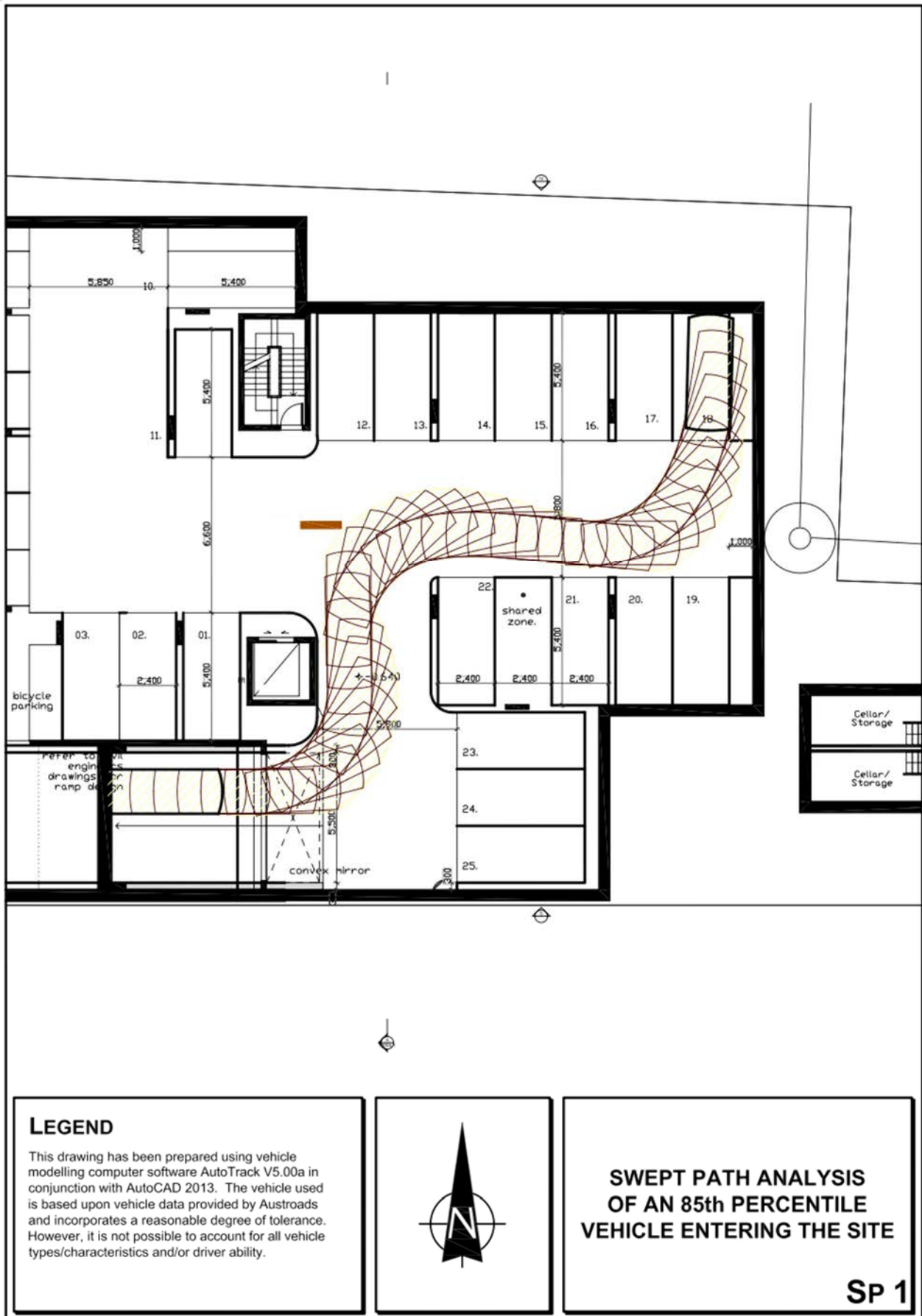
	MON 17TH	TUE 18TH	WED 12TH	THU 13TH	FRI 14TH	SAT 15TH	SUN 16TH	5 Day		7 Day	
								Total	Average	Total	Average
Midnight - 1am	2	3	1	1	1	8	11	8	2	27	4
1am - 2am	2	3	6	1	0	8	14	12	2	34	5
2am - 3am	1	2	3	1	1	9	5	8	2	22	3
3am - 4am	3	5	2	8	2	4	5	20	4	29	4
4am - 5am	8	12	8	7	11	5	2	46	9	53	8
5am - 6am	30	40	32	27	29	11	10	158	32	179	26
6am - 7am	50	55	58	55	58	26	18	276	55	320	46
7am - 8am	94	89	93	98	87	72	47	461	92	580	83
8am - 9am	109	102	106	125	110	123	76	552	110	751	107
9am - 10am	103	91	110	112	92	129	109	508	102	746	107
10am - 11am	103	84	84	87	97	136	113	455	91	704	101
11am - Midday	104	106	98	88	102	113	130	498	100	741	106
Midday - 1pm	104	93	126	85	99	151	121	507	101	779	111
1pm - 2pm	91	87	87	99	122	126	118	486	97	730	104
2pm - 3pm	132	89	98	96	114	117	104	529	106	750	107
3pm - 4pm	132	144	121	132	144	88	111	673	135	872	125
4pm - 5pm	137	160	150	140	159	118	101	746	149	965	138
5pm - 6pm	124	149	140	142	126	135	109	681	136	925	132
6pm - 7pm	121	106	122	114	111	110	69	574	115	753	108
7pm - 8pm	74	60	64	71	70	63	47	339	68	449	64
8pm - 9pm	40	40	61	50	58	37	30	249	50	316	45
9pm - 10pm	24	32	27	47	49	26	18	179	36	223	32
10pm - 11pm	10	14	25	23	31	26	9	103	21	138	20
11pm - Midnight	4	5	4	5	12	30	9	30	6	69	10
Total	1602	1571	1626	1614	1685	1671	1386	8098	1619	11155	1593

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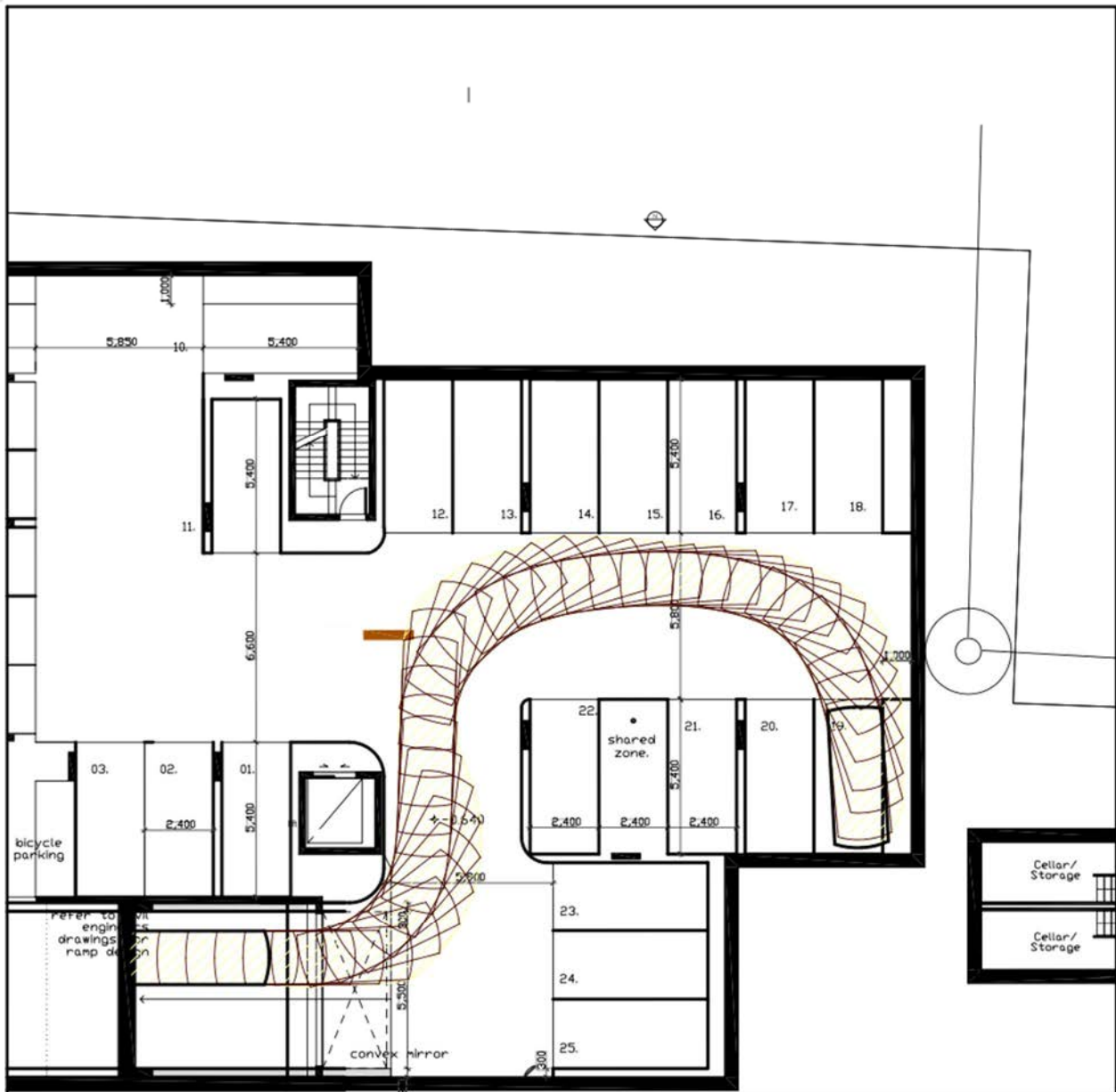
Appendix C

Turning Path Assessment









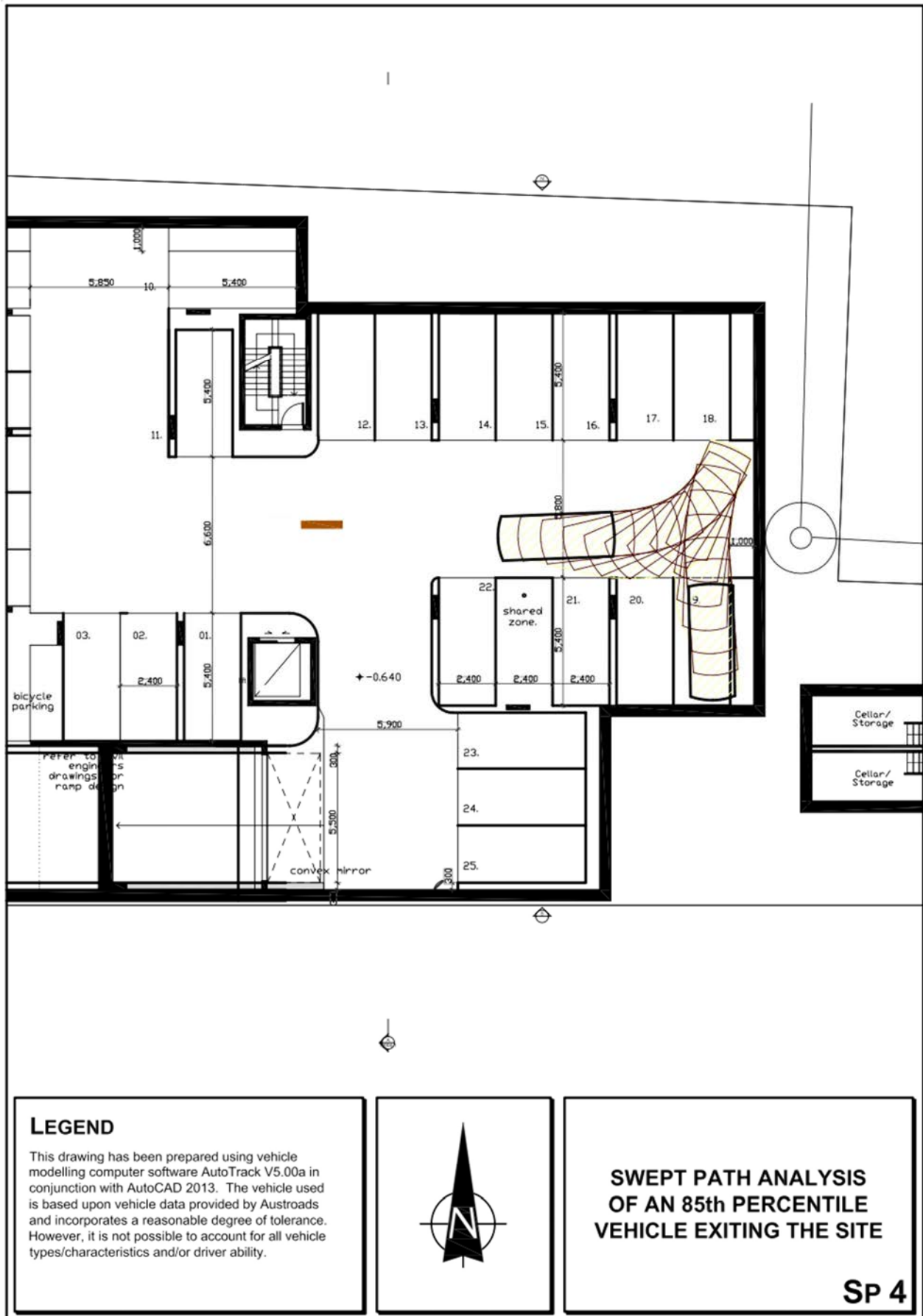
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE ENTERING THE SITE**

SP 3



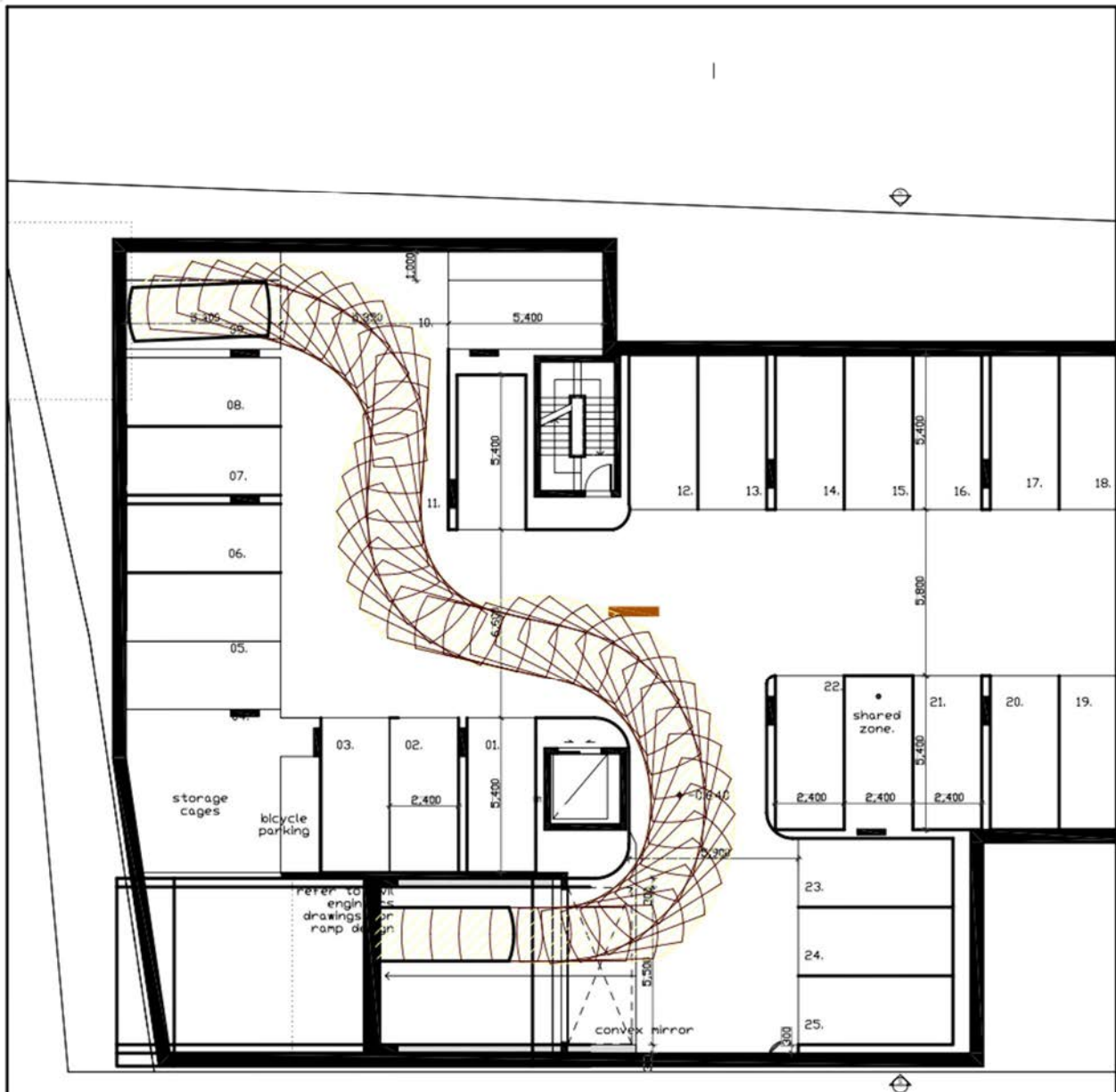
LEGEND

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**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE EXITING THE SITE**

SP 4



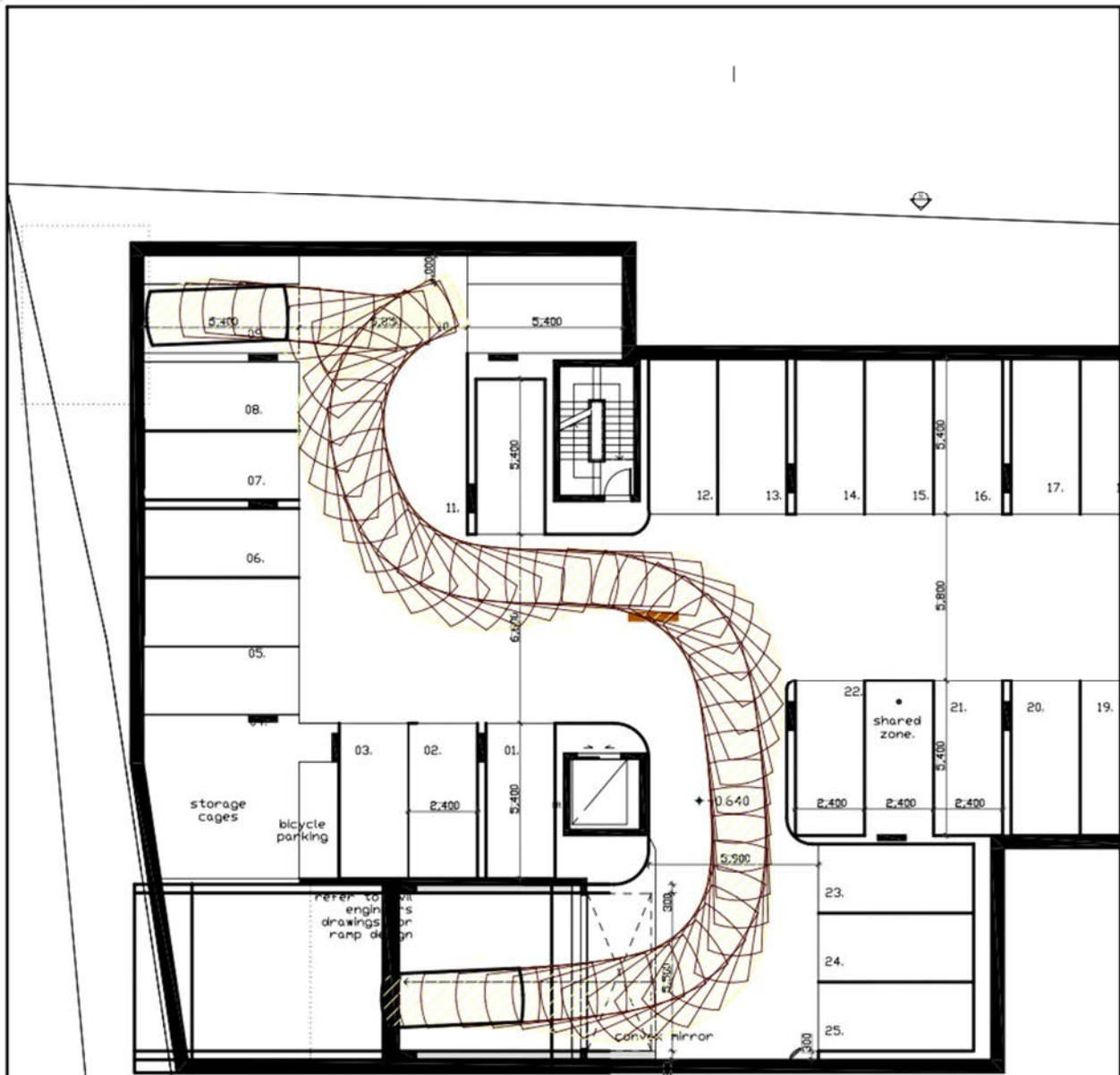
LEGEND

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**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE ENTERING THE SITE**

SP 5



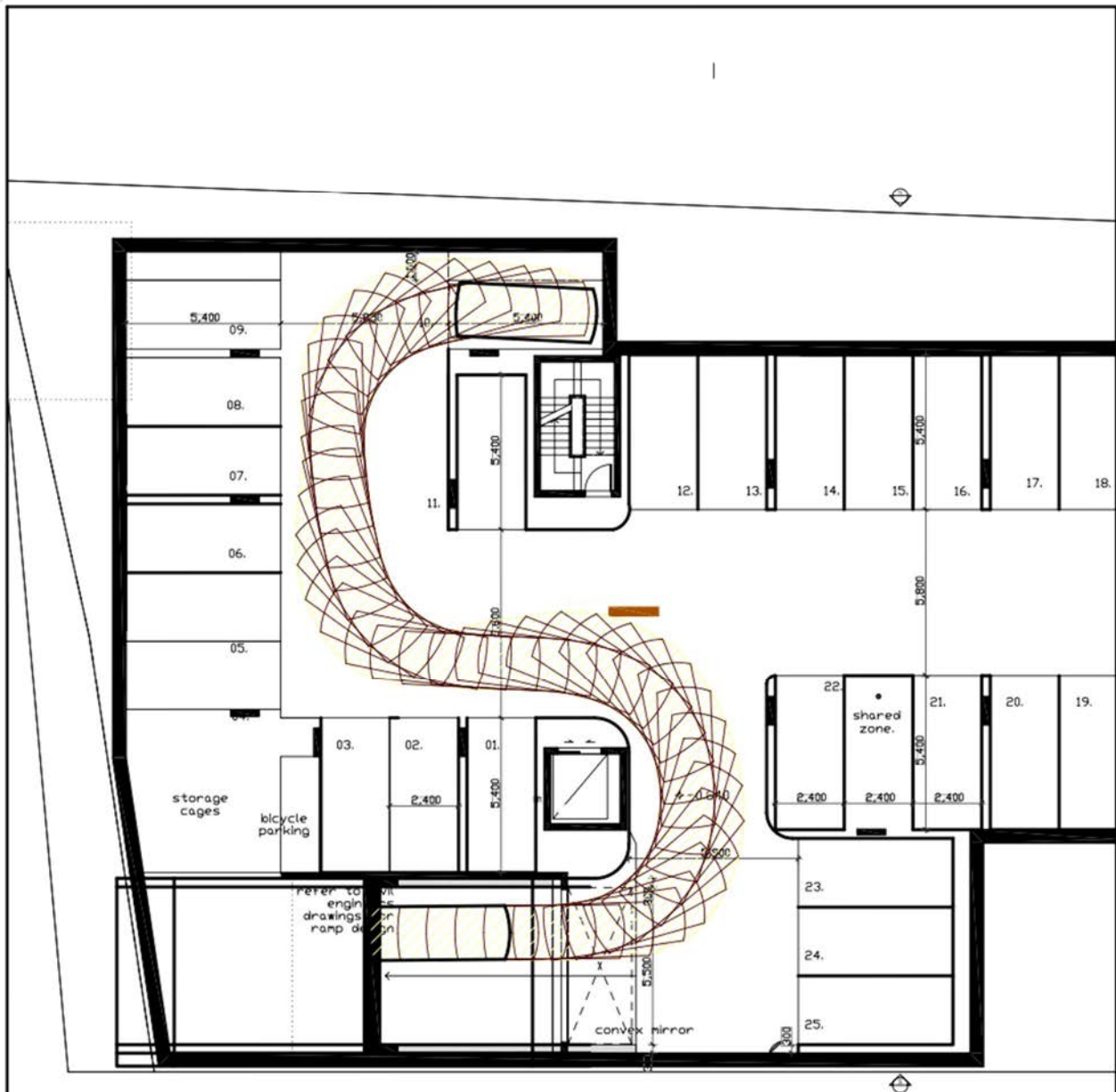
LEGEND

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**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE EXITING THE SITE**

SP 6



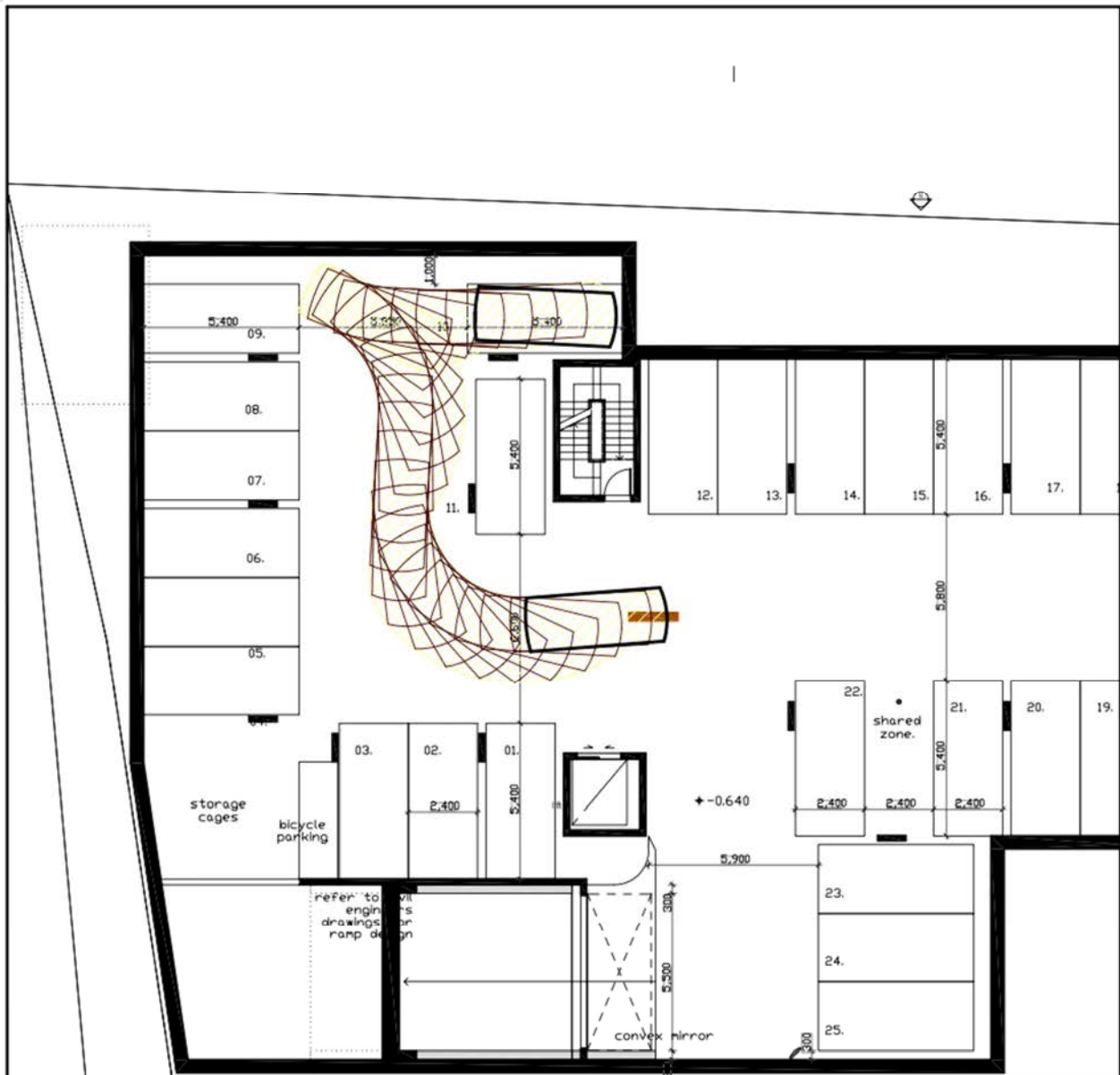
LEGEND

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**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE ENTERING THE SITE**

SP 7



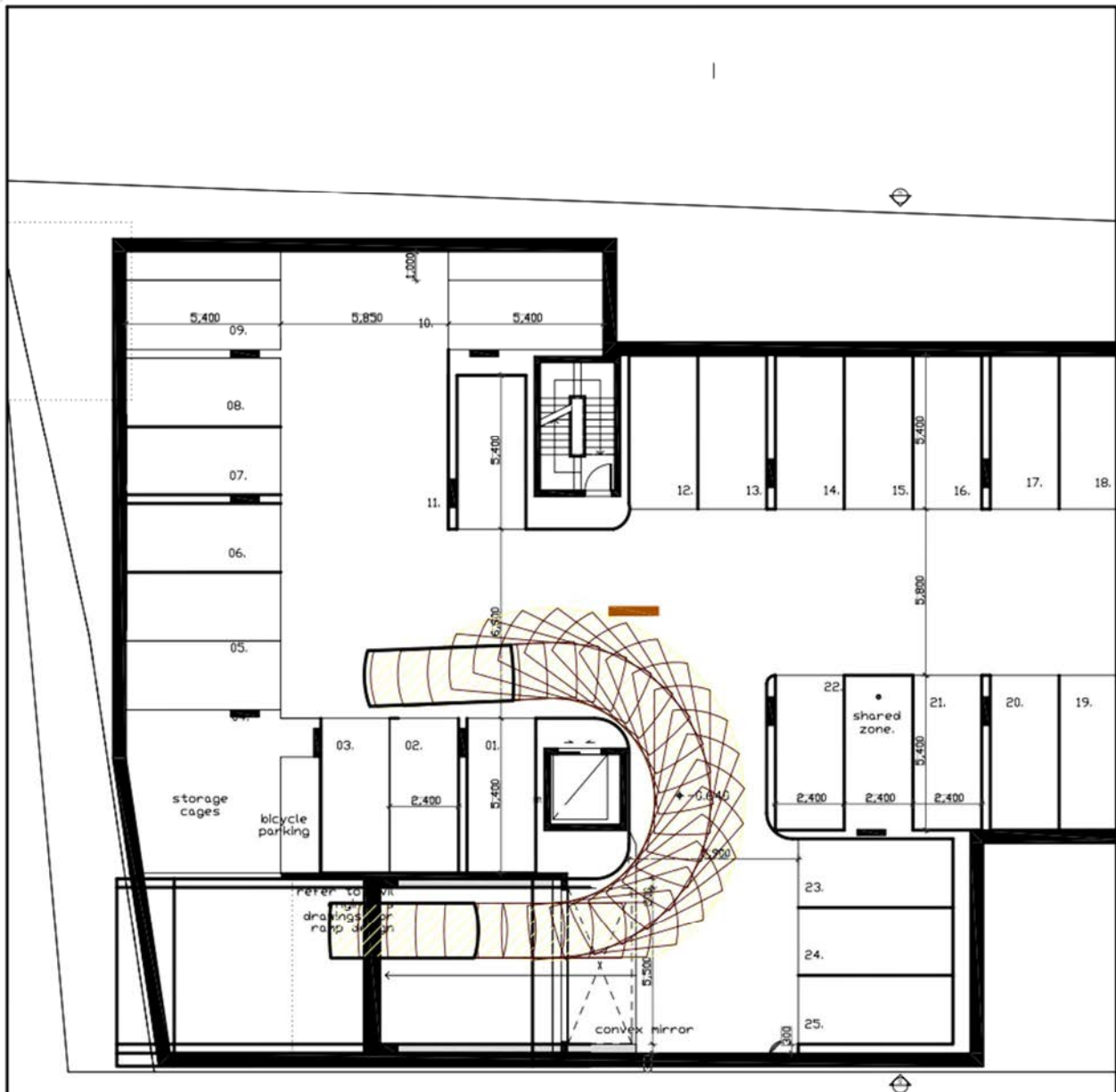
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
 OF AN 85th PERCENTILE
 VEHICLE EXITING THE SITE**

SP 8



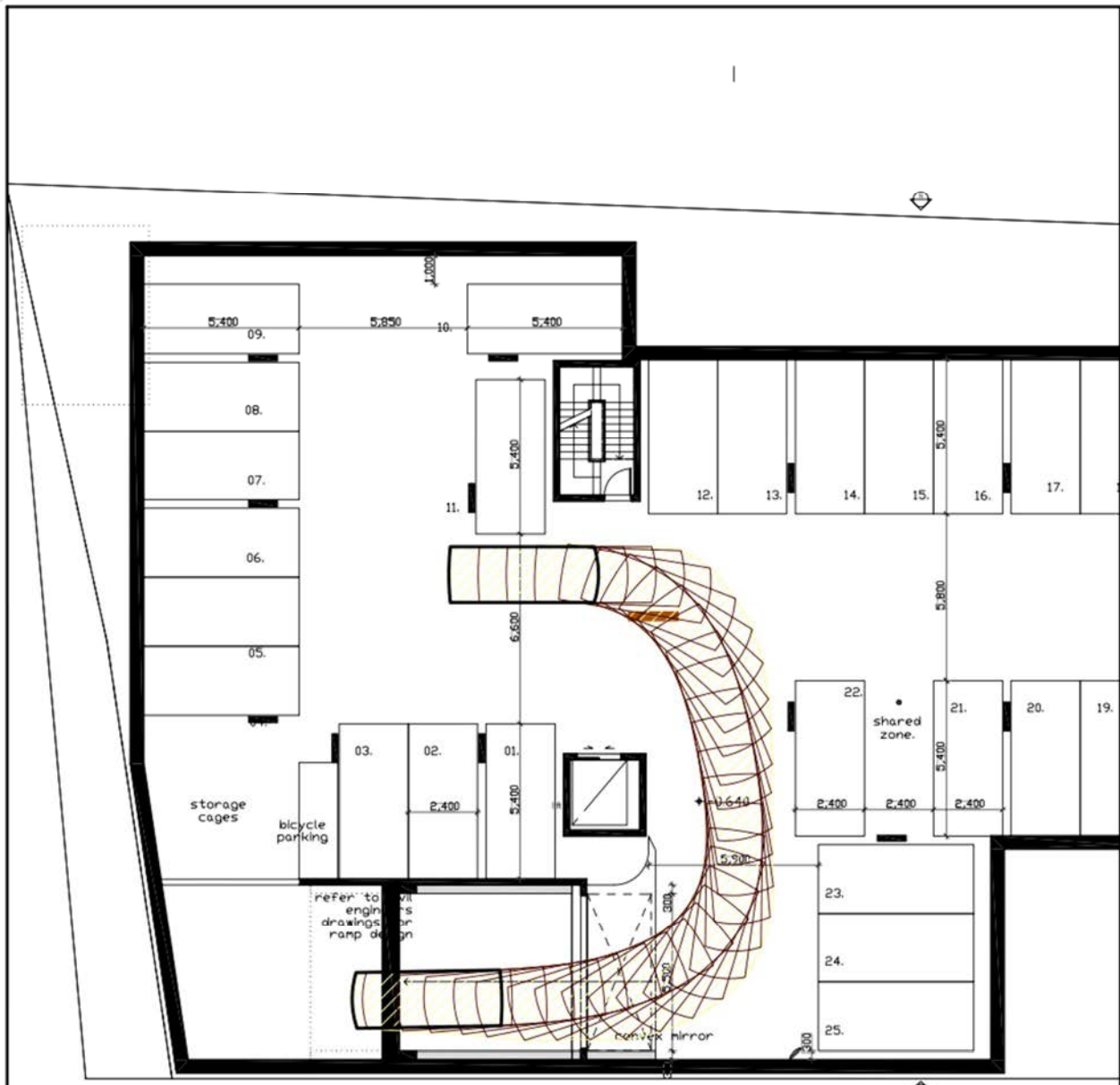
LEGEND

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**SWEPT PATH ANALYSIS
 OF A 99th PERCENTILE
 VEHICLE ENTERING THE SITE**

SP 9



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
 OF A 99th PERCENTILE
 VEHICLE EXITING THE SITE**

SP 10



Michael Leavey Consulting
Planning & Development Services

ABN 63 279 339 494

Statement of Environmental Effects Addendum

Proposed Mixed Use Development
(Commercial Premises and Residential Flat Building)

34 & 36 Brisbane Water Drive, Koolewong



Prepared for DFK Holdings Pty Ltd

April 2019

1. INTRODUCTION

This Statement of Environmental Effects addendum has been prepared on behalf of DHK Holdings Pty Ltd in support of revised plans submitted to Central Coast Council for a mixed-use development on 34-36 Brisbane Water Drive, Koolewong (DA54122/2018).

The addendum addresses the revised plans against relevant planning controls, including revised clause 4.6 variations.

This addendum should be read in conjunction with the submitted Statement of Environmental Effects (April 2018) and additional planning information dated 4 July 2018, as well as revised architectural plans prepared by White + Dickson Architects.

2. REVISED PLANS

The revised plans make a number of changes to the layout and distribution of floor space in the development, in response to issues raised by Council in its initial assessment and issues raised in public submissions. In particular the revised plans reduce building height and floor space ratio compared to the original submitted plans.

In July 2018 amended plans were submitted to accommodate a possible road widening along Brisbane Water Drive, which mirror-reversed the proposed driveway and basement entry from the southern side of the site to the northern side, and relocated the proposed commercial premises driveway and car parking to the southern side of the commercial premises. There were also minor changes to the proposed commercial premises building and the location of waste storage bins.

The revised plans now submitted make the following changes to the amended plans:

- the basement entry driveway has been located on the southern side of the site, consistent with the original plans, and the driveway and basement entry accommodate the potential road widening along Brisbane Water Drive;
- the commercial driveway entry and car park has been located to the northern side of the site, consistent with the original plans, and the driveway and car parking spaces accommodate the potential road widening along Brisbane Water Drive;
- the upper level of the residential flat building element in the centre of the site has been removed, and the building footprint reduced to provide additional setback at both the sides and to Brisbane Water Drive, and which also reduces the number of units in this part of the development from 15 to 6 units;
- floor space removed from the central element has been relocated to an additional two 2-storey units at the rear of the site, and the introduction of 7 new 2-storey maisonette units to be located along the Brisbane Water Drive frontage above the proposed shop, which retains the same floor area as per the original application; and
- the basement layout has been reconfigured to remove the proposed tandem spaces, and 25 spaces are proposed in the basement level, including 2 accessible car spaces.

The revised development has reduced the maximum building height compared to the original application by 4m, and has the following building heights:

Element	Building Height	Comment
Front RFB (Maisonette) Units	8.25m – 9.02m	Partly complies, part minor variation (6.1%)
Central RFB Units (incl rear balcony roof)	8.55m – 9.39m	Minor variation (0.59% - 10.47%)
Central Lift Overrun	9.76m – 9.81m	Minor variation (14.8% - 15.4%)
Rear RFB Units	6.37m – 6.59m	Complies

A comparison between the original and revised plans is shown in the following figures, with the original plans shown with a dashed red outline.

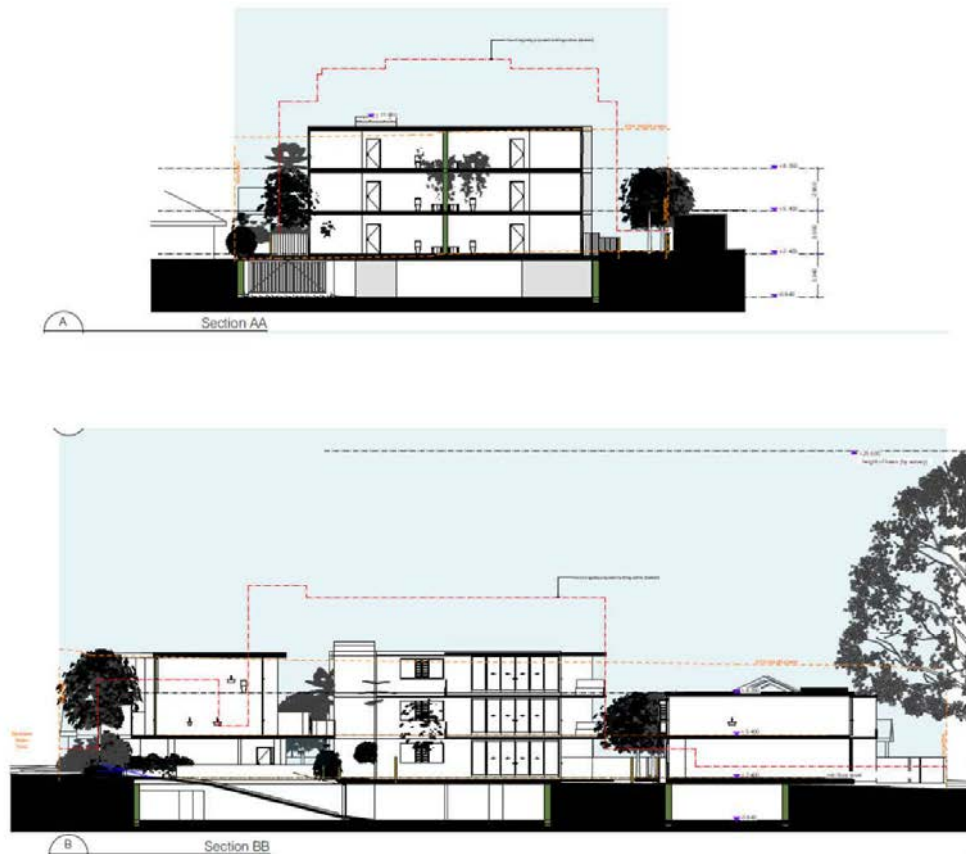


Figure 1 – Comparison between original and revised plans

W+D Architects

A revised clause 4.6 variation request is provided for the minor variations to building height for parts of the development, and the area of the greatest variation is the central lift overrun, which constitutes 0.5% of the site area and is well setback from the front and side boundaries.

The gross floor area of the revised plans is 1,275.91m², which is a reduction of 113.16m² compared to the original submitted plans. The Floor Space Ratio of the revised plans is 0.82:1, which is a minor variation of 9.97% to the 0.75:1 standard, and a revised clause 4.6 variation is provided.

The proposed front maisonette units will include architectural detailing along the front elevation at the first level, which serves as a design/ artwork feature, and will provide acoustic protection for the first level living areas, and with double glazing proposed for the windows on the second level facing Brisbane Water Drive. Each maisonette unit includes a private courtyard on the eastern

side of each unit, which is oriented away from Brisbane Water Drive and has direct access to internal living areas. Secondary courtyards are also provided on the western side, which will be located behind the feature/ acoustic fencing, and will accommodate plant (ie air conditioning) and landscaping. Privacy fencing is proposed to the eastern courtyards, and there are no windows on the northern and southern elevations so as to avoid any privacy impacts for adjoining properties.

The proposed rear units are located on the narrowest part of the site, fronting Couche Park, and have living and dining areas at the ground level to minimise privacy impacts on adjoining properties, and bedrooms on the first level. The scale of the rear units facing the Park will be compatible with surrounding development.

Internally, a communal deep-soil open space area is provided on the northern side of the development, with access to the main residential entrance courtyard, and large private open space areas are provided for the ground-level central and rear units. A revised landscape plan has also been prepared and is submitted with the amended plans.

3. PLANNING CONSIDERATIONS

3.1 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 comprises <i>commercial premises</i> and a <i>residential flat building</i> , which are permitted with consent in the B1 Neighbourhood Centre zone. The residential flat building includes different building elements, including the front, central and rear units, which are located over the common basement car parking.	Yes
To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood.	The proposal provides a new small-scale retail/ business opportunity in the local area.	Yes
To allow for an increased residential population in neighbourhood centres where land is not required to serve local needs.	The proposal provides additional housing and housing types, with increased housing choice, in combination with small-scale commercial development.	Yes
To ensure that development is compatible with the desired future character of the zone.	The development is consistent with the future character of the area, having regard to the commercial zoning of the land, as addressed in the DCP assessment below.	Yes
To promote ecologically, socially and economically sustainable development.	The proposal provides additional commercial development and additional housing, which contributes to social and economic sustainability.	Yes
To ensure that local nodes and neighbourhood centres are recognised as small-scale centres that provide a range of services and facilities commensurate with their local population catchments and that development is of a scale that is appropriate to meet local needs.	The range of services proposed is within the capacity of the site, particularly noting the site's high level of access to public transport (both train and bus) and is within a walking distance for surrounding residential development.	Yes
To encourage residential development as either stand alone development or as part of mixed use development in local nodes and neighbourhood centres, while retaining opportunities for retail and service activities to serve the population in the immediate locality.	The residential development is part of a mixed-use development, and the proposal increases the range of retail and service activities available in the local area.	Yes
Clause 4.3 Height of buildings - 8.5m	The building has variable building heights, with a maximum height of 9.79m at the lift overrun, 9.39m for the central RFB element and 9.05m for part of the front RFB (Maisonette) element.	Refer cl 4.6 request

Clause 4.4 Floor space ratio - 0.75:1	The proposed floor space ratio is 0.82:1, which is a 9.97% variation to the LEP standard.	Refer cl 4.6 request
Clause 7.1 Acid sulfate soils sets out requirements for managing acid sulfate soils	The site is identified as Class 5 for acid sulfate soils, and a small area at the rear of the site is identified as Class 2. The Class 2 land is proposed as private open space, and there will be no development or excavation of this area other than landscaping. A Geotechnical Assessment Report is provided as part of the application which indicates that acid sulfate soils are potentially present, and the assessment report <u>includes an Acid Sulfate Soil Management Plan</u> which addresses the requirements of clause 7.1(3) of the LEP.	Yes
Clause 7.2 Flood planning sets out requirements in relation to flood prone land	Council has advised the 1% AEP flood level applying to the site is RL 1.7m AHD, and the minimum floor level including 0.5m freeboard is RL 2.4m. The proposed minimum floor level of the development is RL 2.4m AHD.	Yes

3.2 Exceptions to Development Standard under Clause 4.6 Gosford LEP 2014

As identified above, the proposal has variations to the floor space ratio and building height requirements and the applicant requests an exemption to the development standards as allowed by Clause 4.6 of Gosford LEP 2014.

In submitting the requests the site has locational characteristics, including a high standard of accessibility to both train and bus public transport facilities, which supports a slightly increased density of development, and the height variation is minor and has been reduced from the submitted application through deletion of the top floor, and a reduction in the footprint of the central building element.

The requests for variation has been prepared with consideration of relevant principles set out in various judgements applying to variations to development standards, including *Wehbe v Pittwater Council* [2007] NSWLEC 827, *Four2Five Pty Ltd v Ashfield Council* [2015] NSWLEC 90, *Four2Five Pty Ltd v Ashfield Council* [2015] NSWCA 248, *Randwick City Council v Micaul Holdings Pty Ltd* [2016] NSWLEC 7 and *Initial Action Pty Ltd v Woollahra Municipal Council* [2018] NSWLEC 118.

3.2.1 Floor Space Ratio

Relevant Development Standard

Clause 4.4 (2) of Gosford LEP 2014 sets maximum floor space ratio through reference to the Floor Space Ratio Map. The Map identifies the site as having a floor space ratio of 0.75:1, which would allow a floor space of 1,160.17m².

Extent of Variation to Development Standard

The proposed building has a gross floor area of 1,275.91m² which is a floor space ratio of 0.82:1. The additional floor space of 115.75m² is a 9.97% variation on the development standard, and is a reduction in gross floor area and floor space ratio compared to the original submitted plans.

Reason for the Variation

The minor variation is a response to the site having a high level of accessibility to public transport services, both train and bus, which provides opportunity for a slightly increased density of development that takes advantage of the site's location and accessibility, and provides additional housing, housing choice and alternative transport options, in a way that does not adversely impact on surrounding properties.

Why compliance with the development standard is unreasonable or unnecessary in the circumstances of the case?

Compliance with the 0.75:1 floor space ratio requirement is unreasonable or unnecessary in the circumstances of this application, for the following reasons:

1. The subject land is located in a neighbourhood business zone, which allows residential flat buildings and the objectives of the zone seek to *encourage residential development* and to *allow for increased densities in neighbourhood centres*.

The subject land is located in an area with a high level of access to public transport services, being within 80m walking distance of Koolewong Railway Station, and 50m walking distance to north and south-bound bus services between Gosford regional centre and Woy Woy. The proximity of the site to public transport is shown in the following figure.

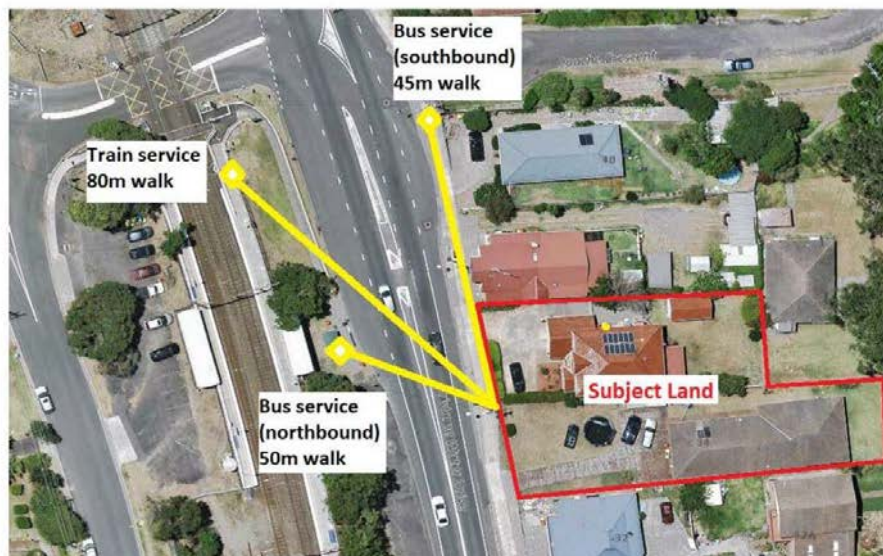


Figure 2 – Proximity of the site to public transport facilities

Koolewong railway station and Busways routes 55 and 70 provide regular services northbound to Gosford (and Newcastle for the train) and southbound to Woy Woy (and Sydney for the train) as follows:

Mode - direction	Weekdays	Saturday	Sunday
Train - north	27 services	23 services	23 services
Train - south	25 services	20 services	20 services
Bus - north	39 services	26 services	8 services
Bus - south	38 services	26 services	8 services

The proximity of the site to major public transport facilities provides opportunity for a modest increase in housing density, which will increase the use and efficiency of existing transport infrastructure, and increase transport choice and options for future residents. It is a well established planning approach to allow for increased densities around public transport facilities, particularly railway stations, and this principle extends to regional planning documents such as the *Central Coast Regional Plan 2036*, which encourages growth in and around local centres with access to transport services.

It is recognised the subject land is part of a neighbourhood-level centre through its zoning, however the proximity of the site to public transport sets it apart from other B1 neighbourhood centres (which have the same allowed floor space ratio as the subject land), including centres such as Saratoga, Wagstaffe, Empire Bay, Bensville, Springfield, Killcare and other locations that have less access to regular public transport facilities compared to the subject land.

The extent of proposed variation to the floor space ratio is not significant, and represents a modest increase that responds to the location of the site and its access to public transport;

2. The proposed additional floor area is able to be accommodated by minor increases in the height of the building rather than requiring an expanded footprint or site coverage, and without compromising landscape or open space areas. The development maintains deep soil areas of 15.4% of the site (with 11.7% having a width of 6m), which meets the SEPP 65 ADG requirements, and the combined communal and private open space areas at the ground level are 25% of the site area;
3. The development provides a high standard of architectural design and quality finishes, and the extent of floor space as proposed is required for this to be viably provided;
4. The floor space variation is minor and will not give rise to adverse amenity or overshadowing impacts on adjoining properties; and
5. The proposal is consistent with the objectives of the B1 Neighbourhood Centre zone.

Are there sufficient environmental planning grounds to justify contravening the development standard?

It is submitted there are sufficient environmental planning grounds to justify a variation to the floor space ratio in this case, for the reasons set out above. The nature of the control is to regulate development density and intensity, and the proposal is consistent with the general intended intensity of use of the land given its zoning and the 0.75:1 floor space ratio applying to the site compared to the lower FSR for nearby residential land. The proposal provides a high standard of architectural design and has capacity to absorb the additional floor space without causing external impacts, and considering the location of the site adjoining other commercial zoned and with a high degree of accessibility to public transport facilities.

Is the proposal in the public interest, being consistent with the objectives of the development standard and the objectives of the B1 Neighbourhood Centre Zone?

The proposal is consistent with the objectives of the development standard as follows:

- (a) *to establish standards for the maximum development density and intensity of land use*

Comment: this objective explains the purpose of the standard, and the proposal is not inconsistent having regard to the objectives and provisions of clause 4.6 of the LEP.

- (b) *to control building density and bulk in relation to site area in order to achieve the desired future character for different locations,*

Comment: The site is in the Koolewong *Open Parklands Bungalows* character area, and is zoned commercial which permits both commercial and residential development, and allows for a higher density of development compared to surrounding residential properties. The adopted character statement in Council's DCP does not reference the local business zone, or the permissibility of development such as commercial premises and residential flat buildings, and therefore the proposal has been assessed against the site's proximity to public transport facilities, the objectives and permitted uses in the B1 Neighbourhood Centre zone, the dual frontages of the land including to Couche Park, the additional floor space ratio available (50% higher than for the surrounding residential land), and the setting of the site with a treed areas to the east in Couch Park (with tree heights of up to 25m) and also to the east along the rail line, which provide screening of the site. Based on consideration of each of these site attributes, along with the design response which maintains 25% of the site as open space, the proposal is consistent with the zoning of the land and the site's proximity to public transport.

- (c) *to minimise adverse environmental effects on the use or enjoyment of adjoining properties and the public domain,*

Comment: the proposed additional floor space reflects the site's location adjoining major public transport routes, and will not adversely impact on adjoining properties, noting that reasonable solar access is maintained, development is oriented to the rear of the site towards Brisbane Water. The development provides a contemporary design response to Brisbane

Water Drive, given the nature of the road and proximity to the rail line, and is setback from Couche Park consistent with nearby development. The proposal will not result in adverse overshadowing of Couche Park or adverse impacts on the public domain and will not unreasonably impact on adjoining properties.

- (d) *to maintain an appropriate visual relationship between new development and the existing character of areas or locations that are not undergoing, and are not likely to undergo, a substantial transformation,*

Comment: the subject site is in a commercial zone, and surrounding properties have redevelopment potential in line with the objectives and permitted uses of the B1 zone. There is an existing residential flat development nearby in Couche Crescent to the north and the redevelopment of other properties in the area is leading to larger and more substantial dwelling houses being constructed commensurate with the waterfront location.

- (e) *to provide an appropriate correlation between the size of a site and the extent of any development on that site,*

Comment: the proposed variation is modest, and is able to be accommodated on the site noting its large size of 1,546m², and that some minor variations to building height are also sought which will maintain the overall proportion of the development, and have been reduced from the original submitted application. The proposed development is consistent with the intended increase of floor space in the B1 zone compared to surrounding residential land and the proposal provides more than the required amount of deep soil zone under SEPP 65.

- (f) *to facilitate design excellence by ensuring the extent of floor space in building envelopes leaves generous space for the articulation and modulation of design,*

Comment: the proposal provides a high standard of architectural form and detailing, and separates the building elements to minimise the massing and bulk of the development. The proposal provides variable building lines and uses design features and changes in materials to provide articulation and modulation to the building.

- (g) *to ensure that the floor space ratio of buildings on land in Zone R1 General Residential reflects Council's desired building envelope,*

Comment: this objective does not apply to the subject site which is zoned B1 Neighbourhood Centre.

- (h) *to encourage lot amalgamation and new development forms in Zone R1 General Residential with car parking below ground level.*

Comment: this objective does not apply to the subject site which is zoned B1 Neighbourhood Centre.

3.2.2 Building Height

Relevant Development Standard

Clause 4.3(2) of Gosford LEP 2014 sets maximum building height through the Height of Buildings Map. The Map identifies the site as having a building height of 8.5m.

Extent of Variation to Development Standard

The proposal has varying building heights given the different building elements and minor changes in existing ground levels.

The proposed building heights and extent of variation are:

Element	Building Height	Comment
Front RFB (Maisonette) Units	8.25m – 9.02m	Partly complies, part minor variation (6.1%)
Central RFB Units (incl rear balcony roof)	8.55m – 9.39m	Minor variation (0.59% - 10.47%)
Central Lift Overrun	9.76m – 9.81m	Minor variation (14.8% - 15.4%)
Rear RFB Units	6.37m – 6.59m	Complies

The proposed height variation plane is shown in the following diagram prepared by White + Dickson Architects.



Figure 3 - Building height plane –looking NE

W+D Architects

Reason for the Variation

The variations are part of a considered design response for the site, which reflects the high degree of accessibility of the site to public transport services and is relative to the minor increase in floor space ratio being sought. The proposal provides separate building elements responding to the

characteristics and different frontages of the site and the area of the greatest variation (the lift overrun) is well setback from all boundaries, and the proposal remains below the allowed building height at the rear of the site facing Couche Park.

Why compliance with the development standard is unreasonable or unnecessary in the circumstances of the case?

Compliance with the 8.5m building height for the proposal is unreasonable or unnecessary in the circumstances of this application and this site, for the following reasons:

1. The additional height is largely located centrally within the site, and the variation along the street frontage is very minor, being effectively the height of the roof, and the variation would not be perceptible when viewed from Brisbane Water Drive and noting that part of the frontage is also below the height limit. The lift overrun, which has the greatest variation is setback a minimum of 17 from the front boundary (being located behind the proposed commercial premises and maisonette units), 19m from the northern side boundary, 8.45m from the southern side boundary and 40m from Couche Park. This element will generally not be visible externally from the site and will not result in adverse visual impacts.

The proposed central building element has minor height variations of between 0.59% - 10.47%, which are all variations of less than 1 metre and area a minor part of the overall height of the top most level.

The rear building element remains below the allowed building height facing Couche Park, and will be consistent with other development facing the park;

2. The additional height is part of a considered design response for the site, which reflects the high degree of accessibility of the site to public transport services and is relative to the requested minor increase in floor space ratio.
3. The location of the additional height centrally within the site will minimise the visual impacts of the development and the additional height, particularly as viewed from public areas, and transition in building height from the front to rear boundaries provides an appropriate building form that minimises overall bulk and scale.

There are a number of large mature trees in Couche Park at the rear of the site which are between 18.5m and 24m tall (over 10m higher than the proposed development), and these provide an effective screening of the site from Brisbane Water, and frame the height of the development as viewed from Brisbane Water Drive and areas beyond.

Land to the north of the subject land in Couche Crescent increases in level, and ground levels are up to 8.5m higher than the subject land. As a result, waterfront development on the eastern side of Couche Crescent appears more elevated compared to the subject land, and the units at 4 Couche Cres are built to an RL of 20.22m, which is 8m higher in

elevation than the proposed development. As viewed from Brisbane Water the proposal would continue some of the RL levels of existing development in Couche Crescent from the north, which further minimises any visual impacts of the additional height, and also considering the screening provided by existing trees;

4. The subject land is relatively low lying in relation to Brisbane Water, and this limits the development being located at a lower level on the site as minimum floor levels are required to satisfy flooding requirements and to avoid further excavation which could impact on acid sulfate soils;
5. An assessment of view impacts undertaken as part of the Statement of Environmental Effects demonstrates the proposal (including additional height) will not adversely impact on views from other properties;
6. The development has been oriented to the rear of the site, away from adjoining properties to the sides, and the outlook for units will be to the east towards Couche Park and Brisbane Water to minimise privacy impacts. The new dwelling house on 1 Couche Crescent (DA 46877) is also be oriented to the east, away from the proposed development, and with no living areas or private open space on the western side.
7. Shadow diagrams submitted as part of the application show the proposal will maintain solar access to the private open space areas of adjoining properties in mid-winter and there will be minor overshadowing of Couche Park or the Brisbane Water foreshore, which largely results from complying building heights. The shadowing of Couche Park is considered to be reasonable, being late in the afternoon in mid-winter, and is consistent with the shadows cast by surrounding developments;
8. The proposed additional height and scale of the development is appropriate for the site having regard to the high level of access to public transport services;
9. The development provides a high standard of architectural design, and will provide a high level of amenity for future residents while minimising impacts on surrounding properties; and
10. The proposal is consistent with the objectives of the B1 Neighbourhood Centre zone.

Are there sufficient environmental planning grounds to justify contravening the development standard?

There are sufficient environmental planning grounds to justify the variation to building height in this case, for the reasons as set out above. The nature of the control is to regulate the scale of development in the zone, and the proposal will provide a reasonable building height for the B1

zoned property having regard to the adopted design approach, which locates the taller elements towards the front and centre of the site. The proposed variation will not result in adverse impacts on surrounding properties or the appearance of the development when viewed from outside the site, with screening provided from Brisbane Water by existing trees in Couche Park.

Is the proposal in the public interest, being consistent with the objectives of the development standard and the objectives of the B1 Neighbourhood Centre Zone?

The proposal is consistent with the objectives of the development standard as follows:

(a) *to establish maximum height limits for buildings*

Comment: this objective explains the purpose of the standard, and the proposal is not inconsistent with the objective having regard to the objectives and provisions of clause 4.6 of the LEP.

(b) *to permit building heights that encourage high quality urban form*

Comment: the design and finish of the proposal is of a high architectural standard, and will create a quality urban form that is appropriate for the site's location in a neighbourhood centre zone and adjoining a busy road and railway station. The proposed design responds to the location of adjoining development, and provides a contemporary urban streetscape presentation to Brisbane Water Drive and an interface with Couche Park to the rear that is consistent with nearby development. Overall, the variation does not compromise the urban form expected in the zone having regard to the planning controls applying to the site.

(c) *to ensure that buildings and public areas continue to receive satisfactory exposure to sky and sunlight*

Comment: There will be minor overshadowing of Couche Park, which largely results from complying building heights of the rear building element which is below the allowed height limit. The shadowing of Couche Park is considered to be reasonable, having regard to the shadows cast by surrounding developments, and the proposal does not unreasonably impact on exposure to sky and sunlight.

(d) *to nominate heights that will provide an appropriate transition in built form and land use intensity*

Comment: the variation does not impact on the overall transition in built form as intended by the development standard and the nominated heights, and the land use intensity is consistent with the underlying zoning and development standards applying to the site. In particular, the site is located in a neighbourhood business zone, in which more intensive development is expected, and the overall building height will be below the level of existing trees in the park behind (by some 10m) and the existing residential flat building to the north at 4 Couche Crescent (by 8m), and will appear to be at a similar overall RL height as other elevated properties to the north.

- (e) *to ensure that taller buildings are located appropriately in relation to view corridors and view impacts and in a manner that is complementary to the natural topography of the area*

Comment: An assessment of view impacts has been undertaken as part of the Statement of Environmental Effects, which demonstrates the proposal (including additional height) will not adversely impact on views from other properties, and particularly having regard to the trees in Couche Park to the rear which already screen views, and which the proposed development will be lower than, existing vegetation adjacent to the rail line which screens views from properties on the lower western side of the rail line, and with the development being low on the viewing horizon for elevated properties located further to the west.

- (f) *to protect public open space from excessive overshadowing and to allow views to identify natural topographical features*

Comment: There will be minor overshadowing of Couche Park, which largely results from the rear building element which is below the allowed height limit. The shadowing of Couche Park is considered to be reasonable, having regard to the shadows cast by surrounding developments, and the proposal does not result in excessive overshadowing of public open space. The proposal will be below the level of existing trees in Couche Park to the rear and the existing development at 4 Couche Crescent to the north. The proposal is consistent with the type of development allowed under the zoning and the expected higher intensity of development in the B1 zone compared to surrounding residential areas.

As detailed in the assessment against Gosford LEP 2014, the proposal is consistent with the objectives of the B1 Neighbourhood Centre zone.

3.3 Gosford Development Control Plan 2013

Consistency with relevant provisions in Gosford DCP 2013 is set out in the table below, and the requirements for residential flat buildings are set out in Chapter 3.3 of the DCP.

In assessing the proposal against Gosford DCP 2013 it is recognised that changes to the *Environmental Planning & Assessment Act* in March 2013 reinforce that the provisions contained in a DCP are to provide guidance and to be flexibly applied (as per Section 3.42 of the Act). Non-compliance can be addressed through alternative solutions or addressing how a proposal otherwise meets the objectives of the DCP.

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 Koolewong *Open Parklands Bungalows* character area, which describes the desired character as:

Desired Character

These areas should remain low-density residential neighbourhoods where the scenic quality of the existing tree canopy is maintained, and where new buildings complement the architectural character of mid-Twentieth Century bungalows that are distinctive streetscape features of the older Brisbane Water suburbs.

Surround each dwelling with a leafy garden to conserve existing bushland remnants and trees that are visually-prominent, particularly any corridors or clusters along back fences and street verges. New trees should be mostly-indigenous to enhance the established canopy.

Ensure that new structures complement the siting of surviving traditional bungalows nearby. Maintain street setbacks that are similar to neighbouring properties. Avoid the appearance of a continuous wall of buildings along any street or laneway by providing at least one wide side setback or by stepping the shape of front and rear facades.

For new dwellings and additions to existing dwellings, reflect the modest scale and simple articulation of traditional mid-Twentieth Century bungalows. Roofs should be simple hips, gables or skillions without elaborate articulation, gently-pitched to minimise the height of ridges, and flanked by wide eaves to disguise the scale and bulk of exterior walls. Use stepped floorplans, or divide floorspace into linked pavilion structures that are capped by individual roofs and separated by landscaped courtyards. Any facades that are taller or longer than those of neighbouring dwellings should be screened by an extra setback or by balconies and verandahs. Preferably, provide parking as open carports or in detached garages that are screened by shady trees.

In order to complement the scale and design character of traditional bungalows, a "light-weight appearance" is preferable for facades that are visible from the street. For example, incorporate large windows plus timber-framed balconies or verandahs, plus painted finishes and some sheet or board cladding rather than extensive plain masonry. Also, provide a traditional "street address" with verandahs and living rooms or front doors that are visible from the road and rear laneways. Ensure that wide garages do not visually-dominate any facade or rear-lane frontage.

Facing the street, maintain the informal qualities of existing wide street verges that are dotted with shady street trees. Plant the boundaries facing streets and laneways with hedges or shrubs to allow a filtered view from each dwelling, rather than using fences that are tall and opaque. Screen terraces and balconies to protect the privacy and amenity that are enjoyed by neighbouring dwellings.

The character statement for the Koolewong *Open Parklands Bungalows* is oriented towards bungalow residential development, and does not differentiate the B1 Neighbourhood Centre zone, and the permitted range of development such as commercial premises and residential flat buildings, and the increased development capacity allowed in the zone compared to other residential zoned land.

Notwithstanding, the character of the neighbourhood centre is a mix of small scale business and residential developments with a main road frontage and proximity to major public transport routes. Existing development is commercial facing Brisbane Water Drive, and with residential uses at the rear. Some properties, including the subject land have not yet been developed in line with the B1 zone objectives, and this is expected to occur given the accessibility of the area and its proximity to Brisbane Water and the foreshore reserve. Surrounding residential land includes a mixture of development styles, including larger new dwelling houses particularly along the waterfront, a

residential flat building located just north of the site in Couche Crescent, and other smaller and older dwelling houses consistent with the early development of the area.

One of the features of the subject land is that has frontages to both Brisbane Water Drive and the Brisbane Water foreshore, and is located centrally within the B1 zoned land. The proximity of the land to the main north rail line and Brisbane Water Drive also brings potential amenity impacts on future development from rail and traffic noise.

The proposed development provides transition in use and development intensity between the dual frontages of the site to Brisbane Water Drive at the front and Couche Park at the rear. On the western side facing Brisbane Water Drive there is a modest-scale commercial building proposed at the street level, which is appropriate for commercial use and is similar to the adjoining commercial developments to the north and the south, which have minimal front setback. The commercial premises are located in the centre of the site's frontage, and have large open areas to the sides and with commercial car parking screened behind landscape planters.

On the upper levels facing Brisbane Water Drive are proposed maisonette units which extend to the side boundaries as is permitted in a Business zone, and which provide a contemporary residential presentation to Brisbane Water Drive and a buffer between the Railway Line/ Brisbane Water Drive and the balance of residential development on the site. The upper maisonette levels are broken into separate horizontal components with stepped building alignments for each unit, and with an architectural treated artwork screen at the first level which provides a quality interface to the street and also acts as an acoustic barrier for road and rail noise .

The coverage of development to the side boundaries at upper levels facing Brisbane Water is consistent with the type of development expected in commercial zones, and other development in Neighbourhood Centre zones across the City.

The main residential flat building element is located behind the commercial premises and maisonette units, and has increased setbacks to Brisbane Water Drive compared to the minimum DCP front setback requirement of 6m. The residential flat building is setback a minimum of 17m from Brisbane Water Drive, and this combined with the screening from the commercial premises/ maisonette units and the reduction of a storey from the proposal will minimise the visual impacts of the residential flat building when viewed from Brisbane Water Drive. Additionally, when viewed from Brisbane Water Drive the site is framed by the large trees located to the rear in Couche Park, which are over 10m taller than the height of the proposed residential flat building.

On the eastern part of the site, adjoining Couche Park, a small 2 storey element of the residential flat building is proposed, which transitions building height down from the central part of the development, and provides a frontage to Couche Park similar to the scale of adjoining developments facing the Park.

Overall the proposal is considered to be consistent with the future character of the land and surrounding area, having regard to the B1 zoning of the land, the permitted uses and greater development potential of the land compared to other residential properties in the character area, and the site's proximity to public transport facilities. Additionally, a considered design approach has been taken for the proposal which locates the taller development towards the front and centre of the site and with a transition in height towards Couche Park and Brisbane Water at the rear.

DCP Chapter 3.3 – Multi Dwelling Housing & Residential Flat Buildings

DCP Requirement	Proposed	Consistent
3.3.2.1 Desired Character Reference to Chapter 2.1	Character is addressed above, and the proposal is submitted to be consistent with the future character of the area having regard to the zoning of the land, permissible uses and increased development intensity under LEP planning controls, and noting the character statement in Chapter 2.1 is silent on permissible development in the commercial zoned land.	Yes
3.3.3.1.2 Maximum Height Controls Compliance with LEP height controls, maximum 2 storeys where height is 8.5m, maximum exterior wall height of 7.5m controls	The proposal seeks a variation to the LEP height controls for parts of the development, in accordance with the submitted clause 4.6 variation request. Accordingly, the variation if supported would require a corresponding variation to the DCP height related controls relating to the number of storeys and external wall height.	Part variation, consistent with clause 4.6 request
3.3.3.1.3 Height Development Controls 2.7m minimum ceiling height	The proposal will provide minimum 2.7m floor to ceiling heights	Yes
3.3.3.2.2 Deep soil and setbacks <ul style="list-style-type: none"> • 6m deep soil adjacent to front and rear boundaries, 2m adjacent to side boundaries • Side setback av 4m, minimum 3.5m • Front & rear setback 6m • Third storey additional 2.5m setback 	<p>The proposal is for a mixed-use development on commercial zoned land, with commercial premises and residential units located facing Brisbane Water Drive, and residential flat building elements in the centre and rear of the site.</p> <p>The commercial premises are setback between 3.0m and 3.81m from the front boundary (or 1.0m to 1.4m to the potential road widening area along Brisbane Water Drive). Side setbacks are 12.6m to the north and 9.6m to the south side boundaries.</p> <p>The front maisonette units are setback between 1.2m and 3m from the front boundary (or on the alignment of the potential road widening area along Brisbane Water Drive, and with a minimum side setback of 0.15m to the north and south side boundaries.</p> <p>The central residential flat building element is setback a minimum of 17.3m from the front boundary, between 5.5m and 6m (walls) and 3.25m and 3.7m (balconies) from the northern side boundary, 5.15m (walls) and 3m (balconies) from the southern side boundary, between 9.0m and</p>	Part compliance, and part variation

	<p>9.45m (walls) and 5.8m and 6.2m (balconies) to the western rear boundary to 1 Couche Cres and a minimum of 23.7m to Couche Park.</p> <p>The rear residential flat building element is setback between 1.5m and 1.95m from the northern side boundary, 1.5m from the southern side boundary and between 6.0m and 6.4m (walls) and 4.4m and 4.8m (balconies) from the rear boundary to Couche Park.</p> <p>Deep soil areas are addressed under the SEPP 65 Apartment Design Guide requirements.</p>	
<p>3.3.3.3.2 Carparking Requirements as per chapter 7.1</p> <ul style="list-style-type: none"> • 1 space per dwelling (being within 400m of a train station) = 15 spaces • 0.2 visitor spaces per dwelling = 3 spaces • 1 space per 30m² (for shops) = 2 spaces <p>Total off-street parking required = 20 spaces</p>	<p>The proposed provides 25 basement car parking spaces for resident and visitors of the residential components, with 2 accessible spaces and a minimum of 3 bicycle parking spaces are provided.</p> <p>Two parking spaces are provided for the commercial premises, which are accessed via a separate driveway from Brisbane Water Drive.</p> <p>In total, 27 off street parking spaces are provided.</p>	Yes
<p>3.3.3.3.4 Car Parking Scenic Quality Above ground parking must not be located within a building elevation facing a public street.</p>	<p>Residential car parking is proposed in a basement level, and the commercial parking will be located to the side of the commercial premises and behind a raised landscape planter area to provide visual screening.</p>	Yes
<p>3.3.3.3.5 Driveway Design 3m minimum width for developments with less than 25 car spaces, and provision of a passing bay at 30m intervals</p>	<p>The proposed driveways have a minimum clear width of 5.5m (residential basement entry) and 6.2m (commercial parking driveway).</p>	Yes
<p>3.3.3.4.2 Maximum building dimensions Maximum width and depth of 25m</p>	<p>The proposal complies with the maximum building width, apart from the front maisonette units which have a combined width of 30.8m, and are located on commercial zoned land.</p> <p>The proposed maisonette units are cantilevered over the ground level commercial premises, creating open areas at the sides, underneath the units, and architectural feature screening is proposed along the front elevation at the first level, and with stepped building alignments behind, in order to provide articulation to the front façade. Additionally, all units will have cross through ventilation.</p>	Variation,
<p>3.3.3.4.4 Articulation of building forms and facades Unarticulated length of any external wall should not exceed 8m</p>	<p>Articulation is provided to the elevations using changes in building materials, balconies and variations to the building lines/ setbacks, including features on the front elevation as detailed above. The side elevations of the maisonette units have an overall wall length of 9.3m however this is</p>	Yes

	broken up by recessed elements in the wall and changes in materials	
3.3.3.5.2 Sunlight and overshadowing Solar access requirements for living rooms and communal open space 3hrs for 70% of units 3hrs for 50% of communal open space Impacts on adjoining development	80% of units meet the SEPP 65 ADG requirements. Over 50% of the communal open space area will receive the required amount of sunlight. Shadow diagrams have been submitted with the application which show shadowing in mid-winter and March/ September. The diagrams show that in mid-winter the proposal will maintain solar access to the private open space areas of adjoining properties to the south and there will be minor overshadowing of Couche Park, which largely results from complying building heights. The shadowing of Couche Park is considered to be reasonable, being late in the afternoon in mid-winter, and is consistent with the shadows cast by surrounding developments	Yes
3.3.3.5.3 Site Planning Provide reasonable privacy for existing and proposed dwellings	The proposal orients the units and living areas, including balconies, to the rear of the buildings, facing east towards Brisbane Water. Along the side elevations, which are also to B1 commercial zoned land, <ul style="list-style-type: none"> • there are no side windows to the maisonette units, and private courtyard areas at the rear are screened, which avoids any privacy impacts; • the central residential flat building element has bedrooms and living windows to the sides, which are setback between 5.15m and 6m from the side boundary, which provides a reasonable setback to other commercial zoned land, and balconies are primarily oriented to the east and views towards Couche Park and Brisbane Water. Where the rear of the building adjoins the rear of 1 Couche Crescent, the new dwelling house on that property is oriented towards Couche Park, and away from the subject land, and the proposal maintains reasonable setbacks to the new dwelling house; • the rear residential flat building element has a bedroom and bathroom/ ensuite windows on the upper level, to minimise any privacy impacts on the adjoining dwelling houses on 1 Couche Crescent and 32A Brisbane Water Drive, and living areas are located on the ground level facing Couche Park and side windows will be screened by proposed side boundary fencing. Internally, the development has been designed to maximise the privacy of individual units, which is achieved through the siting and orientation of the different building elements, the location of internal walls and the relative location of opposing windows, so that there will not be cross views between units.	Yes
3.3.3.5.4 Natural cross ventilation	Cross ventilation is provided for 100% of the units. All living areas are located within 8m of large windows.	Yes

Min 60% corner or through floor configurations Living areas no further than 8m from a window		
3.3.3.5.5 Private Open Space 8m ² / balcony for 1 bed unit 12m ² / balcony for 2 bed unit 16m ² / balcony for 3 bed unit, with min 2.5m x 2.5m area	Terraces or balconies are provided for each unit which comply with the minimum size and dimensions in the DCP, and further landscaped courtyard areas are provided for the ground level units.	Yes
3.3.3.5.6 Communal Open Space 10% of setbacks, minimum 50m ² per parcel	The proposal provides a communal open space area of 69.45m ² on the northern side of the central residential flat element, with direct access from the residential entry courtyard.	Yes
3.3.4.1.2 Dwelling types No more than 1/3 rd of dwellings same type	The development provides good variation of dwelling types, with 2 storey maisonette units, traditional residential units (including some with garden courtyards), and 2 storey garden units at the rear.	Yes
3.3.4.1.3 Accessible dwellings Minimum 10% of dwellings	All 6 of the central residential units are capable of adaptation in accordance with details provided in the architectural plans.	Yes
3.3.4.2.3/4 Traditional address Various requirements	The proposal is located on business zoned land, and forms part of a mixed-use development with commercial premises and shop top maisonette units facing Brisbane Water Drive. The residential flat building elements are located behind the commercial premises, and have separate pedestrian access from the entry foyer/ lobby to Brisbane Water Drive. The street address responds to the commercial zoning of the land, and the treatment of the front elevation to Brisbane Water Drive responds to the site's location adjoining a busy road and railway line. The proposal provides a traditional residential flat building presentation towards Couche Park and the rear boundary.	Yes
3.3.4.3.1 Articulation of Facades Various requirements	The proposal provides articulation of the different building elements, including changes in building materials and setbacks/ alignment, and with architectural detailing along the front elevation.	Yes
3.3.4.4.2.3 Landscaping Landscape concept plan required, various requirements	A revised landscape plan has been prepared and is submitted with the revised architectural plans.	Yes
3.3.4.5.1 Building Services Not detract from desired streetscape character	Building services will be provided behind the building line, and will not be visible from the street. Screened bin areas are proposed at the rear of the commercial building, adjoining the car parking area, and all service meters will be screened from external view.	Yes
3.3.4.5.5 Storage 6m ³ for 1-bedroom units 8m ³ for 2-bedroom units 10m ³ for 3-bedroom units	The proposal provides internal and garage storage areas that will comply with the DCP requirements.	Yes

3.4 State Environmental Planning Policies

Relevant State Environmental Planning Policies (SEPPs) applying to the land are SEPP 65 - Design Quality of Residential Apartment Development, SEPP – Building Sustainability Index (BASIX), SEPP 71 – Coastal Protection and SEPP 55 – Remediation of Land.

SEPP 65 Design Quality of Residential Apartment Development

The revised plans are accompanied by SEPP 65 Design Verification from White + Dickson Architects which addresses compliance of the project with the design quality principles in the SEPP. The SEPP 65 *Apartment Design Guide* also applies to the proposal, and an assessment of how the proposal addresses the design criteria is provided below.

Design Criteria	How the proposal addresses the criteria
<p>Communal Open Space Communal open space minimum of 25% of the site</p> <p>50% direct sunlight to communal open space for min. 2hrs, 9am-3pm mid-winter</p>	<p>The proposal provides a communal open space area of 69.45m² on the northern side of the central building element, which will meet the solar access requirements.</p> <p>In addition to the communal open space the proposal also provides private courtyard open space areas of 323.22m², being a total of 392.67m² combined communal/ private open space at the ground level, which is 25.38% of the total site area, and reasonably meets the intent of the criteria given the mix of different housing/ open space types proposed.</p>
<p>Deep Soil Zones For sites greater than 1,500m², 7% of site area, min width 6m.</p>	<p>The proposal provides deep soil areas of 182.17m² at 6m width (11.7% of the site), which complies, and a further 56.43m² with less than 6m width. Overall deep soil areas are 238.6m², which is 15.4% of the site.</p>
<p>Visual Privacy Side & rear boundary setbacks</p> <p><u>Habitable</u></p> <ul style="list-style-type: none"> 6m up to 4 storeys <p><u>Non-Habitable</u></p> <ul style="list-style-type: none"> 3m up to 4 storeys 	<p>The subject land is zoned commercial and could potentially build at least in part to boundaries. Notwithstanding, the proposal provides setbacks to each side boundary for the central and rear elements.</p> <p>Rear setbacks generally exceed the required 6m setback, apart from a minor part of one balcony, and a 6m rear setback is provided to the external walls of the rear units facing Couche Park.</p> <p>Minor variation is sought to the minimum side setbacks for the central and rear building elements.</p>
<p>Solar & Daylight Access Living rooms and POS of 70% of apartments receive min 3hrs sunlight, 9am-3pm mid-winter.</p> <p>Max 15% apartments receive no direct sunlight, 9am-3pm mid-winter.</p>	<p>Solar access requirements are met for 80% (12 of 15) of the units, and none of the units receive no direct sunlight.</p> <p>There are no units that receive no direct sunlight between 9am and 3pm mid-winter.</p>
<p>Natural Ventilation</p>	<p>100% of units comply with the requirement, being either cross-over apartments or having dual aspects.</p>

<p>Min 60% apartments naturally cross ventilated.</p> <p>Max 18m depth of cross-over or cross-through apartments.</p>	<p>All units have a depth of less than 18m.</p>
<p>Ceiling Heights Min 2.7m (hab), 2.4m (non-hab)</p>	<p>Min 2.7m floor levels will be provided</p>
<p>Apartment Size and Layout Min apartment size</p> <ul style="list-style-type: none"> • 1 Bed 50m² • 2 Bed 70m² • 3 Bed 90m² <p>Variable sizing and layout requirements.</p>	<p>The proposal complies with 1 bedroom units being 50m² and 3 bedroom units being 105.88m² and 115.23m².</p> <p>The building has been designed to provide quality apartments that are well proportioned, functional and provide a good standard of amenity for residents. All apartments have been designed to accommodate a variety of household activities and needs.</p>
<p>Private Open Space Min balcony area/ depth</p> <ul style="list-style-type: none"> • Studio – 4m²/ - • 1 Bed – 8m²/ 2m • 2 Bed – 10m²/ 2m • 3 bed – 12m²/ 2.4 <p>Ground level min POS 15m²/ 3m</p>	<p>All balconies and ground level private open space areas meet the minimum required areas.</p>
<p>Common Circulation Max 8 apartments off circulation core on a single level</p>	<p>The proposal has a maximum of 9 units on the first floor level serviced by the circulation core, and these are broken into two separate building elements and with an open walkway to the maisonette units which does not result in long internal corridors.</p>
<p>Storage</p> <ul style="list-style-type: none"> • Studio – 4m³ • 1 Bed – 6m³ • 2 Bed – 8m³ • 3 bed – 10m³ <p>50% within apartment</p>	<p>The proposal will meet the requirements for storage, in both the units and garage areas, and reasonable storage will be available for all apartments.</p>

SEPP – Building Sustainability Index (BASIX)

A revised BASIX Certificate is submitted with the application that concludes that with the commitments contained in the certificate, the proposed development is able to meet BASIX requirements, and is BASIX compliant.

State Environmental Planning Policy 71 - Coastal Protection

The relevant State Environmental Planning Policy (SEPP) applying to the land at the time the application was lodged is SEPP 71 – Coastal Protection, and an assessment against the requirements of the SEPP is detailed below.

SEPP Requirement	Proposed	Consistent
Aims of the Policy		
(a) to protect and manage the natural, cultural, recreational and economic attributes of the New South Wales coast, and	The proposal is consistent with the zoning of the land, and the anticipated increased density of development on B1 zoned land, and will not adversely impact on these attributes.	Yes
(b) to protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore, and	The proposal will not impact on any right of access for the public to the coastal foreshore.	Yes
(c) to ensure that new opportunities for public access to and along coastal foreshores are identified and realised to the extent that this is compatible with the natural attributes of the coastal foreshore, and	Public access is already provided along the foreshore at the rear of the site, and there is an existing public access connection between Brisbane Water Drive and the foreshore, approximately 15m south of the subject land.	Yes
(d) to protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge, and	An AHIMS search confirms no aboriginal sites are recorded in or within 200m of the property.	Yes
(e) to ensure that the visual amenity of the coast is protected, and	The proposal will be visually screened from Brisbane Water by existing mature trees in Couch Park to the east of the site, which are substantially taller than the proposed development, and the proposal will not adversely impact on the visual amenity of the coast.	Yes
(f) to protect and preserve beach environments and beach amenity, and	The proposal will not have an adverse impact on the beach environment or amenity.	Yes
(g) to protect and preserve native coastal vegetation, and	The proposal will not have an adverse impact on any native coastal vegetation, and will provide additional landscaping on the site.	Yes
(h) to protect and preserve the marine environment of New South Wales, and	The proposal will not impact on the marine environment.	Yes
(i) to protect and preserve rock platforms, and	The proposal will not impact on any rock platforms.	Yes

(j) to manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of section 6 (2) of the Protection of the Environment Administration Act 1991), and	The proposal is consistent with the principles of ecologically sustainable development.	Yes
(k) to ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area, and	The nature, bulk and scale of the proposal is appropriate for the location, noting the zoning of the land, permissible uses and the intended increased development potential (ie FSR) for B1 zoned land. Additionally, the proposed development will be substantially below the height of the trees located in Couche Park to the rear, and will also be below the level of existing development in Couche Crescent located further to the north. The proposal will provide a good transition and interface to Couche Park to the east will be consistent with the future character of the area having regard to the zoning and planning controls applying to the site.	Yes
(l) to encourage a strategic approach to coastal management.	The proposal does not impact on the strategic management of the coast.	Yes
Matters for consideration		
(a) the aims of this Policy set out in clause 2,	Addressed above	Yes
(b) existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved,	Addressed above	Yes
(c) opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability,	Addressed above	Yes
(d) the suitability of development given its type, location and design and its relationship with the surrounding area,	Addressed above	Yes
(e) any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore,	The proposal will not result in adverse overshadowing of the coastal foreshore or any loss of views to the coastal foreshore from a public place.	Yes
(f) the scenic qualities of the New South Wales coast, and means to protect and improve these qualities,	Addressed above	Yes

(g) measures to conserve animals (within the meaning of the <i>Threatened Species Conservation Act 1995</i>) and plants (within the meaning of that Act), and their habitats,	The proposal will not impact on threatened species, populations or ecological communities or their habitats.	Yes
(h) measures to conserve fish (within the meaning of Part 7A of the <i>Fisheries Management Act 1994</i>) and marine vegetation (within the meaning of that Part), and their habitats	The proposal will not impact on fish or marine environments.	Yes
(i) existing wildlife corridors and the impact of development on these corridors,	The proposal will not impact on wildlife corridors.	Yes
(j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards,	The subject land is not subject to coastal hazards in accordance with Chapter 6.2 of Gosford DCP 2013.	Yes
(k) measures to reduce the potential for conflict between land-based and water-based coastal activities,	The proposal will not lead to conflict between land-based and water-based coastal activities.	Yes
(l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals,	An AHIMS search confirms no aboriginal sites are recorded in or within 200m of the property.	Yes
(m) likely impacts of development on the water quality of coastal waterbodies,	The proposal will not result in adverse impacts on water quality, with stormwater to be managed in accordance with the submitted stormwater strategy (see cl.16 below), and sediment and erosion controls will be put in place for the demolition and construction stages.	Yes
(n) the conservation and preservation of items of heritage, archaeological or historic significance,	The site does not contain any identified heritage, archaeological or historic items	Yes
(o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities,	N/A	N/A
(p) only in cases in which a development application in relation to proposed development is determined: (i) the cumulative impacts of the proposed development on the environment, and (ii) measures to ensure that water and energy usage by the proposed development is efficient.	The proposal is consistent with the zoning, permitted uses and intended increased FSR applying to the land under Gosford LEP 2014, and will not result in adverse cumulative impacts. The application is accompanied by a BASIX certificate addressing water efficiency measures.	Yes

Clause 14 Public Access	The proposal will not impact on any right of access for the public to the coastal foreshore.	Yes
Clause 15 Effluent Disposal	The proposal will be connected to the reticulated sewerage system.	Yes
Clause 16 Stormwater	Roof and ground stormwater will be managed in accordance with the revised stormwater strategy, which includes on site storage (23.5kL reuse tank) and with a level spreader at the rear of the property for high level overflow During the construction stage sediment and erosion measures will be put in place.	Yes

State Environmental Planning Policy 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, and previously known use of the site is for domestic residential purposes, and there are no known previous uses that would lead to the site being contaminated or unsuitable for the proposed use.

4. CONCLUSION

The revised plans respond to issues raised in Council's initial assessment and matters raised in public submission. The revised plans reduce the building height and floor space ratio compared to the original submitted plans, and make changes to the layout and distribution of floor space which respond to the separate frontages of the site, and provide a transition in building heights and intensity between the road frontage and the rear of the site adjoining Couche Park. The revised plans also respond to the potential road widening along Brisbane Water Drive.

The proposal seeks minor variations to building height and floor space ratio, which are supported by revised clause 4.6 variation requests, and the variations are warranted given the site's location in a neighbourhood business zone and immediately opposite a railway station.



Report on
Geotechnical Investigation and Acid Sulfate Soil
Assessment

Proposed Mixed Use Development
34-36 Brisbane Water Drive, Koolewong

Prepared for
Harman Project Engineering Management Pty Ltd

Project 83242.00
October 2017

Integrated Practical Solutions





Document History

Document details

Project No.	83242.00	Document No.	R.001.Rev0
Document title	Report on Geotechnical Investigation and Acid Sulfate Soil Assessment Proposed Mixed Use Development		
Site address	34-36 Brisbane Water Drive, Koolewong		
Report prepared for	Harman Project Engineering Management Pty Ltd		
File name	83242.00.R.001.Rev0		



Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	James Rayner	John Harvey	18 October 2017

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	-	Lin Xu, Harman Project Engineering Management Pty Ltd
Revision 0	1	1	DP Archive

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		18 October 2017



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Report on Geotechnical Investigation and Acid Sulfate Soil Assessment Proposed Mixed Use Development 34-36 Brisbane Water Drive, Koolewong

1. Introduction

This report presents the results of a geotechnical investigation and acid sulfate soil assessment undertaken for a proposed mixed use development at 34-36 Brisbane Water Drive, Koolewong. The investigation was commissioned in an email dated 8 September 2017 by Lin Xu of Harman Project Engineering Management Pty Ltd and was undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal WYG170146 dated 14 June 2017.

From the information provided, it is understood that development of the site will include demolishing existing buildings and proposed construction of residential dwellings and a commercial building located on the frontage of Brisbane Water Drive. A basement is proposed to be located in the central part of the site, along with internal access roads/carparks.

The aim of the investigation was to provide comment on:

- Subsurface conditions and groundwater observations at test locations;
- Site classification in accordance with AS2870-2011: Residential Slabs and Footings;
- Geotechnical parameters for the design of footings;
- Safe batter slopes;
- Retaining wall design parameters;
- Recommendations on site preparation and earthworks; and
- Presence of acid sulfate soils (ASS).

The investigation included the drilling of four boreholes with in-situ testing, collection of representative soil samples and subsequent laboratory testing. The details of the field work are presented in this report, together with comments and recommendations on the issues outlined above.

2. Site Description

The site is located at 34-36 Brisbane Water Drive, Koolewong and is identified as Lots 16 and 17 in DP 19496. It is bounded to the north and south by previously developed residential lots, to the east by an undeveloped residential lot and to the west by Brisbane Water Drive. Lots 16 and 17 have a total surface area of approximately 1,500 m².

At the time of the investigation Lot 16 (southern lot) contained an existing dwelling surrounded by grassed lawns. Lot 17 (northern lot) also contained an existing dwelling surrounded by grassed lawns,

with a detached garage/shed and swimming pool located towards the eastern boundary of the lot. A photograph showing the site is presented in Figure 1.



Figure 1: View of the site looking from Brisbane Water Drive to the east

Figure 2 shows an aerial image of the site and location of the proposed development.



Figure 2: Aerial image of the site showing the location of the proposed development

(Image sourced from Nearmap PhotoMaps, dated 13 November 2016)

Based on survey information provided, it is understood surface levels in Lot 16 fall from approximately 2.6 m AHD in the north-western corner of the lot to approximately 1.6 m AHD to the south-eastern corner, whilst surface levels in Lot 17 fall from approximately 2.8 m AHD in the north-western corner to



approximately 2 m AHD in the south-eastern corner of the lot. The topography at the site is relatively level with surface gradients of less than 1° falling from north-west to south-east towards Brisbane Water estuary.

3. Regional Geology and Acid Sulfate Soil Mapping

With reference to the 1:100,000 scale Gosford-Lake Macquarie Geology Sheet, the site is primarily underlain by Quaternary Alluvium comprising gravels, sands, silts, and clays. Underlying the Quaternary Alluvium and on the western side of the lots, fronting onto Brisbane Water Drive, is the Terrigal Formation belonging to the Narrabeen Group. The Terrigal Formation typically comprises interbedded shale and sandstone.

Reference to the Soil Conservation Service of NSW Acid Sulfate Soil Risk Map for Gosford indicates that the site is mapped as a sandplain with ground surface levels about 1 m to 2 m AHD. The risk map indicates that the site is not mapped as having acid sulfate soils, however directly adjacent to the east and south lot boundaries of the site there is a high probability of occurrence of acid sulfate soils occurring within 1 m of the ground surface.

4. Field Work Methods

Field work for the investigation was undertaken on 13 September 2017 and included the drilling of four boreholes (Bore 1 to Bore 4) to depths of between 2.0 m and 3.8 m. The boreholes were drilled using a utility-mounted push tube rig fitted with 60 mm diameter sampling tubes. Dynamic cone penetrometer tests (DCPs) were carried out adjacent to the boreholes, to provide information on the relative strength or density of the near-surface soil.

Borehole locations were set out with reference to the site plan of the proposed development and are therefore approximate. The locations of the boreholes are shown on Drawing 1, included in Appendix B.

Engineering logs of the subsurface conditions encountered in the boreholes were prepared by a geotechnical officer 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.

5. Field Work Results

The subsurface conditions encountered during the investigation are broadly summarised as alluvial / estuarine deposits consisting of a layer of topsoil to a depth of between 0.1 m and 0.5 m, overlying alluvial soils comprising mainly loose to medium dense sand and silty sand. Some thin layers of dense and very dense sand were encountered in Bore 1 and Bore 4 at depths of 1.5 m and 1.8 m respectively. A layer of soft to firm clayey silt was encountered between 0.9 m and 1.4 m in Bore 2. In



Bore 1, filling comprising red mottled brown sand with a trace of fine grained gravel was encountered to a depth of 0.5 m, overlying the alluvial sands. A layer of dense to very dense/very stiff to hard clayey sand/sandy clay was also encountered at a depth of 1.9 m in Bore 1.

Groundwater was observed at depths of between 1.3 m and 1.6 m in Bores 1 to 3, at the time of investigation. Standing groundwater level was not observed in Bore 4; however, groundwater seepage was encountered at 1.9 m depth. Boreholes were backfilled on completion of logging and sampling which precluded long term monitoring of groundwater levels. It should be noted that groundwater levels are variable and can be affected by factors such as soil permeability and recent climatic conditions, and can vary with time.

6. Laboratory Testing

To assess for the presence/absence of acid sulfate soils, samples collected from the boreholes were tested in Douglas Partners' laboratory using a calibrated pH meter for measurement of pH in water (pH_w) and pH following oxidation in hydrogen peroxide (pH_{FOX}) in accordance with the ASSMAC Guidelines (Ref 7). The following samples were tested:

- Nine (9) samples from Bore 1;
- Five (5) samples from Bore 2;
- Seven (7) samples from Bore 3; and
- Eight (8) samples from Bore 4.

Based on the results of the screening tests, four samples were selected and forwarded to Envirolab Services Pty Ltd to undergo Chromium reducible sulfur (S_{Cr}) testing. The results of these tests are summarised in Table 1, with the laboratory testing certificate provided in Appendix D.

Table 1: Results of Acid Sulfate Soils 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 _{cr} (%S)	Titratable Actual Acidity (TAA) [%sulfur]	Acid Neutralising Capacity (ANC) [%sulfur]	Net Acidity (%sulfur)
				pH _F	pH _{FOX}	pH _F - pH _{FOX}						
1	0.20	Light grey SAND	Coarse	6.3	4.3	2.0	F	-	-	-	-	-
1	0.40	Red brown SAND	Coarse	6.4	5.8	0.6	1	-	-	-	-	-
1	0.60	Light grey SAND	Coarse	6.5	5.6	0.9	1	-	-	-	-	-
1	1.00	Dark grey and brown SLIGHTLY SANDY SILT	Coarse	6.6	5.7	0.9	1	-	-	-	-	-
1	1.50	Light grey SAND	Coarse	6.6	5.9	0.7	1	-	-	-	-	-
1	2.00	Light grey and light brown CLAYEY SAND/SANDY CLAY	Coarse	6.5	5.4	1.1	1	-	-	-	-	-
1	2.50	Light grey and light brown CLAYEY SAND/SANDY CLAY	Coarse	5.7	5.2	0.5	4	-	-	-	-	-
1	3.00	Light grey and light brown CLAYEY SAND/SANDY CLAY	Coarse	5.7	5.2	0.5	2	-	-	-	-	-
1	3.80	Light grey and light brown CLAYEY SAND/SANDY CLAY	Coarse	5.4	4.9	0.5	4	-	-	-	-	-
2	0.05	Dark brown SILTY SAND	Coarse	5.9	5.0	0.9	F	-	-	-	-	-
2	0.30	Dark brown SAND	Coarse	6.1	5.2	0.9	1	-	-	-	-	-
2	0.70	Light brown SAND	Coarse	6.2	5.1	1.1	1	-	-	-	-	-
2	1.00	Dark brown SILTY CLAY/CLAYEY SILT	Coarse	6.2	2.9	3.3	2	4.3	0.05	0.1	<0.005	0.20
2	1.80	Light brown SAND	Coarse	5.7	3.4	2.3	1	-	-	-	-	-
3	0.10	Dark grey SILTY SAND	Coarse	5.9	3.5	2.4	F	-	-	-	-	-
3	0.50	Dark brown SILTY SAND	Coarse	6.3	3.4	2.9	1	5.4	<0.005	0.11	<0.005	0.12
3	1.00	Light brown SAND	Coarse	6.4	4.0	2.4	1	-	-	-	-	-
3	1.30	Dark brown SAND	Coarse	6.4	3.3	3.1	1	-	-	-	-	-
3	2.20	Dark brown SILTY SAND	Coarse	6.1	2.4	3.7	4	-	-	-	-	-

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83242.00.R.001.Rev0
 October 2017

Bore	Sample Depth ^a (m)	Sample Description	Soil Textural Classification	Screening Test Results				Laboratory Results				
				pH			Strength of Reaction ^b	pH _{KCL}	S _{cr} (%S)	Titratable Actual Acidity (TAA) [%sulfur]	Acid Neutralising Capacity (ANC) [%sulfur]	Net Acidity (%sulfur)
				pH _F	pH _{FOX}	pH _F - pH _{FOX}						
3	3.00	Light brown SAND	Coarse	6.2	2.2	4.0	4	4.8	0.04	0.01	<0.005	0.056
3	3.80	Light brown SAND	Coarse	6.2	2.4	3.8	4	-	-	-	-	-
4	0.30	Light brown SAND	Coarse	6.3	4.6	1.7	F	-	-	-	-	-
4	0.60	Light grey SAND	Coarse	6.5	5.3	1.2	1	-	-	-	-	-
4	1.00	Light grey SAND	Coarse	6.6	4.2	2.4	1	-	-	-	-	-
4	1.50	Grey CLAYEY SILTY SAND	Coarse	5.6	3.0	2.6	2	4.5	<0.005	0.04	<0.005	0.042
4	2.00	Light grey SAND	Coarse	5.8	5.1	0.7	1	-	-	-	-	-
4	2.70	Light brown SILTY SAND	Coarse	5.9	3.1	2.8	1	-	-	-	-	-
4	3.00	Light grey SAND	Coarse	6.2	2.9	3.3	1	-	-	-	-	-
4	3.70	Dark brown SILTY SAND	Coarse	5.7	2.0	3.7	1	4.0	1.4	0.12	<0.005	1.5
ASSMAC Indicators	Coarse Texture: 'Sands to loamy sands'			<4	<3.5	>1	-	-	-	-	-	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" i.e. Very rigorous effervescence, gas evolution and heat

F after number indicates a bubbling/frothy reaction (organics)

- not tested

Bold notates exceedance of net acidity action criteria or ASSMAC indicator

7. Proposed Development

It is understood that development of the site will include the following:

- Demolishing existing dwellings;
- Construction of approximately 14 residential dwellings. From the conceptual plan provided it appears as though the dwellings are two-storey;
- Construction of a commercial building, located on the frontage of Brisbane Water Drive;
- Construction of a basement, located in the centre of the site, with a footprint of approximately 600 m²; and
- Internal pavements for vehicular access.

Figure 3 shows a concept plan for the proposed development.

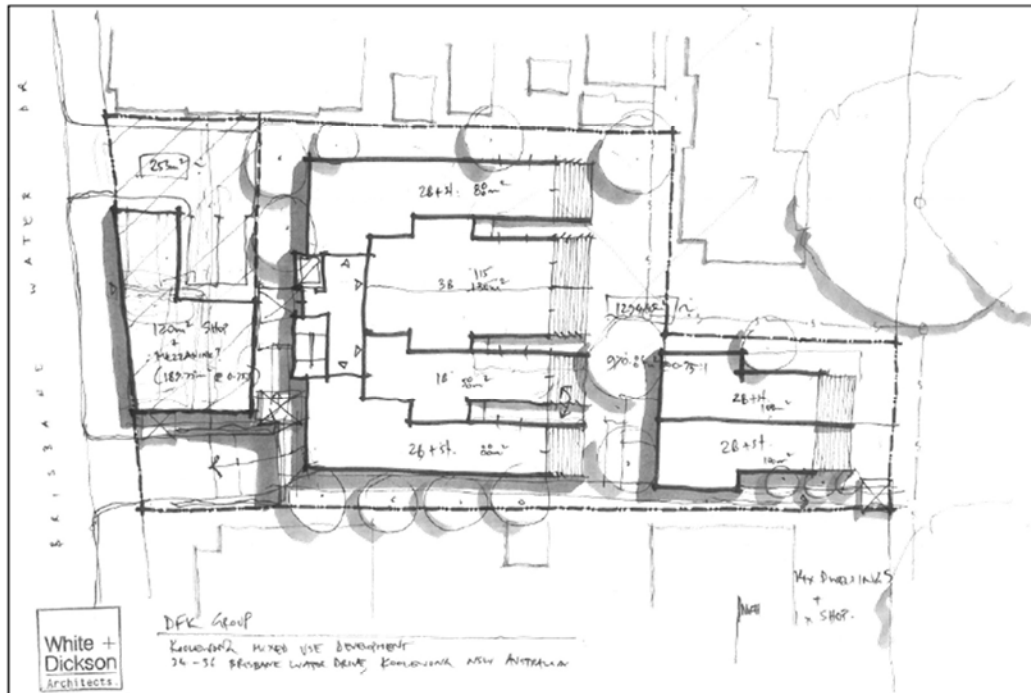


Figure 3: Concept plan show the proposed development

(Adapted from drawing provided by White + Dickson Architects)



8. Comments

8.1 Site Classification

Site classification of residential sites, as described in AS 2870 – 2011: *Residential Slabs and Footings* (Ref 1), is partly based on ground movement limits, which are defined by the characteristic surface movement (y_s), applicable to sites containing cohesive (clay) soils. Site classification also has to consider other factors such as the presence of uncontrolled filling, or weak soils.

Based on the presence of up to approximately 1.5 m of loose sand/silty sand, as identified in Bores 1 to 4, the site is classified as 'Class P' in accordance with AS 2870-2011 (Ref 1).

Residential footings for a 'Class P' site would need to be specifically designed according to the engineering principles detailed in AS2870-2011 (Ref 1) and in this report.

If footings for the proposed development are supported beneath the loose sand/silty sand and founded within medium dense sand (water-charged) or better, a 'Class A' classification could be considered appropriate for foundation design.

It should be noted that the site classification is also dependent on proper site maintenance, which should be carried out in accordance with AS 2870 – 2011 and with the CSIRO Building Technology File 18: Foundation Maintenance and Footing Performance – A Homeowner's Guide, which is attached.

8.2 Footings

At this stage, DP does not have any information on the proposed excavation depths and structural loads for the proposed buildings. Due to the presence of loose sand/silty sand to a depth of approximately 1.5 m below existing surface levels and groundwater at between 1.3 m and 1.6 m depth, shallow footings are not considered to be an appropriate footing system. It is envisaged that piled footings may be the most appropriate footing system.

8.2.1 Piled Footings

Piled footings taken to found within at least medium dense sand below 1.5 m depth, may be considered appropriate.

Based on the subsurface conditions encountered, steel screw piles or continuous flight auger (CFA) piles are considered to be appropriate pile types for the proposed development. Concrete bored piles were considered, however, given the presence of free groundwater at between 1.3 m and 1.6 m depth and saturated sandy soils which are prone to collapse, concrete bored piles are not recommended. Timber driven piles were considered, however not considered suitable due to the proximity of surrounding buildings and the vibrations that would be induced during pile installation.



The design, installation and testing of piles should be undertaken with reference to the piling code AS 2159–2009 (Ref 2). 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:

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

The calculated value $R_{d,g}$ must equal or exceed the structural design action effect E_d . Selection of the 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). A geotechnical strength reduction factor ϕ_g of 0.48 is considered appropriate for the design of piles for this project but it should be reduced to 0.4 if pile testing is not proposed.

Steel Screw Piles

In the event that screw piles are considered, it is suggested that specialist installers be consulted in relation to the suitability of ground conditions and the most suitable screw pile for the site.

Steel screw piles are a proprietary pile type and are relatively quick to install. They rely on the soil underlying the helix to resist vertical loads without undergoing excessive settlement. It is usual practice to ignore skin friction in determining the vertical capacity of screw piles.

Steel screw piles are not suitable for support of the proposed basement excavation because they have negligible lateral load-carrying capacity.

It is suggested that the ratio of the pile helix outstand to the helix plate thickness be less than 10, otherwise considerable elastic flexing or plastic deformation of the helix plate will occur and conventional pile settlement predictions could be exceeded. For example, for a 16 mm thick helix plate, the outstand width should be less than or equal to 200 mm. Where a 160 mm diameter pile shaft and 16 mm thick helix plate is used, the total helix diameter should be less than or equal to 480 mm.

Steel screw piles should be founded at a depth of at least 2.0 m and extend into medium dense (or better) sand. The ultimate end bearing pressure of piles in sand is a function of depth and soil strength. Table 2 shows preliminary design values and capacities for steel screw piles of selected diameter and founding depth.

Table 2: Steel Screw Pile – Preliminary Design Values and Capacities

Founding Depth (m)	Helix Diameter (mm)	Ultimate End-Bearing Pressure (kPa)	Ultimate Geotechnical Strength $R_{d,ug}$ (kN)	Design Geotechnical Strength $R_{d,g}^{(1)}$ (kN)
2.0	350	1,500	140	65
2.0	500	1,500	290	135
2.0	700	1,500	570	270

Notes:

- Design geotechnical strength based on $\phi_g = 0.48$



Notwithstanding the above estimates, the piling contractor should confirm the pile capacities achieved taking into account the equipment used, installation monitoring (such as torque measurements), site conditions and experience. Design of steel screw piles should also take into account the durability requirements of the ground conditions.

Continuous Flight Auger Piles

Continuous Flight Auger piles (also referred to as grout injected piles) should be founded at a depth of at least 2.0 m and extend into medium dense (or better) sand. The ultimate end bearing pressure of piles in sand is a function of depth and soil strength. Table 3, below, provides preliminary design values and capacities for 450 mm and 600 mm diameter CFA piles.

Table 3: Geotechnical Strengths for CFA Piles

Founding Depth (m)	Pile Diameter (mm)	Ultimate End-Bearing Pressure (kPa)	Ultimate Geotechnical Strength $R_{d,ug}$ (kN)	Design Geotechnical Strength $R_{d,g}^{(1)}$ (kN)
2.0	450	1,500	230	110
2.0	600	1,500	420	200

Notes:

- 1 Design geotechnical strength based on $\phi_g = 0.48$

8.3 Excavation Support

In the area of the proposed basement, due to the proximity of site boundaries and existing structures, the presence of loose sand/silty sand to a depth of 1.5m, and the presence of groundwater at depths of between 1.3 m to 1.6 m, it is anticipated that retaining walls (either permanent or temporary) will be required for the support of excavations.

8.3.1 Retaining Wall Design Parameters

For the design of retaining walls or temporary shoring, 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 4.

Table 4: Retaining Wall Design Parameters - Unfactored

Material	Bulk Unit Weight (kN/m ³)	Submerged 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 / Silty Sand (Loose)	18	8	0.35	0.55	2.6
Sand / Silty Sand (Medium Dense)	18	8	0.30	0.45	3.2
Sand / Silty Sand (Dense or better)	18	8	0.25	0.40	4.0

It should be noted that the parameters provided in Table 4 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 located behind the wall. Braced retaining walls should be designed for 'at rest' conditions as described above.

The earth pressure design parameters given above are based on the assumption that full drainage will be provided behind the retaining walls. All retaining walls, regardless of height, should be provided with geotextile encapsulated free draining backfill (such as 10 mm single size aggregate) with a slotted drainage pipe at the base of the wall for the relief of hydrostatic pressures. Water collected by the drainage system should be discharged to a formal stormwater drainage system. If drainage is not provided behind retaining walls, then the walls should be designed to withstand hydrostatic pressures over the full height of the walls, with the submerged bulk unit weight values provided in Table 4. This is necessary even for retaining walls that are supporting sand soils.

8.4 Site and Subgrade Preparation

Site preparation for the proposed development should be carried out in general accordance with the following methodology:

- Strip existing vegetation and any organic topsoils and stockpile for later use in landscaping (if required);
- Where required, excavate to design level;
- Proof roll the exposed surface accompanied by careful visual inspection by an experienced geotechnical consultant to allow detection and treatment of any soft or compressible zones. Unsuitable materials should be over-excavated and replaced with suitable filling. Based on the presence of loose soils identified up to about 1.5 m depth, a provisional rate for over-excavation and replacement of soft or compressible zones should also be allowed for in the budget estimates;
- Within the building pad, the exposed surface should be compacted to a density ratio of at least 98% Standard Compaction in areas proposed for filling.



- Filling should be placed in near horizontal layers no thicker than 300 mm (loose thickness) and be compacted to the density ratio indicated above. Moisture contents of the subgrade and additional filling should be maintained within -3% to +1% of the optimum moisture content for Standard compaction. Filling should comprise relatively homogeneous materials (such as site won natural materials) with a maximum particle size of not greater than 100 mm and be free from organic and other deleterious matter; and
- Protect the area after subgrade preparation to maintain moisture content close to the equilibrium as far as practicable. The placement of subbase gravel, or concrete slab (within building footprint) would normally provide adequate protection.

Earthworks testing and inspections for filling should be carried out, within the building area and at least 1 m beyond, to Level 1 conditions, as defined in AS 3798-2007: *Guidelines on Earthworks for Commercial and Residential Developments* (Ref 3).

NSW EPA Guidelines require that all material removed from site should be subjected to a Waste Classification Assessment.

8.5 Pavement Design

It is considered that a flexible pavement would be suitable for on-grade access roads and carparks. If a carpark pavement design is required for the basement, it is recommended that, due to subsurface soil conditions and groundwater levels, a concrete pavement be adopted.

8.5.1 Design Traffic Loading

Traffic loadings have not been advised for the project; however, it is considered that a design traffic loading of 6×10^4 Equivalent Standard Axle (ESA) repetitions over a 30 year design period would be appropriate for the proposed on-grade car park. This traffic loading is equivalent to a 'Shareway' road class as per Table 6.1 of Central Coast Council's *Gosford Civil Works Specification Volume 1 - Design* (Ref 4).

8.5.2 Design CBR

Based on the results of the investigation, the subgrade in the area of the proposed internal access roads and car parking areas generally comprise loose to medium dense sand/silty sand. Based on the results of the boreholes, DCPs and experience with similar soils in the local area, a design subgrade CBR value of 7% has been adopted for the pavement thickness design.

8.5.3 Pavement Thickness Design

Table 5 shows the minimum layer thicknesses for the proposed new flexible pavement. This design is based on procedures contained in Central Coast Council's *Gosford Civil Works Specification Volume 1 – Design* (Ref 4), and Austroads *Guide to Pavement Technology – Part 2: Pavement*

Structural Design (Ref 6). It also requires that subgrade preparation will be carried out in accordance with Section 8.5.4 of this report.

Table 5: Minimum Flexible Pavement Design– Internal Access Roads and On-grade Carpark

Pavement	Road Class	Design Traffic Load (ESA)	Subgrade CBR (%)	Total Pavement Thickness (mm)	Layer Component		
					Wearing Course (mm)	Basecourse (mm)	Subbase Course (mm)
Internal Access / Carpark	Shareway	6 x 10 ⁴	7	310*	40mm* AC14 and primer seal	150*	120*

Notes: * As per minimum council requirements

Note that placement and compaction of relatively thin pavement layers, such as 120 mm of subbase, on sand can prove difficult. Alternatives include increasing the subbase thickness sufficiently (say, 150 mm) or placing the whole granular pavement as 270 mm of basecourse.

It is recommended that, due to subsurface soil conditions and groundwater levels, a concrete pavement is adopted for the basement carpark.

8.5.4 Subgrade Preparation

Subgrade preparation for the proposed internal access roads and carpark pavement should be carried out in general accordance with the following methodology:

- Strip all vegetation and topsoils, topsoil can be expected to a depth of up to about 0.5 m;
- Where required, excavate to design subgrade level within the area of proposed pavement construction;
- Proof roll the exposed subgrade with smooth drum vibrating roller having a static weight of at least 8 tonnes. At least six passes of the roller would be required. A final pass should be carried out in the presence of an experienced geotechnical engineer in order to check for any soft or compressible zones which may require over-excavation and replacement with suitable filling;
- Subgrade materials should be compacted to at least 100% Standard compaction or 80% density index, with moisture contents within $\pm 2\%$ of the optimum moisture content (OMC);
- Additional subgrade filling, if required, should comprise material having a soaked CBR value of 10%. The filling should be well graded and have a maximum particle size of not greater than 50 mm. This material should be placed in layers not exceeding 250 mm loose thickness, with each layer compacted to at least 100% Standard compaction;
- Protect the area after subgrade preparation to maintain moisture content close to the equilibrium as far as practicable and prevent further disturbance. The placement of subbase gravel would normally provide adequate protection; and
- Place subsequent layers of suitable pavement materials in layers not thicker than 250 mm loose thickness and compact in accordance with details given in Section 8.5.5 of this report.

In accordance with Central Coast Council's (CCC) requirements, individual pavement layers (subgrade, subbase and basecourse) must be presented for testing immediately after placement and compaction. The results of such testing would need to be reported to CCC for final approval.

8.5.5 Material Properties

The material quality and compaction requirements for pavement layers are presented in Table 6.

Table 6: Material Quality and Compaction Requirements

Layer	Material Quality	Compaction
Wearing Course	Conform to RMS Spec. R116	RMS Spec R116
Base Course	Conform to RMS Spec. 3051; DGB20 with minimum soaked CBR 80%	Minimum 98% Modified Compaction
Subbase Course	Conform to RMS Spec. 3051; DGS20 with minimum soaked CBR 40%	Minimum 95% Modified Compaction
Select Material	Conform to <i>Gosford Civil Works Specification Volume 2 – Construction</i> (Ref 5)	Minimum 100% Standard Compaction
Subgrade	Minimum Soaked CBR 7%	Minimum 100% Standard Compaction / 80% Density Index

8.5.6 Drainage

The vehicular pavement thickness design provided above depends on the provision of adequate surface and subsoil drainage to maintain the subgrade as close to the optimum moisture content as possible and to ensure that the pavement layers do not become saturated.

Preparation of subgrade surfaces should normally be such that adequate crossfalls for surface drainage are achieved across the final pavement.

8.6 Acid Sulfate Soils

The results of the screening tests for pH in H₂O (pH_F) were in the range of 5.4 to 6.6 pH units. The ASSMAC guidelines (Ref 7) suggest that actual acid sulfate soils (AASS) may be present if the pH_F is less than 4 pH units when measured in dry seasonal conditions. This condition did not occur in any of the 29 samples screened.

The results of the initial screening tests for pH following addition of H₂O₂ (pH_{Fox}) were in the range of 2.0 to 5.9 pH units. The ASSMAC guidelines suggest that potential acid sulfate soil (PASS) conditions may be present where pH in H₂O₂ (pH_{Fox}) is less than 3.5 pH units. This condition occurred in 11 of the 29 samples screened.



The ASSMAC guidelines also suggest that potential acid sulfate soil conditions may be present where the difference between pH in H₂O (pH_F) and pH in H₂O₂ (pH_{Fox}) is greater than 1 pH unit. This occurred in 19 of the 29 samples screened.

The 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 Sulfate (SPOCAS) or Chromium reducible sulfur (S_{Cr}) methods. Chromium reducible sulfur testing was carried out on five samples that exceeded the above indicators of acid sulfate soils. The results of these tests are presented in Table 1, Section 6.

As outlined in *The Soil Management Guidelines* (Ref 8) the action criteria which define the requirement for management of acid sulfate soils vary depending on the amount of soil disturbed and textural classification of the soil.

The method for determining net acidity has been derived from the Soil Management Guidelines (Ref 8) and the Laboratory Methods Guidelines (Ref 9) and can be summarised as follows:

- When $4.5 \leq \text{pH}_{\text{KCl}} < 5.5$ Net acidity = S_{Cr} + S⁻TAA; and
- When $\text{pH}_{\text{KCl}} < 4.5$ Net acidity = S_{Cr} + S⁻TAA + S⁻S_{NAS}.

Where: pH_{KCl} = Potassium chloride suspension pH
 S_{Cr} = Chromium Reducible Sulfur
 FF = Fineness Factor (at least 1.5)
 S⁻TAA = Titratable Actual Acidity

Due to the proposed basement, it is expected that more than 1,000 tonnes of soil will be disturbed during construction of the proposed development.

Therefore based on the results of the screening and detailed laboratory testing, DP has made the following interpretation in relation to ASS conditions at the site:

- The light brown, light grey and dark brown sands between 0.5 m and 2.2 m depth in Bores 2 to 4 are considered to be moderately potential acid sulfate soils (PASS);
- The light brown sand and dark brown silty sand below 2.2 m depth in Bores 2 to 4 are considered to be highly potential acid sulfate soils (PASS);
- The brown to grey sand/silty sand with organics to a depth of 0.5 m are not considered to be acid sulfate soils. The soils may be considered to be slightly acidic; and
- The light grey sand (0.0 - 1.9 m) and light grey/light brown clayey sand/sandy clay (1.9 - 3.8 m) in Bore 1 are not considered to be acid sulfate soils;

Excavation of PASS should be undertaken with reference to an Acid Sulfate Soil Management Plan as outlined in Section 9.



9. Acid Sulfate Soil Management Plan (ASSMP)

9.1 Proposed Management Options

Based on the results of the screening and laboratory testing and DP's understanding of the project, excavation of the identified PASS (refer to Section 8.6) will occur. The following options for the excavated PASS have been considered:

- Following treatment/neutralisation, the neutralised soils would be suitable for re-use on site below a non-permeable surface such as pavement or at least 0.3 m of non-acid sulfate soil, such as topsoil; and
- Following treatment/neutralisation, the neutralised soils may be disposed to a licensed landfill. In the event that any spoil is to be disposed of from site, the generator of the waste is obliged to chemically assess the soil in accordance with *Waste Classification Guidelines, Part 1: Classifying Waste* (Ref 10). DP's investigations did not include a waste classification assessment.

9.2 Proposed Excavation Procedure

The following excavation procedure is recommended during the proposed works:

- Excavation of the identified PASS and stockpile on site for treatment/neutralisation prior to on-site reuse or off-site disposal; and
- Excavation of soils identified in Section 8.6 as non PASS should be stockpiled on-site separately from PASS for re-use on-site or removal from site as required.

Stockpiles of acid sulfate soils should be kept separate to other materials and should include:

- Bunding, preferably constructed of low permeability soil (i.e. clay) or hay bales covered with impermeable plastic, of at least 0.3 m in height around the entire treatment area;
- An impervious pad on which to place the stockpile. Where an impervious pad cannot be provided, a guard layer of lime should be placed across the temporary stockpiling and treatment area. A rate of approximately 1 kg/m² per vertical metre of fill with Grade 1 Agricultural Lime is suggested to counteract the generation of acidic leachate due to the soils being exposed to air;
- Measures to minimise the surface area exposed to oxidation; and
- Incorporation of a leachate collection and treatment system.

Stockpiles of PASS should be kept moist to minimise oxidation, prior to lime treatment. They should be covered to prevent rainfall leaching through the stockpile and possibly creating acidic runoff and be located as far away as possible from any sensitive receptors (e.g. waterways).



9.3 Soil Treatment

Excavated acid sulfate soils should be treated with lime in accordance with the liming rate outlined below. Following lime treatment the soils will require validation testing (soil screening and laboratory testing) to confirm that the appropriate quantities of lime have been added and the soils have been appropriately mixed/blended.

The required dosing rate for lime treatment should be calculated from the following formula, which includes a factor of safety of 1.5.

$$\text{Alkali Material Required (kg) per tonne of soil} = (\text{Net Acidity}\%S \times 30.59 \times 1.02) \times \frac{100}{\text{ENV}(\%)} \times \text{FOS}$$

Where: 30.59 = conversion factor to H_2SO_4 ;
1.02 = conversion factor to $CaCO_3$;
1.5 = safety factor (FOS);
ENV = Effective Neutralising Value (e.g. 80% for Grade 1 Agricultural lime).

Note: The ENV is calculated based on the molecular weight, particle size and purity of the neutralising agent and should be assessed for proposed materials in accordance with The Soil Management Guidelines (Ref 8).

It is recommended that Grade 1 agricultural lime is used for the neutralisation of acid sulfate soils. Advice is given against the use of other more reactive types of lime (such as hydrated lime) as they would pose a much greater risk to the environment than would be posed by the use of agricultural lime.

Based on the results of the laboratory testing carried out during the investigation, the following initial liming rates are recommended:

- Acid Sulfate Soils
 - o Light brown/light grey/dark brown sand (0.5 - 2.2 m) 12 kg lime / tonne of soil; and
 - o Light brown sand/dark brown silty sand (> 2.2 m) 90 kg lime / tonne of soil.

The neutralising agent should be thoroughly mixed into the soils using the bucket of an excavator or skid-steer loader. The actual liming rate may need to change due to the natural variations in the pyritic components in the soil. The actual liming will therefore be appropriately adjusted on the basis of monitoring results obtained during the treatment process. Additional lime will be required if monitoring results indicate that appropriate neutralisation has not been achieved.

Following initial liming, screening and laboratory testing will be required to determine whether the acid sulfate soil have been appropriately neutralised.

Further treatment of the acid sulfate soil will be required if monitoring of the material reveals any of the following properties:



- If soil pH is less than 6; and
- If soil pH after forced oxidation is less than 5 or greater than 9; and
- Net Acidity greater than zero following treatment.

9.4 Placement of a Guard Layer

Following completion of excavation activities, the newly exposed PASS within the excavation should be dosed at a rate of approximately 1 kg/m² with Grade 1 Agricultural Lime to counteract the generation of acidic leachate due to the soils being exposed to air.

9.5 Dewatering

Groundwater was measured at 1.3 m to 1.6 m depth during the investigation. Provisions for dewatering and treatment of leachate should therefore be included in the methodology and budget estimates for the proposed works.

The following procedure is recommended in order to minimise potential adverse impacts resulting from excavation and dewatering of PASS during construction:

- minimise the dewatering depth required for excavation;
- minimise the time and volume of exposed PASS (i.e. staged dewatering and excavation over relatively short durations);
- extracted groundwater should be discharged to a bunded area (i.e. evaporation/infiltration area or storage tanks) away from the dewatering site or discharged to stormwater/sewer, subject to regulatory approval; and
- the pH and turbidity of the extracted water should be monitored prior to discharge. Neutralisation should be undertaken if discharge water pH falls below natural groundwater levels or regulatory requirements.

The amount of neutraliser required to be added to the leachate or discharged groundwater can be calculated from the equation below:

$$\text{Alkali Material Required (kg)} = \frac{M_{\text{Alkali}} \times 10^{-\text{pH initial}}}{2 \times 10^3} \times V$$

Where: pH initial = initial pH of leachate
 V = volume of leachate or collected water (litres)
 M_{Alkali} = molecular weight of alkali material (g/mole)

Note: molecular weight of hydrated lime = 74 g/mole.

The alkali should be added to the leachate/discharged groundwater water as a slurry. Mixing of the slurry is best achieved using an agitator.



Whilst agricultural lime is well suited to the treatment of acid sulfate soils, it does not dissolve readily in water; hence it should not be used for adjusting the pH of water. Hydrated lime ($\text{Ca}(\text{OH})_2$) is more soluble than agricultural lime making it more suited to treating water, but it has a high pH value (pH ~ 12). Therefore, if hydrated lime is to be used to treat water, it should be added incrementally with care and thoroughly mixed to prevent overshooting the desired pH.

As a guide, the approximate quantities of hydrated lime would be required to neutralise acidic water to pH 7 are provided in Table 7.

Table 7: Recommended Dosing Rates for Water using Hydrated Lime (in kg of $\text{Ca}(\text{OH})_2$)

Water pH	Dosing Rate (kg of $\text{Ca}(\text{OH})_2$)		
	2 m ³ #	5 m ³ #	10 m ³ #
2	0.74	1.85	3.7
3	0.074	0.185	0.37
4	0.0074	0.0185	0.037
5	0.00074	0.00185	0.0037
6	0.000074	0.000185	0.00037

Notes: # volume of extracted water

It should be recognised that portable holding and treatment tanks will be required to allow on site neutralisation of water generated by dewatering activities prior to disposal.

Notwithstanding any additional regulatory requirements placed on water disposal by Central Coast Council (CCC), formerly Gosford City Council, it is recommended that CCC's *Gosford Policy for the Discharge of Liquid Trade Waste and Septic Waste to the Gosford City Council Sewage System* (Ref 11) be met before discharging any water, leachate or groundwater to the sewerage system.

Table 8: CCC's Gosford Liquid Trade Waste General Acceptance Limits

Indicator	Sewerage System
pH	7.0 – 9.0
Total Suspended Solids ¹	300 mg/L (600 mg/L) ²

Notes:

1 – Field measurement of Turbidity may be substituted for TSS subject to regulatory approval. Correlation of Turbidity to TSS is dependant of site specific factors and it is recommended that if turbidity is to be monitored then the relationship should be established at the commencement of the monitoring programme. Notwithstanding, an initial approximate correlation of turbidity to TSS would be 0.5 NTU approximates 1 mg/L TSS.

2 – It is understood that of Discharge limit of 600 mg/L maybe be accepted by CCC for some sites.

Depending on the results of testing, additional lime may need to be applied to adequately neutralise the soil.

9.6 Reporting

A record of treatment of acidic and acid sulfate soils should be maintained by the contractor and should include the following details:

- date;
- location/area;
- time of excavation;
- neutralisation process undertaken;
- lime rate utilised;
- results of monitoring;
- disposal location; and
- tonnages and landfill dockets (if applicable).

A record should also be maintained confirming contingency measures and additional treatment if undertaken. A final report should be issued upon completion of the works presenting the monitoring regime and results, and confirming that adverse environmental impact has not occurred during the works.

10. References

1. Australian Standard, AS 2870-2011: *Residential Slabs and Footings*, Standards Australia, January 2011
2. Australian Standard, AS 2159-2009: *Piling Design and Installation*, Standards Australia, November 2009
3. Australian Standard, AS 3798-2007: *Guidelines on Earthworks for Commercial and Residential Developments*, Standards Australia, March 2007
4. Central Coast Council, *Gosford Civil Works Specification, Volume 1 – Design*, Central Coast Council Publication, Revision date July 2017
5. Central Coast Council, *Gosford Civil Works Specification, Volume 2 – Construction*, Central Coast Council Publication, Revision date July 2017
6. Austroads, *Guide to Pavement Technology Part 2: Pavement Structural Design*, Austroads Publication No. AGPT02-12, 2012
7. NSW Acid Sulfate Soil Management Advisory Committee, *Acid Sulfate Soil Manual*, August 1998.
8. Dear SW, Ahern CR, O'Brien LE, Dobos SK, McElnea AE, Moore NG and Watling KM, *Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines*, Department of Science, Information, Technology, Innovation and the Arts, Queensland Government, Version 4.0, 2014
9. Ahern CR, McElnea AE and Sullivan LA, *Acid Sulfate Soils Laboratory Methods Guidelines*, Department of Natural Resources, Mines and Energy, Indooroopilly, June 2004



10. NSW Environment Protection Authority (EPA), *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.
11. Central Coast Council, formerly Gosford City Council, *Policy for the Discharge of Liquid Trade Waste and Septic Waste to the Gosford City Council Sewage System*

11. Limitations

Douglas Partners (DP) has prepared this report for this project at 34-36 Brisbane Water Drive, Koolewong in accordance with DP's proposal dated 14 June 2017 and acceptance received from Kejia Liu dated 8 September 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Harman Project Engineering Management Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party 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.

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.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current



scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the geotechnical / environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

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

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

Borehole and Test Pit Logs

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

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

Groundwater

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

- 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

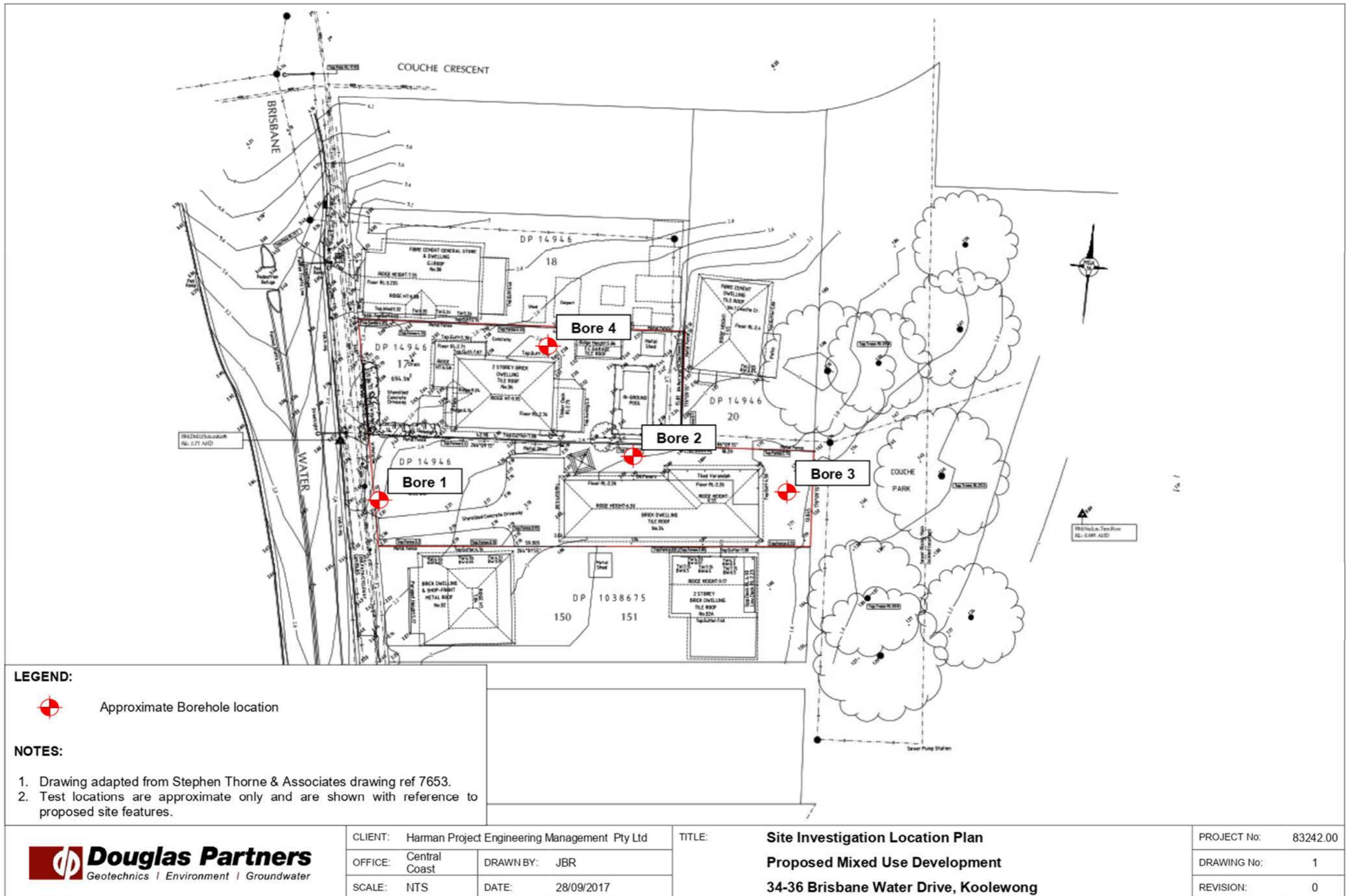
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate 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

Drawings



Appendix C

Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Borehole logs

Sampling Methods

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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

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

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Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. 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	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

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

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

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	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 - 5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

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;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Symbols & Abbreviations

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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
cl	clay
fe	iron oxide
mn	manganese
sit	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


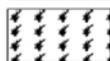








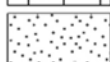
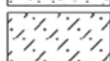
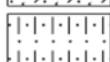

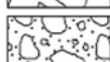


Symbols & Abbreviations

Graphic Symbols for Soil and Rock

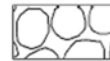


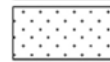




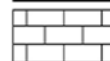
General

	Asphalt
	Road base
	Concrete
	Filling

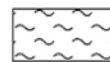


Soils

	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

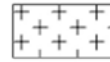


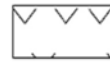

Sedimentary Rocks

	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

BOREHOLE LOG

CLIENT: Harman Project Engineering Management Pty Ltd	SURFACE LEVEL: --	BORE No: 1
PROJECT: Proposed Mixed Use Development	EASTING: 343789	PROJECT No: 83242.00
LOCATION: 34-36 Brisbane Water Drive, Koolewong	NORTHING: 6295724	DATE: 13/9/2017
	DIP/AZIMUTH: 90°/--	SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.2	TOPSOIL/FILLING: Light grey sand topsoil/filling with abundant fine rootlets, humid		D	0.2				5
	0.4	FILLING: Red mottled brown sand filling with trace fine grained gravel, humid		D	0.4				10
	0.6	SAND: Medium dense, light grey sand with trace silt, damp		D	0.6				15
	1.0	SANDY SILT: Stiff, dark grey and brown sandy silt with trace organics and clay, moist		D	1.0				20
	1.5	SAND: Medium dense, light grey sand with trace silt, wet - Dense to very dense from 1.5 m		D	1.5				
	2.0	CLAYEY SAND/SANDY CLAY: Dense to very dense / very stiff to hard, light grey and light brown clayey sand/sandy clay, wet / M<wP		D	2.0				
	2.5			D	2.5				
	3.0			D	3.0				
	3.8	Bore discontinued at 3.8m. Limit of investigation		D	3.8				

RIG: Toyota 4WD **DRILLER:** M Harrison **LOGGED:** M Harrison **CASING:**
TYPE OF BORING: Dynamic Push Tube (continuous sample)
WATER OBSERVATIONS: Free Groundwater Observed at 1.3m
REMARKS:

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 (s/50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test (s/50) (MPa)
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)
D Disturbed sample	W Water seep	S Standard penetration test
E Environmental sample	W Water level	V Shear vane (kPa)



BOREHOLE LOG

CLIENT: Harman Project Engineering Management Pty Ltd	SURFACE LEVEL:--	BORE No: 2
PROJECT: Proposed Mixed Use Development	EASTING: 343824	PROJECT No: 83242.00
LOCATION: 34-36 Brisbane Water Drive, Koolewong	NORTHING: 6295734	DATE: 13/9/2017
	DIP/AZIMUTH: 90°/--	SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)					
				Type	Depth	Sample		Results & Comments	5	10	15	20	
	0.1	TOPSOIL/FILLING: Dark brown silty sand topsoil/filling with abundant rootlets, humid	☒	D	0.05								
		SAND: Loose to medium dense, dark brown sand with some silt and trace organics, humid	☐	D	0.3								
	0.5	SAND: Loose, light brown coarse grained sand, damp	☐	D	0.7								
	0.9	SILTY CLAY/CLAYEY SILT: Soft to firm, dark brown silty clay/clayey silt with some sand, wet, M>Wp	☐	D	1.0								
	1.4	SAND: Medium dense, light brown coarse grained sand, saturated	☐	D	1.6			▼					
	2.0	Bore discontinued at 2.0m. Hole collapse											
	3												
	4												

RIG: Hand Tools **DRILLER:** M Harrison **LOGGED:** M Harrison **CASING:**
TYPE OF BORING: 70mm φ Hand Auger
WATER OBSERVATIONS: Free Groundwater Observed at 1.6m
REMARKS:

☐ 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 (s/50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test (s/50) (MPa)
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)
D Disturbed sample	W Water seep	S Standard penetration test
E Environmental sample	▼ Water level	V Shear vane (kPa)



BOREHOLE LOG

CLIENT: Harman Project Engineering Management Pty Ltd	SURFACE LEVEL: --	BORE No: 3
PROJECT: Proposed Mixed Use Development	EASTING: 343846	PROJECT No: 83242.00
LOCATION: 34-36 Brisbane Water Drive, Koolewong	NORTHING: 6295732	DATE: 13/9/2017
	DIP/AZIMUTH: 90°/--	SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample		
	0.15	TOPSOIL/FILLING: Dark grey silty sand topsoil/filing with abundant rootlets, humid	[X]	D	0.1			
		SILTY SAND: Loose, dark brown silty sand with trace organics, humid	[---]	D	0.5			
	0.75	SAND: Loose to medium dense, light brown coarse grained sand, damp	[...]	D	1.0			
	1.2	SAND: Loose, dark brown coarse grained sand with trace silt, wet	[...]	D	1.5		▼	
	2.1	SILTY SAND: Medium dense, dark brown silty sand with some decomposed organics, saturated	[---]	D	2.2			
	2.3	SAND: Medium dense, light brown coarse grained sand, saturated	[...]	D	3.0			
	3.8	Bore discontinued at 3.8m. Limit of investigation		D	3.8			

RIG: Toyota 4WD **DRILLER:** M Harrison **LOGGED:** M Harrison **CASING:**
TYPE OF BORING: Dynamic Push Tube (continuous sample)
WATER OBSERVATIONS: Free Groundwater Observed at 1.55m
REMARKS:

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 (s/50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test (s/50) (MPa)
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)
D Disturbed sample	W Water seep	S Standard penetration test
E Environmental sample	W Water level	V Shear vane (kPa)



BOREHOLE LOG

CLIENT: Harman Project Engineering Management Pty Ltd PROJECT: Proposed Mixed Use Development LOCATION: 34-36 Brisbane Water Drive, Koolewong	SURFACE LEVEL: - EASTING: 343811 NORTHING: 6295747 DIP/AZIMUTH: 90°/-	BORE No: 4 PROJECT No: 83242.00 DATE: 13/9/2017 SHEET 1 OF 1
--	--	---

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample		
	0.3	TOPSOIL/FILLING: Light brown sand filling/topsoil, with some silt, abundant rootlets and trace plastic tile, humid	[Cross-hatch pattern]	D	0.3			
	0.6	SAND: Medium dense to dense, light grey sand, humid	[Dotted pattern]	D	0.6			
	1.0	CLAYEY SILTY SAND: Loose, clayey silty sand with trace organics, damp	[Diagonal lines]	D	1.0			
	1.5	- Medium dense from 1.5 m	[Diagonal lines]	D	1.5			
	2.0	SAND: Medium dense to dense, light grey sand with trace silt, damp	[Dotted pattern]	D	2.0			
	2.7	SILTY SAND: Medium dense, light brown silty sand with some organics, moist	[Vertical lines]	D	2.7			
	3.0	SAND: Medium dense, light grey sand with trace silt, moist/wet	[Dotted pattern]	D	3.0			
	3.35	CLAYEY SILTY SAND: Medium dense, dark brown clayey silty sand, wet	[Diagonal lines]	D	3.35			
	3.8	Bore discontinued at 3.8m. Limit of investigation						

RIG: Toyota 4WD **DRILLER:** M Harrison **LOGGED:** M Harrison **CASING:**
TYPE OF BORING: Dynamic Push Tube (continuous sample)
WATER OBSERVATIONS: Water Seepage Observed at 1.9m
REMARKS:

Sand Penetrometer AS1289.6.3.3
 Cone Penetrometer AS1289.6.3.2

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



Appendix D

Laboratory Test Reports



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 175934

Client Details

Client	Douglas Partners Tuggerah
Attention	Joel Cowan
Address	Unit 5, 3 Teamster Close, Tuggerah, NSW, 2259

Sample Details

Your Reference	83242.00, Koolewong
Number of Samples	5 soil
Date samples received	19/09/2017
Date completed instructions received	19/09/2017

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	26/09/2017
Date of Issue	25/09/2017
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

Nick Sarlamis, Inorganics Supervisor

Authorised By



David Springer, General Manager

Envirolab Reference: 175934
 Revision No: R00



Page | 1 of 6

Client Reference: 83242.00, Koolewong

Chromium Suite						
Our Reference		175934-1	175934-2	175934-3	175934-4	175934-5
Your Reference	UNITS	2	3	3	4	4
Depth		1.0	0.5	3.0	1.5	3.7
Date Sampled		13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017
Date analysed	-	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017
pH _{kel}	pH units	4.3	5.4	4.8	4.5	4.0
s-TAA pH 6.5	%w/w S	0.1	0.11	0.01	0.04	0.12
TAA pH 6.5	moles H ⁺ /t	61	71	9	26	75
Chromium Reducible Sulfur	%w/w	0.05	<0.005	0.04	<0.005	1.4
a-Chromium Reducible Sulfur	moles H ⁺ /t	30	<3	26	<3	860
S _{HCl}	%w/w S	0.006	<0.005	<0.005	<0.005	0.077
S _{KCl}	%w/w S	<0.005	<0.005	0.006	<0.005	0.093
S _{NaS}	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
ANC _{BT}	% CaCO ₃	<0.05	<0.05	<0.05	<0.05	<0.05
s-ANC _{BT}	%w/w S	<0.05	<0.05	<0.05	<0.05	<0.05
s-Net Acidity	%w/w S	0.20	0.12	0.056	0.042	1.5
a-Net Acidity	moles H ⁺ /t	91	74	35	26	930
Liming rate	kg CaCO ₃ /t	6.8	5.6	2.6	2.0	70
a-Net Acidity without ANCE	moles H ⁺ /t	91	74	35	26	930
Liming rate without ANCE	kg CaCO ₃ /t	6.8	5.6	2.6	2.0	70
s-Net Acidity without ANCE	%w/w S	0.15	0.12	0.056	0.042	1.5

Client Reference: 83242.00, Koolewong

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: 83242.00, Koolewong

QUALITY CONTROL: Chromium Suite					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/09/2017	1	21/09/2017	21/09/2017		21/09/2017	[NT]
Date analysed	-			21/09/2017	1	21/09/2017	21/09/2017		21/09/2017	[NT]
pH _{nat}	pH units		Inorg-068	[NT]	1	4.3	4.3	0	99	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-068	<0.01	1	0.1	0.1	0	[NT]	[NT]
TAA pH 6.5	moles H ⁺ /t	5	Inorg-068	<5	1	61	61	0	95	[NT]
Chromium Reducible Sulfur	%w/w	0.005	Inorg-068	<0.005	1	0.05	0.04	22	105	[NT]
a-Chromium Reducible Sulfur	moles H ⁺ /t	3	Inorg-068	<3	1	30	27	11	[NT]	[NT]
S _{Na}	%w/w S	0.005	Inorg-068	<0.005	1	0.006	0.006	0	[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	<0.005	<0.005	0	[NT]	[NT]
ANC _{BT}	% CaCO ₃	0.05	Inorg-068	<0.05	1	<0.05	<0.05	0	[NT]	[NT]
s-ANC _{BT}	%w/w S	0.05	Inorg-068	<0.05	1	<0.05	<0.05	0	[NT]	[NT]
s-Net Acidity	%w/w S	0.005	Inorg-068	<0.005	1	0.20	0.15	29	[NT]	[NT]
a-Net Acidity	moles H ⁺ /t	5	Inorg-068	<5	1	91	88	3	[NT]	[NT]
Liming rate	kg CaCO ₃ /t	0.75	Inorg-068	<0.75	1	6.8	6.6	3	[NT]	[NT]
a-Net Acidity without ANCE	moles H ⁺ /t	5	Inorg-068	<5	1	91	88	3	[NT]	[NT]
Liming rate without ANCE	kg CaCO ₃ /t	0.75	Inorg-068	<0.75	1	6.8	6.6	3	[NT]	[NT]
s-Net Acidity without ANCE	%w/w S	0.005	Inorg-068	<0.005	1	0.15	0.14	7	[NT]	[NT]

Client Reference: 83242.00, Koolewong

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.	

Client Reference: 83242.00, Koolewong

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.



CHAIN OF CUSTODY DESPATCH SHEET

Project No: 83242.00		Suburb: Koolewong		To: Envirolabs										
Project Name: Acid Sulfate Soils and Geotech		Order Number												
Project Manager: Joel Cowan		Sampler: MJH		Attn: Aileen										
Emails: joel.cowan@douglaspartners.com.au				Phone:										
Date Required: Same day <input type="checkbox"/> 24 hours <input type="checkbox"/> 48 hours <input type="checkbox"/> 72 hours <input type="checkbox"/> Standard <input type="checkbox"/>				Email:										
Prior Storage: <input type="checkbox"/> Esky <input type="checkbox"/> Fridge <input type="checkbox"/> Shelved		Do samples contain 'potential' HBM? Yes <input type="checkbox"/> No <input type="checkbox"/> (If YES, then handle, transport and store in accordance with FPM HAZID)												
Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation	
			S - soil W - water	G - glass P - plastic	Heavy Metals	OCP/OPP PCB	TRH and BTEX	PAH	Total Phenols	Asbestos 500 ml	Scr Suite			
2/1.0	1	13/09/17	S	P									X	
3/0.5	2	13/09/17	S	P									X	
3/3.0	3	13/09/17	S	P									X	
4/1.5	4	13/09/17	S	P									X	
4/3.7	5	13/09/17	S	P									X	
Job No: 175734 Date Received: 19/9/17 12:30 Time Received: Received by: F 15.9 Temp: Cool/Ambient Cooling: Ice/Inspack Security: Intact/Broken/None														
PQL (S) mg/kg												ANZECC PQLs req'd for all water analytes <input type="checkbox"/>		
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit												Lab Report/Reference No:		
Metals to Analyse: 8HM unless specified here:														
Total number of samples in container: 5		Relinquished by: MJH		Transported to laboratory by:										
Send Results to: Douglas Partners Pty Ltd		Address		Phone:				Fax:						
Signed:		Received by:				Date & Time:								



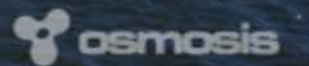
DOUBTFIRE BRISBANE WATER DRIVE PRELIMINARY

osmosis





DOUBTFIRE WHARF PRELIMINARY





DOUBTFIRE WHARF PRELIMINARY

