

ANNEXURE 4

**Engineering Assessment
(including Consolidated Traffic Assessment)**

**prepared by
Kiama Municipal Council**

**Various Allotments
Terralong, Akuna and Shoalhaven Streets
Kiama**



DEVELOPMENT APPLICATION REFERRAL ~ INTERNAL DOCUMENT ~

Please complete and return this referral to Mr B Leo by 25 October 2018

This Referral To: Subdivision & Development Engineer

Date:	11 October 2018
Application Number:	10.2016.304.1
Application Type:	Development / Construction Certificate / Combined
BCA Classification:	10B ,7A ,U ,10B ,6 ,10B ,2
Development Description:	DEMOLITION OF EXISTING STRUCTURES AND CONSTRUCTION OF A MIXED USE DEVELOPMENT COMPRISING RESIDENTIAL APARTMENTS ABOVE RETAIL SHOPS, COMMERCIAL TENANCIES AND ASSOCIATED CAR PARKING AREAS
Premises:	LOT: 1 DP: 50193, LOT: 3 DP: 1104857, LOT: 200 DP: 1017091, LOT: 1 DP: 506764, LOT: 100 DP: 1211384 - 100 Terralong Street KIAMA, 3 Akuna Street KIAMA, 55 Shoalhaven Street KIAMA, 61 Shoalhaven Street KIAMA
Current Property Zoning:	LEP2011 - B2 Local Centre
Applicant:	adm Architects

1.0 Overview

A review of the engineering aspects of the development has been undertaken.

The following plans and documents were used in the assessment:

- Civil Design Plans prepared by Jones Nicholson Consulting Engineers – Project No. 16020029 dated 14.02.2018;
- Architectural Plans prepared by ADM Architects –Project No 2016-19(a) – Issue Z dated 4.09.2018;
- Traffic Impact Assessment prepared by Jones Nicholson Consulting Engineers dated 31.10.2017;
- Revised Statement of Environmental Effects prepared by TCG dated 5.10.2018; and
- Review of Traffic Impact Assessment prepared by Traffic Impact Services dated 13.11.2017

2.0 Parking

Please note that this advice does not consider whether the parking numbers provided in the proposal are compliant with the requirements set out in Chapter 9 of Kiama Development Control Plan 2012.

The car parking for the residential component of the development accesses from Akuna Street via an existing public laneway. The car parking for the commercial component of the development accesses from Shoalhaven Street. The residential component provides 134 car parking spaces. The commercial component provides 212 car parking spaces.

The dimensions of the parking spaces and manoeuvring shown on the plans provided comply with the following Australian Standards:

- AS 2890.1 - 2004 Off-street car parking;
- AS 2890.2 - 2002 Off-street commercial vehicle facilities;
- AS 2890.3 - 2015 Bicycle Parking; and
- AS 2890.6 - 2009 Off-street parking for people with disabilities.

3.0 Traffic Impact Assessment

Council defers to the NSW Roads and Maritime Services standards in assessing traffic impacts. The principle document used is the *RTA Guide to Traffic Generating Developments Version 2.2 October 2002* (Guide). The Guide advises that the peak activity time of the adjacent road network and the peak activity time of the development itself is used to assess the effect of the development on the road system.

3.1 Assessment of peak activity time

3.1.1 For the adjacent road network

The Guide set out the following peak hour vehicle trips and daily vehicle trips for the different uses within the development. The Guide provides rates for Thursdays and Fridays from 16:30 to 17:30 and Saturdays from 11:00 to 12:00. The largest rate provided (Saturday) has been shown in **Table 1**.

Table 1 - Assessment of Average Daily Vehicle Trips and Total Peak Hour Trips

Use	Quantity	Average Daily Vehicle Trips (DVT)	Total DVT	Peak Hour Vehicle Trips (PHVT)	Total PHVT
Unit	96	5	480	0.65 trips /dwelling	63
Retail	2568 m ² Gross Leasable Floor Area * (GLFA)	121 trips / 100m ² GLFA	3108	16.3 trips/ 100m ² GLFA	419
Office	245m ²	10 trips / 100m ² GLFA	25	2 trips / 100m ² GLFA	5
TOTAL			3613		487

Gross Leasable Floor Area is defined in the Guide as the sum of the area of each floor of a building where the area of each floor is taken to be the area within the internal faces of the walls, excluding stairs amenities, lifts, corridors and other public areas but including stock storage areas.

In order to assess the impacts of the traffic generated by the proposal in the existing road network the applicant has submitted a Traffic Impact Assessment (TIA) from a suitably qualified traffic engineer. The TIA assessed the maximum peak hour vehicle trips to be 754. This equates to an additional 267 trips

greater than Council's assessment. This was due to the engineer calculating the Gross Floor Area, which also includes common areas.

The TIA provided traffic counts (collected through the installation of traffic tubes) at key locations in Kiama for the period of 13 April 2017 to 27 April 2017. From this data the traffic engineer undertook traffic modelling using the SIDRA traffic analysis program. The program determines impacts through assessing vehicle delay at an intersection. It classifies the delays as per **Table 2**.

Table 2 – Level of Service Classifications

Level of Service	Delay (seconds)	Classification
A	0 to 14.5	Good
B	14.5 to 28.5	Good with minimal delay and spare capacity
C	28.5 to 42.5	Satisfactory with spare capacity
D	42.5 to 55	Satisfactory but operating at capacity
E	55 to 70.5	At capacity and incidents will cause excessive delay
F	Greater than 70.5	Unsatisfactory and requires additional capacity

The SIDRA analysis demonstrated that the level of service around the turning manoeuvres at key intersections would be no worse than a 'B' level of service in both the AM and PM peak periods. **Table 3** and **Table 4** indicate the resulting levels of service post development for the A.M and P.M. peak periods.

Table 3 – SIDRA analysis for the A.M. Peak Period

Intersection	Movement	Level of Service
Collins Street and Terralong Street	Collins Street South left turn	A
	Collins Street South straight	A
	Collins Street South right turn	B
	Terralong Street East left turn	A
	Terralong Street East straight	A
	Terralong Street East right turn	B
	Collins Street North left turn	B
	Collins Street North straight	B
	Collins Street North right turn	B
	Terralong Street West left turn	A
	Terralong Street West straight	B
	Terralong Street West right turn	A
Collins Street and Akuna Street	All vehicle movements	A
Collins Street and Bong Bong Street	All vehicle movements	A
Akuna Street and Shoalhaven Street	All vehicle movements	A
Bong Bong Street and Shoalhaven Street	Bong Bong Street (all)	A
	Shoalhaven Street (all)	B
Terralong Street and Shoalhaven Street	Shoalhaven Street (all)	B
	Terralong Street East left turn	A
	Terralong Street East straight	B
	Terralong Street East right turn	A
	Terralong Street West left turn	B
	Terralong Street West straight	A
	Terralong Street West right turn	B
Manning Street and Bong Bong Street	All vehicle movements	A

Table 4 – SIDRA analysis for the P.M. Peak Period

Intersection	Movement	Level of Service
Collins Street and Terralong Street	Collins Street South (all)	B
	Terralong Street East left turn	A
	Terralong Street East straight	A
	Terralong Street East right turn	B
	Collins Street North (all)	B
	Terralong Street West left turn	A
	Terralong Street West straight	B
	Terralong Street West right turn	A
Collins Street and Akuna Street	All vehicle movements	A
Collins Street and Bong Bong Street	All vehicle movements	A
Akuna Street and Shoalhaven Street	All vehicle movements	A
Bong Bong Street and Shoalhaven Street	All vehicle movements	A
Terralong Street and Shoalhaven Street	Shoalhaven Street (all)	B
	Terralong Street East left turn	A
	Terralong Street East straight	B
	Terralong Street East right turn	A
	Shoalhaven Street North(all)	A
	Terralong Street West left turn	B
	Terralong Street West straight	A
	Terralong Street West right turn	B
Manning Street and Bong Bong Street	All vehicle movements	A

In order to confirm the accuracy of the advice in the TIA, Council commissioned an independent peer review. The peer review confirmed that:

- a. The traffic counts provided in the report represented a suitable base for comparing with future development traffic;
- b. The levels of service provided by the SIDRA modelling is considered to be a reasonable assessment;
- c. Any change in level of service from 'A' to "B" does not warrant the need to undertake further action;
- d. The main area to be impacted is in Shoalhaven Street. The following requirements have been recommended to better manage traffic flow:
 - i. Central medians in Shoalhaven Street at Bong Bong Street are to be provide for a dual "Stop" signage on each approach;
 - ii. Blisters on the road at the carpark egress are to be provided to gain improved sight distances;
 - iii. Road widening of Shoalhaven Street on the approach to Terralong Street to provide for a short section of two lanes is required;
 - iv. "No right turn" sign for articulated vehicles from Terralong Street into Shoalhaven Street is required;

A consent condition, which reflects this matter, has been included below in Appendix 'A'.

3.1.2 For the development itself

The recommendations listed immediately above ameliorate adverse impacts caused by increased traffic.

In order to ensure that the parking facilities in the commercial car parking area do not become gridlocked and queuing does not occur with the adjoining road network it is recommended that the following consent conditions are included if the development is approved:

1. Boom gates are prohibited from being installed.
2. An electronic car parking management system shall be installed. The system shall include ultrasonic detectors and electronic message board located on each level and external to the building, which informs customers of the available spaces remaining.

A consent condition, which reflects this matter, has been included below in Appendix 'A'.

3.2 Assessment of traffic generation

The main road system through Kiama (Terralong and Manning Street) was previously part of the national highway system before the town was bypassed; however, since the bypass was opened traffic calming, pedestrian crossings and round-a-bouts have been constructed which have the potential to change traffic flow.

The traffic counts provided in the TIA for Terralong Street from Collins Street to Shoalhaven Street indicates the average daily traffic (both directions combined) was 9130 vehicles. This reasonably compares to Council's traffic counts in Terralong Street undertaken in February 2017 which indicated average daily traffic (east bound and westbound combined) was 8076 vehicles.

Table 1 indicates that the likely traffic generated by the development on its busiest day will be up to approximately 3600 daily vehicle trips. The site currently contains a car park that services the existing commercial areas from Thomson Street to Railway Street. The Guide indicates that based on the commercial areas in this precinct, this existing carpark would likely generate up to 800 vehicle trips per day. Therefore, the approximate increase in the number of daily vehicle trips generated by the development will be 2800. This would represent an increase of around 30% on current levels. A further factor that needs to be taken into consideration is that shoppers already in town using the existing shopping centre (at the intersection of Thomson Street and Terralong Street) need to be excluded, so this increase in traffic would likely be lower if more detailed widespread studies were undertaken.

From a traffic viewpoint, the proposal is considered suitable for the site; however, as demonstrated in the traffic modelling provided by the applicant, there will be changes in the existing traffic flow once the development is operational.

4.0 Access

The proposal will require the excavation and reconstruction of the unnamed Laneway (6.095m wide) which dissects the proposal. This work can be approved through Section 138 of the Roads Act 1993. Prior to issue of any Construction Certificate a legal arrangement will need to be agreed to by Council for the use of the land above/below the unnamed Laneway (pursuant to the requirements of Section 149 of the Roads Act 1993).

A licence agreement will also need to be made for the proposed awnings (overhanging the road reserve) prior to occupation.

The existing right of way (Lot 51 in DP1200006) is proposed to be used for garbage trucks, commercial vehicles and ALDI delivery trucks from the proposal. The ALDI articulated delivery vehicle (AV) is the largest vehicle that needs to be catered for in the laneway. The AV's width is 2.5 m (see fig 2.1 of Australian Standard AS2890.2). Collapsible mirrors may protrude up to 0.23 metres (Section 2.2 of Australian Standard AS2890.2). This would make a total width of 2.96m. Besides turning in and out of the delivery driveway, the route is best defined as one-way straight run. Deferring to AS2890.2 - Table 3.1 – Design Vehicle AV – Curve Radius greater than 800 (incl. straight) – Single lane - the width required is 3.5m. Of note - the minimum requirement for all vehicles in the table (SRV, MRV, HRV) is 3.5m. The clear width in the right of way adjoining the development is 3.05 metres wide. Table 3.1 of

AS2890.2 recommends a 3.5m wide laneway, however, as previously outlined in the Traffic Impact Assessment clause 3.3.1 of AS2890.2, states:

“A guide to the minimum width between kerbs or edges of pavement for circulation roadways is given in Table 3.1. Regardless of the dimensions given in the Table, circulation roadways shall be designed to accommodate the swept path of the largest design vehicle using the facility plus the specified clearances from the vehicle body to vertical obstructions and vehicle to vehicle on two-way roadways as set out in Clause 5.4.”

Council's interpretation is that 3.5m is the recommended minimum and that swept paths are to be utilised where they exceed the minimum. The consultant's interpretation is that the 3.5m is a guide and that swept paths can be used to design to the absolute minimum. In this instance there will only be 45 mm clearance each side of the vehicle's mirrors. The applicant has indicated that he has negotiated a 300mm right of way over Lot 4 DP555589, No. 106 Terralong Street that if dedicated would provide additional width to the existing laneway and therefore provide a clearance of 195mm outside of each wing mirror. An ideal situation would be to have a least a clear 3.5 metre width; however, given that only one side of Lot 51 is obstructed by a wall (constructed for No. 64 Collins Street / Lot C in DP 160615) a 3.35 metre wide access way could be supported on the condition that the right of way is created to the benefit of Council.

The application has provided turning manoeuvres for the articulated delivery vehicles which will deliver goods to the proposed supermarket. A right turn from Terralong Street into Shoalhaven Street is proposed to be prohibited due to the turning path conflicting with paths of oncoming traffic. The route of the delivery vehicle will be along Terralong Street, turning right into Railway Parade, then turning right into Bong Bong Street, then turning right into Shoalhaven Street and then turning left into the development. All turning movements have been reviewed for compliance with Australian Standards and are considered satisfactory. After deliveries have been undertaken in the loading bay of the development the path of travel will be a right turn into Collins Street and then a left turn into Terralong Street. Again, turning movements have been reviewed for compliance with Australian Standards and are considered satisfactory.

5.0 Flooding and Stormwater

5.1 - Flooding

The site is not affected by stormwater flooding or tidal inundation.

5.2 – Stormwater Disposal

The applicant has supplied stormwater plans prepared by a suitably qualified civil engineer in support of the application. Council has no concerns with the design proposed. Conditions have been included in Appendix 'A' should the development application be recommended for approval by the assessing officer.

5.3 – Stormwater Quality

The applicant has provided a stormwater quality report and a MUSIC model in support of the development application. Council's performance criteria is sourced from its document adopted by Council 19/7/2005 titled - *Kiama Municipal Council Water Sensitive Urban Design Policy*. The performance criteria seeks the following targets:

- Total Suspended Solids (TSS) - 80% retention of the baseline annual load
- Total Nitrogen (TN) - 45% retention of the baseline annual load
- Total Phosphorous (TP) - 45% retention of the baseline annual load
- Gross pollutants (GP) - 70% retention of the baseline annual load

The site in its current state serves as a public carpark. The author of the stormwater quality report advises that *“The existing site area is currently served by the Black Beach Stormwater Project with stormwater quality improvement devices such as Enviropod pit inserts and a sand filtration system in*

Hindmarsh Park. As the subject site in its existing state is a high pollutant generating site with 80% impervious surface, the Black Beach Stormwater Project will already have accounted for these pollutant loads in the modelling and design of the water quality system. This differs from many other parts of Kiama outside of the central business district where no water quality catchment management system is in place."

The stormwater quality report and Music model was peer reviewed by a suitably qualified civil engineer. The review assessed that the percentage reduction in baseline pollutant loads are 43% TSS, 25% TN 40% TP, 93% GP. TSS and TN reductions are well below the targets nominated in the Kiama WSUD policy. Although compliance has not been achieved, given that the site is currently being treated by a downstream public system it is considered that non-compliance in this instance should not be a reason for refusal of the application. Conditions have been included in Appendix 'A' should the development application be recommended for approval by the assessing officer.

The peer review also advised of a number of non-compliances, as follows:

- a. *Model uses 2m² x 0.59m deep whereas actual size from drawings is 5.8m² x 0.7m deep. The model is therefore considered conservative.*
- b. *The Stormwater 360 Stormfilter Operation, Design Maintenance and Performance Manual recommend a minimum of 1500mm headroom inside the vault for maintenance access. The engineering drawings show only 900mm.*
- c. *The Stormwater 360 Stormfilter Operation, Design Maintenance and Performance Manual recommend a minimum hydraulic drop (from inlet to outlet) of 700mm for 460mm cartridges. Section 1 on Sheet C11 shows the difference to be about 600mm, whilst the unnamed section on the storm filter cartridge section detail shows considerably less.*
- d. *The plan and section of the stormfilter cartridge detail on Sheet C11 show the inlet pipe discharging directly into the OSD tank and bypassing the storm filter chamber. This contradicts the detail on Section 1 on Sheet C11.*

Conditions have been included in Appendix 'A' should the development application be recommended for approval by the assessing officer.

6.0 - Construction

The proposal will require a Construction Environmental Management Plan and other additional development controls to manage health, safety and environmental impacts.

Concerns are raised regarding excavations in the vicinity of the existing bluestone wall along the northern boundary in that its integrity may be compromised.

Conditions have been included in Appendix 'A' should the development application be recommended for approval by the assessing officer.

7.0– Public domain and Public Submissions

7.1 – Public domain

The proposal will cause no impact to current levels of on-street parking.

Council will require upgrading along the road frontage in accordance with its Driveway and Footpath Procedures Manual.

Street lighting upgrades are required *Australian Standard AS1158*.

Sub-stations servicing the proposal shall need to be screened from view.

Conditions have been included in Appendix 'A' should the development application be recommended for approval by the assessing officer.

7.2 – Public submissions

Relevant public submission have been responded to in **Table 5**

Table 5 - Public Submissions

Issue	Response
<p>Construction Impacts</p> <ul style="list-style-type: none"> Heavy vehicle movements will impacts on local traffic network and safety. Noise Dust Fumes 	<p>The developer will be required (through consent conditions) to provide a Construction Environmental Management Plan which takes into account all construction impacts.</p> <p>The developer will be required to comply with the <i>Protection of the Environment Operations Act 1997</i> in regard to managing offensive noise, dust and fumes.</p> <p>Heavy vehicle traffic routes will need approval from the Roads Authority before use. The Roads Authority will take into consideration impacts in the public domain prior to any Road Occupancy Approval (issued pursuant to Section 138 of the <i>Roads Act 1993</i>).</p>
<p>Construction Impacts</p> <ul style="list-style-type: none"> Excavation will impact on structural integrity of adjoining buildings 	<p>The developer has a responsibility to adjoining land holders to ensure that buildings on adjoining lands remain unaffected by their developments</p>
<p>Construction Impacts</p> <ul style="list-style-type: none"> How will access be provided to residents and shop keepers to laneway while development under construction. Inadequate provision for pedestrian movements along Shoalhaven Street and through to Terralong Street (particularly access to Edessa Arcade). 	<p>The laneway is proposed to be closed off during the construction period only.</p> <p>Alternative access is provided in the existing road network which has been provided with paved pathways.</p>
<p>Traffic Impacts</p> <ul style="list-style-type: none"> Traffic congestion within local road network. 	<p>The traffic impact assessment undertaken indicates that the traffic generated by the development will result in an average increased delay of no more than 14 seconds at some intersections within the surrounding road network. There will be a 45% increase in daily traffic. The road system is considered capable of providing for the increased traffic associated with the development.</p>
<p>Traffic Impacts</p> <ul style="list-style-type: none"> Akuna Street very narrow to accommodate additional traffic. Increase in traffic by residents and shoppers along Akuna Street. Proposal will increase traffic movements along Akuna and Collins Street. Resulting in traffic conflicts with buses (particularly school busses) that presently travel along Akuna Street. Busses already experience difficulties along Akuna Street due to its narrowness and parking of cars along 	<p>All commercial parking is accessed via Shoalhaven Street.</p> <p>The current use of the site as a carpark accommodates 79 vehicles and accesses Akuna Street. The carpark services the shops in the Kiama township.</p> <p>Using the assessment for the proposal as guide, the 79 spaces currently create up to 800 daily vehicle trips. The residential carpark is proposed to access Akuna Street and the figures in Table 4</p>

north side of this road.	<p>indicate 480 daily vehicle trips will be created.</p> <p>The perceived narrowness and parking of cars has been pointed out by the objectors and this would likely result in Akuna Street not being used as shortcut by a large number of shoppers due to speed limitations.</p> <p>Council is unaware of issues with busses in Akuna Street.</p> <p>It is considered that there is likely to be less traffic in Akuna Street as a result of the proposal.</p>
Traffic Impacts <ul style="list-style-type: none"> Proposal will result in increased traffic movement along Collins and Akuna Streets due prohibition on right turn movements form Terralong into Shoalhaven Street. 	Only articulated vehicles are proposed from being prohibited from making this turn.
Traffic Impacts <ul style="list-style-type: none"> Heavy vehicles turning into Collins Street will create traffic hazard for vehicles travelling along Collins Street. 	Vehicles exiting the access driveway from the development and making a right hand turn will have to do so carefully, just as they would at any intersection. There are no impediments to safe sight distance, which would prevent drivers from doing this. There are likely to be only a limited number of heavy vehicle movements per day.
Traffic Impacts <ul style="list-style-type: none"> Trucks should be prevented from entering Akuna Street from Collins Street. Truck movements travelling along Collins Street will experience difficulties due to steepness and create concerns due to presence of school. 	<p>During operation of the development, there will be no need for trucks to enter Akuna Street or drive up Collins Street.</p> <p>Also of note is that there is a 5 tonne load limit on Collins Street south of Akuna Street. This will remain unchanged and not impact the school.</p>
Noise Impacts <ul style="list-style-type: none"> Collins Street exit also adjacent to day care centre. Noise form heavy vehicles will disturb young children at day care centre. 	The delivery driveway adjacent to the childcare centre is at a flat grade and narrow. It currently serves an existing shopping centre. It is unlikely heavy vehicles will be travelling at excessive speeds, changing gears or using their brakes, which are all activities which can cause offensive noise
Parking <ul style="list-style-type: none"> Not enough parking provided by development. 	The parking meets Council's adopted development controls.
Parking <ul style="list-style-type: none"> Loss of existing public parking on-site (about 100 spaces) and loss of street parking in Shoalhaven and Akuna Streets. There is no plan to replace these spaces. This will lead to additional pressures for parking in town centre Access for residents and shop keepers to parking spaces in CBD during construction will be lost due to work vehicles and 	<p>This is a commercial decision by the current landholder to change the use of the site. The objection is not considered relevant to the assessment.</p> <p>A public parking lot with 52 spaces on the southern side of Akuna Street will remain available. Aerial photo's taken in in 2011, 2012, 2013 and 2016 indicates an average 10% occupancy.</p>

<p>construction vehicles.</p> <ul style="list-style-type: none"> Impacts to shop keepers and tourists during construction. 	
<p>Parking</p> <ul style="list-style-type: none"> Parking controls will lead to parking fees. 	This will be a commercial decision by the future owner/operator. It is not relevant to the application.
<p>Parking</p> <ul style="list-style-type: none"> Parking controls will lead to traffic conflicts in Shoalhaven Street which will require left turn lane into development. This will further result in loss of street parking. 	There is no intention or requirement that a turning lane into the development is required at this time.
<p>Parking</p> <ul style="list-style-type: none"> Traffic congestion and loss of parking along Shoalhaven Street would have adverse impact on Inn business. 	The current proposal indicates that there will be no loss of on-street parking.

APPENDIX A – RECOMMENDED CONSENT CONDITIONS

General Conditions

1. This consent does not include any subdivision of the proposal.
2. No work (including demolition) is to take place until a Construction Certificate has been issued for the development and the relevant conditions of development consent are satisfied and complied with.
3. The development shall not be occupied until such time as all conditions of this Development Consent are met.
4. Prior to the issue of any Construction Certificate the applicant shall provide to the accredited Certifying Authority evidence that:
 - a minimum 300mm wide strip of land located along the southern boundary of Lot 4 in DP 555589 has been provided with a right of carriageway over its entirety (with terms acceptable to Council) benefitting Council and
 - any existing lots in which proposed buildings straddle a boundary have been consolidated with the adjoining lot.
5. Prior to the issue of any Construction Certificate the applicant shall provide to the accredited Certifying Authority certification from a Registered Surveyor that Lot 51 in DP 1200006 has a minimum clear span, free of any obstructions, of at least 3.0 metres over its entirety.
6. The developer at its own cost shall, carry out any necessary amplification or upgrading of the downstream drainage system, including the negotiation and dedication of appropriate easements, to ensure that the treatment standards of this development consent are complied with.
7. The cost of relocation or adjusting of levels of any public utilities shall be borne by the developer.
8. Any substation installed to service the proposal shall not be located within the road reserve and shall be screened from the public domain.
9. All electricity, telecommunications and natural gas services shall be located underground. Common or shared trenching and the document “*A Model Agreement for Local Councils and Utility/Service Providers*” prepared by the NSW Streets Opening Conference are policies adopted for the Kiama Municipal Council Local Government Area.
10. The car wash bays shall be connected to the Sydney Water Corporation's sewer and be subject to a licensed trade waste agreement with the Corporation.

11. Boom gates shall not be installed within any car parking areas unless approved in writing by Council.
12. Furniture and white good pickups and deliveries for the residential apartments shall be undertaken from the commercial delivery area located within the site and not from any public road. Tenants shall be informed of this requirement in their leasing agreements.
13. The applicant shall obtain a Registered professional engineers report for the structural integrity of the existing stone retaining wall along the northern boundary. This report shall be used as a guide in the preparation of the construction certificate drawings and construction program.

Prior to the Issue of a Construction Certificate

14. A legal arrangement shall be made with Council for the use of any land below the 6.095m wide LANE (identified in DP 40304) or airspace above. Evidence of the Council endorsed arrangement shall be sighted by the accredited Certifying Authority prior to the issue of any Construction Certificate.
15. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the following requirements have been met:
 - a. Car parking spaces, parking aisles, blind aisles, access driveways, circulation roadways and ramps comply with the requirements of the following Australian Standards :
 - i. AS 2890.1 - 2004 Off-street car parking;
 - ii. AS 2890.2 - 2002 Off-street commercial vehicle facilities;
 - iii. AS2890.3 - 2015 Bicycle Parking; and
 - iv. AS 2890.6 - 2009 Off-street parking for people with disabilities.
 - b. The car parking area shall be line marked and signposted in compliance with the requirements of the Australian Standards AS 1742.2, AS 1743, AS 1744, AS1906.1, AS 1906.2, AS 1906.3 and AS 4049.1.
 - c. Access and manoeuvring into the proposed delivery areas for all commercial vehicles shall comply with Australian Standard AS 2890.2 - 2002 Off-street commercial vehicle facilities.
16. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the approved plans include a detailed stormwater drainage network designed in accordance with the requirements of "*Section D5 Stormwater Drainage*" of Kiama Development Code as appended to Kiama Development Control Plan 2012.
17. Prior to the issue of any Construction Certificate, the Certifying Authority shall ensure that the approved stormwater plans provide for an on-site detention storage for stormwater runoff in conjunction with the proposed development drainage network. The on-site detention system shall be designed to ensure that post development flow rates from the site are no greater than pre-developed site runoff at each discharge point for all rainfall events up to 1% Annual Exceedance Probability. The applicant shall provide full hydrological and hydraulic computer modelling of the stormwater drainage system to the Certifying Authority for approval prior to the issue of any Construction Certificate.
18. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the approved stormwater plans comply with the plans and modelling lodged in support of the development application for the water quality control system. The following corrections shall be made on engineering plans and submitted to the Certifying Authority for approval prior to issue of a Construction Certificate:
 - The water quality modelling uses a 2m² x 0.59m deep pit whereas the size shown on the drawings is 5.8m² x 0.7m deep.

- The Stormwater 360 Stormfilter Operation, Design Maintenance and Performance Manual recommends a minimum of 1500mm headroom inside the vault for maintenance access. The engineering drawings show only 900mm.
 - The Stormwater 360 Stormfilter Operation, Design Maintenance and Performance Manual recommended a minimum hydraulic drop (from inlet to outlet) of 700mm for 460mm cartridges. Section 1 on Drawing C11 shows the difference to be about 600mm, whilst the unnamed section on the storm filter cartridge section detail shows considerably less.
 - The plan and section of the stormfilter cartridge detail on Drawing C11 show the inlet pipe discharging directly into the OSD tank and bypassing the storm filter chamber. This contradicts the detail on Section 1 on Drawing C11.
19. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the approved stormwater plans provide for overflow paths to allow for flows of water in excess of the capacity of the pipe drainage system draining the land, as well as from any detention storage on the land. Blocked pipe situations with 1 in 100 year ARI events must be incorporated in the design. Overflow paths must also be provided in low points and depressions.
 20. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the stormwater drainage design has been issued with certification from a suitably qualified civil engineer which states that that the constructed stormwater drainage system and water quality system meets with the stormwater requirements conditioned within this consent.
 21. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that the design of the development causes no adverse effects to adjoining properties as a result of stormwater run-off.
 22. Prior to the issue of any Construction Certificate, the accredited Certifying Authority shall ensure that allowance is made for surface run-off from adjoining properties. Any redirection or treatment of that run-off must not adversely affect any other adjoining properties
 23. Prior to the issue of any Construction Certificate the developer shall submit to the accredited Certifying Authority a detailed design plan of the lighting proposed throughout the development and adjoining public road network. The lighting design shall comply with the Australian Standard AS 1158. The developer shall liaise with Council in order to determine the required design treatment for all lighting within the adjoining road network. All work shall be completed prior to the issue of any Occupation Certificate.
 24. The developer shall submit to the accredited Certifying Authority for approval, prior to the issue of any Construction Certificate, a detailed Soil and Water Management Plan (SWMP) designed in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction* Volume 1 (Landcom 2004) and *Managing Urban Stormwater: Soils and Construction* Volume 2 (Department of Environment and Climate Change 2007). All works on the site must be in accordance with the approved SWMP for the full duration of construction works and must provide an overall site detail. For staged development, a SWMP shall be provided for each stage of the development.

Prior to the commencement of Construction

25. Prior to the commencement of work, the developer shall lodge with Council a bond of **\$300,000** in the form of an unconditional bank guarantee or cash, as a security for new and remedial work associated with the development proposal and covering all work within the public roads administered by Council under the Roads Act 1993.

The bond shall be refunded in full subject to the following:-

- a. There being no damage to the existing infrastructure and/or vegetation in the road reserve which can be attributed to the construction of the proposal, and if so, rectification/replacement is undertaken in accordance with the requirements of Council;

- b. There being no damage to the works undertaken in the road reserve, as a result of poor workmanship and/or inferior materials being used, and if so, rectification works are undertaken in accordance with the requirements of Council;
 - c. Twelve (12) months has elapsed from the date of the issue of the Final Occupation Certificate; and
 - d. The submission and approval by Council of a waste compliance certificate inclusive of supporting documentation (dockets/receipts) verifying compliance with the Waste Management Plan as provided to Council.
26. The project engineer shall prepare a Construction Environmental Management Plan (CEMP) and provided to the Principal Certifying Authority for their written endorsement, prior to any works commencing on site. The CEMP shall include, but not be limited to, the following items:
- timing and duration of works;
 - location of work sites offices, compounds, stockpiles and refuelling areas;
 - a description of the site and surrounds and location of environmentally sensitive areas;
 - description of the impacts associated with the construction; activities and control measures;
 - legislative requirements;
 - on-site staff structure and responsibility;
 - staff training, awareness and competency requirements;
 - emergency planning and response;
 - auditing and monitoring; and
 - the supplementary plans:
 - Soil and Water Management Plan;
 - Noise and Vibration Management Plan;
 - Air Quality (Dust Control) Management Plan;
 - Waste Management Plan;
 - Tree Protection Plan; and
 - Traffic and Pedestrian Management Plan
27. The developer shall submit to Council and the Principal Certifying Authority a dilapidation survey and report prepared by a suitably qualified civil engineer of the adjoining development and road network prior to commencement of any work.
28. Before the commencement of any stripping or demolition, all parts of the site shall be examined, by competent specialists, to determine, as far as it is practicable, the presence of noxious, toxic or explosive materials or conditions, which would be hazardous to the health of the public if disturbed by stripping or demolition.
29. Prior to commencement of any work the developer shall provide hoarding around the site where it adjoins a public road and man-proof fencing around the remainder of the site.
30. Prior to commencement of works, the developer shall provide tree protection measures around all trees to be protected, in accordance with Australian Standard AS4970-2009. Work shall not commence until certification from a suitably qualified Arborist stating that compliance with AS4970-2009 has been achieved, and provided to the Principal Certifying Authority and Council.

During Construction

31. The developer shall ensure that all construction work associated with the development is carried out in accordance with the approved Construction Environmental Management Plan (CEMP) and any variations are approved by the Principal Certifying Authority. A copy of the approved CEMP shall be kept on site at all times.
32. No material or plant or equipment shall be stored on a public road without prior permission of the roads authority.

33. Any material deposited on public roads resulting from the works must be removed within the same day.
34. The emission of dust from the site must be controlled and in this regard watering equipment shall be kept on the site at all times for this purpose.
35. A shaker pad is to be installed at the exit point of the site to prevent soil material leaving the site on the wheels of vehicles and other plant and equipment.
36. Sediment traps must be installed on-site around all affected stormwater inlets and drainage lines. All sediment control measures must be maintained on a daily basis until the site has been fully revegetated.
37. Road Occupancy approval, pursuant to Section 138 of the Roads Act 1993 shall be obtained from Council prior to any proposed interruption to pedestrian and/or vehicular traffic within the surrounding road network caused by the construction of the development. The following items shall be submitted to Council with the Road Occupancy Approval a minimum of five days before approval is required:
 - A completed application form;
 - Fees in accordance with Council's adopted fees and charges;
 - A traffic control plan endorsed by a person with Roads & Maritime Services accreditation. The traffic control plan shall satisfy the requirements of the latest versions of Australian Standard AS1742 – Traffic Control Devices for Works on Roads and the RTMS Traffic Control at Worksites Manual. This plan is required to maintain public safety, minimise disruption to pedestrian and vehicular traffic within this locality and to protect services, during demolition, excavation and construction phases of the development;
 - Public liability insurance for an amount of no less than \$20M; and
 - Where excavation will take place, a security bond in accordance with Council's adopted fees and charges.

Where road and footpath levels will be varied or the surface is altered, plans and specifications to Council's requirements shall be provided for assessment and approval.

Prior to the Issue of an Occupation Certificate

38. Pursuant to the requirements of Section 149 of the Roads Act 1993, a lease shall be consented to by Council for any proposed awnings overhanging the road reserve. Evidence of the lease shall be sighted by the Principal Certifying Authority prior to the issue of any Occupation Certificate.
39. A Works-As-Executed (WAE) drawing for all work undertaken shall be submitted to the Principal Certifying Authority prior to the release of any Occupation Certificate. The WAE drawing shall indicate in contrasting coloured ink all changes to the Construction Certificate approved plans and specifications. The WAE plans shall be signed by a Registered Surveyor and certified by a suitably qualified civil engineer stating that all the works as completed, including variations, meet the original intent of the Construction Certificate approved plans and specifications and will have no adverse impact on adjacent properties or on Council infrastructure.
40. Prior to the issue of any Occupation Certificate, the following items shall be provided in the adjoining road network to the satisfaction of Council
 - i. Footpaths adjoining the development site are to be formalised with pavers or concrete paths (or any other material as approved by Council) at a grade of no more than 2.5% from the site boundary to the kerb line. All work shall be designed and constructed in accordance with Council's *"Driveway and Footpath Works Procedure Manual"*;

- ii. Shoulder, footpath, stormwater drainage, part road width, pavement, asphalt surfacing and kerb in Akuna Street for the full length of the property frontage;
- iii. Any redundant vehicle crossing shall be restored to barrier kerb in compliance with Council's *"Driveway and Footpath Works Procedure Manual"*;
- iv. All footpath access driveways in compliance with Council's *"Driveway and Footpath Works Procedure Manual"*;
- v. Central medians in Shoalhaven Street at Bong Bong Street to provide for a dual "Stop" signage on each approach;
- vi. Blisters on the road at the carpark egress to gain improved sight distances;
- vii. Road widening of Shoalhaven Street on the approach to Terralong Street to provide for a short section of two lanes;
- viii. "No right turn" sign for articulated vehicles from Terralong Street into Shoalhaven Street;
- ix. Blind spot mirrors as required;
- x. Line-marking and signposting for re-allocated on-road car parking spaces
- xi. Street lighting;
- xii. Pit lids; and
- xiii. Bollards between the existing laneway and proposed delivery driveway

The requirements listed above shall be shown on plans which demonstrate compliance with the requirements of the Roads Authority and/or Council. Approval shall be pursuant to the requirements of the Roads Act 1993. Prior to any approval the plans shall be referred to the Kiama Traffic Committee (KTC) for endorsement of works in the road reserve.

The approved construction work shall be completed to the satisfaction (in writing) of Council prior to the issue of any Occupation Certificate. The Principal Certifying Authority shall not issue any Occupation Certificate until this certification is provided to them.

- 41. Under the provisions of Section 88B of the Conveyancing Act 1919 the developer shall provide a restriction on the use of land and a positive covenant in favour of Kiama Municipal Council detailing protection measures and long term maintenance requirements for the on-site stormwater detention system and water quality systems. The document shall meet the standard terms applied by Council and shall be submitted to Council for assessment and approval and shall have these titles registered prior to issue of any Occupation Certificate.
- 42. A Section 73 Compliance Certificate under the Sydney Water Act 1994 shall be obtained from Sydney Water. The Section 73 Certificate shall be submitted to Principal Certifying Authority prior to issue of any Occupation Certificate.
- 43. Prior to issue of any Occupation Certificate and/or operation of the development an electronic car parking management system shall be installed for all car parking spaces which are provided for the commercial and retail uses in the development. The minimum requirements for the system shall include ultrasonic detectors for each space that is linked to an electronic message board, located one each level and external to the building, which informs customers of the available spaces remaining. The system shall remain in good working order for the lifespan of the development.
- 44. Prior to issue of any Occupation Certificate, each residential space shall be clearly signposted with the apartment number.

45. Prior to issue of any Occupation Certificate, each residential visitor spaces shall be clearly signposted with the wording that it is a visitor's space. The visitor's space shall not be made unavailable through the location of the security gates.
46. Prior to issue of any Occupation Certificate, each car wash bay shall be clearly signposted with the wording that it is a car wash bay. Each carwash bay shall be supplied with its own individual cold water tap and power point.

Signature**Date**

15/10/2018