WLPP No.	Item No. 1
DA No.	DA-2018/1071
Proposal	Residential - demolition of garage and tree removals, Subdivision - Torrens title - two (2) lots, construction of dual occupancy on rear lot and Subdivision of dual occupancy - Torrens title - two (2) lots
Property	2 Coast Street, THIRROUL NSW 2515
Applicant	Mr Russell Brown, Mrs Carni Brown and Mr Steven Arnold
Responsible Team	Development Assessment and Certification – City Wide Planning Team (RT)

ASSESSMENT REPORT AND RECOMMENDATION

Executive Summary

Reason for consideration by Wollongong Local Planning Panel (WLPP)

The proposal has been referred to the WLPP **for determination** pursuant to part 2(b) of Schedule 2 of the Local Planning Panels Direction, as the application is the subject of 10 or more unique submissions by way of objection.

Proposal

The proposal seeks consent for the following:

- Demolition of the existing garage and tree removals;
- Subdivision – Torrens title – two (2) residential lots (Lots 1 and 2) including access and services infrastructure;
- Construction of a detached dual occupancy on Lot 2; and
- Subdivision – Torrens title – two (2) residential lots (Lots 201 and 202) of existing dual occupancy.

Permissibility

The subject site is zoned R2 Low Density Residential pursuant to Wollongong Local Environmental Plan (WLEP) 2009. Dual Occupancy development and subdivision are permissible with consent in the R2 zone. Demolition and tree removal are ancillary works to facilitate the proposal and as such are also permissible.

Consultation

Details of the proposal were publicly exhibited in accordance with Appendix 1 of the Wollongong Development Control Plan (WDCP) 2009. Sixteen (16) submissions were received. The issues identified are discussed at section 1.5 of this report

Internal

Details of the proposal were referred to Council's Geotechnical, Development Engineering, Environment and Landscape Officers for assessment. Satisfactory referral advice, comments and/or recommended conditions were provided in each instance. Assessment considerations of internal groups as relates to relevant Chapters of the WDCP 2009 are presented at section 2.3.1 of this report.

External

Details of the application submission were referred to the NSW Rural Fire Service for a Bushfire Safety Authority as required under Section 100B of the NSW Rural Fires Act 1997. Advice received indicates the proposal is considered satisfactory and the Bushfire Safety Authority issued.

Main Issues

The main issues resulting from the assessment process are:-

- Variation request regarding the number of storeys development control in Chapter B1 Clause 4.1.2(1) of WDCP2009;
- Tree removals;
- Privacy and amenity issues;
- Traffic impacts and safety; and
- Character of the area.

RECOMMENDATION

DA-2018/1071 be approved subject to the conditions provided in **Attachment 6**.

1.0 APPLICATION OVERVIEW

1.1 PLANNING CONTROLS

The following planning controls apply to the proposal:

State Environmental Planning Policies:

- SEPP No. 55 – Remediation of Land
- SEPP (Building Sustainability Index: BASIX) 2004

Local Environmental Planning Policies:

- Wollongong Local Environmental Plan (WLEP) 2009

Development Control Plans:

- Wollongong Development Control Plan (WDCP) 2009

Other policies

- Wollongong City Wide Development Contributions Plan 2018
- Planning for Bushfire Protection 2006 (PBP 2006)

1.2 DETAILED DESCRIPTION OF PROPOSAL

The application proposes the following phases of development:

Phase 1 - Demolition of the existing garage and tree removals;

Phase 2 - Subdivision – Torrens title – two (2) residential lots (Lots 1 and 2) including access and services infrastructure;

Phase 3 - Construction of a detached dual occupancy on Lot 2; and

Phase 4 - Subdivision – Torrens title – two (2) residential lots (Lots 201 and 202) of existing dual occupancy.

Separate Construction Certificates will be required for phases 2 and 3 with conditions as relevant to each phase to be met.

Separate Subdivision Certificates will be required for phases 2 and 4 with conditions as relevant to each phase to be met.

1.3 BACKGROUND

The development history of the site is as follows:

PL-2018/22, Residential - dual occupancy and subdivision - torrens title -two lots - Completed

DA-2018/1071, Residential - demolition of garage and tree removals, Subdivision - Torrens title - two (2) lots, construction of dual occupancy on rear lot and Subdivision of dual occupancy - Torrens title - two (2) lots – Current Application

Customer service actions:

There are no outstanding customer service requests of relevance to the properties.

1.4 SITE DESCRIPTION

The site is located at 2 Coast Street, THIRROUL and the title reference is Lot 13 Sec O DP 5418.

Situated on the land is single storey brick dwelling with a pitched tile roof. There are several ancillary structures located on the site including a detached garage forward of the dwelling and three (3) small sheds/outbuildings to the rear. The subject site is accessed via driveway off Coast Street.

The land is an irregular shaped allotment with an overall site area of 1669.3m². The site slopes to the front of the block has a cross fall to the East.

The street scene in the immediate vicinity is characterised by low density residential dwellings of single and double storey construction. Adjoining development consists of a double storey dwelling to the West. The adjoining lot to the East has been subdivided and has a two (2) storey dwelling on the front lot and a two (2) storey dwelling on the rear, battle-axe allotment created by the subdivision.

Figure 1: Aerial photograph (2018)

Property constraints

- Unstable
- Flood Risk Precinct- Uncategorised Flood Risk Precinct
- Bushfire Prone Land
- Natural Resource Sensitivity – Biodiversity
- Acid sulphate soils – Class 5

There are no restrictions on the title.

1.5 SUBMISSIONS

Details of the proposal were publicly exhibited in accordance with Appendix 1 of the Wollongong Development Control Plan (WDCP) 2009. Sixteen (16) submissions were received. The main issues identified within the submissions are discussed below.

Table 1: Submissions

Concern	Comment
1. Proposed Tree Removals	Consideration was given to the proposed tree removal and impacts of the proposed development on trees to be retained. Council's Landscape Officer commissioned

Concern	Comment
	an independent arborist report included at **Attachment 2** to assess in particular Tree 12 (Magenta Lilly Pilly) and Tree 20 (Lemon Scented Gum). The independent arborist report considered Tree 12 to not be a long term specimen tolerant of extensive building works or safe enough to increase the target area below the canopy. Tree 20 was found to be a significant tree with no reason for removal and provided the structural design of the footings for Unit 2A could be sympathetic to the Tree Protection Zone (TPZ) of this tree then it should be possible to be retained. Concerns were raised by Council's Landscape and Environment Officers with regard to tree removal, impacts on existing trees to be retained and compensatory planting. Amended Architectural Plans, Landscape Plans, documentation and Arborist Report identifying all trees on the site, impacts on all trees including trees on adjoining properties, protection of Tree 20 and compensatory planting were provided by the applicant. These amended plans and documentation have been reviewed by Council's Landscape and Environment Officers in conjunction with the independent arborist report and are considered to resolve concerns raised. It was noted by Council's Environment Officer that although Tree 12 (Magenta Lilly Pilly) and Tree 21 (Wallangarra White Gum) are both threatened species, Tree 12 is considered a planted specimen based on its habit, location and review of aerial photos and Tree 21 is not considered endemic to the area therefore a 5 part test as per Section 7.3 of the Biodiversity Conservation Act is not required. The six (6) trees to be removed are considered to be in poor health or introduced species such that they are not worthy of retention. Landscaping conditions are included at **Attachment 6** specifying trees to be removed, trees to be retained, compensatory plantings, tree protection and management
2. Subdivision of the Property	Consideration was given to the proposed subdivision of the property. Subdivision of the subject site is permissible pursuant to Clause 2.6(1) of Wollongong Local Environmental Plan 2009. The proposed phase 2 two (2) lot Torrens title subdivision will result in Lot sizes of 790.3m² for Lot 1 and 781.9m² excluding the access handle for Lot 2 which are both compliant with Clause 4.1 Minimum

Concern	Comment
	Subdivision Lot Size of WLEP 2009. Phase 4 of the proposal involves a two (2) lot Torrens title subdivision of the newly constructed dual occupancy. WLEP 2009 Subclause 4.1(4C) identifies that Clause 4.1 does not apply in relation to the subdivision of an existing dual occupancy. A condition relating to the issue of an Occupation Certificate for the detached dual occupancy prior to the application for the phase 4 Torrens title subdivision so that the proposal satisfies subclause 4.1(4C) is included at **Attachment 6**
3. Construction of Dual Occupancy	The proposed development is a permissible use in the R2 zone and satisfies controls for dual occupancy development under WDCP 2009. The proposal is considered to not detract from the existing character of Thirroul and is considered compatible with the desired future character for the locality. The proposed development satisfies Council's Floor Space Ratio and Building Height development standards as identified in the WLEP 2009, and overall the bulk and scale of the proposed development is considered acceptable in this circumstance.
4. Number of Storeys	The number of storeys for Units 2A and 2B are considered acceptable for the following reasons: • It is considered that the proposed development will have minimal impact on the streetscape and the natural setting of the area. The proposed dwellings are separated by distance and roof form from each other and the existing dwelling on the relatively large site. This separation of the buildings is consistent with the built environment of the adjacent and surrounding land. The proposed dwellings fit below the tree canopy line and are screened from the street by the existing dwelling (to be retained), adjoining development and existing mature vegetation. • The variation for Unit 2B is considered to be a minor point encroachment with the remainder of the dwelling presenting as a single storey development. • The proposed development will have minimal impact on the adjoining dwellings in terms of overlooking for the following reasons: - The upper level windows on the eastern elevation of Unit 2A consist of highlight windows within the hallway and bedroom window. Windows on the upper level of the rear elevation consist of bathroom windows. - Unit 2B presents as a single storey dwelling to the adjoining property to the West due to the

Concern	Comment
	topography of the site which results in a cross fall to the East. - Reasonable setbacks consisting of 1m (West) for Unit 2B and 0.95m to the ground floor and 4.07m to the first floor (East) for Unit 2A have been maintained to the side boundaries. - The private open space and living areas have been set on the ground floor of Unit 2A and have been screened to the East by landscaping and privacy screens to minimise overlooking. • The proposed development will have minimal impact on the adjoining dwellings in terms of overshadowing for the following reasons: - Reasonable setbacks have been proposed to the site boundaries. - Reasonable separation distances have been maintained between the proposed dwellings and the adjoining dwellings to the North, East and West. - Reasonable building heights have been proposed. The proposed dwellings are approximately 2.635m for Unit 2A and 3.965m for Unit 2B below the 9m maximum building height. - The proposal complies with bulk and scale controls. • The proposed dwelling has been designed to be sympathetic to and address site constraints. • It is considered that the building character and form of the proposed dwelling is reasonable in this circumstance. There are dwellings of similar bulk and scale within the immediate vicinity of the subject site.
5. Site Drainage	The application submission included a concept stormwater drainage plan which was referred to Council's Development Engineering Officer for comment. Advice received indicates that the stormwater drainage design is considered to be conditionally acceptable. The stormwater drainage design is in accordance with WDCP2009 Chapter E14 and incorporates On Site Detention (OSD) so as to limit the flow rate and ensure there is no increase in flow rates from the site. The OSD will ensure that runoff volumes will discharge at a controlled rate. Conditions as at **Attachment 6** account for the OSD design and stormwater run-off from the proposed development such that is not directed so as to have an

Concern	Comment
	adverse effect on adjoining properties.
6. Private Open Space for Unit 2A	Unit 2A has a 24m² area of private open space in the form of a deck recessed into the Eastern elevation of the ground floor with direct connectivity to the living areas. This deck is setback 1.5m form the Eastern side boundary and does not project closer than the Eastern elevation of the dwelling which has an Eastern side setback of 0.95m. A 1.5m wide landscaping bed with screen planting has been provided along Eastern elevation of the private open space for Unit 2A so as to minimise privacy impacts. A design condition as at **Attachment 6** requires the replacement of the 1.2m high balustrade with a 1.5m high solid balustrade or privacy screen so as to minimise privacy impacts on the adjoining property to the East. A second area of lawn is located to the rear of Unit 2A providing a further area of private open space. The proposed development satisfies the objectives and standards of Council's private open space controls in this circumstance.
7. Traffic Safety	Consideration was given to traffic safety in the assessment of the application. Details of the application were referred to Council's Development Engineering Officer for comment. Advice received indicates that the car parking, access and egress arrangements and manoeuvring are acceptable in this circumstance for the following reasons: - Council's DCP requires five (5) parking spaces for the proposed development. The proposal provides five (5) onsite parking spaces. - The proposed development satisfies Council's driveway cross over width controls thus minimising impacts on street parking spaces. - The proposed development will result in a maximum of 1.3 additional trips in the peak hour based on RMS rates. Therefore it is considered that the traffic generated by the proposed development will not be unreasonable in this circumstance, and is within the capacity of the local road network. - The proposed access arrangement will improve existing egress arrangements for the site by allowing vehicles to now leave the site in a forward facing direction.
8. Character of the Area	Chapter D1 indicates that for the treed upper slopes of Thirroul moderately pitched roof lines are preferred, new dwellings on sloping sites should be stepped down

Concern	Comment
	the slope to minimise disturbance of the natural contours and designed to fit below the tree canopy line. The proposal provides for retention of the existing dwelling, Torrens title subdivision creating a battle-axe allotment to the rear and dual occupancy development on the newly created rear lot on the subject site. The proposed dual occupancy dwellings are considered generally consistent with the future desired character of the leafy upper slopes of Thirroul proposing clad dwellings with moderately pitched iron roofing separated by distance and roof form from each other and the existing dwelling on the relatively large site. This separation of the buildings is consistent with the built environment of the adjacent and surrounding land. The proposed dwellings are considered to have been stepped to follow the cross fall of the site and minimise disturbance of the natural contours and fit below the tree canopy line. The subject site is located within the lower section of the slopes above the railway line. Surrounding properties include residential development within a leafy setting. Adjoining development consists of a double storey dwelling to the West. The adjoining lot to the East has been subdivided and has a two (2) storey dwelling on the front lot and a two (2) storey dwelling on the rear, battle-axe allotment created by the subdivision. Further examples of larger lots being subdivided to create battle-axe allotments with two (2) storey dwellings constructed on the rear lot can be found within close proximity to the site. The proposed development satisfies Council's Floor Space Ratio and Building Height development standards as identified in the WLEP 2009, and overall the bulk and scale of the proposed development is considered acceptable in this circumstance. The proposed development is a permissible use in the R2 zone and satisfies controls for dual occupancy development under WDCP 2009. The proposal is considered to not detract from the existing character of Thirroul and is compatible with the desired future character for the locality.
9. Devaluation of Property	Devaluation of property by a proposed development is not a head of consideration under Section 4.15 of the Environmental Planning and Assessment Act.
10. Overdevelopment of the Site	The proposed development satisfies Council's Floor Space Ratio and Building Height development standards as identified in the WLEP 2009, and overall the bulk and

Concern	Comment
	scale of the proposed development is considered acceptable in this circumstance. The proposal it is considered satisfies the controls for dual occupancy development under WDCP 2009. The development has been designed so as to minimise impacts on the natural contours by stepping across the site. Inherent site constraints in the form existing mature vegetation have been considered such that only trees in poor health or introduced species are proposed to be removed. Therefore it is considered that the development as proposed is not an over development of the site.

Table 2: Number of concerns raised in submissions

Concern	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Frequency	*15*	*13*	*14*	*11*	*12*	*10*	*11*	*8*	*1*	*4*

Submissions from public authorities

NSW Rural Fire Service

Details of the application submission were referred to the NSW Rural Fire Service for a Bushfire Safety Authority as required under Section 100B of the NSW Rural Fires Act 1997. Advice received indicates the proposal is considered conditionally satisfactory.

1.6 CONSULTATION

1.6.1 INTERNAL CONSULTATION

Geotechnical Engineer

Council's Geotechnical Officer has assessed the application submission and provided conditionally satisfactory advice.

Development Engineering Officer

Council's Development Engineering Officer has assessed the application submission in regard to traffic, stormwater and subdivision matters and provided conditionally satisfactory advice.

Landscape Officer

Council's Landscape Officer has assessed the application submission and provided conditionally satisfactory advice.

It is noted that particular consideration was given to tree removal and impacts of the proposed development on trees to be retained by Council's Landscape Officer. Council's Landscape Officer commissioned an independent arborist report included at **Attachment 2** to assess in particular Tree 12 (Magenta Lilly Pilly) and Tree 20 (Lemon Scented Gum).

The independent arborist report considered Tree 12 to not be a long term specimen tolerant of extensive building works or safe enough to increase the target area below the canopy. Tree 20 was found to be a significant tree with no reason for removal and provided the structural design of the footings for Unit 2A could be sympathetic to the Tree Protection Zone (TPZ) of this tree then it should be possible to be retained.

Concerns were raised by Council's Landscape Officer with regard to tree removal, impacts on existing trees to be retained and compensatory planting. Amended Architectural Plans, Landscape

Plans, documentation and Arborist Report identifying all trees on the site, impacts on all trees including trees on adjoining properties, protection of Tree 20 and compensatory planting were provided by the applicant. These amended plans and documentation have been reviewed by Council's Landscape Officer in conjunction with the independent arborist report and are considered to resolve concerns raised. The six (6) trees to be removed are considered to be in poor health or introduced species such that they are not worthy of retention.

Landscaping conditions are included at **Attachment 6** specifying trees to be removed, trees to be retained, compensatory plantings, tree protection and management.

Environment Officer

Council's Environment Officer has assessed the application submission and provided conditionally satisfactory advice.

It is noted that particular consideration was given to Tree 12 (Magenta Lilly Pilly) and Tree 21 (Wallangarra White Gum) both threatened species and Tree 21 (Lemon Scented Gum). Initial concerns were raised regarding the proposed removal and/or impacts on these trees. Amended Architectural Plans, Landscape Plans, documentation and Arborist Report identifying all trees on the site, impacts on all trees including trees on adjoining properties, protection of Tree 20 and compensatory planting were provided by the applicant. These amended plans and documentation have been reviewed by Council's Environment Officer in conjunction with the independent Arborist Report commissioned by Council's Landscape Officer and are considered to resolve concerns raised.

It was noted by Council's Environment Officer that although Tree 12 (Magenta Lilly Pilly) and Tree 21 (Wallangarra White Gum) are both threatened species, Tree 12 is considered a planted specimen based on its habit, location and review of aerial photos and Tree 21 is not considered endemic to the area therefore a 5 part test as per Section 7.3 of the Biodiversity Conservation Act is not required.

Conditions are included at **Attachment 6** specifying environmental site management measures to be taken during construction.

1.6.1 EXTERNAL CONSULTATION

NSW Rural Fire Service

Details of the application submission were referred to the NSW Rural Fire Service for a Bushfire Safety Authority as required under Section 100B of the NSW Rural Fires Act 1997. Advice received indicates the proposal is considered satisfactory and the Bushfire Safety Authority issued.

2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 – 4.15 EVALUATION

2.1 SECTION 4.15(1)(A)(1) ANY ENVIRONMENTAL PLANNING INSTRUMENT

2.1.1 STATE ENVIRONMENTAL PLANNING POLICY NO. 55 – REMEDIATION OF LAND

7 Contamination and remediation to be considered in determining development application

(1) A consent authority must not consent to the carrying out of any development on land unless:

(a) it has considered whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

A desktop audit of the subject site revealed there is no previous history of land uses that could be considered to present as a contamination risk. The earthworks are considered minor, reflective of normal residential construction and the proposal does not comprise a change of use. Council's

Environmental Officer has reviewed the history of the site in conjunction with details of the application submission. Satisfactory referral advice was received indicating no concerns are raised in regard to contamination as relates to the intended use of the land and the requirements of clause 7.

The site is therefore considered suitable for the proposed development and consistent with the assessment considerations of SEPP 55.

2.1.2 STATE ENVIRONMENTAL PLANNING POLICY (BUILDING SUSTAINABILITY INDEX: BASIX) 2004

SEPP BASIX applies to the development. In accordance with Schedule 1 of the Regulations and the requirements of the SEPP, a BASIX Certificate has been submitted in support of the application demonstrating that the proposed development achieves the BASIX targets.

2.1.3 STATE ENVIRONMENTAL PLANNING POLICY (VEGETATION IN NON-RURAL AREAS) 2017

Application lodged 30 August 2018.

Under Clause 7 of *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* a person must not clear any vegetation in any non-rural area of the State to which Part 3 applies without the authority conferred by a permit granted by the council under that Part.

Clause 9 of Part 3 indicates that this Part applies to vegetation in any non-rural area of the State that is declared by a development control plan to be vegetation to which this Part applies.

The subject site is zoned R2 Low Density Residential a non-rural area. It is considered that the vegetation proposed to be removed is vegetation declared by a development control plan, WDCP 2009 Chapter E17, to which Part 9 would apply.

Council's Landscape and Environment Officers have assessed the application submission, which included an Arborist Report, Independent Arborist Report and letter of compliance by the applicants Bushfire Consultant. Conditionally satisfactory referral advice was received and conditions as at **Attachment 6** specify trees to be removed, trees to be retained, compensatory plantings and tree protection and management.

2.1.4 WOLLONGONG LOCAL ENVIRONMENTAL PLAN 2009

Part 1 Preliminary

Clause 1.4 Definitions

Demolition: In relation to a building means wholly or partly destroy, dismantle or deface the building.

Dual Occupancy is defined as two (2) dwellings (whether attached or detached) on one lot of land (not being an individual lot in a strata plan or community title scheme), but does not include a secondary dwelling.

Dual occupancy (detached) means 2 detached dwellings on one lot of land, but does not include a secondary dwelling.

Note. Dual occupancies (detached) are a type of ***dual occupancy***—see the definition of that term in this Dictionary.

Subdivision of land for the purposes of the Environmental Planning & Assessment Act 1979, means the division of land into two or more parts that, after the division, would be obviously adapted for separate occupation, use or disposition. The division may (but need not) be effected:

(a) by conveyance, transfer or partition, or

(b) by any agreement, dealing, plan or instrument rendering different parts of the land available for separate occupation, use or disposition.

Part 2 Permitted or prohibited development

Clause 2.2 – zoning of land to which Plan applies

The zoning map identifies the land as being zoned ***R2 Low Density Residential***.

Figure 2: WLEP 2009 zoning map

Clause 2.3 – Zone objectives and land use table

The objectives of the zone R2 Low Density Residential are as follows:

- *To provide for the housing needs of the community within a low density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*

It is considered that the proposed dual occupancy is generally satisfactory with regards to the above objectives for Zone R2 Low Density Residential.

The land use table permits the following uses in the zone.

ZONE R2 Low Density Residential permitted uses:

Attached dwellings; Bed and breakfast accommodation; Boarding houses; Boat launching ramps; Child care centres; Community facilities; **Dual occupancies**; Dwelling houses; Environmental facilities; Exhibition homes; Exhibition villages; Group homes; Health consulting rooms; Hospitals; Hostels; Information and education facilities; Jetties; Multi dwelling housing; Neighbourhood shops; Places of public worship; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Residential flat buildings; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Signage; Veterinary hospitals

The proposal is categorised as a dual occupancy and subdivision and is permissible in the R2 Low Density Residential zone with development consent. Demolition and tree removal are ancillary works to facilitate the proposal and as such are also permissible.

Clause 2.6 Subdivision—consent requirements

Subdivision is permissible with consent as the subject site is on land to which the Wollongong Local Environmental Plan 2009 applies.

Clause 2.7 Demolition requires development consent

Demolition of a building may be carried out only with development consent. The demolition of the existing detached garage on the land is required to facilitate access to the development as proposed.

Part 4 Principal development standards

Clause 4.1 Minimum subdivision lot size

The minimum allotment size for the subdivision of land under Part 4.1 of WLEP2009 is 449m². The proposed phase 2 two (2) lot Torrens title subdivision will result in Lot sizes of 790.3m² for Lot 1 and 781.9m² excluding the access handle for Lot 2 which are both compliant with the clause.

Phase 4 of the proposal involves a two (2) lot Torrens title subdivision of the newly constructed dual occupancy. Subclause 4.1(4C) identifies that clause 4.1 does not apply in relation to the subdivision of an existing dual occupancy. A condition relating to the issue of an Occupation Certificate for the detached dual occupancy prior to the application for the phase 4 Torrens title subdivision so that the proposal satisfies subclause 4.1(4C) is included at **Attachment 6**.

Clause 4.3 Height of buildings

The proposed building height of 6.365m for Unit 2A and 5.035m Unit 2B does not exceed the maximum of 9m permitted for the site.

The proposal does not alter the building height of the existing dwelling.

Clause 4.4 Floor space ratio

Maximum FSR permitted for the site:	0.5:1
Resultant FSR provided for Lot 1:	104.8m²/790.3m² = 0.133:1 (existing dwelling)
Resultant FSR provided for Lot 2	322.11m²/882m² = 0.365:1 (dual occupancy)
Resultant FSR provided for Lot 201:	167.538m²/462m² = 0.36:1 (Unit 2A)
Resultant FSR provided for Lot 202:	154.573m²/420m² = 0.37:1 (Unit 2B)

The proposed floor space ratio does not exceed the maximum permissible for the site.

Part 7 Local provisions – general

Clause 7.1 Public utility infrastructure

The proposal has been assessed against Clause 7.1 of WLEP2009 and it is considered that the subject site is already serviced by public utilities which can be augmented to service the new proposal.

Clause 7.2 Natural resource sensitivity – biodiversity

A small portion of the site is identified as “Natural Resource Sensitivity – Biodiversity”. No works are proposed within the area of the site mapped as “Natural Resource Sensitivity – Biodiversity”.

Details of the application submission including the Arborist report, Bushfire report and the NSW Rural Fire Services referral response were referred to Council’s Environment and Landscape Officers for comment.

Conditionally satisfactory referral advice was received and conditions are included at **Attachment 6**.

Figure 3: WLEP 2009 "Natural Resource Sensitivity – Biodiversity" map

Clause 7.3 Flood planning area

The land is identified as being flood affected. Council's Development Engineering Officer has assessed the application submission in this regard and has not raised any objections subject to conditions.

Clause 7.5 Acid Sulfate Soils

The subject site is identified as being affected by Class 5 acid sulphate soils and is less than 100m from a Class 4 acid sulphate soils area. However as the proposed works for the development are to be located at and above 21m A.H.D and are not likely to lower the water table beyond 1m it is considered that there is minimal impact. The application submission has been assessed by Council's Environment Officer in this regard and is considered satisfactory.

Clause 7.6 Earthworks

Earthworks associated with the proposal are considered minor, reflective of normal residential construction and thus acceptable in this circumstance. Council's Geotechnical Officer has assessed the application submission and considered it satisfactory subject to conditions.

2.2 SECTION 4.15(1)(A)(II) ANY PROPOSED INSTRUMENT

None applicable to the site or proposed development.

2.3 SECTION 4.15(1)(A)(III) ANY DEVELOPMENT CONTROL PLAN

2.3.1 WOLLONGONG DEVELOPMENT CONTROL PLAN 2009

The development has been assessed against the relevant chapters of WDCP 2009. Compliance tables can be found at **Attachment 4** to this report. The proposal does involve a variation to the number of storeys on a battle-axe lot control for Units 2A and 2B. A variation request statement with justification has been provided by the applicant in accordance with clause 8 of Chapter A1 of WDCP

2009 and is included at **Attachment 5**. The variation has been considered and is capable of support in this instance as discussed within **Attachment 4** of this report.

2.3.2 WOLLONGONG CITY WIDE DEVELOPMENT CONTRIBUTIONS PLAN 2018

The estimated cost of works is $600,000 and a levy of 1% is applicable under this plan as the threshold value is $100,000.

2.4 SECTION 4.15(1)(A)(IIIA) ANY PLANNING AGREEMENT THAT HAS BEEN ENTERED INTO UNDER SECTION 7.4, OR ANY DRAFT PLANNING AGREEMENT THAT A DEVELOPER HAS OFFERED TO ENTER INTO UNDER SECTION 7.4

There are no planning agreements entered into or any draft agreement offered to enter into under S7.4 which affect the development

2.5 SECTION 4.15(A)(IV) THE REGULATIONS (TO THE EXTENT THAT THEY PRESCRIBE MATTERS FOR THE PURPOSES OF THIS PARAGRAPH)

92 What additional matters must a consent authority take into consideration in determining a development application?

A condition at **Attachment 6** requires compliance with AS 2601 for demolition works.

93 Fire safety and other considerations

Not applicable as there is no change of use proposal.

94 Consent authority may require buildings to be upgraded

Not applicable

2.6 SECTION 4.15(1)(B) THE LIKELY IMPACTS OF DEVELOPMENT

Context and Setting:

In regard to the matter of context, the planning principle in Project Venture Developments v Pittwater Council [2005] NSWLEC 191 is relevant in that it provides guidance in the assessment of compatibility. The two major aspects of compatibility are physical impact and visual impact. In assessing each of these the following questions should be asked:

- Are the proposals physical impacts on surrounding development acceptable? The physical impacts include constraints on the development potential of surrounding sites.
- Is the proposals appearance in harmony with the buildings around it and the character of the street?

In response to the first question, matters such as overshadowing, privacy concerns, bulk scale and setbacks are relevant. The proposed development is for a 4 phase development involving subdivision and dual occupancy development. The proposed lots allow for reasonable siting of the proposed dwellings to satisfy the objectives of Council's boundary setback requirements so as to have minimal impact on the adjoining properties in terms of privacy and overshadowing and to allow reasonable solar access to the proposed dwellings.

In regard to the visual impact, the development is considered to be largely in harmony with the surrounding character the area. The immediate area surrounding the site is characterised by low density residential development of varying architectural styles within a leafy area of the suburb. The proposed development satisfies Council's Floor Space Ratio and Building Height development standards as identified in the WLEP 2009, and overall the bulk and scale of the proposed development is considered acceptable in this circumstance.

Though views to the rear of the block are obscured by existing development and the leafy outlook of the street it is considered that the scale of the development as viewed from the street is comparable

to other developments in the locality.

In summary, the proposal has been assessed with regard to the amenity impacts from the development, the zoning, permissible lot size and existing and future character of the area, and is considered to be compatible with the local area.

Access, Transport and Traffic:

Access to the site will be via an approved right of carriageway to Council's formed roadway which adjoins Council's Local Road. The development is considered not to result in an adverse impact on the traffic movement and access to the site. Council's Development Engineering Officer has no objections to the proposed access arrangements subject to conditions included at **Attachment 6**.

Public Domain:

The development is considered to be consistent with the amenity of the locality, the development is not considered to result in significant impact on the public domain.

Utilities:

The proposal is not envisaged to place an unreasonable demand on utilities supply. Existing utilities can be augmented to service the proposal.

Heritage:

No heritage items will be impacted by the proposal.

Other land resources:

The proposal is considered to contribute to orderly development of the site and is not envisaged to impact upon valuable land resources.

Water:

The site is presently serviced by Sydney Water, and the proposal is not envisaged to have unreasonable water consumption. A BASIX certificate has been provided for the proposal.

Soils:

It is expected that, with the use of appropriate erosion and sedimentation controls during construction, soil impacts will not be unreasonably adverse.

The soil profile is considered to be acceptable for the construction of the proposed development. Council's Geotechnical, Development Engineering and Environment Officers have assessed the application submission and considered it satisfactory subject to conditions.

Air and Microclimate:

The proposal is not expected to have a negative impact on air or microclimate.

Flora and Fauna:

Trees are proposed to be removed as part of this proposal to make way for the proposed development. The proposal is not expected to adversely impact fauna. Council's Landscape and Environment Officers have reviewed the application submission including the Arborist report, independent Arborists Report and landscape plan, and raised no issues with the proposed removal of the trees subject to conditions that specify trees to be removed, trees to be retained, tree protection and management and compensatory plantings.

Conditions are included at **Attachment 6** that account for inspection of trees for wildlife prior to removal, contacting WIRES for advice and protection of wildlife during tree removal.

For Council's Environment and Landscape Officers response please see Section 1.6.1 of the report.

Waste:

Waste management during construction can be managed through proper arrangements. A condition is proposed requiring the use of an appropriate receptacle for any waste generated during the construction and compliance with the Site Waste Management and Minimisation Plan provided with the DA.

Energy:

The proposal is not envisaged to have unreasonable energy consumption. A BASIX certificate has been provided for the proposal.

Noise and vibration:

Noise and vibration impacts during demolition, excavation and construction are unavoidable. If the development is approved, a suite of conditions are recommended for imposition (see **Attachment 6**) to minimise nuisance during demolition and construction.

Natural hazards:

There are no natural hazards affecting the site that would prevent the proposal.

Council records list the site as bushfire affected. The application was referred to the NSW RFS for comments in regards to Planning for Bushfire Protection 2006 and authorisation under section 100B of the Rural Fires Act 1997. The NSW RFS considered the application acceptable in this circumstance and the Bushfire Safety Authority issued. For the NSW RFS response please see section 1.6.2 External Consultation of this report.

Council records list the site as being flood affected. Council's Development Engineering Officer has assessed the application submission in this regard and has not raised any objections subject to conditions.

Technological hazards:

There are no technological hazards affecting the site that would prevent the proposal.

Council records list the site as being potentially unstable land. The application submission has been assessed by Council's Geotechnical Officer who considered the application conditionally satisfactory.

The proposal is identified as being affected by class 5 acid sulphate soils. The application submission has been assessed by Council's Environment Officer in this regard and is considered satisfactory. It is considered that there is minimal impact and threat presented by Acid Sulphate Soils.

Safety, Security and Crime Prevention:

This application does not result in greater opportunities for criminal or antisocial behaviour.

Social Impact:

The proposal is not expected to create negative social impacts.

Economic Impact:

The proposal is not expected to create negative economic impacts.

Site Design and Internal Design:

The application does not result in any departures from development standards. The application identifies a variation to the number of storeys (number of storeys on a battle-axe allotment) control in Chapter B1 Clause 4.1.2(1) of WDCP2009. This variation has been considered in section 2.3.1 as being adequately justified and is thus capable of support.

Construction:

Conditions of consent are recommended in relation to construction impacts such as hours of work,

erosion and sedimentation controls, works in the road reserve, excavation, demolition and use of any crane, hoist, plant or scaffolding. A condition will be attached to any consent granted that all works are to be in compliance with the Building Code of Australia.
Cumulative Impacts: The development is considered consistent with the amenity of the neighbourhood and to be consistent with the surrounding development.

2.8 SECTION 4.15(1)(C) THE SUITABILITY OF THE SITE FOR DEVELOPMENT

Does the proposal fit in the locality?

The proposal is considered appropriate with regard to the zoning of the site and is not expected to result in negative impacts on the amenity of the locality or adjoining developments.

Are the site attributes conducive to development?

There are no site constraints that would prevent the proposal.

2.9 SECTION 4.15(1)(D) ANY SUBMISSIONS MADE IN ACCORDANCE WITH THIS ACT OR THE REGULATIONS

See section 1.5 of this report.

2.10 SECTION 4.15(1)(E) THE PUBLIC INTEREST

The proposal is not expected to result in unreasonable impacts on the environment or the amenity of the locality. It is considered appropriate with consideration to the zoning and the character of the area and is therefore considered to be in the public interest.

3 CONCLUSION

The proposed development has been assessed with regard to the relevant prescribed matters for consideration outlined in Section 4.15 of the Environmental Planning & Assessment Act 1979, the provisions of Wollongong Local Environmental Plan 2009 and all relevant Council DCPs, Codes and Policies and found to be satisfactory.

Both subdivisions and dual occupancies are permitted in the R2 land use zone with development consent pursuant to the WLEP 2009. The proposal does not result in exceptions to development standards.

The proposal does involve a variation to the number of storeys on a battle-axe allotment control for Units 2A and 2B. A variation request statement with justification has been provided by the applicant in accordance with clause 8 of Chapter A1 of WDCP 2009. The variation has been considered and is capable of support in this instance as discussed within section 2.3.1 of this report.

The design of the development is appropriate with regard to the controls outlined in the Wollongong DCP 2009.

Some of the issues raised in the public submissions have been resolved by the applicant in the submission of amended plans/additional information. Any unresolved issues are not considered sufficient to warrant refusal of the application.

All internal and external referrals are satisfactory and there are no outstanding issues.

It is considered that the proposed development is unlikely to result in adverse impacts on the character or amenity of the surrounding area, environment and adjoining development.

4 RECOMMENDATION

DA-2018/1071 be approved pursuant to Section 4.16(1) of the Environmental Planning & Assessment Act 1979 subject to the conditions provided at **Attachment 6**.

5 ATTACHMENTS

1 Plans and Arborist Report

2 Independent Arborist Report commissioned by Council

3 Site Inspection Photos

4 Compliance table for Wollongong Development Control Plan 2009

5 Clause 8 Variation to Development Control Statement

6 Conditions

ATTACHMENT 1 - PLANS AND ARBORIST REPORT

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval

Legend

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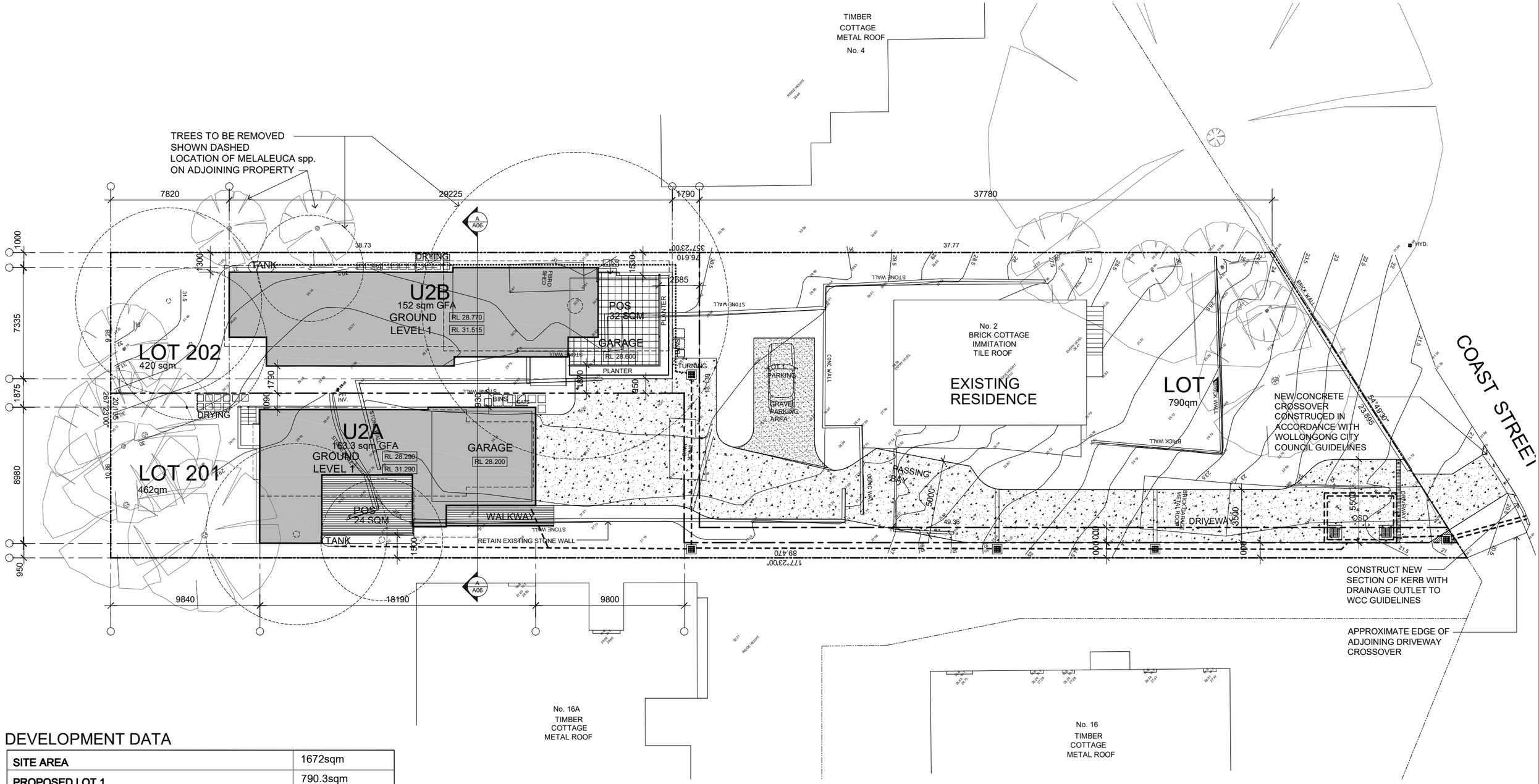
PO Box 119, Thirroul, NSW, 2515. Tel. 0449 284488 e. steve@developmyland.com.au

PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:		Job No.	Dwg.No
SITE CONTEXT ANALYSIS		DML 17/028	A-00
FOR: Arnold & Brown	Scale 1:250 (A3)	Date 01.02.18	Rev. A



DEVELOPMENT DATA

SITE AREA	1672sqm
PROPOSED LOT 1	790.3sqm
PROPOSED LOT 2	882sqm
PROPOSED LOT 2 (EXCL. ACCESS HANDLE)	781.9sqm
PROPOSED BUILDING AREA LOT 1	100 sqm
PROPOSED BUILDING AREA LOT 2	315.3 sqm
PROPOSED FSR LOT 1	0.127:1
PROPOSED FSR LOT 2 (EXCLUDES 36sqm GARAGE)	0.403:1
PROPOSED SITE COVERAGE LOT 2	300.45sqm (24%)
PROPOSED LANDSCAPE AREA LOT 2	274.68sqm (35%)
PROPOSED ON SITE CARPARKING (LOTS 1 & 2)	5 spaces

DEVELOPMENT DATA - LOT 201

PROPOSED SITE AREA	462 sqm
PROPOSED SITE AREA EXCL. ACCESS HANDLE	410.77 sqm
PROPOSED BUILDING AREA / FSR	163.33sqm (0.397:1)
PROPOSED SITE COVERAGE	117.3sqm (0.285:1)
PROPOSED LANDSCAPE AREA	149.11 sqm (36.3%)
PROPOSED DEEP SOIL AREA	58 sqm (14.11%)
PROPOSED ON SITE CARPARKING	2 SPACES

DEVELOPMENT DATA - LOT 202

PROPOSED SITE AREA	420 sqm
PROPOSED SITE AREA EXCL. ACCESS HANDLE	360.35 sqm
PROPOSED BUILDING AREA / FSR	152 sqm (0.421:1)
PROPOSED SITE COVERAGE	183.15sqm (50.8%)
PROPOSED LANDSCAPE AREA	125.57 sqm (34.8%)
PROPOSED DEEP SOIL AREA	44 sqm (12.2%)
PROPOSED ON SITE CARPARKING	2 SPACES

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue
27.03.19	C	Revised DA Issue

Legend

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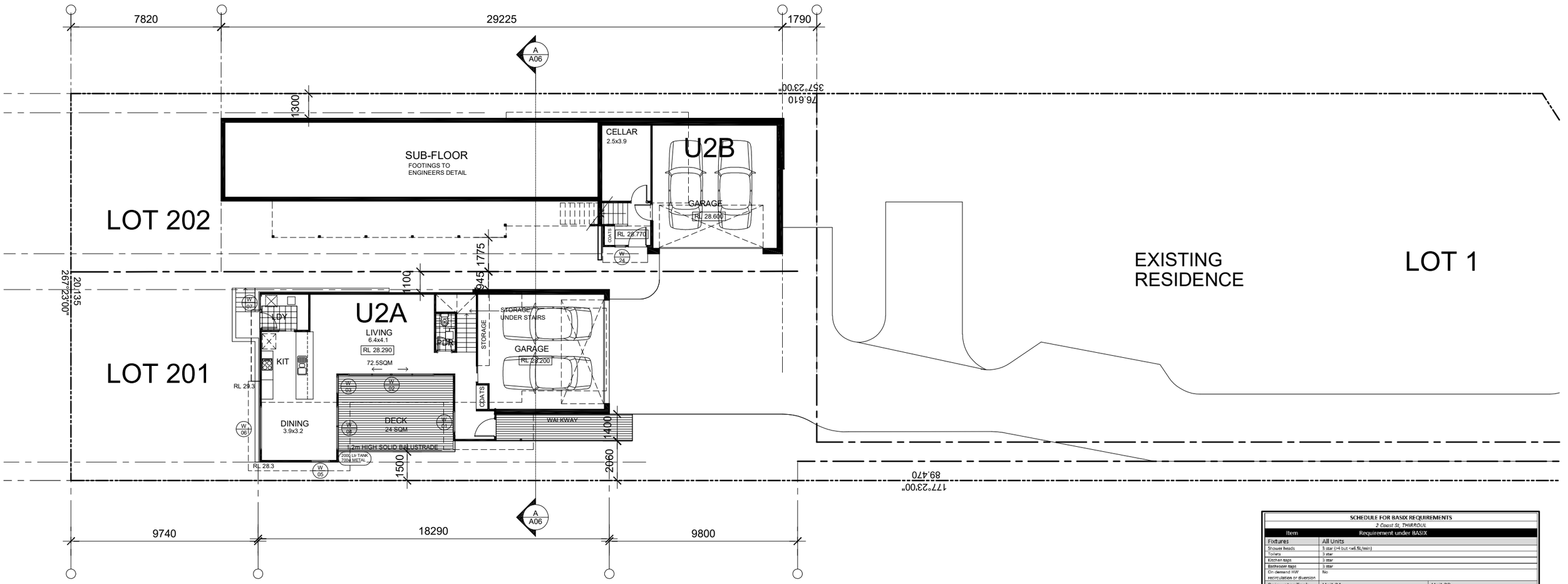
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name: SITE PLAN		Job No. DML 17/028	Dwg.No A-01
FOR: Arnold & Brown	Scale 1:250 (A3)	Date 01.02.18	Rev. C



SCHEDULE FOR BASIX REQUIREMENTS

2 Coast St, THIRROUL

Item	Requirement under BASIX	
Fixtures	**All Units**	
Shower heads	3 star (>4 but <=6.5L/min)	
Toilets	3 star	
Kitchen taps	3 star	
Bathroom taps	3 star	
On demand HW recirculation or diversion	No	
Rainwater Tank	**Unit 2A**	**Unit 2B**
Rainwater Tank	2000L - Capturing 130m² - Plumbing to Landscape, Laundry	2000L - Capturing 170m² - Plumbing to Landscape, Laundry

Thermal Comfort	All Units
Building Elements	External Walls: Brick Veneer, R2.5, DEFAULT Medium in colour, No insulation to 2B Garage External Walls: FC Cladding, R2.5, DEFAULT Medium in colour Internal Walls: Plasterboard, R2.5 between garage & dwelling, R2 between unconditioned zones and dwelling (ie. laundry, bathroom, wc) Roof: Colorbond Roof 10 & 1deg, R1.3 Anticon, DEFAULT Medium in colour Ceiling: Plasterboard (horizontal & raked), R4 Floor: Concrete slab on ground, no insulation Floor: Suspended timber above plasterboard, no insulation between levels, R2.5 to garage ceiling below dwelling. Floor Coverings: DEFAULT – Tiles to wet areas, Bare concrete to garage, Carpet to all other areas
Glazing	DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.57, Type A: Awning – W7, W35, W36, W37 DEFAULT : Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.7, TypeB: Louvres, Fixed – W12, W13, W24, W38-W42, W44 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.49, Type A: Awning – W6, W9, W10 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.58, Type B: Louvres, Fixed, Sliding – W1, W3, W5, W8, W11, W14-W23, W31, W43, W45 DEFAULT: Alum, Double Glazed, Clear, U-Value: 4.8, SHGC: 0.59, Type B: Sliding – W2, W4 DEFAULT: Alum, Double Glazed, Low Solar Gain Low E, U-Value: 4.9, SHGC: 0.33, Type A: Awning – W46, W47, W48 DEFAULT: Alum, Double Glazed, High Solar Gain Low E, U-Value: 4.3, SHGC: 0.53, Type B: Fixed, Sliding – W25-W30

Energy Commitments	All Units
Hot Water	Gas Instantaneous – 6 Star
Cooling System	No active system
Heating System	No active system
Bathroom Ventilation	2A: Individual fan ducted to façade or roof, manual on/off switch (internal WC only modelled in NatHERS) 2B: Natural ventilation only
Kitchen Ventilation	Individual fan ducted to façade or roof, manual on/off switch (modelled in NatHERS)
Laundry Ventilation	Natural ventilation only
LED Lighting	ALL lighting (no recessed downlights modelled in NatHERS)
Fridge Space	Well ventilated
Kitchen Appliances	Gas cooktop, Electric oven
Clothes Line	Outdoor Private
Alternative Energy	None

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue

Legend

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PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:	Job No.	Dwg.No
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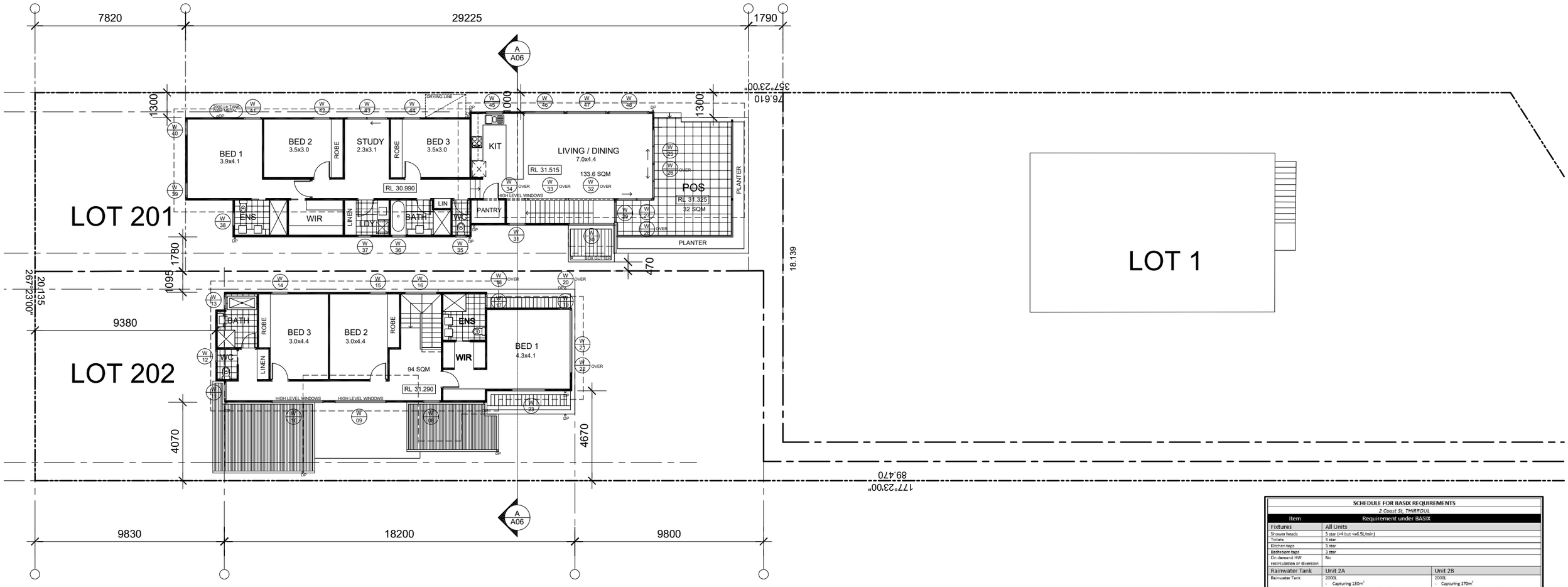
FOR: Arnold & Brown	**Scale** 1:250 (A3)	**Date** 01.02.18
		Rev. B



SCHEDULE FOR BASIX REQUIREMENTS

2 Coast St, THIRROUL

Item	Requirement under BASIX	
Fixtures	**All Units**	
Shower heads	3 star (>4 but <=6.5L/min)	
Toilets	3 star	
Kitchen taps	3 star	
Bathroom taps	3 star	
On demand HW recirculation or diversion	No	
Rainwater Tank	**Unit 2A**	**Unit 2B**
Rainwater Tank	2000L - Capturing 130m² - Plumbing to Landscape, Laundry	2000L - Capturing 170m² - Plumbing to Landscape, Laundry

Thermal Comfort	All Units
Building Elements	External Walls: Brick Veneer, R2.5, DEFAULT Medium in colour, No insulation to 2B Garage External Walls: FC Cladding, R2.5, DEFAULT Medium in colour Internal Walls: Plasterboard, R2.5 between garage & dwelling, R2 between unconditioned zones and dwelling (ie. laundry, bathroom, wc) Roof: Colorbond Roof 10 & 1deg, R1.3 Anticon, DEFAULT Medium in colour Ceiling: Plasterboard (horizontal & raked), R4 Floor: Concrete slab on ground, no insulation Floor: Suspended timber above plasterboard, no insulation between levels, R2.5 to garage ceiling below dwelling, Floor Coverings: DEFAULT – Tiles to wet areas, Bare concrete to garage, Carpet to all other areas
Glazing	DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.57, Type A: Awning – W7, W35, W36, W37 DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.7, TypeB: Louvres, Fixed – W12, W13, W24, W38-W42, W44 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.49, Type A: Awning – W6, W9, W10 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.58, Type B: Louvres, Fixed, Sliding – W1, W3, W5, W8, W11, W14-W23, W31, W43, W45 DEFAULT: Alum, Double Glazed, Clear, U-Value: 4.8, SHGC: 0.59, Type B: Sliding – W2, W4 DEFAULT: Alum, Double Glazed, Low Solar Gain Low E, U-Value: 4.9, SHGC: 0.33, Type A: Awning – W46, W47, W48 DEFAULT: Alum, Double Glazed, High Solar Gain Low E, U-Value: 4.3, SHGC: 0.53, Type B: Fixed, Sliding – W25-W30

Energy Commitments	All Units
Hot Water	Gas Instantaneous – 6 Star
Cooling System	No active system
Heating System	No active system
Bathroom Ventilation	2A: Individual fan ducted to façade or roof, manual on/off switch (internal WC only modelled in NatHERS) 2B: Natural ventilation only
Kitchen Ventilation	Individual fan ducted to façade or roof, manual on/off switch (modelled in NatHERS)
Laundry Ventilation	Natural ventilation only
LED Lighting	ALL lighting (no recessed downlights modelled in NatHERS)
Fridge Space	Well ventilated
Kitchen Appliances	Gas cooktop, Electric oven
Clothes Line	Outdoor Private
Alternative Energy	None

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue

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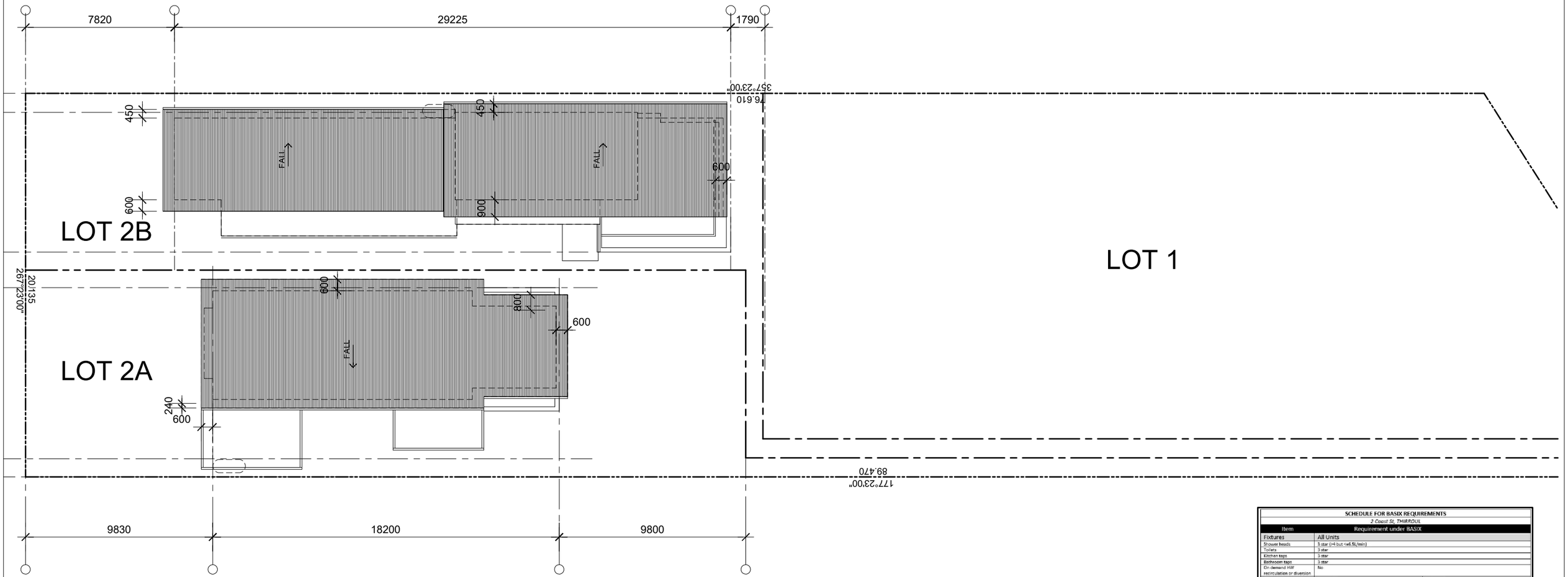
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name: LEVEL 1 PLAN		Job No. DML 17/028	Dwg.No A-03
FOR: Arnold & Brown	Scale 1:200 (A3)	Date 01.02.18	Rev. B



SCHEDULE FOR BASIX REQUIREMENTS

2 Coast St, THIRROUL

Item	Requirement under BASIX	
Fixtures	**All Units**	
Shower heads	3 star (>4 but <=6.5L/min)	
Toilets	3 star	
Kitchen taps	3 star	
Bathroom taps	3 star	
On demand HW recirculation or diversion	No	
Rainwater Tank	**Unit 2A**	**Unit 2B**
Rainwater Tank	2000L - Capturing 130m² - Plumbing to Landscape, Laundry	2000L - Capturing 170m² - Plumbing to Landscape, Laundry

Thermal Comfort	All Units
Building Elements	External Walls: Brick Veneer, R2.5, DEFAULT Medium in colour, No insulation to 2B Garage External Walls: FC Cladding, R2.5, DEFAULT Medium in colour Internal Walls: Plasterboard, R2.5 between garage & dwelling, R2 between unconditioned zones and dwelling (ie. laundry, bathroom, wc) Roof: Colorbond Roof 10 & 1deg, R1.3 Anticon, DEFAULT Medium in colour Ceiling: Plasterboard (horizontal & raked), R4 Floor: Concrete slab on ground, no insulation Floor: Suspended timber above plasterboard, no insulation between levels, R2.5 to garage ceiling below dwelling. Floor Coverings: DEFAULT – Tiles to wet areas, Bare concrete to garage, Carpet to all other areas
Glazing	DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.57, Type A: Awning – W7, W35, W36, W37 DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.7, TypeB: Louvres, Fixed – W12, W13, W24, W38-W42, W44 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.49, Type A: Awning – W6, W9, W10 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.58, Type B: Louvres, Fixed, Sliding – W1, W3, W5, W8, W11, W14-W23, W31, W43, W45 DEFAULT: Alum, Double Glazed, Clear, U-Value: 4.8, SHGC: 0.59, Type B: Sliding – W2, W4 DEFAULT: Alum, Double Glazed, Low Solar Gain Low E, U-Value: 4.9, SHGC: 0.33, Type A: Awning – W46, W47, W48 DEFAULT: Alum, Double Glazed, High Solar Gain Low E, U-Value: 4.3, SHGC: 0.53, Type B: Fixed, Sliding – W25-W30

Energy Commitments	All Units
Hot Water	Gas Instantaneous – 6 Star
Cooling System	No active system
Heating System	No active system
Bathroom Ventilation	2A: Individual fan ducted to façade or roof, manual on/off switch (internal WC only modelled in NatHERS) 2B: Natural ventilation only
Kitchen Ventilation	Individual fan ducted to façade or roof, manual on/off switch (modelled in NatHERS)
Laundry Ventilation	Natural ventilation only
LED Lighting	ALL lighting (no recessed downlights modelled in NatHERS)
Fridge Space	Well ventilated
Kitchen Appliances	Gas cooktop, Electric oven
Clothes Line	Outdoor Private
Alternative Energy	None

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue

Legend

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PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:		Job No.	Dwg.No
ROOF PLAN		DML 17/028	A-04
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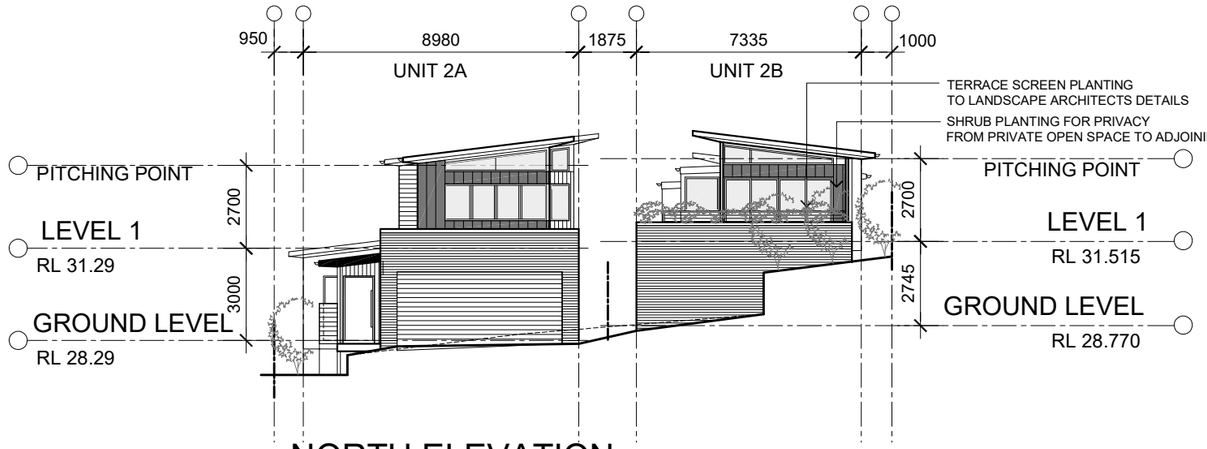
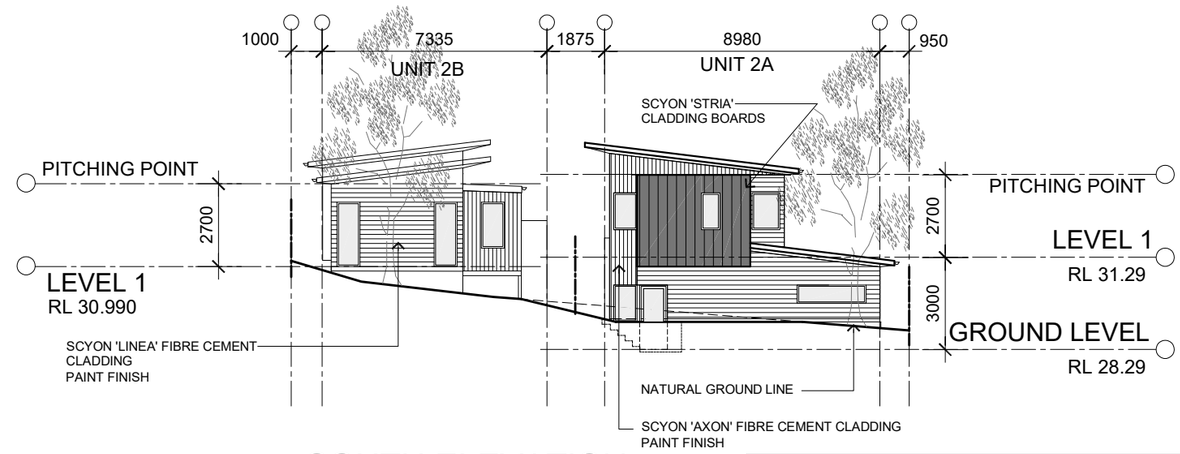


NORTH ELEVATION



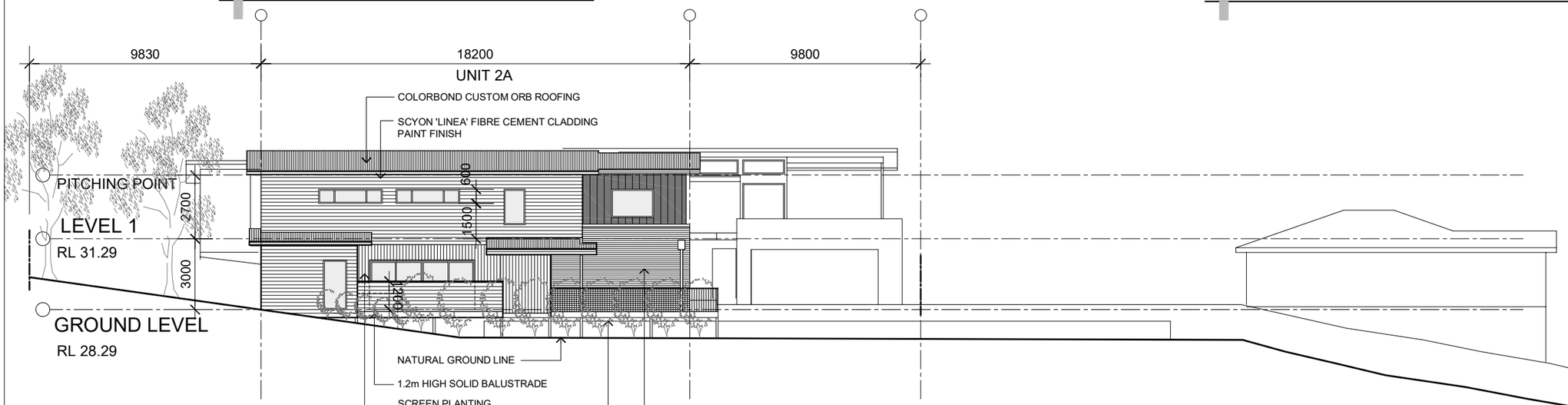
SOUTH ELEVATION

SCHEDULE FOR BASIX REQUIREMENTS
2 Coast St, THIRROUL

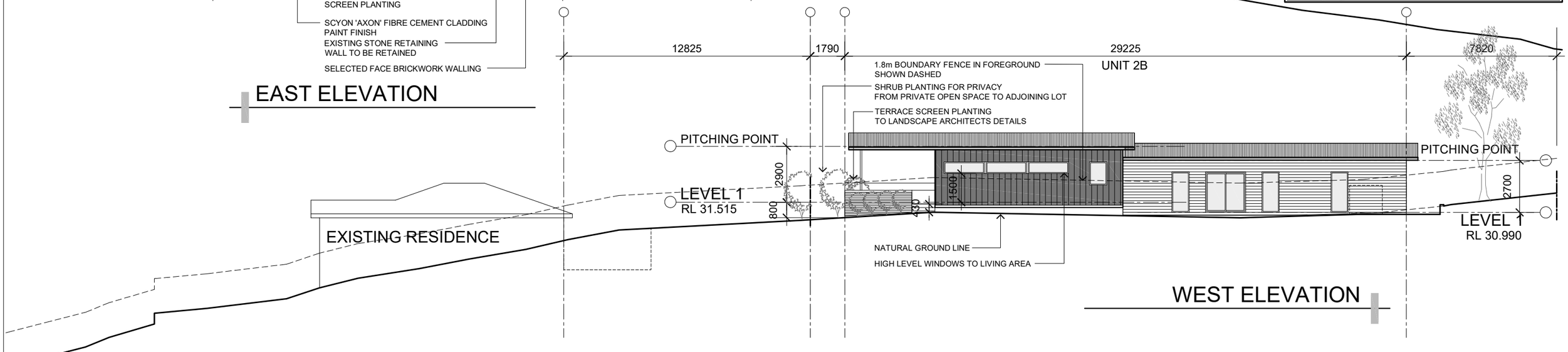
Item	Requirement under BASIX	
Fixtures	**All Units**	
Shower heads	5 star (>4 but <=6.5L/min)	
Toilets	3 star	
Kitchen taps	3 star	
Bathroom taps	3 star	
On demand HW recirculation or diversion	No	
Rainwater Tank	**Unit 2A**	**Unit 2B**
Rainwater Tank	2000L - Capturing 130m² - Plumbing to Landscape, Laundry	2000L - Capturing 170m² - Plumbing to Landscape, Laundry

Thermal Comfort	All Units
Building Elements	External Walls: Brick Veneer, R2.5, DEFAULT Medium in colour, No insulation to 2B Garage External Walls: FC Cladding, R2.5, DEFAULT Medium in colour Internal Walls: Plasterboard, R2.5 between garage & dwelling, R2 between unconditioned zones and dwelling (ie. laundry, bathroom, wc) Roof: Colorbond Roof 10 & 10eg, R1.3 Anticon, DEFAULT Medium in colour Ceiling: Plasterboard (horizontal & rakes), R4 Floor: Concrete slab on ground, no insulation Floor: Suspended timber above plasterboard, no insulation between levels, R2.5 to garage ceiling below dwelling. Floor Coverings: DEFAULT – Tiles to wet areas, Bare concrete to garage, Carpet to all other areas
Glazing	DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.57, Type A: Awning – W7, W35, W36, W37 DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.7, TypeB: Louvres, Fixed – W12, W13, W24, W38-W42, W44 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.49, Type A: Awning – W6, W9, W10 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.58, Type B: Louvres, Fixed, Sliding – W1, W3, W5, W8, W11, W14-W23, W31, W43, W45 DEFAULT: Alum, Double Glazed, Clear, U-Value: 4.8, SHGC: 0.58, Type B: Sliding – W2, W4 DEFAULT: Alum, Double Glazed, Low Solar Gain Low E, U-Value: 4.9, SHGC: 0.33, Type A: Awning – W46, W47, W48 DEFAULT: Alum, Double Glazed, High Solar Gain Low E, U-Value: 4.3, SHGC: 0.53, Type B: Fixed, Sliding – W25-W30

Energy Commitments	All Units
Hot Water	Gas Instantaneous – 6 Star
Cooling System	No active system
Heating System	No active system
Bathroom Ventilation	2A: Individual fan ducted to façade or roof, manual on/off switch [internal WC only modelled in NatHERS] 2B: Natural ventilation only
Kitchen Ventilation	Individual fan ducted to façade or roof, manual on/off switch [modelled in NatHERS]
Laundry Ventilation	Natural ventilation only
LED Lighting	ALL lighting [no recessed downlights modelled in NatHERS]
Fridge Space	Well ventilated
Kitchen Appliances	Gas cooktop, Electric oven
Clothes Line	Outdoor Private
Alternative Energy	None



EAST ELEVATION



WEST ELEVATION

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue

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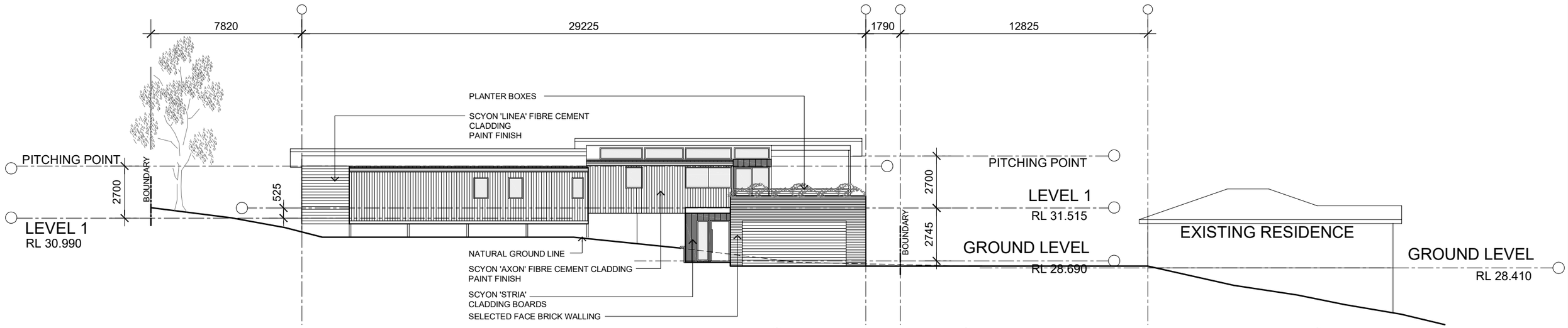
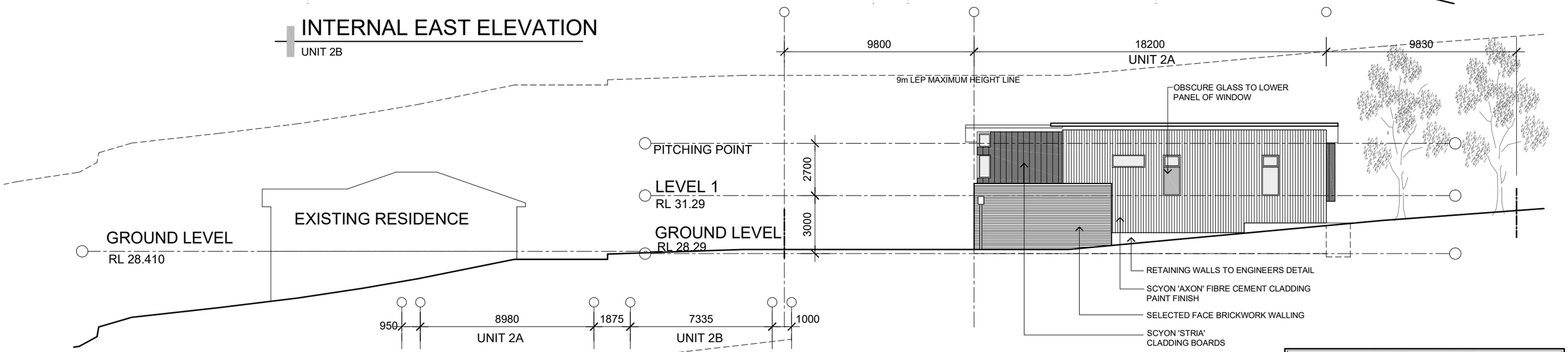
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:	Job No.	Dwg.No
ELEVATIONS	DML 17/028	A-05
FOR: Arnold & Brown	**Scale** 1:200 (A3)	**Date** 01.02.18	**Rev.** B



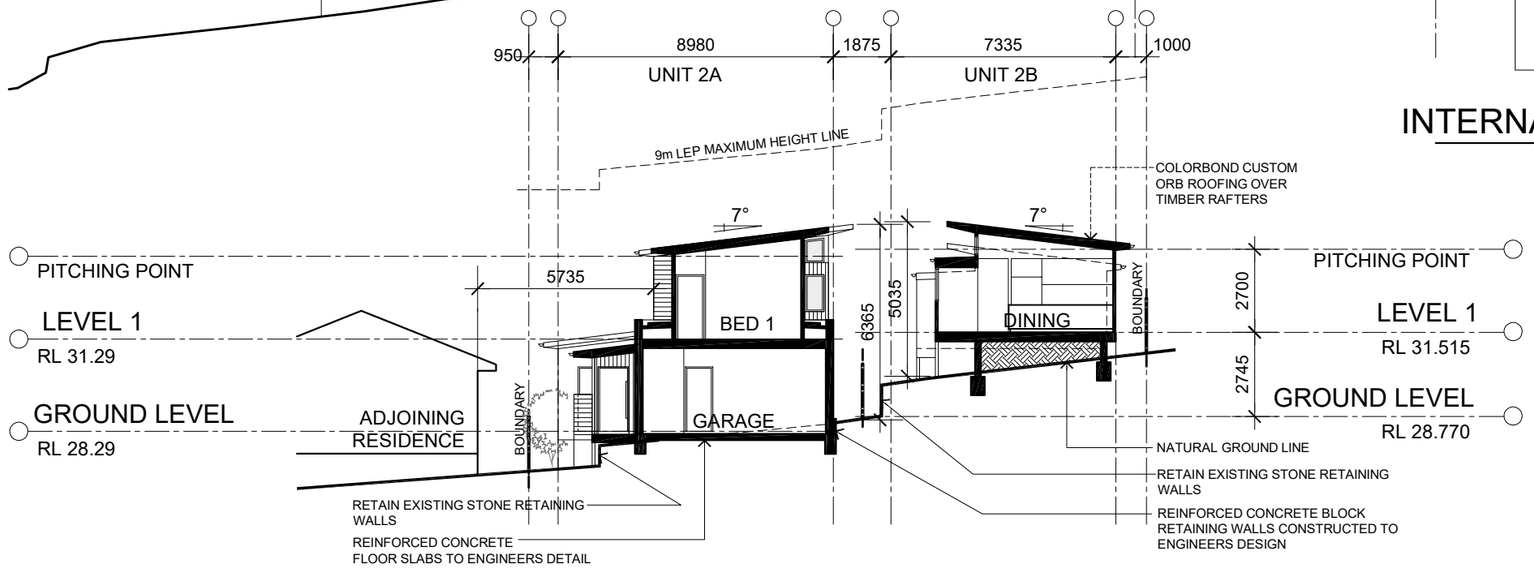
INTERNAL EAST ELEVATION

UNIT 2B



INTERNAL WEST ELEVATION

UNIT 2A



SECTION A-A

SCHEDULE FOR BASIX REQUIREMENTS

2 Coast St, THIRROUL

Item	Requirement under BASIX	
Fixtures	All Units	
Shower heads	5 star (>4 but <=6.5L/min)	
Toilets	3 star	
Kitchen taps	3 star	
Bathroom taps	3 star	
On demand HW recirculation or diversion	No	
Rainwater Tank	Unit 2A	Unit 2B
Rainwater Tank	2000L - Capturing 130m² - Plumbing to Landscape, Laundry	2000L - Capturing 170m² - Plumbing to Landscape, Laundry
Thermal Comfort	All Units	
Building Elements	External Walls: Brick Veneer, R2.5, DEFAULT Medium in colour, No insulation to 2B Garage External Walls: FC Cladding, R2.5, DEFAULT Medium in colour Internal Walls: Plasterboard, R2.5 between garage & dwelling, R2 between unconditioned zones and dwelling (ie. laundry, bathroom, wc) Roof: Colorbond Roof 10 & 1deg, R1.3 Anticon, DEFAULT Medium in colour Ceiling: Plasterboard (horizontal & raked), R4 Floor: Concrete slab on ground, no insulation Floor: Suspended timber above plasterboard, no insulation between levels, R2.5 to garage ceiling below dwelling; Floor Coverings: DEFAULT – Tiles to wet areas, Bare concrete to garage, Carpet to all other areas	
Glazing	DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.57, Type A: Awning – W7, W35, W36, W37 DEFAULT: Alum, Single Glazed, Clear, U-Value: 6.7, SHGC: 0.7, TypeB: Louvres, Fixed – W12, W13, W24, W38-W42, W44 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.49, Type A: Awning – W6, W9, W10 DEFAULT: Alum, Single Glazed, High Solar Gain Low-E, U-Value: 5.4, SHGC: 0.58, Type B: Louvres, Fixed, Sliding – W1, W3, W5, W8, W11, W14-W23, W31, W43, W45 DEFAULT: Alum, Double Glazed, Clear, U-Value: 4.8, SHGC: 0.59, Type B: Sliding – W2, W4 DEFAULT: Alum, Double Glazed, Low Solar Gain Low E, U-Value: 4.9, SHGC: 0.33, Type A: Awning – W46, W47, W48 DEFAULT: Alum, Double Glazed, High Solar Gain Low E, U-Value: 4.3, SHGC: 0.53, Type B: Fixed, Sliding – W25-W30	
Energy Commitments	All Units	
Hot Water	Gas Instantaneous – 6 Star	
Cooling System	No active system	
Heating System	No active system	
Bathroom Ventilation	2A: Individual fan ducted to façade or roof, manual on/off switch (internal WC only modelled in NatHERS) 2B: Natural ventilation only	
Kitchen Ventilation	Individual fan ducted to façade or roof, manual on/off switch (modelled in NatHERS)	
Laundry Ventilation	Natural ventilation only	
LED Lighting	ALL lighting (no recessed downlights modelled in NatHERS)	
Fridge Space	Well ventilated	
Kitchen Appliances	Gas cooktop, Electric oven	
Clothes Line	Outdoor Private	
Alternative Energy	None	

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue

Legend

Develop My Land
. management . consultancy . landscape architecture . urban design .
PO Box 119, Thirroul, NSW, 2515. Tel. 0449 259488 e. steve@developmyland.com.au

PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:	Job No.	Dwg.No
INTERNAL ELEVATIONS & SECTION	DML 17/028	A-06
FOR: Arnold & Brown	Scale 1:200 (A3)	Date 01.02.18
		Rev. B

9AM
JUNE 22

12PM
JUNE 22

3PM
JUNE 22

N

PRELIMINARY
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Date	Issue	Revision
25.08.18	A	Issued for development approval

Legend

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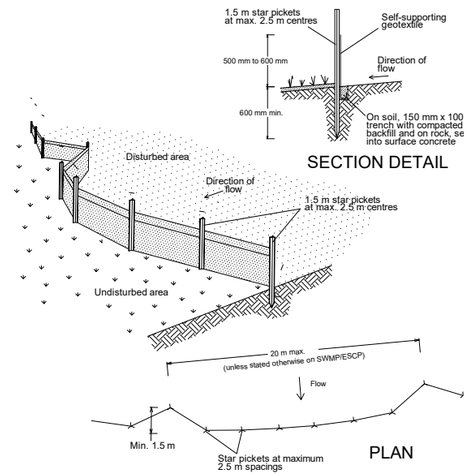
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:		Job No.	Dwg.No
SHADOW DIAGRAMS		DML 17/028	A-07
FOR: Arnold & Brown	Scale 1:200 (A3)	Date 01.02.18	Rev. A

Garage to be demolished

SEDIMENT FENCE DETAIL



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

GENERAL NOTES

1. Trade waste to be separated to recycle products, timber, glass and paper.
2. Builder to relocate site shed, amenities, storage facilities, etc. as required during the construction process.
3. Additional carparking to be provided on site following construction of basement carparking area.
4. All vehicles to leave the site in a forward direction.
5. No vehicles to be parked on the footpath reserve.

DEMOLITION, SITE CLEARING & CONTAMINATION

The Contractor is to carry out necessary demolition and on-site clearance in accordance with AS 2601 (Demolition of Structures) on the subject site. This is applicable to demolition of existing buildings, structures and services including planning and execution of the work, protection and support of adjacent structures and removal of demolished material. Demolished materials, hazardous materials (particularly if found in the renovations to the existing structures) and asbestos shall be removed from site prior to any new construction work taking place on site.

If hazardous materials are encountered, appropriate and qualified personnel shall be employed to remove from site and dispose of such materials in approved manner in accordance with the provisions of all applicable legislation and with any relevant recommendations published by the National Occupational Health and Safety Commission (Worksafe Australia). If hazardous materials are encountered underground, appropriate and qualified personnel shall be employed to remove from site and dispose of such materials in approved manner in accordance with the protection of all applicable legislation and with any relevant recommendations published by the National Occupational Health and Safety Commission (Worksafe Australia).

The Contractor shall be responsible for maintaining security fencing around the perimeter of the site and any additional precautionary measures taken as may be necessary to prevent unauthorised entry to the site at all times during the demolition period. Safe access to and egress from adjoining properties shall be maintained at all times for the duration of the demolition work. In the event that the site is found to be contaminated the Contractor is to follow the directions and recommendations of a site contamination consultant to ensure that the site is un-contaminated prior to any building works taking place on site.

CONSTRUCTION MANAGEMENT POINTS

1. Note that all proposed works will be undertaken whilst the building and site is vacant;
2. All site fencing and sediment control used during demolition phase shall be retained for the construction phase and shall be extended as detailed on drawings;
3. A new hard stand area and shaker grid shall be constructed on corkwood circuit frontage during all phases of the project. All to confirm with the requirements of the local council and RTA;
4. During construction phase as area is set aside on site for use of mobile crane or concrete pump;
5. All construction materials are to be stored on site. A designated area has been allowed;
6. All site accommodation and amenities as required will be located within the site. Some site sheds maybe relocated on the podium level in the final phase of construction; and
7. A dilapidation survey will be carried out by the contractor before the commencement of any work on site.

Australian Standards
AS2601 - Demolition of structures
AS2436 - Guide to noise control....demolition sites
AS3798 - Guide to earthworks.....residential developments
AS1289 - Methods of testing soils for engineering purposes
AS1725 - Galvanised railess chainwire security fencing
Exit/Entrance - Access Point
The exit/entrance to the site will be constructed of a bed of 50-75mm aggregate, 200mm deep, for the vehicular exit/entrance width and to a length of 5.0 metres from the street kerb, so as to ensure soil and excavated materials are not transported off-site.
Storage Areas
Storage areas will be front yard open space.
Rubbish Disposal
Trade waste will be contained on site until removal.
Silt Barrier
Sediment will be prevented from washing off-site by geotextile fabric with metal support and/or continuous straw bales, placed in 100mm deep trench and fixed with stakes. All silt barriers are to be wholly with the site area.
Existing Paving and Vegetation
Existing pavement and vegetation will be retained as much as possible to minimise the amount of exposed soil.
Material Stockpiles
Stockpiles of loose materials (gravel, sand, etc.) will be contained undercover and water courses and within a suitable barrier. Footpaths and road surfaces will not be used for material stockpiles.
Cleaning of Tools and Equipment
Tools and equipments will be cleaned away form drainage lines, road and pavement.

SOIL & WATER MANAGEMENT

This plan shall be read in conjunction with the engineering plans, and any other plans or written instructions that may be issued relating to the future development at the subject site. The contractor shall ensure that all soil and water management works are located as indicated on this drawing. All sub-contractors shall be made aware of their responsibilities in minimising the potential for soil erosion and pollution to down-slope lands and water ways. Where practical, the soil erosion hazard on the site shall be kept as low as possible to this end. Works should be undertaken in the following sequence:
a) install any necessary security/boundary fences for this site;
b) construct silt fencing as detailed along boundaries and contours.

During windy weather, large unprotected areas shall be kept moist (not wet) by sprinkling with water to keep the dust under control. Final site landscaping shall be undertaken as soon as possible, and within 20 working days from completion of construction activities. Any sand used in the concrete curing process (spread over the surface) shall be removed as soon as possible, and within 10 working days from placement. Water shall be prevented from entering the permanent drainage system, unless it is sediment free: i.e. - the catchment area has been permanently landscaped and/or any likely sediment has been filtered through an approved structure.

Temporary soil and water management structures shall be removed only after the lands they protected are rehabilitated. The contractors shall provide acceptable receptors for concrete and mortar slurries, paints acid washings, lightweight waste materials and litter. Receptors for concrete and mortar slurries, paints, acid washings, light-weight waste materials and litter are to be emptied as necessary. Disposal of waste shall be in a manner approved by the site superintendent.

At least weekly the contractor shall inspect the site, providing particular attention to the following matters:
c) ensure drains operate freely, and initiate repair or maintenance as required;
d) remove spilled sand (or other materials) from hazard areas, including lands closer than 2 metres from likely areas of concentrated or high-velocity flows such as waterways, gutters, paved areas and driveways;
e) construct additional erosion and/or sediment works as necessary to ensure the desired protection is given to downslope lands and waterways i.e. maie ongoing changes to the plan;
f)pme maintain erosion and sediment control measures in a functioning conditioning condition until all earthwork activities are completed and the site rehabilitated; and
g) Remove temporary soil conservation structures as a last activity in the rehabilitation programme.

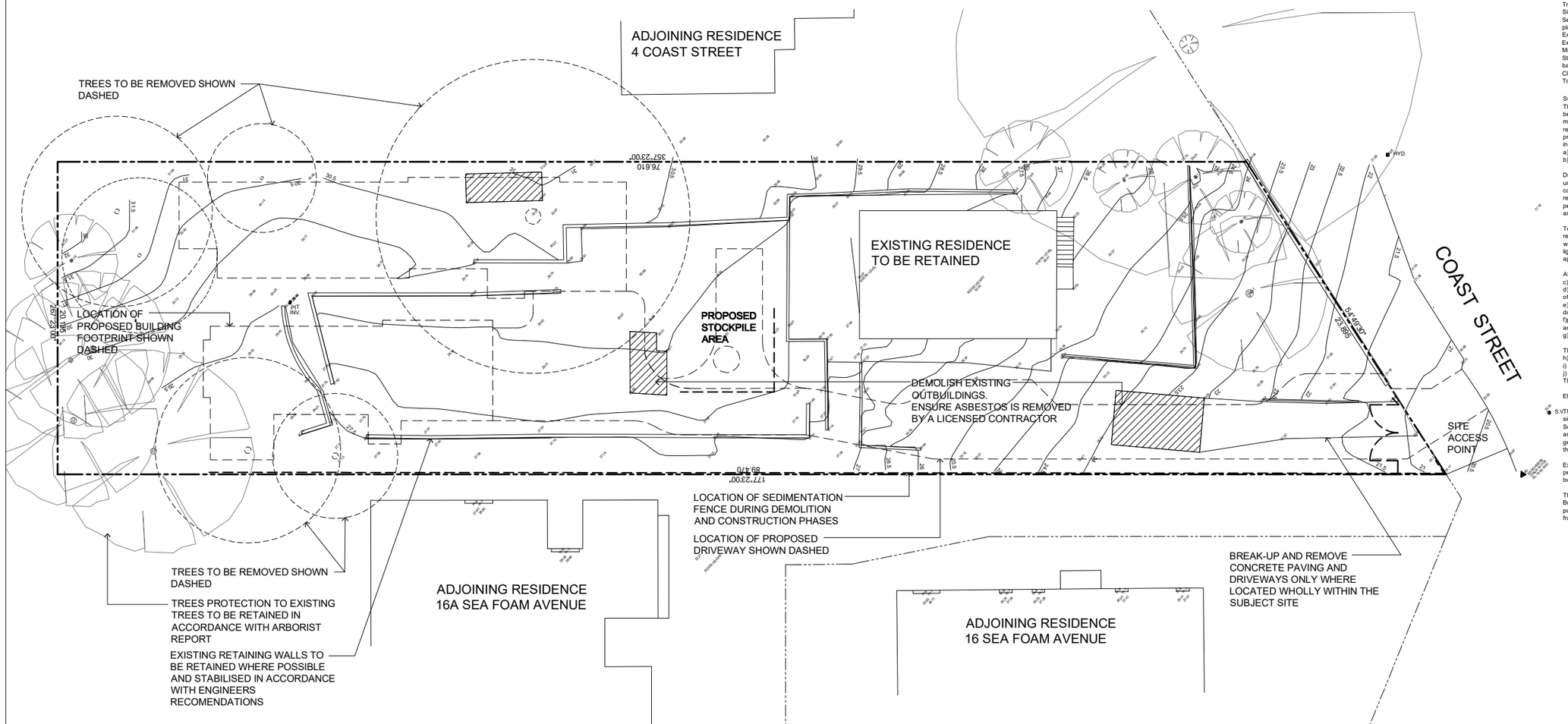
The contractor shall keep a log book, making entries at least weekly, and after rainfall and/or site closure record:
h) the volume of any rainfall events (check water bureau);
i) the conditions of any soil and water management works;
j) remedial work
The book shall be kept on site and made available to any authorised person on request.

EROSION AND SEDIMENTATION CONTROL NOTES

S.VThe Contractor shall provide sediment fencing material during construction to be installed inside site fencing on low sides of site to contain all site water run off and prevent erosion. Tie sediment fencing material to security fencing. Sediment control fabric shall be an approved material (e.g. humes propex silt stop) standing 500min above ground and extending 150 below ground. Silt barriers, silt traps, saltation screens and the like shall be constructed with geotextile sediment fabric attached to steel star pickets or security fencing, or with Hessian bags. All to conform with the requirements of the local council and RTA.

Existing drains located within the site shall be isolated by sediment control. No parking or stock piling of material is permitted in the public domain unless stated. Grass verges shall be maintained as much as practical to provide a buffer zone to the construction site. Construction entry/exits shall be located as per dwg.

The Contractor shall ensure all droppable soil and sediment is removed prior to construction traffic exiting the site. Builder shall ensure all construction traffic entering and leaving the site do so in a forward direction as much as possible. Site security fencing to consist of 1800mm high galvanised chain mesh panels fixed to galvanised pipe frame and supported on concrete "feet".



DEMOLITION & SITE MANAGEMENT PLAN

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval

Legend

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PO Box 119, Thirroul, NSW, 2515. Tel. 0448 284488 e. steve@developmyland.com.au

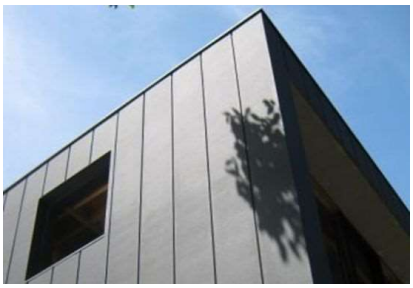
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

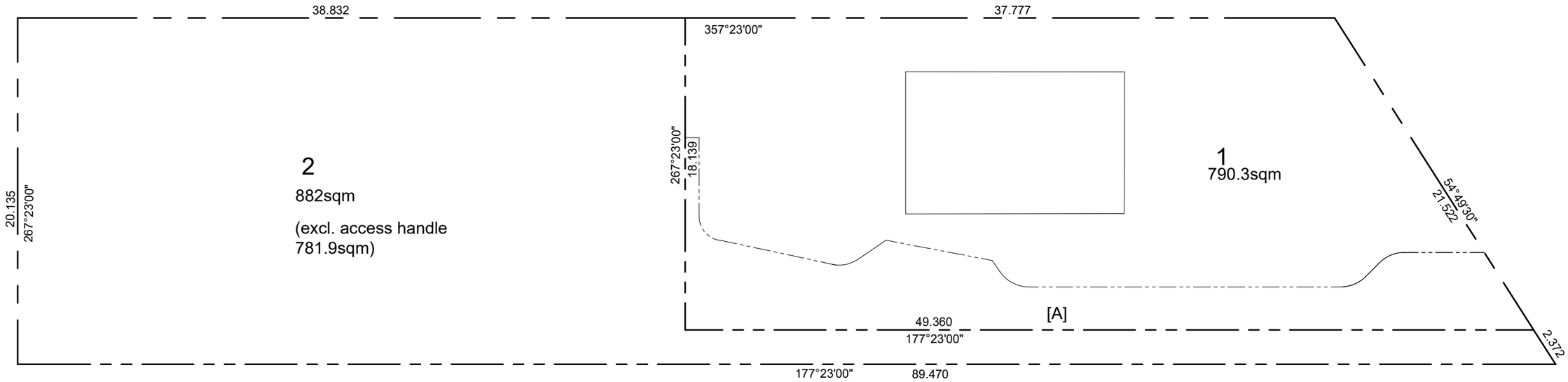
Drawing Name:		Job No.	Dwg.No
SITE MANAGEMENT & DEMOLITION PLAN		DML 17/028	A-08
FOR: Arnold & Brown	Scale 1:300 (A3)	Date 01.02.18	Rev. A

APPENDIX 3

Schedule of External Materials and Finishes

2 Coast Street THIRROUL

Material	Building Element	Specification
	External walling 	Scyon 'Axon' fibre cement cladding boards. Mounted vertically. To be finished in Dulux 'Surfmist
	External Walling 	Scyon 'Stria' fibre cement cladding sheets. Mounted vertically. To be finished in Dulux 'Bronze Fig'
	External Walling	Face brick walling PGH BRICKS 'Truffle'
	Roofing	Roofing – Colorbond 'Shale Grey' Custom Orb roofing.



[A] PROPOSED RIGHT OF CARRIAGEWAY VARIABLE WIDTH

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue
27.03.19	C	Revised DA Issue

Legend

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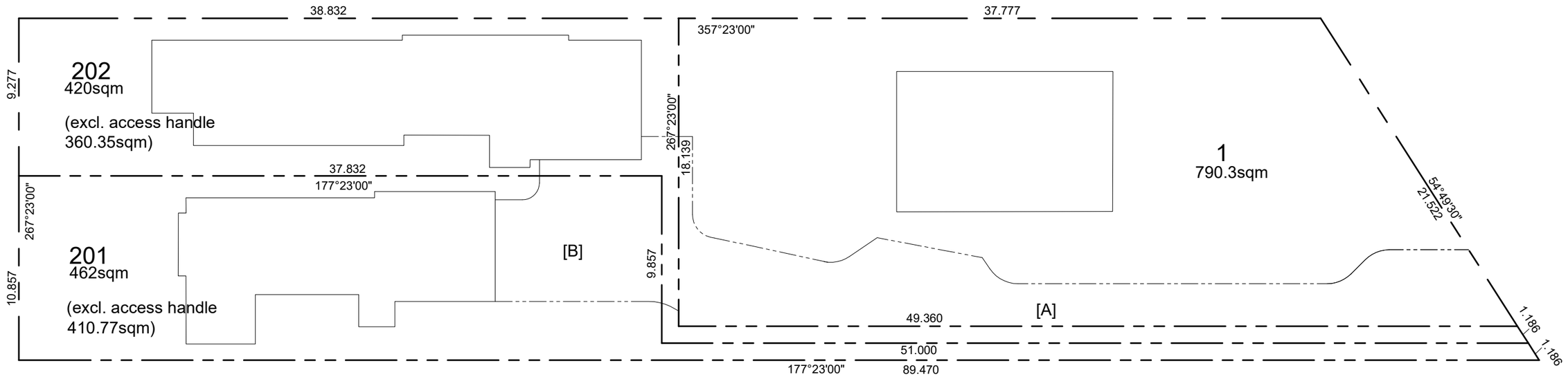
PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name:	Job No.	Dwg.No
PHASE 1 - SUB-DIVISION PLAN	DML 17/028	SD-01

FOR:	Scale	Date	Rev.
Arnold & Brown	1:250 (A3)	01.02.18	C



[A] PROPOSED RIGHT OF CARRIAGEWAY VARIABLE WIDTH

[B] PROPOSED RIGHT OF CARRIAGEWAY VARIABLE WIDTH

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
25.08.18	A	Issued for development approval
25.02.19	B	Revised DA Issue
27.03.19	C	Revised DA Issue

Legend

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PROJECT: Two lot subdivision and Dual Occupancy Development
2 COAST STREET THIRROUL

Drawing Name: PHASE 2 - SUB-DIVISION PLAN
Job No. DML 17/028
Dwg.No SD-02
FOR: Arnold & Brown
Scale 1:250 (A3)
Date 01.02.18
Rev. C

A1 SHEET

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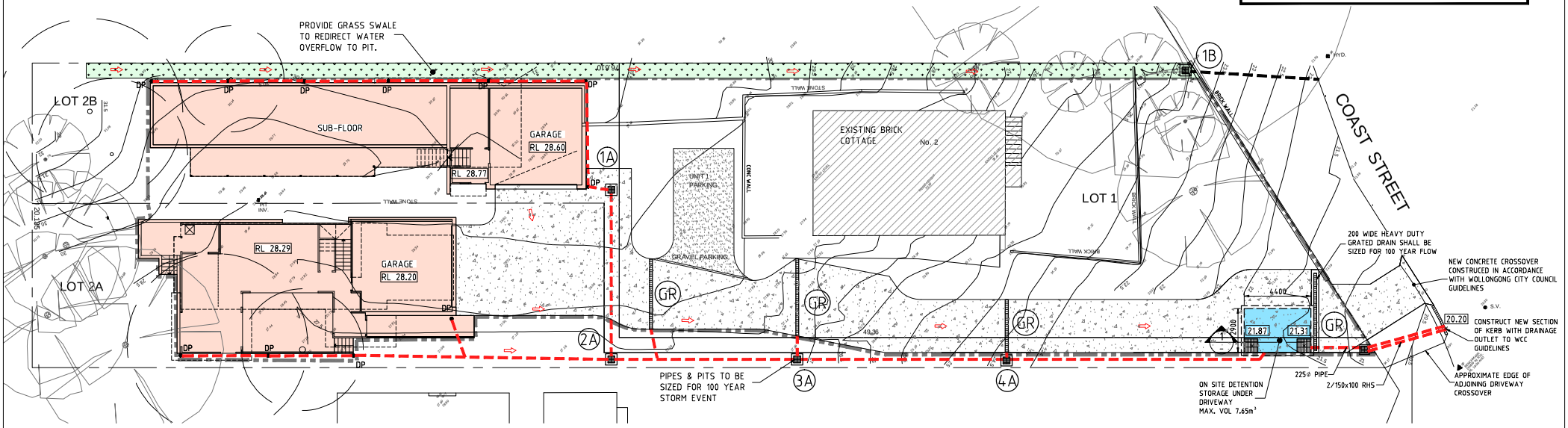


CONCEPT DRAINAGE PLAN

Scale: 1:100 @ A1, 1:200 @ A3

0 1 2 5 10 metres

STEP 1

SITE INFORMATION		GRAPHS		OSD REQUIREMENTS	
SITE AREA	1672.4 m²	F_2	1.11	PSD_5	40.9 L/s
TRIBUTARY AREA	1316.5 m²	F_3	0.13	PSD_{100}	70.8 L/s
DEV. IMP. AREA	697 m²	F_4	0.60	SSR_5	6.6 m³
$I_{\frac{5hr}{1hr}}$	99.5 mm/hr	$F1_5$	1.054	SSR_{100}	11.5 m³
		$F1_{100}$	1.043		

STEP 2

SITE INFORMATION		GRAPHS		OSD REQUIREMENTS	
SITE AREA	1672.4 m²	F_2	1.11	PSD_5	38.8 L/s
TRIBUTARY AREA	1316.5 m²	F_3	0.05	PSD_{100}	67.8 L/s
DEV. IMP. AREA	212.5 m²	F_4	0.60	SSR_5	2.3 m³
$I_{\frac{5hr}{1hr}}$	99.5 mm/hr	$F1_5$	1.00	SSR_{100}	4.0 m³
		$F1_{100}$	1.00		

FINAL OSD REQUIRED

	OSD REQUIREMENTS	
GRAPHS	PSD_5	40.9 L/s
	PSD_{100}	70.8 L/s
	SSR_5	6.6-2.3=4.35m³
	SSR_{100}	11.5-4.0=7.49m³

VOLUME

OSD TANK UNDER DRIVEWAY

VOL = (4.4 x 2.9)m² x 0.6m = 7.65m³

REQUIRED STORAGE = 7.49m³
TOTAL AVAILABLE STORAGE = 7.65m³

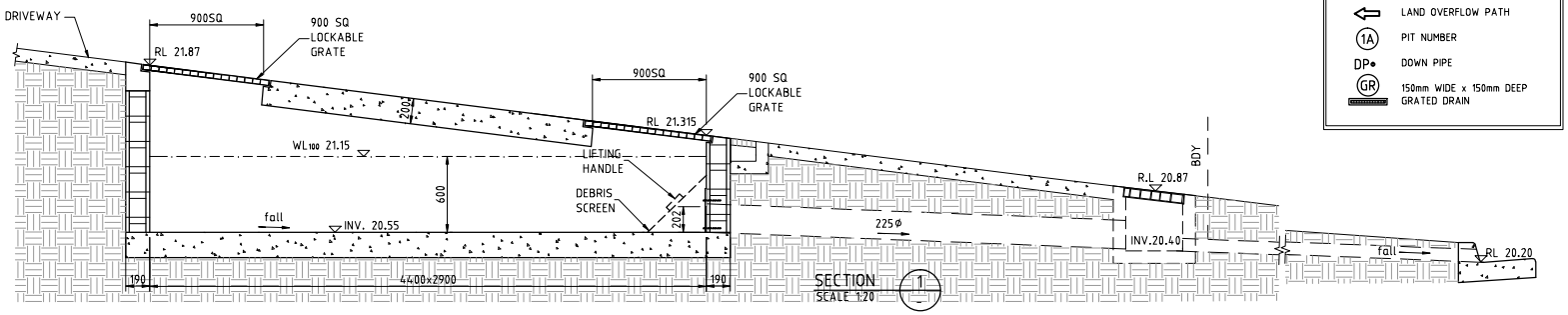
ORIFICE SIZING

Q_5 = 40.9 L/s
TWL_5 = .
HEAD = 0.34m

$$D = \left(\frac{0.0409}{1.62 \times 0.34^{0.63}}\right)^{\frac{1}{1.87}}$$

D = 201mm

ADOPT 201mmø CIRCULAR ORIFICE



OSD SECTION

Scale: 1:20 @ A1, 1:40 @ A3

0 0.2 0.5 1.0 2.0 metres

LEGEND

- × 28.20 — PROPOSED SURFACE LEVEL
- 250 — EXISTING CONTOUR LEVEL
- PROPERTY BOUNDARY
- DRAINAGE PIPE AND PIT
- LAND OVERFLOW PATH
- 1A — PIT NUMBER
- DP● — DOWN PIPE
- GR — 150mm WIDE x 150mm DEEP GRATED DRAIN

NOTE:
1. ALL SITE CONDITIONS INCLUDING LEVELS TO BE CONFIRMED, AND ANY DISCREPANCIES TO BE REFERRED TO ARCHITECT PRIOR TO COMMENCEMENT.
2. DO NOT SCALE THE DRAWING. USE FIGURED DIMENSIONS, FOR ALL DIMENSIONS AND LEVELS REFER TO ARCHITECTURAL DRAWINGS
3. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATING ANY ITEM AND/OR PLACING CONCRETE
4. USE ONLY LATEST REVISION OF THE DRAWINGS ISSUED FOR CONSTRUCTION.
5. THESE DRAWINGS ARE SUBJECT TO COPYRIGHT.

No	DATE	AMENDMENT
A	03-08-2018	ISSUED FOR DA

OPTIMA
CONSULTING ENGINEERS
Consulting Structural & Civil Engineers | Project Management

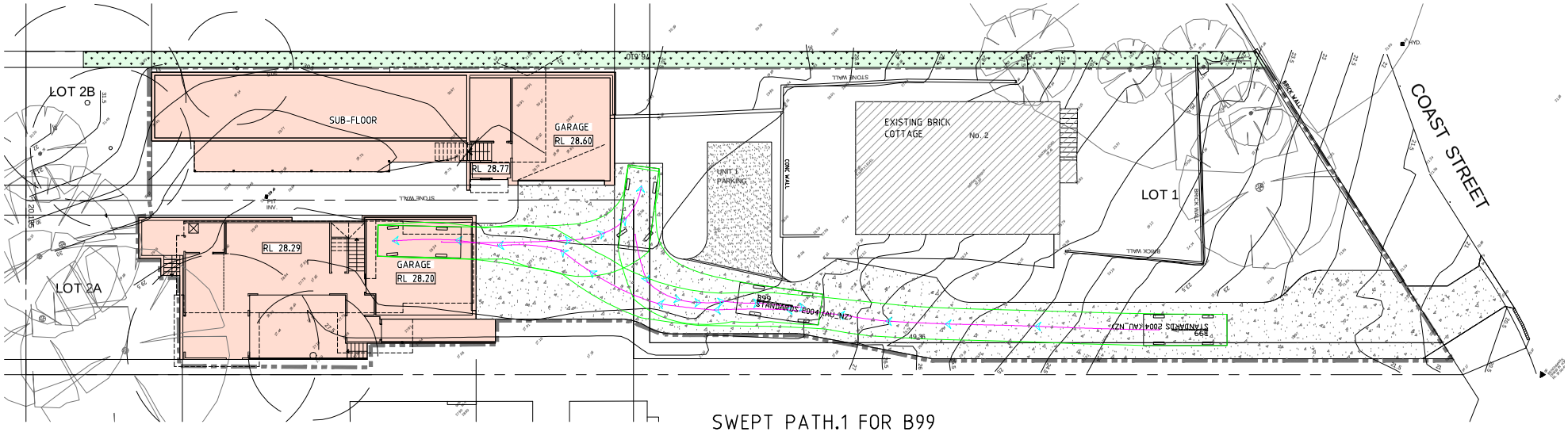
CLIENT: ARNOLD & BROWN

PROJECT: PROPOSED DUAL OCCUPANCY
SITE: 2 COAST STREET THIRROUL

DRAWING: C.01 - CONCEPT DRAINAGE
DWG. No: OCE12998/C01/DA/A

SCALE: AS SHOWN
DATE: JULY 2018
DRAWN: R.J.
CHECKED: I.O.

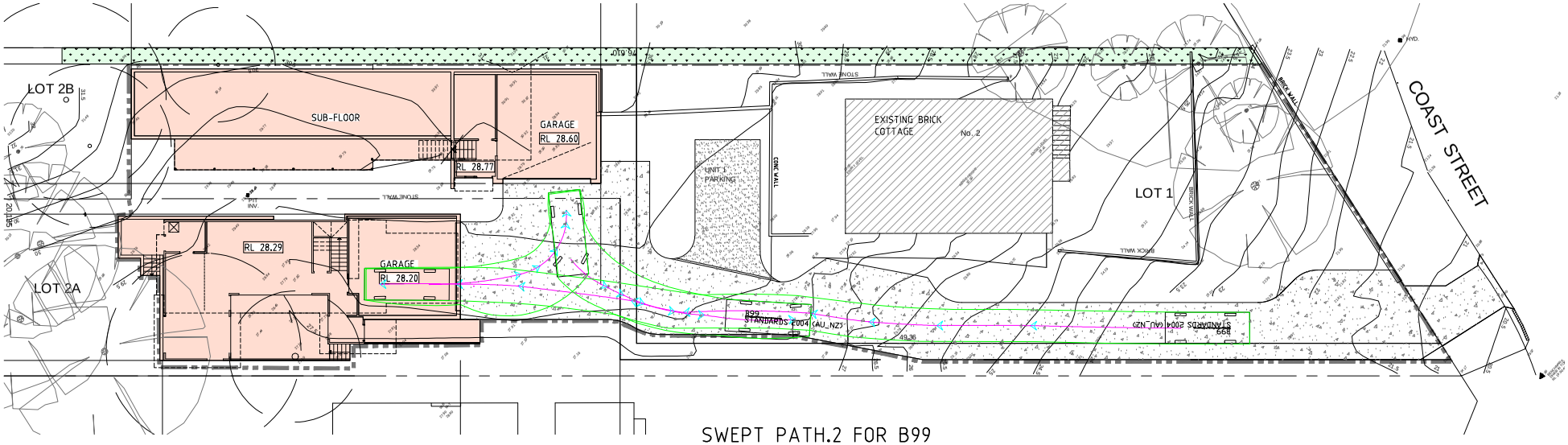
SHEET 01
No IN SET 1



SWEPT PATH.1 FOR B99

Scale: 1:100 @ A1, 1:200 @ A3

metres



SWEPT PATH.2 FOR B99

Scale: 1:100 @ A1, 1:200 @ A3

metres

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NOTE:
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2. DO NOT SCALE THE DRAWING. USE FIGURED DIMENSIONS, FOR ALL DIMENSIONS AND LEVELS REFER TO ARCHITECTURAL DRAWINGS
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No	DATE	AMENDMENT
A	18-07-2018	FOR DA

OPTIMA
CONSULTANCY GROUP
Consulting Structural & Civil Engineers / Project Management

CLIENT: ARNOLD & BROWN

PROJECT: PROPOSED DUAL OCCUPANCY

SITE: 2 COAST STREET THIRROUL

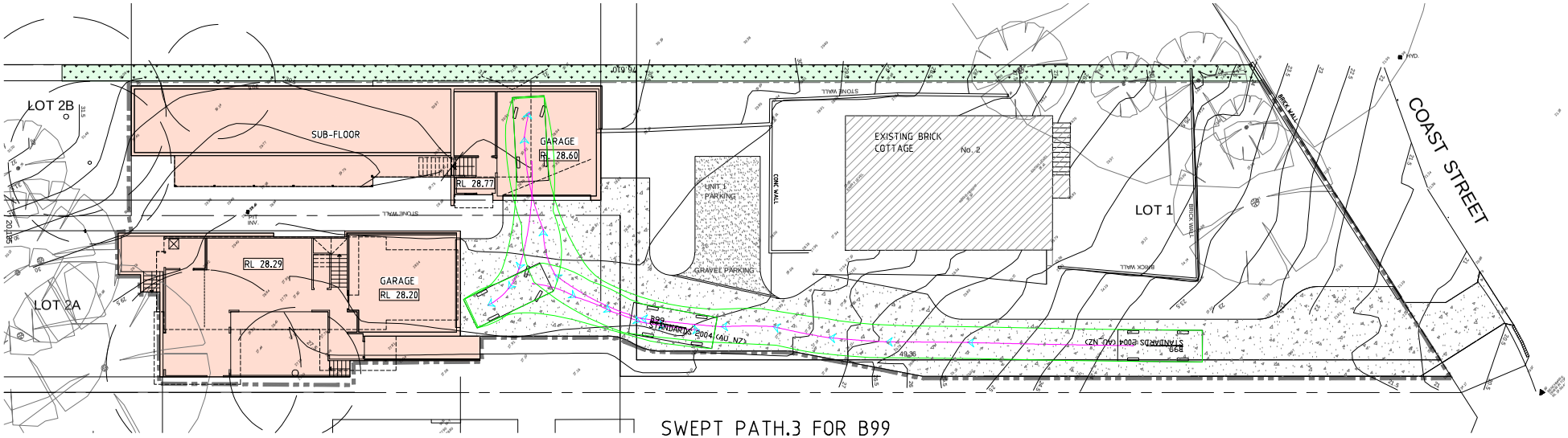
DRAWING: C.02 - SWEPT PATH B99

DWG. No: OCE12975/C02/DA/A

SCALE: AS SHOWN
DATE: JULY 2018
DRAWN: R.J.
CHECKED: I.O.

SHEET 02
No IN SET 3

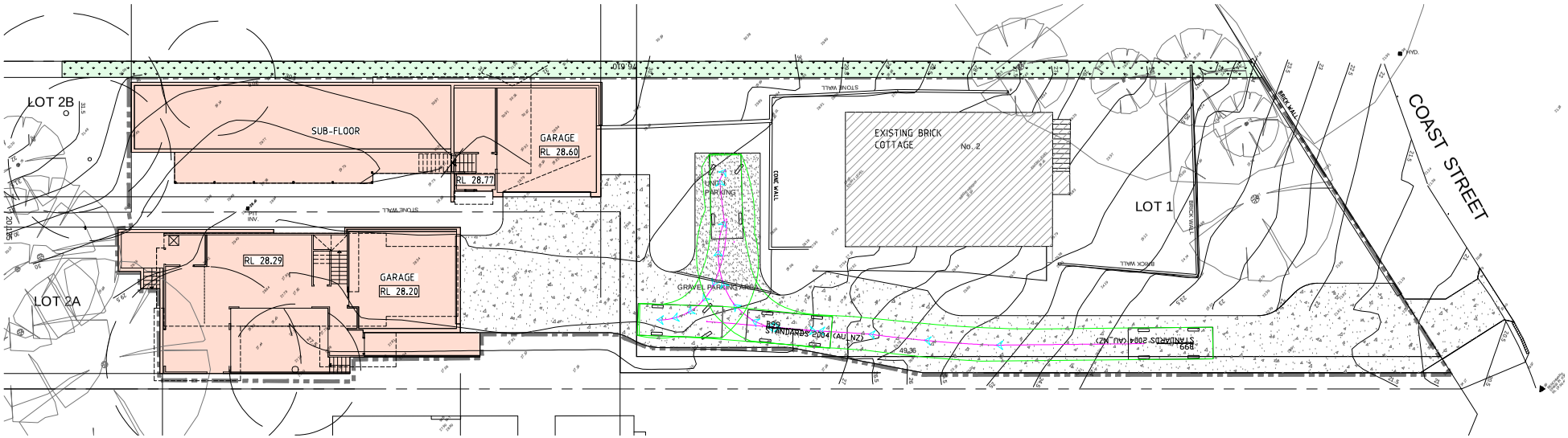
A1 SHEET



SWEPT PATH.3 FOR B99

Scale: 1:100 @ A1, 1:200 @ A3

metres



SWEPT PATH.4 FOR B99

Scale: 1:100 @ A1, 1:200 @ A3

metres

NOT FOR CONSTRUCTION
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NOTE:
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2. DO NOT SCALE THE DRAWING. USE FIGURED DIMENSIONS, FOR ALL DIMENSIONS AND LEVELS REFER TO ARCHITECTURAL DRAWINGS
3. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATING ANY ITEM AND/OR PLACING CONCRETE
4. USE ONLY LATEST REVISION OF THE DRAWINGS ISSUED FOR CONSTRUCTION.
5. THESE DRAWINGS ARE SUBJECT TO COPYRIGHT.

No	DATE	AMENDMENT
A	18-07-2018	FOR DA

OPTIMA
CONSULTANCY GROUP LTD
Consulting Structural & Civil Engineers / Project Management

CLIENT: ARNOLD & BROWN

PROJECT: PROPOSED DUAL OCCUPANCY

SITE: 2 COAST STREET THIRROUL

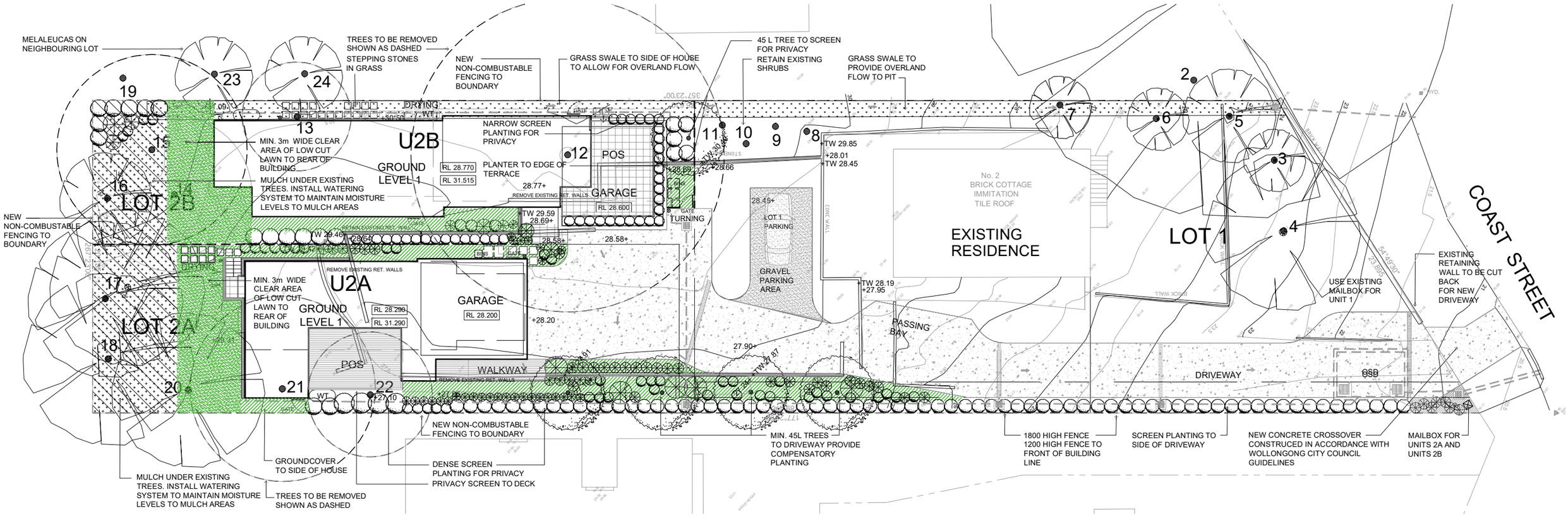
DRAWING: C.03 - SWEPT PATH B99

DWG. No: OCE12975/C03/DA/A

SCALE: AS SHOWN
DATE: JULY 2018
DRAWN: R.J.
CHECKED: I.O.

SHEET 03

No IN SET 3



LEGEND

- PROPERTY BOUNDARY
- EXISTING TREE TO BE RETAINED
- EXISTING TREE TO BE REMOVED - REFER TO ARBORIST REPORT
- PROPOSED TREE
- PROPOSED SHRUB AND GROUNDCOVER PLANTING
- MULCH UNDER EXISTING TREES. MAINTAIN MOISTURE LEVELS - REFER TO PLAN.
- LOW CUT LAWN
- GRASS SWALE
- EXISTING LEVELS AND CONTOURS
- PROPOSED SPOT LEVELS
- DEEP SOIL ZONE
- PROPOSED CONCRETE DRIVEWAY
- PARKING WITH PERMEABLE SURFACE
- CONCRETE PAVERS SET IN GRASS OR GROUNDCOVER
- PROPOSED 1800 HIGH FENCE
- PROPOSED GATE
- RETAINING WALL
- PROPOSED DRAINAGE
- PROPOSED MAILBOX
- PROPOSED HOSEBIB

TREE SPECIES TO BE REMOVED
(REFER ALSO TO ARBORIST REPORT):
TREE 12 - *Syzygium paniculata*
TREE 13 - *Melaleuca armillaris*
TREE 15 - *Jacaranda mimosifolia*
TREE 21 - *Eucalyptus scoparia*
TREE 22 - *Brachychiton acerifolia*

PROPOSED PLANT SCHEDULE

BOTANICAL	COMMON NAME
TREES AND LARGE SHRUBS	
Acmena smithii	Lilly Pilly
Archontophoenix cunnninghamiana	Bangalow Palm
Banksia integrifolia	Coast Banksia
Banksia serrata	Old Man Banksia
Cyathea australis	Tree Fern
Elaeocarpus reticulatus	Blueberry Ash
Grevillea 'Honey Gem'	Grevillea
Syzigium australe	Lilly Pilly
Syzigium 'Straight & Narrow'	Lilly Pilly
SMALL SHRUBS AND ACCENT PLANTS	
Asplenium australaslcum	Birds Next Fem
Correa alba	White Correa
Correa 'Coastal Pink'	Pink Correa
Philotheca myoporoides	Wax Flower
Westringea 'Naringa'	Coastal Rosemary
Westringea 'Blue Gem'	Coastal Rosemany
GROUND COVERS, NATIVE GRASSES AND SMALL ACCENTS	
Crinum penduculatum	Swamp Lily
Dianella 'Emerald Arch'	Flax Lily
Dichondra repens	Kidney Weed
Lomandra 'Evergreen Baby'	Dwarf Mat Rush
Lomandra 'Tanika'	Dwarf Mat Rush
Lomandra 'Katie Belles'	Mat-rush
Myoporum parvifolium	Creeping Boobialla
Viola hederaceae	Native violet

DEVELOPMENT DATA

TOTAL LOT AREA UNIT 2A = 462sqm
TOTAL LANDSCAPE AREA UNIT 2A = 149.11sqm (92.4sqm REQ.)
TOTAL DEEP SOIL UNIT 2A = 58.0sqm (46.2sqm REQ.)
TOTAL LOT AREA UNIT 2B = 419sqm
TOTAL LANDSCAPE AREA UNIT 2B = 125.57sqm (83.8sqm REQ.)
TOTAL DEEP SOIL ZONE UNIT 2B = 44.0sqm (41.9 REQ.)

NOTE: REFER ALSO TO STORMWATER CONCEPT PLAN BY OPTIMA ENGINEERING. LANDSCAPE PLAN HAS BEEN COORDINATED WITH STORMWATER CONCEPT PLAN

AN APZ IS REQUIRED TO BE ESTABLISHED AND SHOULD BE MAINTAINED FOR PERPETUITY. REFER TO LANDSCAPE REQUIREMENTS IN SECTION 6 OF THE BUSHFIRE ASSESSEMENT REPORT BY HARRIS ENVIRONMENTAL. THE LANDSCAPE PLAN IS COMPATIBLE WITH THE BUSHFIRE REPORT.

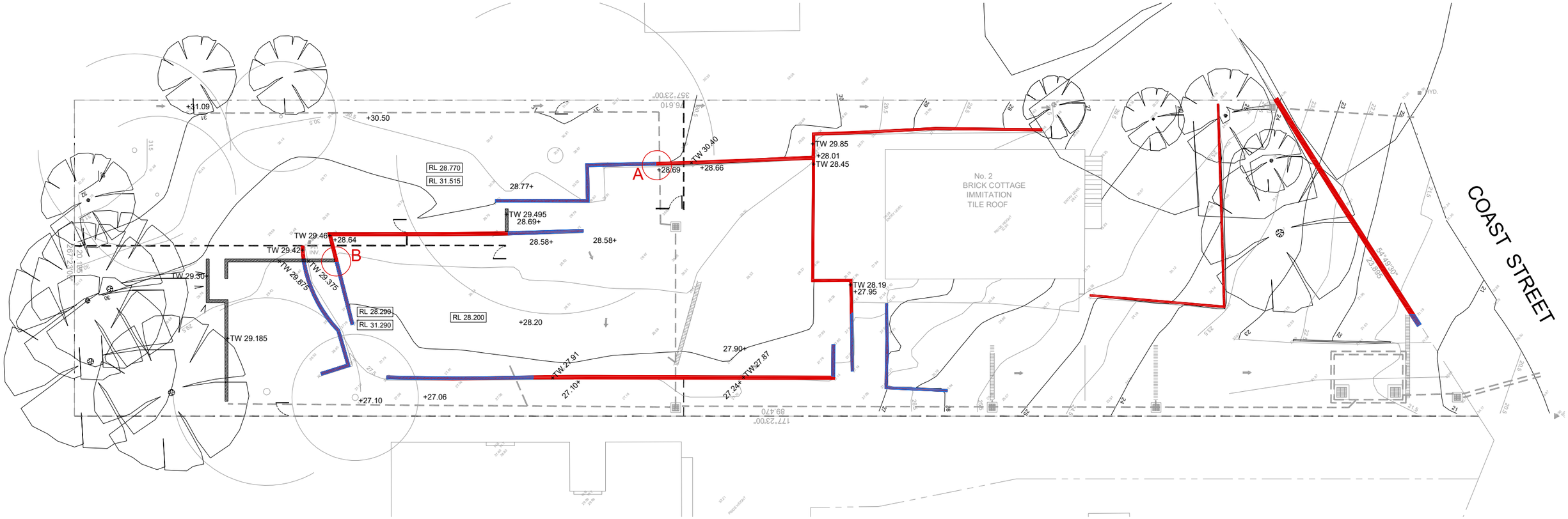
COMPENSATORY PLANTING: FIVE MIN.45L TREES ARE PROPOSED.

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
17.07.18	A	DA
17.02.19	B	ADDITIONAL INFORMATION

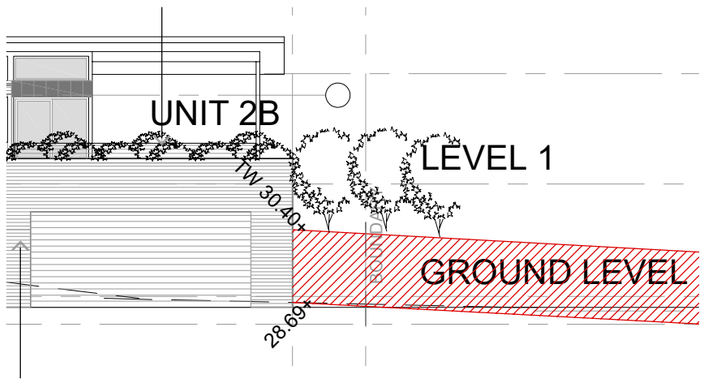
Develop My Land
. management . consultancy . landscape architecture . urban design .
PO Box 119. Thirroul. NSW. 2515. Tel. 0449 255488 e. steve@developmyland.com.au

PROJECT: 2 COAST STREET THIRROUL
Drawing Name: LANDSCAPE PLAN | Job No. DML 17/028 | Dwg.No L-01
CLIENT: ARNOLD AND BROWN | Scale 1:250 (A3) | Date 17/07/18 | Rev. B

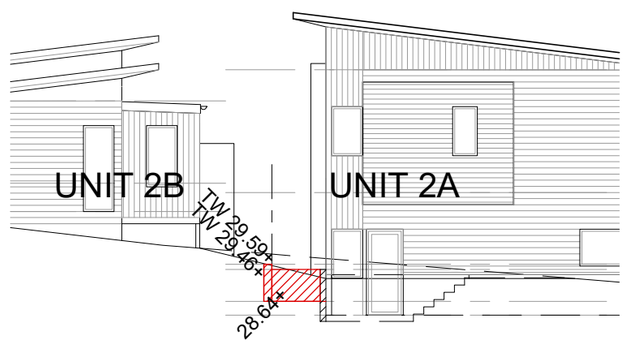


LEGEND

- EXISTING RETAINING WALL TO BE RETAINED
- SECTION OF EXISTING RETAINING WALL TO BE REMOVED
- PROPOSED RETAINING WALL
- + 24.40 — PROPOSED FINISHED LEVELS



SECTION A - INTERFACE OF EXISTING RETAINING WALL WITH UNIT 2B LOOKING WEST
SCALE 1:150@A3



SECTION B - INTERFACE OF EXISTING RETAINING WALL WITH UNIT 2A LOOKING NORTH
SCALE 1:150@A3

N

PRELIMINARY
NOT FOR CONSTRUCTION

Date	Issue	Revision
17.02.19	A	ADDITIONAL INFORMATION

Develop My Land
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PO Box 119. Thirroul. NSW. 2515. Tel. 0449 255488 e. steve@developmyland.com.au

PROJECT: 2 COAST STREET THIRROUL

Drawing Name: RETAINING WALL PLAN		Job No. DML 17/028	Dwg.No L-02
CLIENT: ARNOLD AND BROWN	Scale 1:250 (A3)	Date 17/07/18	Rev. A

26 February 2019

Kate Harris
PO BOX 70
Jamberoo
NSW 2533

The General Manager
Wollongong City Council
Locked bag 8821
Wollongong DC NSW 2500

Att: Mr Rodney Thew

Dear Rodney

Re: Compliance for condition 7. BFSA D18/7272 for DA 2018/1071 Integrated Development Application- 2 Coast Street, Thirroul 2515

The BFSA for the proposed subdivision of 2 Coast Street, Thirroul dated 19 October 2018, requires in Section 7 that the landscaping to the site complies with the principles of Appendix 5 of "*Planning for Bushfire Protection 2006"*.

I visited the site on 25 February 2019 to inspect the garden in relation to the proposed landscape plans Issue B and the requirements of Appendix 5.

This letter now provides confirmation of compliance to the requirements of the PBP 2006 Bushfire Dire Provisions- Landscaping and Property Maintenance.

The requirements of Appendix 5 are that in general, it is expected the environmental aspects of the development have already been considered and that after subdivision, gardens will be established and landscaping of the grounds will be maintained.

There is an overgrown garden at the rear of the southern elevation of the lot which will be retained as landscaped area and deep soil zone. Once the weeds are removed there will be approximately 8 trees remaining in this area. It is proposed to place mulch underneath these trees and a watering system is being installed to maintain moisture content.

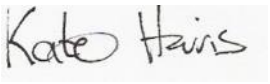
The requirements identified in Appendix 5 for providing and maintaining a garden that does not contribute to the spread of bushfires are provided in the table below. Alongside these requirements, comments have been made regarding the landscape plan.

PBP Appendix 5 requirements	Comments
A clear area of low cut lawn or pavement adjacent to the house	There will be 3 m of low-cut lawn at the rear of the units.
Areas under fences, fence posts and gates and trees raked and cleared of fuel	It is assumed that once occupied, the residents will rake and clear fuel as part of maintaining a garden. The landscape plans propose ensure that the garden will be easy to maintain with clearly defined areas.
Utilisation of non-combustible fencing and retaining walls	Complies
Breaking up of the canopy of trees and shrubs with defined garden beds	The plan and photos below show how the current regrowth is mostly weeds which will be removed. The trees proposed to be retained will be incorporated in to the garden,
Use of non flammable mulch	Organic mulch is proposed under the existing trees on the southern elevation tress in the plan however a watering system will retain the moisture.
Planting of trees and shrubs such that the branches will not overhang the roof, the tree canopy is not continuous, there is a windbreak in the direction the fires are likely to come	The canopy cover provided by these trees form a small isolated cluster that would be less than 15 percent of the proposed lots. Furthermore, the canopy cover provided is reasonable for a garden in this vicinity

Photos are provided below with comments. It was noted during the site inspection that the adjoining properties are managing the trees within their respective lots. This is not evident in the aerials.

In summary the proposed landscape plan Issue B complies with Appendix 5 Planning for Bushfire Protection (RFS, 2006).

Kind Regards

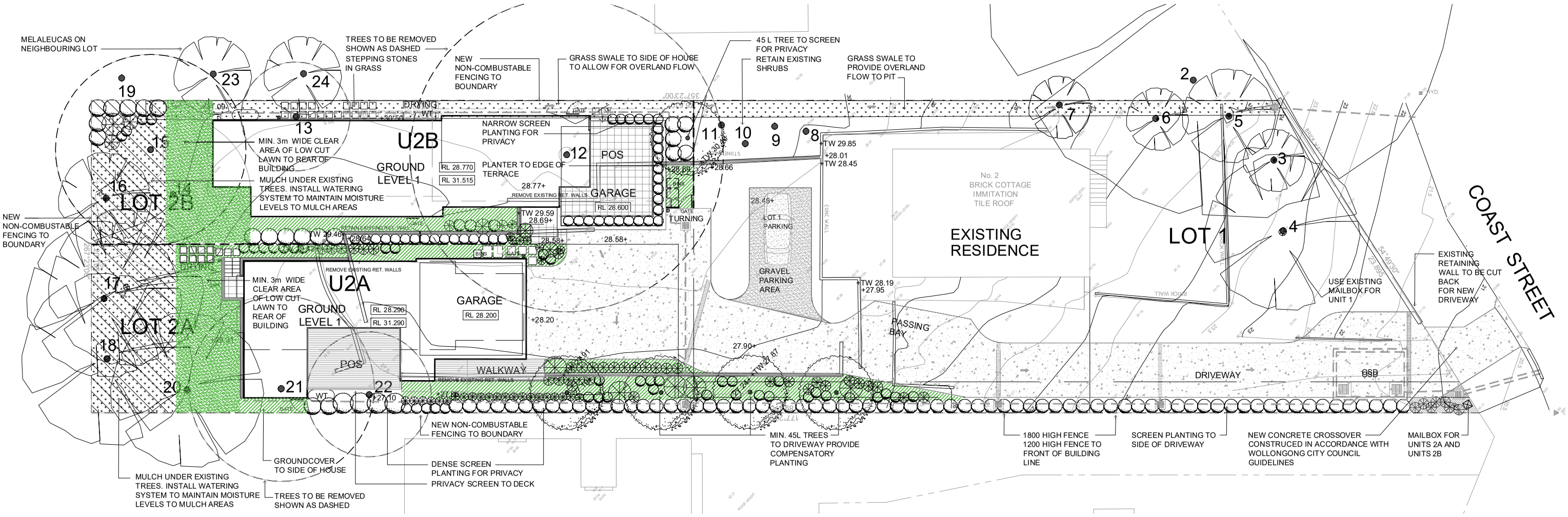


Katherine Harris
BPAD-L3-26927
GRAD DIP BUSH FIRE PROTECTION, UWS
GRAD DIP ENVIRO MANG HERTS, UK,
GRAD DIP NAT RES UNE,
BSC APP SC, AGRICULTURE HAC

FOLLOWING 4 PHOTOS OF ADJOINING WESTERN PROPERTY SHOWING MANAGEMENT

FOLLOWING THREE PHOTOS OF SUBJECT LOT SHOWING OVERGROWN WEEDS WITH SINGLE STANDING TREES WHICH WILL BE MANAGED AS GARDENS IN PLAN

FOLLOWING PHOTO OF ADJOINING EASTERN PROPERTY SHOWING MANAGEMENT



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PROJECT: 2 COAST STREET THIRROUL

Drawing Name: LANDSCAPE PLAN		Job No. DML 17/028	Dwg.No L-01
CLIENT: ARNOLD AND BROWN	Scale 1:250 (A3)	Date 17/07/18	Rev. B

ALLIED TREE
CONSULTANCY
Level 5 and 8 Arboriculturist

Arboricultural Impact Assessment Report

For the site address
Lot 13, (D.P. 5418)
No. 2 Coast Street,
THIRROUL, NSW

Prepared for
Develop My Land

AUTHOR
Warwick Varley

STATUS

Draft	April 2018
Final	August 2018
Amended	February 2019

REFERENCE D3347A

OFFICE
A PO Box 456, WOLLONGONG NSW 2520
P 1300 767 414
E admin@Alliedtrees.com.au
W www.alliedtrees.com.au

TABLE OF CONTENTS

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1.0 Introduction

1.1 The following Arborist report has been requested by the *Develop My Land*, for the trees located within and adjacent to the area of proposed development, being the area of No. 2 Coast Road, Thirroul, NSW. This development includes the subdivision and construction of a two residential dwellings. This report includes twenty-two trees located on and adjacent to the lot and discusses the viability of these trees based on the proposed works.

1.2 This report will address for these trees, the:

- species' identification, location, dimensions, and condition;
- SULE and STARS rating;
- discussion and impact of the proposed works on each tree;
- recommendations for the removal, retention and/or pruning;
- tree protection zones and protection specifications for trees recommended for retention.

1.3 The subject site resides within Thirroul; for this reason, Wollongong City Council is the consenting authority for any tree works recommended in this report.

2.0 Standards

2.1 Allied Tree Consultancy provides an ethical and unbiased approach to all assignments, possessing no association with private utility arboriculture or organisations that may reflect a conflict of interest.

2.2 This report must be made available to all contractors during the tendering process so that any cost associated with the required works for the protection of trees can be accommodated.

2.3 It is the responsibility of the project manager to provide the requirements outlined in this report relative to the Protection Zones, Measures (Section 7.0) and Specifications (Section 8.0) to all contractors associated with the project before the initiation of work.

2.4 All tree related work outlined in this report is to be conducted in accordance with the:

- Australian Standard – AS4373; Pruning of Amenity Trees.
- Guide to Managing Risks of Tree Trimming and Removal Work[1].
- All tree works must be carried out at a tertiary level (minimum Certificate-level 3) qualified and experienced (minimum five years) arboriculturist.
- For any works in the vicinity of electrical lines, the arboriculturist must possess the ISSC26 endorsement (Interim guide for operating cranes and plant in proximity to overhead powerlines).

[1] Safe Work Australia; July 2016; Guide to Managing Risks of Tree Trimming and Removal Work, Australia

2.5 As a minimum requirement, all trees recommended for retention in this report must have removed all dead, diseased, and crossing limbs and branch stubs to be pruned to the branch collar. This work must comply with the local government tree policy (Wollongong City Council) and Section 2.4.

2.6 Any tree stock subject to conditions for works carried out in this report must be supplied by a registered Nursery that adheres to the AS 2303; 2015[2].

- All tree stock must be of at least 'Advanced' size (minimum 75lt) unless otherwise requested.
- All tree stock requested must be planted with adequate protection. This may include tree guards (protect stem and crown) and if planted in a lawn area, a suitable barrier (planter ring) of an area, at least, $1m^2$ to prevent grass from growing within the area adjacent to the stem.

3.0 Disclosure Statement

Trees are living organisms and, for this reason, possess natural variability. This cannot be controlled. However, risks associated with trees can be managed. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the time when a tree will fail. To live or work near a tree involves some degree of risk, and this evaluation does not preclude all the possibilities of failure.

4.0 Methodology

4.1 The following tree assessment was undertaken using criteria based on the guidelines laid down by the International Society of Arboriculture.

4.2 The format of the report is summarised below;

4.2.1 **Plan 1;** Tree Location Relative to Site: This is an unscaled plan reproduced from the Survey Plan as referenced in Section 4.4.1, depicting the area of assessment.

4.2.2 **Table 1;** This table compiles the tree species, dimensions**,** brief assessment (history, structure, pest, disease or any other variables subject to the tree), significance, allocation of the zones of protection (i.e., Tree Protection Zone[3] ;TPZ and Structural Root Zone; SRZ) for each tree illustrated in Plan 1, Section 5.0. All measurements are in meters. An 'Action' is included and provides the nomination for retention/removal based on the tree location relative to the proposed design (drawing set, Section 4.4.2).

4.2.3 Discussion relating to the site assessment and proposed works regarding the trees.

[2] Australian Standard; 2015, AS2303, Tree stock for landscape use, Australia

[3] *Australian Standard, 4970; 2009* – Protection of Trees on Development Sites, Australia

4.2.4 Protection Specification; This Section (Section 8.0) details the requirements for that area designated as the Tree Protection Zone (TPZ), for those trees recommended for retention.

4.3 The opinions expressed in this report, and the material, upon which they are based, were obtained from the following process and data supplied:

4.3.1 Site assessment on the 12th March 2018 and follow up on the 12th February 2019 using the method of the Visual Tree Assessment[4]. This has included a Level 2 risk assessment, being a *Basic Assessment*[5]. The assessment has been conducted by Matthew Reed[6] and Warwick Varley[7] on behalf of *Allied Tree Consultancy*.

4.3.2 Trees included in this report are those that are 3m or greater in height.

4.3.3 All measurements, unless specified otherwise are taken from the tree centre.

4.3.4 Raw data from the preliminary assessment including the specimen's dimensions was compiled by the use of a diameter tape, height clinometer, angle finder, compass, steel probes, Teflon hammer, binoculars and recording instruments.

4.4 Documentation provided

The following documentation has been provided to Allied Tree Consultancy and utilised within the report.

4.4.1 Surveyor

Drawn by *C. Robson and Associates P/L*
Date: November 2017
Reference: 17606/0
Drawing No: Sheet 1 of 1

Note 1: Trees no. 2, 8, 9, 10, 11, 19, 23, 24 and 25 have been omitted from the plans provided, however, are required for inclusion because they conform to the definition of a prescribed tree within the local government tree policy. The tree location has been plotted onto the Plan 1 by *Allied Tree Consultancy*. The tree location was established by measuring from known points and scaling onto the drawing. *Allied Tree Consultancy* is not a registered surveyor and, however, the accuracy of the survey is attempted; the true position of the trees may marginally deviate. Any such

[4] Mattheck, C. Breloer, H.,1994, The Body Language of Trees – A handbook for failure analysis The Stationary Office, London
[5] Dunster J.A., 2013, Tree Risk Assessment Manual, International Society of Arboriculture, 2013, USA
[6] Consulting Arborist, level 5
[7] Consulting Arborist, level 5 and 8

deviation provides the potential for changing the actual impact (encroachment) provided to a tree.

4.4.2 Design
Drawn by *Develop My Land P/L*
Date: 20 July 2017
Reference: DML 17/028
Drawing No: A-01- A-05(P7)

4.4.3 Civil
Drawn by *Optima P/L*
Date: July 2018
Reference: OCE12998/C01/DA/A
Drawing No: Sheet 1

4.5 Limitations of the assessment/discussion process

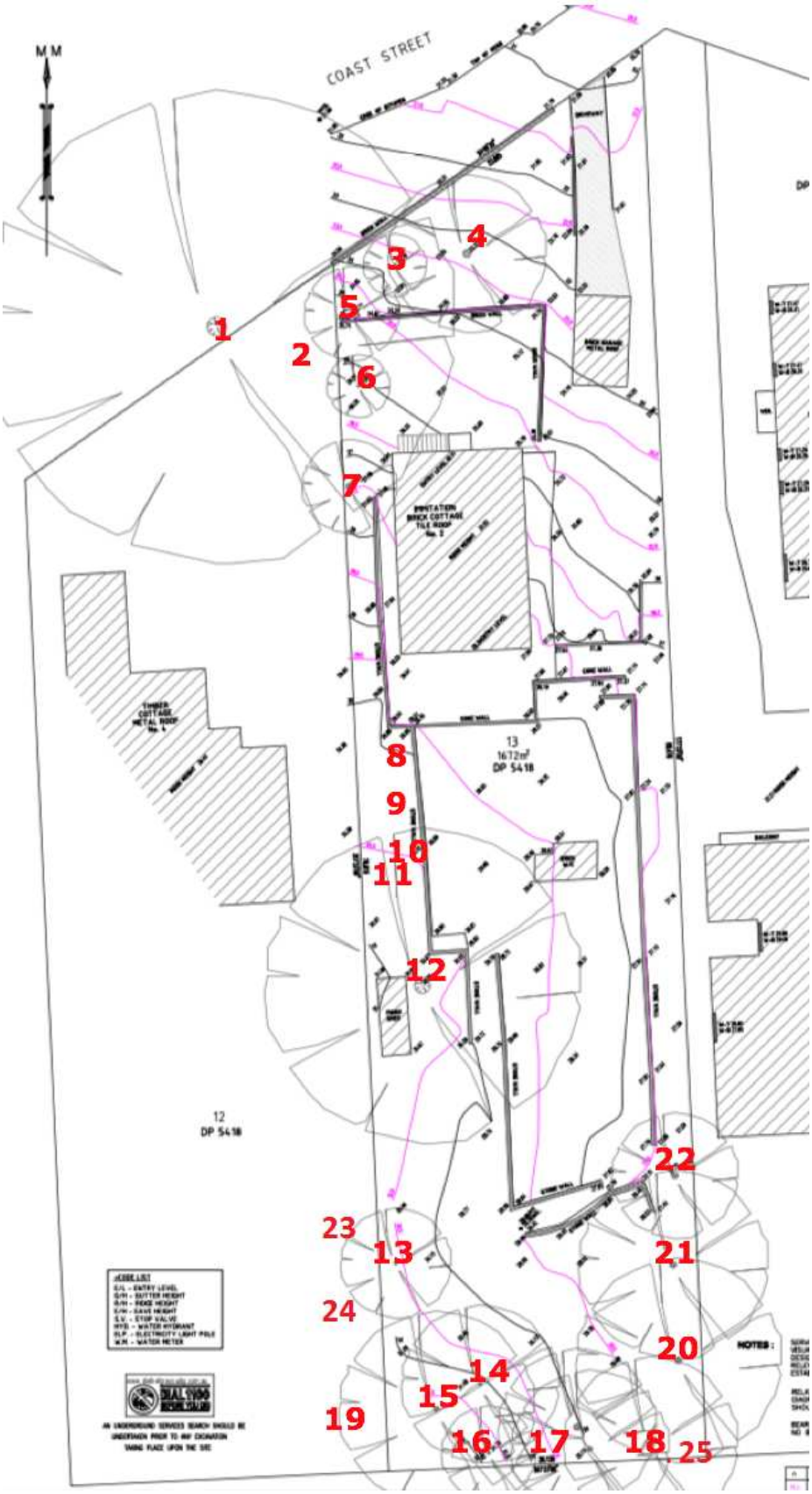
4.5.1 The location of trees no. 2, 8, 9, 10, 11, 19, 23, 24 and 25 have been estimated by the arborist. Allied Tree Consultancy is not a registered surveyor and, however, the accuracy of the survey is attempted; the true position of these trees may marginally deviate. Any such deviation provides the potential for changing the actual impact (encroachment) provided to a tree.

4.5.2 The assessment has considered only those target zones that are apparent to the author and the visually apparent tree conditions, during the time of assessment.

4.5.3 Any tree regardless of apparent defects would fail if the forces applied to exceed the strength of the tree or its parts, for example, extreme storm conditions.

4.5.4 The assessment has been limited to that part of the tree which is visible, existing from the ground level to the crown. Root decay can exist and in some circumstances provide no symptoms of the presence. This assessment responds to all the symptoms provided by a tree, however, cannot provide a conclusive recommendation regarding any tree that may have extensive root decay that leads to wind throw without the appropriate symptoms.

5.0 Plan 1; Area of assessment illustrating tree location



Not to scale

Source: Adapted from *C. Robson and Associates P/L,* see Section 4.4.1

6.0 Table 1 – Tree Species Data

Terminology/references provided in Appendix A.

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
1	*Eucalyptus pilularis* Blackbutt	22	0.60 0.80 0.95	20 x 20	M	D	Sym.	F	**A2**	**HIGH**	**15.0**	**3.9**
Assessment		This remnant street tree is codominant at ground level and provides the broad-spreading habit typical for the open-grown species. This remnant street tree is codominant at ground level and provides the habit typical for the open-grown species. This tree provides for a significant contribution to the streetscape.									**Retain** See Section 7.1.1	
2	*Acacia maidenii* Maiden's wattle	9	0.18	3 x 3	M	S	E bias	P	**A2**	**HIGH**	**2.2**	**1.7**
Assessment		This tree is located in the neighbouring lot, no. 4 Coast Road. The tree provides the habit typical for the urban grown species; foliage is somewhat sparse. Located approximately 1000mm from boundary and crown ingress into site was noted at approximately 8m in height by 1-2m.									**Retain** See Section 7.1.1	
3	*Gingko biloba* Gingko	8	0.11 0.17	4 x 4	M	S	Sym.	F	**A2**	**MEDIUM**	**2.4**	**1.8**
Assessment		This tree is codominant at 1m in height otherwise provides the habit typical for the species.									**Retain** See Section 7.1.1	
4	*Jacaranda mimisofolia* Jacaranda	10	0.20 0.31	8 x 8	M	S	Sym.	F	**A2**	**MEDIUM**	**4.4**	**2.3**
Assessment		This tree is codominant at 0.5m in height otherwise provides the habit typical for the species.									**Retain** See Section 7.1.1	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
5	*Stenocarpus sinuatus* Firewheel Tree	12	0.25	3 x 3	M	S	Sym.	F	**A1**	**MEDIUM**	**3.0**	**1.9**
Assessment		This tree provides the habit typical for the species and normal vitality.									**Retain** See Section 7.1.1	
6	*Eucalyptus ficifolia* Red-flowering Gum	6	0.23	4 x 4	M	C	Sym.	F	**A3**	**LOW**	**2.8**	**1.9**
Assessment		This tree has been poorly pruned (topped) at 1.5m and is composed of epicormic regrowth.									**Retain** See Section 7.1.1 and 7.1.2	
7	*Ceratopetalum gummiferum* NSW Christmas Bush	9	0.19 0.24	3 x 4	M	D	Sym.	F	**A2**	**MEDIUM**	**3.6**	**2.1**
Assessment		This tree is codominant at 1m otherwise displays habit typical for the species. Assessment was limited by a vine growing over the tree.									**Retain** See Section 7.1.1	
8	*Cupressus sempervirens 'Swanes Golden'* Swanes Golden Pencil Pine	7	0.30[B]	1 x 1	M	C	Sym.	F	**A1**	**LOW**	**3.6**	**2.1**
Assessment		This tree provides the habit typical for the species and normal vitality.									**Retain** See Section 7.1.1	
9	*Banksia serrata* Old Man Banksia	6	0.30	5 x 4	M	S	E bias	F	**A2**	**LOW**	**3.6**	**2.1**
Assessment		This tree provides the habit typical for the species however the vitality is low due to the suppressed class.									**Retain** See Section 7.1.1	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
10	*Leptospermum petersonii* Lemon-scented Tea Tree	7	0.16-0.20	6 x 6	M	S	E bias	P	**A2**	**LOW**	**4.8**	**2.3**
Assessment		This tree is codominant at ground level (composed of 5 leaders) and provides the habit typical for the species however vitality is low due to the suppressed class.									**Retain** See Section 7.1.5	
11	*Callistemon viminalis* Weeping Bottlebrush	6	0.09 0.15	3 x 2	M	S	N bias	P	**A2**	**LOW**	**2.0**	**1.6**
Assessment		This tree is codominant at ground level and provides the habit typical for the species, however, vitality is compromised by the suppressed growing position.									**Retain** See Section 7.1.4	
12	*Syzygium paniculata* Magenta Lilly Pilly	16	0.95[B]	14 x 14	M	D	Sym.	F	**A3/C4[E]**	**MEDIUM[E]**	**11.4**	**3.4**
Assessment		This tree provides the habit typical of the urban grown species and normal vitality. Composed of three leaders that initiate from a 1.5m high stem, the crotches are included, and one of these crotches contains an active crack. This provides a risk of failure for one of these three leaders. The tree, although indigenous to the Illawarra is planted, and this has been based on the open sprawling habit and location from where the tree is growing. Perched in a suspended garden bed, the retaining wall containing this tree has breached, likely a combination of tree growth and the construction method. The tree is an exceptional specimen, based on the size and provides high amenity value. The crack is rated as a MODERATE[8] risk rating. The opportunity for mitigation may exist, however regardless will provide for a reduced useful life expectancy.									**Remove** See Section 7.1.2 and 7.1.3	

[8] TRAQ Method, ISA

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
13	*Melaleuca armillaris* Honey Bracelet Myrtle	7	0.18 0.19 0.20	5 x 3	O	C	S	P	**A3**	**LOW**	**4.0**	**2.2**
Assessment		This tree is codominant at 1m and provides the habit typical for the species, however, vitality is compromised by the suppressed growing position.									**Remove** See Section 7.1.2 and 7.1.3	
14	*Cassia sp.*[A]	7	0.25	5 x 3	M	S	N	F	**A2**	**LOW**	**3.0**	**1.9**
Assessment		This tree is codominant at 1.5m and vitality is good despite suppressed position.									**Retain** See Section 7.1.4	
15	*Jacaranda mimosifolia* Jacaranda	12	0.50	8 x 8	M	D	Sym.	F	**A1**	**MEDIUM**	**6.0**	**2.6**
Assessment		This tree provides the habit typical for the species and normal vitality.									**Retain** See Section 7.1.4	
16	*Brachychiton acerifolius* Illawarra Flame Tree	10	0.25	3 x 3	M	S	Sym.	S	**A2**	**MEDIUM**	**3.0**	**1.9**
Assessment		This tree provides the habit typical for the species, and however, vitality may have been compromised by leaf tier pest.									**Retain** See Section 7.1.1	
17	*Brachychiton acerifolius* Illawarra Flame Tree	12	0.30	5 x 5	M	D	Sym.	S	**A2**	**MEDIUM**	**3.6**	**2.1**
Assessment		This tree provides the habit typical for the species, and however, vitality may have been compromised by leaf tier pest.									**Retain** See Section 7.1.1	
18	*Brachychiton acerifolius* Illawarra Flame Tree	11	0.40	4 x 4	M	C	Sym.	S	**A4**	**MEDIUM**	**4.8**	**2.3**

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
Assessment		This tree is dead, likely a result of extensive borer attack.									**Remove** See Section 7.1.2	
19	*Ficus sp.* Fig Tree	15	0.20 0.20 0.25[C]	8 x 7	M	C	Sym.	F	**A2**	**HIGH**	**4.0**	**2.2**
Assessment		This tree is a neighbouring tree in property to the west 4 Coast Road. The tree is approximately 2m from the boundary, and crown ingress into site was noted at approximately 4m in height by 3-4m.									**Retain** See Section 7.1.1	
20	*Corymbia citriodora* Lemon-scented Gum	19	0.50	10 x 10	M	D	Sym.	F	**A1**	**HIGH**	**6.0**	**2.6**
Assessment		This tree provides the habit typical for the species and normal vitality.									**Retain** See Section 7.1.5	
21	*Eucalyptus scoparia*[A] Wallangarra White Gum	17	0.40[C]	8 x 8	M	C	Sym.	F	**A3[C]**	**LOW**	**4.8**	**2.3**
Assessment		This tree provides a biased crown due to the co-dominant class. Several lower branches have been removed, and these wounds have yet to occlude. Several branches exhibit dieback, supporting possible pathogen infection. The species appears to be *E. scoparia*, however, may also be *E. maniferra*. The tree is planted.									**Remove** See Section 7.1.2 and 7.1.3	
22	*Brachychiton acerifolius* Illawarra Flame Tree	8	0.16 0.25	4 x 4	M	D	Sym.	F	**A2**	**MEDIUM**	**4.6**	**2.3**
Assessment		This tree is codominant at ground level otherwise provides the habit typical for the species and normal vitality. There may be decay in the codominant crotch.									**Remove** See Section 7.1.3	

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	STARS Rating	TPZ	SRZ
23	*Melaleuca linarifolia* Snow in Summer	7	0.31[C]	5 x 5	M	D	Sym.	A	**A1[C]**	**MEDIUM**	**3.7**	**2.0**
Assessment		This tree is in the neighbouring lot, No. 4 Coast Road. The tree is approximately 1600mm from the boundary, and crown ingress into site is 2m in height by 5m. The tree presents typical habit for the species.									**Retain** See Section 7.1.1	
24	*Melaleuca linarifolia* Snow in Summer	7	0.28[C]	6 x 5	M	C	E	A	**A1[C]**	**MEDIUM**	**3.4**	**1.9**
Assessment		This tree is in the neighbouring lot, No. 4 Coast Road. The tree is approximately 1600mm from the boundary, and crown ingress into site is 1m in height by 5m. The tree presents typical habit for the species.									**Retain** See Section 7.1.1	
25	*Brachychiton acerifolius* Illawarra Flame Tree	6	0.19	4 x 3	Y	S	S	B	**A2[C]**	**MEDIUM**	**2.3**	**1.7**
Assessment		This tree presents typical form, although limited branch structure due to the suppressed class. The foliage is sparse as are the other *Brachychitons*, No. 17 and 22. No apparent reason exists for this.									**Retain** See Section 7.1.1	

A. Incomplete identification of species due to insufficient available plant material
B. Diameter taken below 1.4m due to low stem bifurcation
C. estimate due to overgrown area and/or limited access
D. deciduous species, void of leaf at the time of assessment
E. Level 3 assessment required to determine accurate rating

7.0 Site Assessment

The area of assessment comprises a long and narrow rectangular shaped lot. The lot has a consistent medium gradient with a north-eastern aspect, where the highest point is located in the south-western corner. Several retaining walls occur adjacent and parallel with the western boundary, and across the front yard which is a tiered garden bed. A concrete retaining wall exists on the western boundary and is approximately 500mm high and adjacent to trees No. 23 and 24. Based on the height of this wall and repsctive grade trees No. 23 and 24 are located on, no root ingress is considered to extend past this wall. The walls located within the lot are a composite of stone and brick, and this supports elevated garden beds and the boundary fence. Several outbuildings exist comprising a garden shed, chicken coop and greenhouse. A concrete strip cross-over services a drive and detached garage. The existing dwelling is a single story wooden clad and supported by brick piers. The verge is grass covered and void of a footpath. The site trees are all planted species. The rear yard is divided between lawn and a natural form garden where the predominate plantings exist. The rear of the yard is overgrown and difficult to access based on steep grades and overgrown weed/garden stock.

7.1 Proposed development

The proposed development consists of the retention of the existing dwelling at the front of the lot and subdivision of the rear of the lot and construction of two residential units development, drive access, and drainage infrastructure.

Observation 1: Trees no. 8, 9, 10, 11, 23 and 24. The calculations of the zones of protection (TPZ, SRZ) are based on the arbitrary formulae provided in the AS 4970, and this document provides scope for modifying this zone, however with supporting evidence. The existing retaining wall has acted as a barrier, therefore reducing root extension and forming a semi-circular root system that is confined to the western side of the wall only. No root ingress will proceed beyond the wall.

Assumption 1: The existing retaining wall supporting the root zones of trees no. 8, 9, 10 and 11 has not been referenced for replacement. Therefore it is assumed that this structure is to be retained and no further work will occur in this area.

This report discusses the impact of the proposed design on the trees. Twenty-two (22) trees have been listed within this report based upon the vicinity of the lot. This has included neighbouring trees that would pose part of the TPZ to encroach into the lot. Recommendations based on the tree significance and condition, together with the impact on these trees regarding the development for this lot follow;

7.1.1 Trees and zones of protection (TPZ/SRZ) outside of the proposed design

Trees no. 1, 2, 3, 4, 5, 6, 7, 8, 9, 16, 17, 19, 23, 24 and 25

Based on Assumption 1, none of the proposed works conflict with the location of these trees or respective zones of protection. These trees can be retained.

7.1.2 Trees providing a limited useful life expectancy

Trees no. 6, 12, 13, 18 and 21

These trees provide low significance based on the species, habit and rating and could be removed due to the low amenity value and limited useful life expectancy.

7.1.3 Trees directly conflicting with the design

Trees no. 12, 13, 21 and 22

These trees are located in the footprint of the proposed design and would require removal based on this premise alone. The conflict is summarised as follows;

Trees no. 12 and 13; within the footprint of the proposed dwelling listed as U2B.

Trees no. 21 and 22; within the footprint of the proposed dwelling listed as U2A.

7.1.4 Trees subject to a minor encroachment

Trees no. 11, 14 and 15

These trees are not directly located in the footprint of the proposed dwelling, however, are subject to a *minor encroachment*. That is, the proportion (<10%) of encroachment provided by design will not adversely impact on the tree. These trees could be retained relative to the design.

Tree no. 11: Encroachment: 1%; based on Assumption 1 and Observation 1. The encroachment (based on drawing A-01) consists of the construction of the proposed garage for the dwelling listed as U2B.

Tree no. 14: Encroachment: 7%; based on drawing A-01. The encroachment consists of the excavation for the drainage pipe.

Tree no. 15: Encroachment: 10%; based on drawing A-01. The encroachment consists of the construction of the proposed dwelling listed a U2B (eight percentage points) and excavation for the drainage pipe (two percentage points)

7.1.5 Trees subject to a major encroachment

Trees no. 10 and 20

These trees are not directly located in the footprint of the proposed design, however, are located close and adjacent to the dwelling footprint and subject to a *major encroachment*, that is, in excess of 10% of the TPZ. The extent and type of encroachment for each tree are discussed and the relative implications.

Tree no. 10: Encroachment: 13%; based on Assumption 1 and Observation 1. The encroachment (based on drawing A-01) consists of excavation for the stormwater pipe. This is three percentage points above a minor encroachment and is not considered to be detrimental to the tree. This

does not consider the other subsurface utilities or landscaping, that may also increase the encroachment.

Tree no. 20: Encroachment: 9%; based on the modified drawing A-01. The encroachment is restricted to the construction of the dwelling listed as U2A. This is a minor encroachment and is not considered detrimental to the tree.

7.2 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than drainage. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

7.3 Protection measures

The following protection measures are required to be implemented for the following trees before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

Trees no. 8, 9, 10, 11, 12, 14, 15, 16, 17, 19 and 20

A protective fence is required to be installed to protect the TPZ from all site-related work and are recommended to be located in accordance with the requirements of the AS 4970, listed in Appendix C. The fence is required to be secured to the ground with pegs to avoid movement during construction. This must be installed prior to the commencement of any demolition, excavation or construction works and shall be maintained throughout the entire construction phase of the development, and until landscaping works and installation of the drive/cross-overs is required.

The location of the protective fence has been illustrated in Plan 2, Appendix B.

Site induction; All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work. This is required as part of the site induction process.

7.4 Compliance Documentation

The following stages will require assessment and documentation (report, letter, certification) by the project arborist or person responsible for the specific work type, and the related documentation is to be issued to the principal certifying agent.

7.4.1 Table 2; Assessment/Certification stages

Stage	Work type	Document required
Pre- works	Installation of the protection measures, Section 7.4	Certificate*

During construction	Any <u>further works</u> required within the area of the TPZ, or decline related to the trees that have not been covered by this report.	Report Brief
During construction	Any crown modification including pruning or root disturbance.	Report Brief

Construction refers to the time between the initiation of demolition and until an occupation certificate is issued.
***Mandatory**

8.0 Protection Specification

The retention and protection of trees provide for the requirement of the Tree Protection Zone (TPZ) to conform to the conditions outlined below. These conditions provide the limitations of work permitted within the area of the Tree Protection Zone (TPZ) and must be adhered to unless otherwise stated.

1. <u>Foundation/footing types should not be strip type</u>, but utilise footing types that are sympathetic towards retaining root system that is, screw, pier, etc. Slab on the ground can be accommodated in some circumstances and will be nominated by the project arborist. The extent of encroachment will be dependent upon the tree species, soil type (texture and profile) and gradients.

2. <u>Subsurface utilities</u> can extend through the TPZ and Structural Root Zone (SRZ), however, are limited to the method of installation. That is under boring is permitted, however trenching is limited and depends on the proposed route within the TPZ. No trenching is permitted within the area of the TPZ unless stipulated by the project arborist.

3. Crown pruning can be accommodated, however, must conform to the AS 4373; *Pruning of Amenity Trees*, and not misshape the crown nor remove in excess of 10-15% of the existing crown, pending on the species, and vigour. The opportunity for, type and proportion of pruning will be required to be nominated by the project arborist.

4. <u>Soil levels within the TPZ must remain the same</u>. Any excavation within the TPZ must have been previously specified and allowed for by the project arborist:

   a) So it does not to alter the drainage to the tree.

   b) Under specified circumstances,

      - Added fill soil does not exceed 100mm in depth over the natural grade. Construction methodologies exist that can allow grade increases in excess of 100mm, via the use of an impervious cover, an approved permeable material or permanent aeration system or other approved methods.

- Excavation cannot exceed a depth of more than 50mm within the area of the TPZ, not including the SRZ. The grade within the SRZ cannot be reduced without the consent from a project arborist.

5. No form of material or structure, solid or liquid, is to be stored or disposed of within the TPZ.

6. No lighting of fires is permitted within the TPZ.

7. All drainage runoff, sediment, concrete, mortar slurry, paints, washings, toilet effluent, petroleum products, and any other toxic wastes must be prevented from entering the TPZ.

8. No activity that will cause excessive soil compaction is permitted within the TPZ. That is, machinery, excavators, etc. must refrain from entering the area of the TPZ unless measures have been taken, and with consultation with the project, arborist to protect the root zone.

9. No site sheds, amenities or similar site structures are permitted to be located or extend into the area of the TPZ unless the project arborist provides prior consent.

10. No form of construction work or related activity such as the mixing of concrete, cutting, grinding, generator storage or cleaning of tools is permitted within the TPZ.

11. No part of any tree may be used as an anchorage point, nor should any noticeboard, telephone cable, rope, guy, framework, etc. be attached to any part of a tree.

12. (a) All excavation work within the TPZ will utilise methods to preserve root systems intact and undamaged. Examples of methods permitted are by hand tools, hydraulic, or pneumatic air excavation technology.

    (b) Any root unearthed which is less than 50mm in diameter must be cleanly cut and dusted with a fungicide, and not allowed to dry out, with minimum exposure to the air as possible.

    (c) Any root unearthed which is greater than 50mm in diameter must be located regarding their directional spread and potential impact. A project arborist will be required to assess the situation and determine future action regarding retaining the tree in a healthy state.

Project Arborist: person nominated as responsible for the provision of the tree assessment, arborist report, consultation with stakeholders, and certification for the development project. This person will be adequately experienced and qualified with a minimum of a level 5 (AQF); Diploma in Horticulture (Arboriculture)[9].

[9] Based upon the definition of a 'consulting arborist' from the AS 4970; Protection of trees on development sites; 2009, Section 1.4.4, p 6.

9.0 Recommendations

Based on the design supplied, the following summary provides the impacts imposed on the trees included in this report.

9.1 Trees no. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 19, 20, 23, 24 and 25

These trees can be retained relative to the nominated zones of protection (TPZ, SRZ) and based on the requirements of the Protection Specification, Section 8.0. The proposed design does not adversely affect these trees.

9.2 Trees no. 12, 13, 18, 21 and 22

The proposed design will require removal of these trees.

9.3 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than drainage. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

9.4 Protection measures

Protection measures (outlined in Section 7.3 and 7.4) are required to be implemented for the trees nominated for retention (referenced in Section 9.1) and installed before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work.

A project arborist is required to be nominated, and the stages and related certification or similar documentation is to be issued to the principal certifying agent.

The opinions expressed in this report by the author have been provided within the capacity of a Consulting Arborist. Any further explanation or details can be provided by contacting the author.

DATED: 26th February 2019

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10.0 Appendix A- Terminology Defined

Height

Is a measure of the vertical distance from the average ground level around the root crown to the top surface of the crown, and on palms - to the apical growth point.

DBH

Diameter at Breast Height – being the stem diameter in meters, measured at 1.4m from ground level, including the thickness of the bark.; Mult. refers to multiple stems, that is in excess of 4 stems.

Crown Spread

A two dimension linear measurement (in metres) of the crown plan. The first figure being the north-south span, the second being the east-west measurement.

Age

Is the estimate of the specimen's age based upon the expected life span of the species. This is divided into three stages.

Young (Y)	Trees less than 20% of life expectancy.
Mature (M)	Trees aged between 20% to 80% life expectancy.
Over-mature (O)	Trees aged over 80% of life expectancy with probably symptoms of senescence.

Crown Aspect

In relation to the root crown, this refers to the aspect the majority of the crown resides in. This will be either termed Symmetrical (Sym.) where the centre of the crown resides over the root crown, or the cardinal direction the centre of the crown is biased towards, being either North (N), South (S), East (E) or West (W).

Crown Ratio;

Refers to the density of the crown in comparison to an example of the same species and age. The crown ratio can be expected to contain the following proportions of foliage in regard to a specimen of average vigour (being 100%).

F - Full 85% - 100%
P - Partial 40% - 85%
S - Sparse less than 40%

Live Crown Ratio

This is a ratio specific to conifers (and few genus of Angiosperms), and offers the proportion of existing crown relative to the overall height. This figure, expressed as a percentage acts as an indicator for stability, vigour and the potential for retention. Trees with a Live Crown Ratio less than 30% typically are "weak, lack vigour and have low diameter growth" [10]

Limb Diameter

Is measured adjacent to the branch collar, which is the cross-Section offering the largest diameter of the limb.

[10] Dunster J. and Dunster K. , 1996, Dictionary of Natural Resource Management UBC Press, University of British Columbia. Vancouver, B.C, Canada

Crown Class

Is the differing crown habits as influenced by the external variables within the surrounding environment. They are:

D – *Dominant* Crown is receiving uninterrupted light from above and sides, also known as emergent.

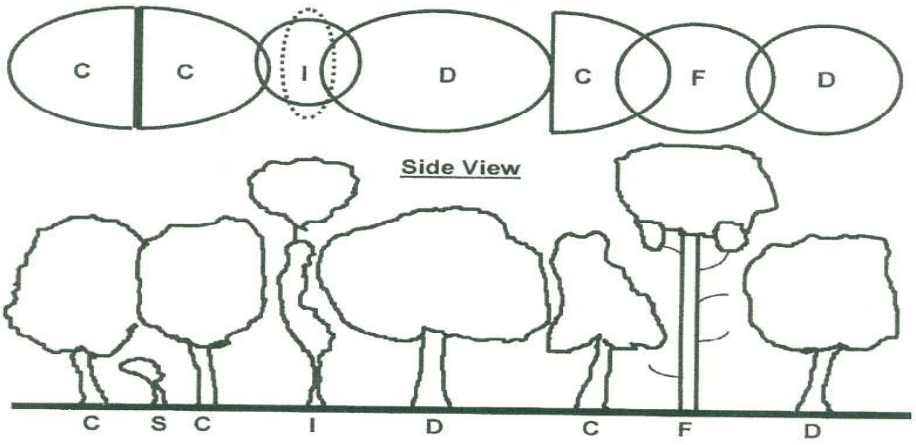
C – *Codominant* Crown is receiving light from above and one side of the crown.

I – *Intermediate* Crown is receiving light from above but not the sides of the crown.

S – *Suppressed* Crown has been shadowed by the surrounding elements and receives no light from above or sides.

F – *Forest* Characterised by an erect, straight stem (usually excurrent) with little stem taper and virtually no branching over the majority of the stem except for the top of the tree which has a small concentrated branch structure making up the crown.

Top View



D C, I & S and side view, after (Matheny, N. & Clark, J. R. 1998, Trees Development, Published by International Society of Arboriculture, P.O. Box 3129, Champaign IL 61826-3129 USA, p.20, adapted from the Hazard Tree Assessment Program, Recreation and Park Department, City of San Francisco, California).

Levels of assessment

Level 1: Limited visual: a visual tree assessment for the purpose of managing large populations of trees within a limited time span and in order to identify obvious faults which would be considered imminent.

Level 2: Basic assessment: a standard performed assessment providing for a detailed visual assessment including all parts of the tree and surrounding environment and via the use of simple tools.

Level 3: Advanced assessment: specific type assessments conducted by either arborists whom specialise with specific areas of assessment or via the use of specialised equipment. For example, aerial assessment by use of an EWP or rope/harness, or decay detection equipment.

All other definitions are referenced from;

Draper D.B., Richards P.A., 2009, Dictionary for Managing Trees in Urban Environments CSIRO Pub., Australia

Significance Rating, Significance of a Tree Assessment Rating System (S.T.A.R.S), IACA, 2010[11]

Tree Significance – Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vitality;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vitality;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vitality;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences,

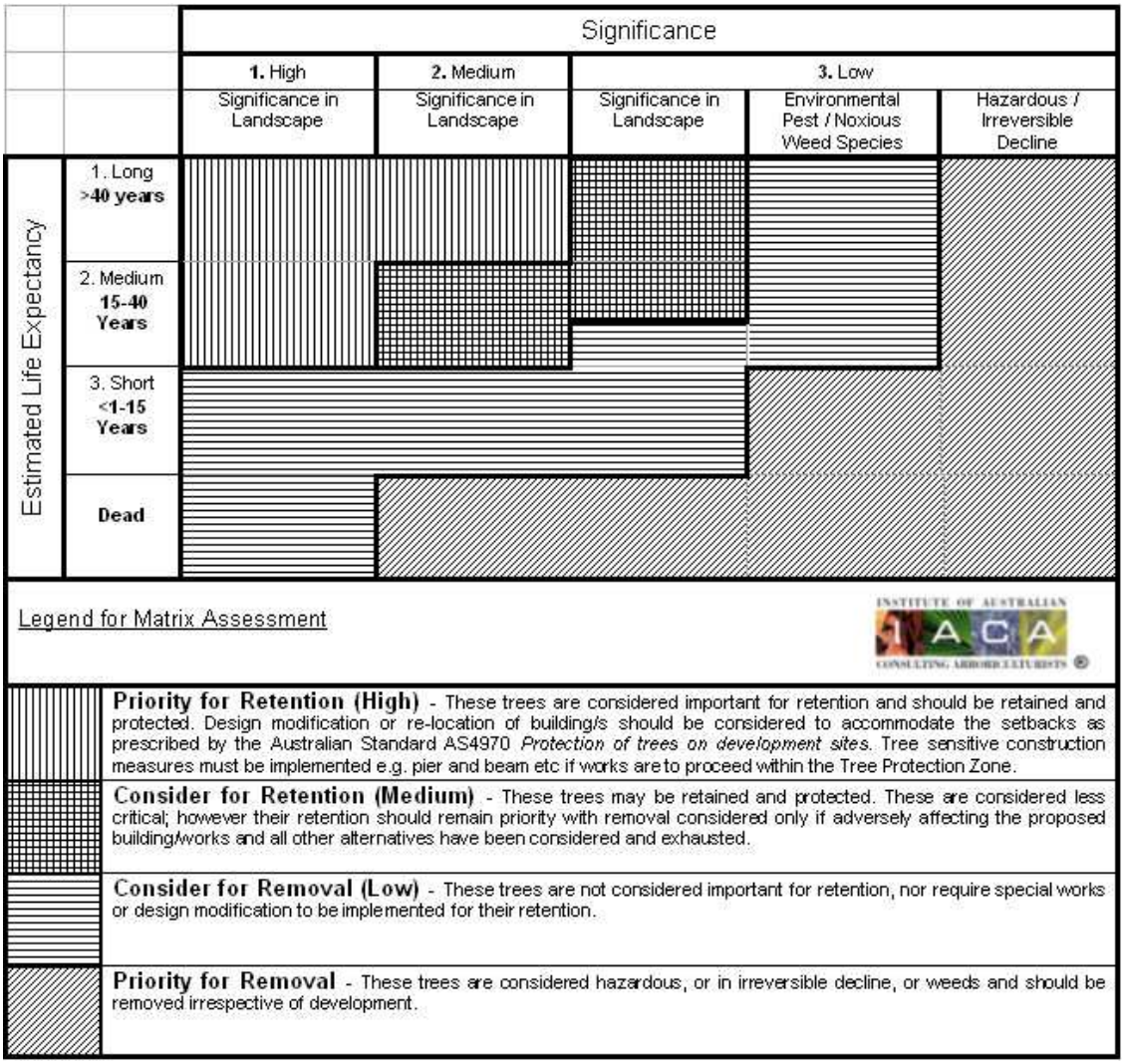
[11] IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.
Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.
Hazardous/Irreversible Decline
- The tree is structurally unsound and/or unstable and is considered potentially dangerous, - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g.

Table 3; Tree Retention Value – Priority Matrix.



Safe Useful Life Expectancy – S.U.L.E (Barell 1995)

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or Replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years.	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability on recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in heights
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after removal of other trees for reasons given in (A) to (F).	

TPZ; Tree Protection Zone
Is an area of protection required for maintaining the trees vigour and long term viability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to, unless otherwise stated.

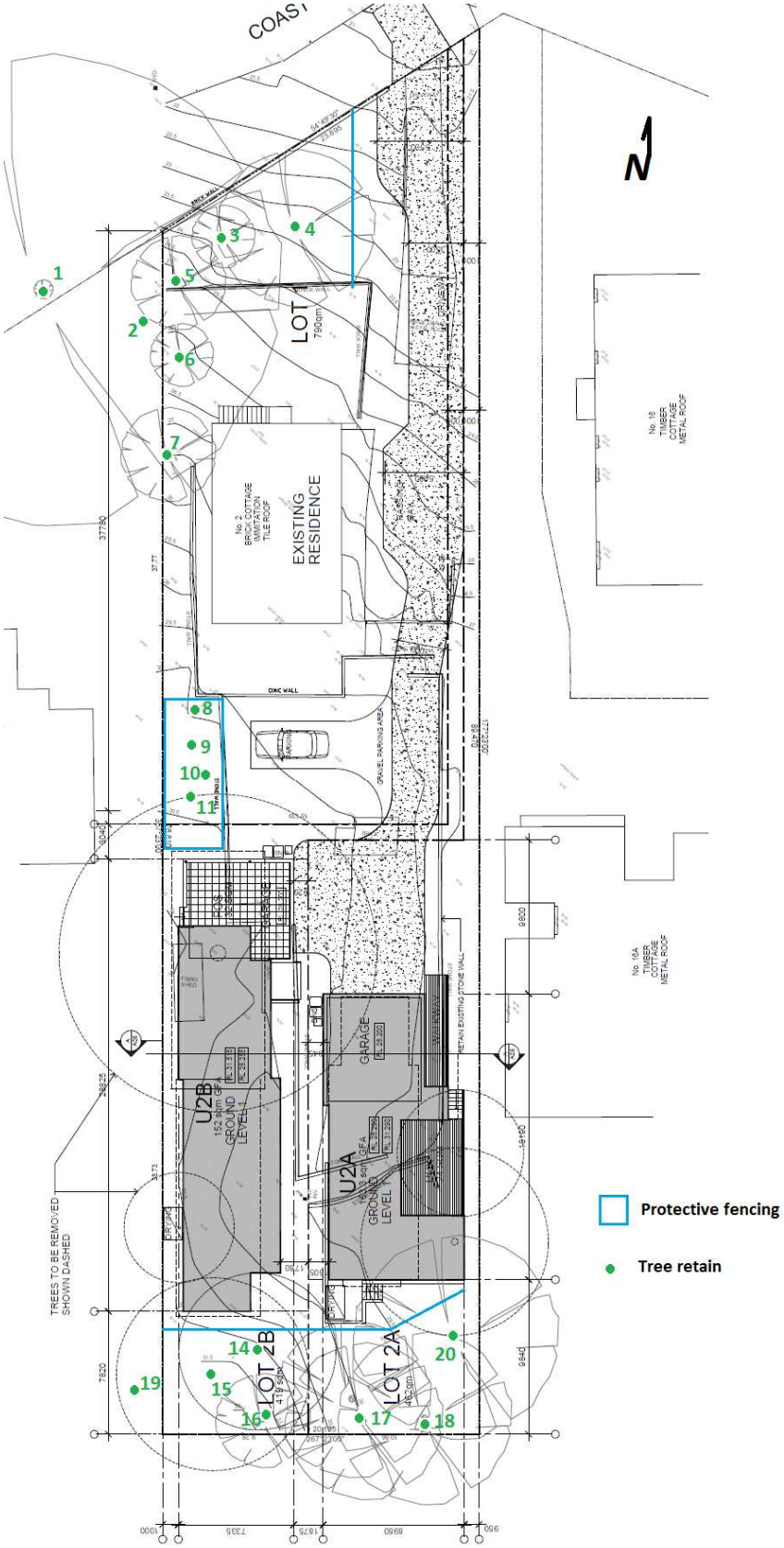
The size of the Tree Protection Zone (TPZ) has been calculated from the *Australian Standard, 4970; 2009* – Protection of Trees on Development Sites

The TPZ does not provide the limit of root extension, however offers an area of the root zone that requires predominate protection from development works. The allocated TPZ can be modified by some circumstances; however will require compensation equivalent to the area loss, elsewhere and adjacent to the TPZ.

SRZ; Structural Root Zone
Is the area around the tree containing the woody roots necessary for stability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to, unless otherwise stated.

Protection Measures
These are required for the protection of trees during demolition/construction activities. Protective barriers are required to be installed before the initiation of demolition and/or construction, and are to be maintained up to the time of landscaping. Samples of the recommended protection measures are illustrated in Appendix C.

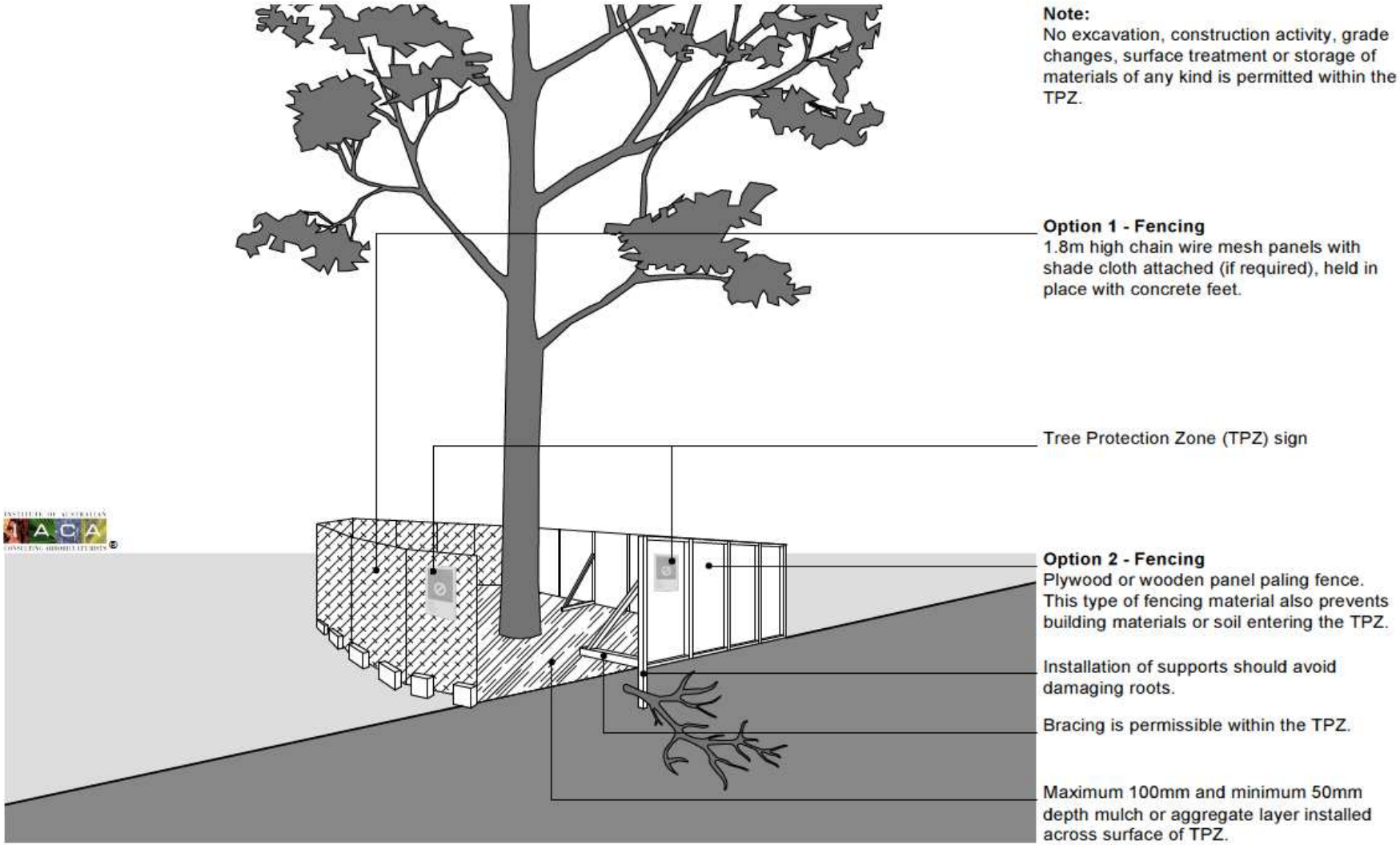
Appendix B- Plan 2; Measures of protection



Not to scale

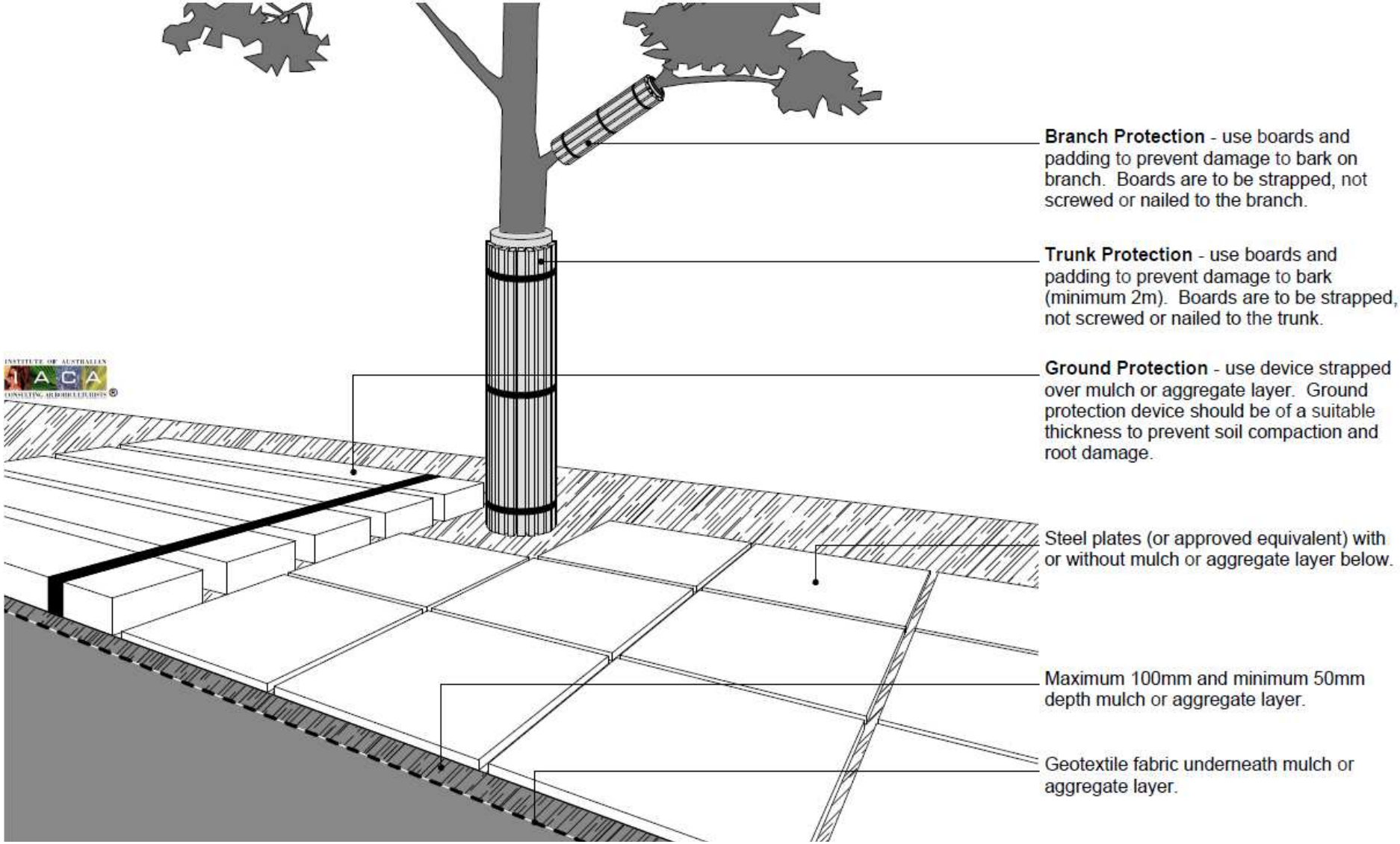
Source: Adapted from *Develop My Land P/L,* See Section 4.4.2

Appendix C- Protection measures;
Protective fence



Tree protection zone sign; requirements

Stem and Ground protection



ATTACHMENT 2 - INDEPENDENT ARBORIST REPORT

Moore Trees
Arboricultural Services

ABN 90887347745

Arboricultural Development Assessment Report

2 Coast Road
Thirroul NSW 2515
Lot 13 Sec 0 DP5418
January 2019
FINAL

Prepared for: Wollongong City Council

Prepared by: Paul Vezgoff
Consulting Arborist
ISA, AA
Arboriculture Australia
Registered Consultant

Member 2019

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Summary

This report has been compiled for Wollongong City Council. The report concerns a proposed Development Application for 2 Coast Street, Thirroul NSW 2515. This Arborist Report refers to two (2) trees, numbered in a previous Arboricultural Report as Trees 12 and 20. This report is an independent professional opinion on two (2) significant trees located at the rear of this site that will be impacted by the proposed development.

This report contains the following information required in Wollongong City Council Development guidelines:-

1) All trees were assessed for Safe Useful Life Expectancy (SULE).
2) Genus and species identification of each tree.
3) Impact of the proposed development on each tree.
4) Impact of retaining tree on the proposed development.
5) The Tree Protection Zone (TPZ) for each tree to be retained.
6) Any root barriers necessary, type and location.
7) Any branch or root pruning that may be required for trees.

Tree 12, due to the crack that has formed between the main stem, would not be considered a long term viable specimen. Although not imminently dangerous, cracks do not heal or seal over. A crack will generally only get worse with time. Based on the long term plans for this site and the proposed development, I do not see it possible to retain this tree and incorporate it into the proposed development.

Based on the plans provided the extensive level changes around the base of Tree 20 will have an adverse impact on the fine feeder roots of this tree. Tree 20 is worthy of retention and should be retained as it forms part of a continuous canopy adjoining the neighbouring properties.

A site specific tree protection specification for Tree 20 will be required for this project should Tree 20 be retained.

Table of Contents

VERSION CONTROL

Date of Issue	Details
22 January 2019	Draft 1 issued
24 January 2019	Final version issued

1 INTRODUCTION

1.1 This report has been conducted to assess the health and condition of two (2) trees located at 2 Coast Street, Thirroul NSW 2515. This report has been prepared for Wollongong City Council as required for a Development Application with Wollongong City Council at this site.

This report is an independent professional opinion on two (2) significant trees located at the rear of this site that will be impacted by the proposed development. This Arborist Report refers to two (2) trees, numbered in a previous Arboricultural Report as Trees 12 and 20.

The subject trees were assessed for their health and condition. Also included in this report are generic tree protection measures that will help retain and ensure that the long term health of the tree(s) to be retained are not adversely affected by the proposed development in the future. Pending the final approval, a site specific tree protection specification will be required as plans may have to be updated or may alter to what has been provided for this report.

As specified in the Wollongong City Council Development Application guidelines the following data was collected for each tree:

1) A site plan locating trees 12 and 20.
2) All trees were assessed for Safe Useful Life Expectancy (SULE), health and amenity value.
3) Genus and species identification of each tree.
4) Impact of the proposed development on each tree.
5) The Tree Protection Zone (TPZ) calculated for each tree.
6) Any branch or root pruning that may be required for trees.

Also noted for the purpose of this report were:

- Health and Vigour; using foliage colour and size, extension growth, presence of deadwood, dieback and epicormic growth throughout the tree.
- Structural condition using visible evidence of bulges, cracks, leans and previous pruning.
- The suitability of the tree taking into consideration the proposed development.
- Age rating; Over-mature (>80% life expectancy), Mature (20-80% life expectancy), Young, Sapling (<20% life expectancy).

1.2 Documents and information provided: For this Arborist Report I was given a site plan of the location, undertaken by Develop My Land marked Job # DML 17/028 DWG # A-01 Rev A dated 25/08/18. The plan showed the proposed buildings, landscaping and existing trees on the site. I have not been provided any plans engineering specifications or service diagrams for the site.

1.3 Location: The proposed development site is located at 2 Coast Street, Thirroul NSW 2515, known as Lot 13, Sec 0, DP5418. The proposed development site from herein will be referred to as "the Site".

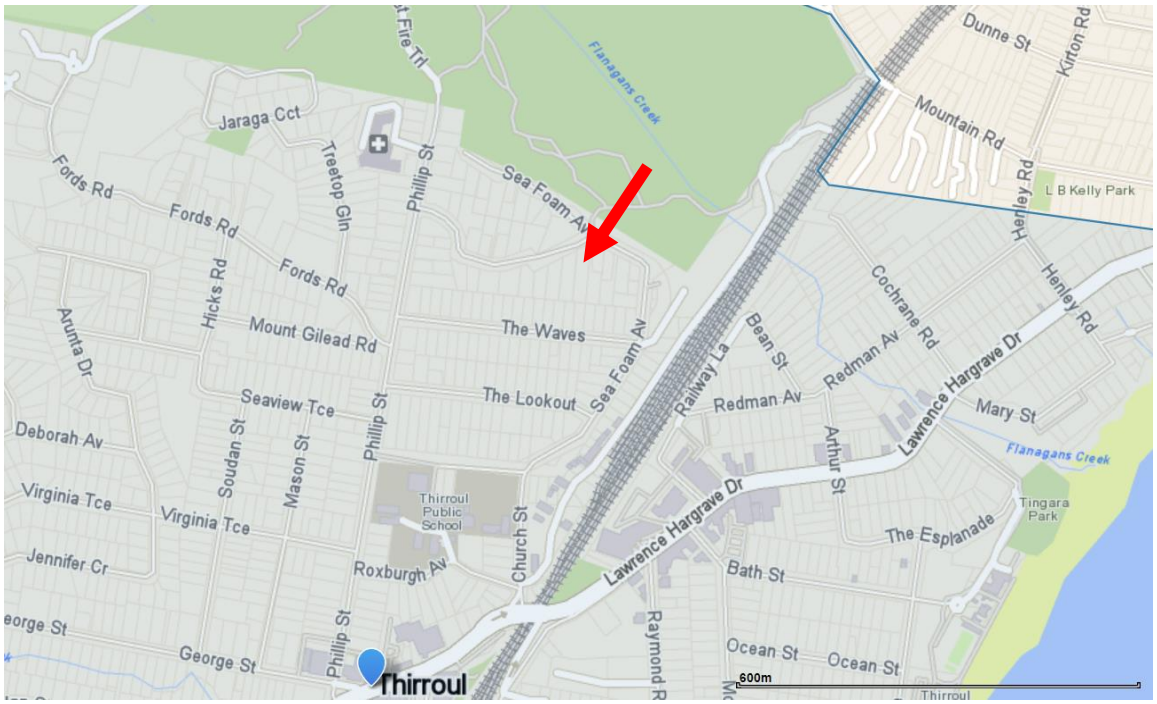


Diagram 1: Location of subject site, 2 Coast Street, Thirroul (Red arrow) (whereis.com.au, 2019)

2 METHODOLOGY

2.1 To record the health and condition of the trees, a Visual Tree Assessment (VTA) was undertaken on the subject trees on 16th January 2019. This method of tree evaluation is adapted from Matheny and Clark, 1994 and is recognised by The International Society of Arboriculture. Individual tree assessments are listed in Appendix 2 of this report. All inspections were undertaken from the ground. No diagnostic devices were used on these trees.

2.2 This report is only concerned with Trees 12 and 20 on the site that come under the Tree Management Permit Policy that is part of the Wollongong City Council Development Control Plan, 2009 (Chapter E17 Preservation and management of Trees and vegetation). Under this Chapter (E17), a person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any prescribed tree or other vegetation, without development consent or a permit being granted by Council. Refer to Part 3 (Chapter E17) Definitions for the meaning of 'prescribed tree' and 'prescribed other vegetation'. Two application processes have been established to deal with the assessment and approval for prescribed trees:

a) Tree Management Permit (generally for individual/small scale tree removal and pruning in urban areas) - refer to Council's website for the Tree Management Permit Policy;

b) Development consent via either Complying Development or Development Application. This Chapter of the DCP should be read in conjunction with clauses 5.10 Heritage conservation, 5.11 Bush fire hazard reduction work and 7.2 Natural resource sensitivity – biodiversity of Wollongong Local Environmental Plan 2009.

This Report is required as per clause (b) via a Development Application for the site. This report takes no account of any tree or shrub under three (3) metres in height.

2.3 Height: The heights and distances within this report have been measured with a Bosch DLE 50 laser measure.

2.4 Tree Protection Zones (TPZ): The TPZ is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. TPZ's have been calculated for each tree to determine construction impacts. The TPZ calculation is based on the Australian Standard *Protection of trees on development sites,* AS 4970, 2009.

2.5 Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of tree roots, both structural and fibrous. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The TPZ and SRZ are measured as a radial measurement from the trunk. No roots should be severed within this area. A detailed methodology on the TPZ and SRZ calculations can be found in Appendix 4.

2.6 Safe Useful Life Expectancy (SULE): The subject trees were assessed for a Safe Useful Life Expectancy (SULE). The SULE rating for each tree can be seen the Tree Assessment Schedule (Appendix 2). A detailed explanation of SULE can be found in Appendix 3.

2.7 Impact Assessment: An impact assessment was conducted on the site trees. This was conducted by assessing the site survey and plans provided by Wollongong City Council. The plans provided were assessed for the following:

- Reduced Level (R.L.) at base of tree.
- Incursions into the Tree Protection Zone (TPZ).
- Assessment of the likely impact of the works.
- Bushfire management impacts.

3 RELEVANT BACKGROUND INFORMATION

3.1 The site is located on the southern side of Coast Street and contains a split level residential dwelling. Trees 12 and 20 are located in the rear garden of the subject site. The proposed works are to retain the existing dwelling whilst constructing two separate dwellings at the rear of the site named as U2A and U2B.

3.2 Tree 12 is a Magenta lilly pilly *(Syzygium paniculatum)*. It is a large, mature specimen, approximately fourteen (14) metre in height with an eight (8) metre symmetrical stem (Plate 1). The main stem bifurcates at approximately 1.6 metres from ground level. It has a broad spreading woody root zone that is particularly contained within a retaining wall (Plate 2). The retaining wall is showing some disruption; however this is possibly attributed to poor construction standards and expansion of the root zone over many years. The subject tree is generally in good health, with a full canopy showing good vigour and minimal deadwood (Plate 3). There is no history of large diameter branch failures however there is evidence of a large crack that has developed between one of the three main stems. The evidence of this crack is on the eastern side of the tree and it can be probed with a steel rod for approximately two hundred (200) millimetres. The tree, in its current form, clearly has limited long term potential. Should this stem fail, it will leave quite an unbalanced tree. In terms of risk, the potential stem that could fail is four hundred and fifty (450) millimetres in diameter however a hazard assessment is outside the scope of this report. The target area, as it currently is, would be considered low.

3.3 Tree 20 is a Lemon-scented Gum Tree *(Corymbia citridora)*. This tree is located in the south-eastern corner of the site (Plate 5). It is in good health and condition, free of any cracks, splits and fruiting bodies (Plate 6). It is approximately nineteen (19) metres in height with a nine (9) metre generally symmetrical spread, although it is codominant with surrounding trees. There is no evidence of large diameter branch failures and it is generally free of large diameter deadwood. It does form part of a group of vegetation within several properties that all form a block of canopy cover in the area. These trees are a mixture of native and exotic species including Turpentine, Illawarra Flame Tree, Jacaranda, Melaleuca linariifolia and several Bangalow Palms. The subject tree is

growing at the base of a terraced area that is likely to be altered for the construction of one of the units.

3.4 **Environmental Significance**: All trees in the Wollongong Local Government Area are protected and cannot be removed without the adequate requirements being met. Specifications relating to what can and cannot be removed are detailed in the Wollongong City Council Development Control Plan (DCP), 2009 in Chapter E17 *'Preservation of trees & management of trees and vegetation'*. This DCP protects all trees above three (3) metres in height with a girth of twenty (20) centimetres or more, measured at a distance of one hundred (100) centimetres above the ground.

3.5 **The Rural Fire Service (RFS)** 10/50 Vegetation Clearing Code of Practice (The Code) has been prepared in accordance with section 100Q of the Rural Fires Amendment (Vegetation Clearing) Act 2014.

The online assessment tool ("Tool") is provided by the NSW Rural Fire Service ("the NSW RFS") to help assess whether the 10/50 Code will allow you to clear vegetation on your property. A search of the site address does show that the property is a designated 10/50 vegetation entitlement clearing area. Clearing can only occur in accordance with the Code. Potentially canopy overhang to U2A from Tree 20 will require this tree to be pruned.

3.6 **Safe Useful Life Expectancy (SULE)** is a method of evaluating individual trees. The evaluation is a subjective assessment, not an absolute judgement, because the nature of trees and opinions on trees can vary greatly. SULE assessments are made only by those who are experienced and knowledgeable in tree management. SULE is generally accepted and used world-wide as a method of evaluating trees. Each category has a number of sub-categories. These sub-categories should always be recorded to help future users of the information appreciate the reason for each allocation decision. It is normal to have instances where trees will not fit neatly into a single SULE category. Based on the assessment of the two (2) trees, I have allocated them SULE ratings as follows;

Tree 12 has been allocated rating 3d rating, *Trees that require substantial remedial tree care and are only suitable for retention in the short term.*

Tree 20 has been allocated a 1a rating, *Structurally sound trees located in positions that can accommodate for future growth.*

3.7 Impacts: Tree 12, due to the crack that has formed between the main stem, would not be considered a long term viable specimen to try to retain in a new development. Although not imminently dangerous, cracks do not heal or seal over. A crack will generally only get worse with time. Based on the long term plans for this site and the proposed development, I do not see it possible to retain this tree and incorporate it into the development, should it go ahead. Tree 12 could be retained in the short term with weight reduction pruning to the south-eastern first order branch that has suffered the crack. Structural testing is also another option that would confirm the extent of the crack. This could be undertaken with the Picus Sonic Tomograph or resistance drilling.

Based on the plans provided the extensive level changes around the base of Tree 20 will have an adverse impact on the fine feeder roots of this tree. Surface hydrology will be impacted along with anticipated root loss. I have not seen footing designs for the unit (U2A) but with a sympathetic footing design this tree should be possible to retain. The allocation of the Bushfire zoning would possibly require canopy reduction pruning where the canopy overhangs the proposed dwelling. The Bushfire Report would be required to further assess the consequences to this tree based on the location of U2A. A site specific tree protection specification for Tree 20 will be required for this project should Tree 20 be retained.

4 RECOMMENDATIONS

4.1 Tree 12, with a TPZ of just over thirteen (13) metres, generally renders it impossible for the construction of U2B in its current form. Radical redesign would be required to retain this tree however, taking into consideration the crack, I do not feel that this tree is a long term specimen that would, (a) tolerate extensive building works around it, and (b) be safe enough to increase the target area below the canopy.

4.2 Tree 20 is clearly a significant tree that is part of a group of vegetation within several rear gardens. There appears to be no reason to remove Tree 20. Provided the structural design of the footings of U2A can be sympathetic to the TPZ area of this tree, then Tree 20 should be possible to retain. For this purpose, the TPZ of seven (7) metres should be applied to design drawings and the incursion calculated from there. The Australian Standard *Protection of trees on development sites,* (AS 4970) recommends no more than 10% encroachment unless the TPZ can be compensated elsewhere and contiguous with the TPZ. Provided the portion of footings, that breach the TPZ, can be bridged via the use of pier and beam construction or floating slab, this would allow the development to comply with AS4970. It is noted that the rear garden area would remain as garden and not hard surfaces. Existing levels for the rest of the TPZ (of Tree 20) between U2A and the rear fence shall be retained.

4.3 The Bushfire Report will require careful interpretation with regards to the canopy reduction that may be required on Tree 20.

4.4 Tree 20 will require trunk protection as specified in Section 4.5 of this report. This trunk protection will be required due to the proximity of heavy equipment operating near this tree.

4.5 Individual trunk protection: Tree 20 will require trunk protection. This is achieved by attaching lengths of timber (75mm x 50mm x 2000mm) fastened around the trunk. Geotextile fabric or carpet underlay shall be wrapped around the trunk prior to the timbers being attached. These timbers are to be fastened with hoop iron strapping and not attached directly into the bark of the tree. These timbers are only to be removed when all construction is complete. See Plate 8 for an example of trunk protection.

4.6 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ): The TPZ is implemented to ensure the protection of the trunk and branches of the subject tree. The TPZ is based on the Diameter at Breast Height (DBH) of the tree. The SRZ is also a radial measurement from the trunk used to protect and restrict damage to the roots of the tree.

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) have been measured from the centre of the trunk. TPZ and SRZ distances are listed in the Tree Schedule (Appendix 2). The following activities shall be avoided within the TPZ and SRZ of Tree 20;

- Erecting site sheds or portable toilets.
- Trenching, ripping or cultivation of soil (with the exception of approved foundations and underground services).
- Soil level changes or fill material (pier and beam or suspended slab construction are acceptable).
- Storage of building materials.
- Disposal of waste materials, solid or liquid.

Tree No.	TPZ (m)	SRZ (m)
Tree 12	13.2m	3.5m
Tree 20	7.2m	2.8m

Table 1: TPZ and SRZ distances for Trees 12 and 20.

4.7 **Root Pruning:** If excavations are required within a TPZ this excavation shall be done by hand to expose any roots. Any roots under fifty (50) millimetres in diameter may be pruned cleanly with a sharp saw. Tree root systems are essential for the health and stability of the tree.

4.8 A site specific tree protection specification for Tree 20 will be required for this project should Tree 20 be retained and incorporated into the conditions of consent.

If you have any questions in relation to this report, please contact me.

Paul Vezgoff
Consulting Arborist
Dip Arb (Dist), Arb III, Hort cert, AA, ISA

21st January 2019

www.mooretrees.com.au

5 IMAGES

Plate 1: Tree 12. P. Vezgoff.

Plate 2: Image showing the raised area that Tree 12 is growing in. P. Vezgoff.

Plate 3: Image showing where the crack has formed on Tree 12. P. Vezgoff.

Plate 4: The upper canopy of Tree 12. P. Vezgoff.

Plate 5: Image showing Tree 20. P. Vezgoff.

Plate 6: Image showing the main stem on Tree 20. P. Vezgoff.

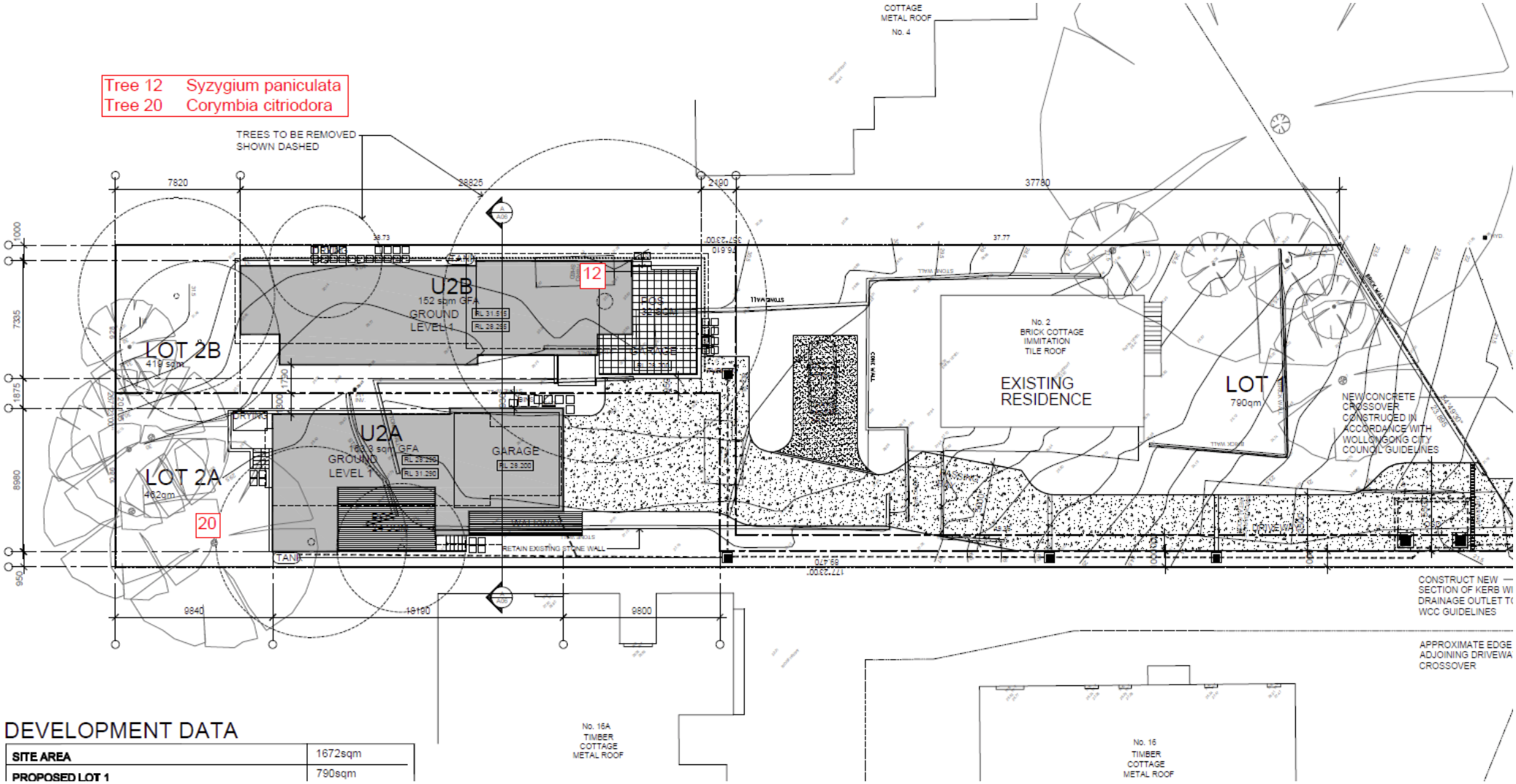
Plate 7: Image showing the lower main stem of Tree 20. P. Vezgoff.

Plate 8: Example of trunk protection with sign attached, recommended for Tree 20 should it be retained. P. Vezgoff.

Appendix 1

Plan 1

Tree Location Plan



DEVELOPMENT DATA

SITE AREA	1672sqm
PROPOSED LOT 1	790sqm

Appendix 2

Tree health & condition assessment schedule

TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE – 2 Coast Street, Thirroul

Tree	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)
12	Magenta lilly pilly (Syzygium paniculatum)	13	8	1.1	95	No visual defects	4c Dangerous tree due to structural defect.	Good	Mature	Crack on main stem	13.2	3.5
20	Lemon-scented gum tree (Corymbia citriodora)	19	9	0.6	95	No visual defects	1a >40 years	Good	Mature	Lower part of slope. Surrounded by terraced gardens to the west	7.2	2.8

KEY

Tree No: Relates to the number allocated to each tree for the Tree Plan.

Height: Height of the tree to the nearest metre.

Spread: The average spread of the canopy measured from the trunk.

DBH: Diameter at breast height. An industry standard for measuring trees at 1.4 metres above ground level, this measurement is used to help calculate Tree Protection Zones.

Live Crown Ratio: Percentage of foliage cover for a particular species.

Age Class:	Young:	Recently planted tree	Semi-mature:< 20% of life expectancy
	Mature:	20-90% of life expectancy	Over-mature:>90% of life expectancy

SULE: See SULE methodology in the Appendix 3

Tree Protection Zone (TPZ): The minimum area set aside for the protection of the trees trunk, canopy and root system throughout the construction process. Breaches of the TPZ will be specified in the recommendations section of the report.

Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of the trees roots both structural and fibrous.

Appendix 3

SULE categories (after Barrell, 2001)[1]

SULE Category	Description
Long	*Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.*
1a	Structurally sound trees located in positions that can accommodate for future growth
1b	Trees that could be made suitable for retention in the long term by remedial tree care.
1c	Trees of special significance that would warrant extraordinary efforts to secure their long term retention.
Medium	*Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.*
2a	Trees that may only live for 15-40 years
2b	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons
2c	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide for new planting.
2d	Trees that could be made suitable for retention in the medium term by remedial tree care.
Short	*Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.*
3a	Trees that may only live for another 5-15 years
3b	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
3c	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
3d	Trees that require substantial remedial tree care and are only suitable for retention in the short term.
Remove	*Trees that should be removed within the next five years.*
4a	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
4b	Dangerous trees because of instability or loss of adjacent trees
4c	Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
4d	Damaged trees that are clearly not safe to retain.
4e	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
4f	Trees that are damaging or may cause damage to existing structures within 5 years.
4g	Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
4h	Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
Small	*Small or young trees that can be reliably moved or replaced.*
5a	Small trees less than 5m in height.
5b	Young trees less than 15 years old but over 5m in height.
5c	Formal hedges and trees intended for regular pruning to artificially control growth.

updated 01/04/01)

1 (Barrell, J. (2001) "SULE: Its use and status into the new millennium" in *Management of mature trees*, Proceedings of the 4th NAAA Tree Management Seminar, NAAA, Sydney.

Appendix 4

TPZ and SRZ methodology

Determining the Tree Protection Zone (TPZ)

The radium of the TPZ is calculated for each tree by multiplying its DBH x 12.

TPZ = DBH x 12

Where

DBH = trunk diameter measured at 1.4 metres above ground

Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 metre outside the crown projection.

Determining the Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

SRZ radius = $(D \times 50)^{0.42} \times 0.64$

Where

D = trunk diameter, in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15m will be 1.5m (see Figure 1).

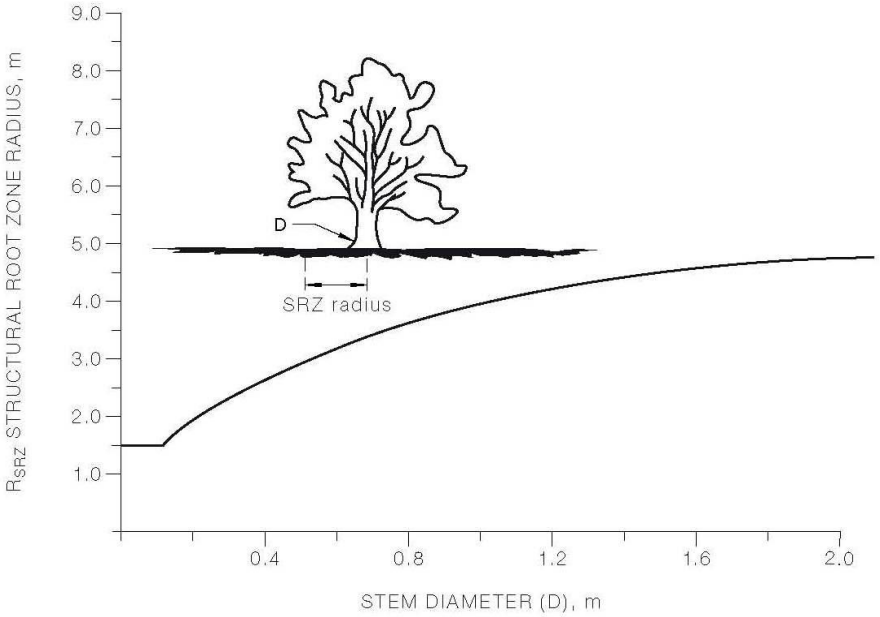


FIGURE 1 - STRUCTURAL ROOT ZONE

Notes:

1 R_{SRZ} is the structural root zone radius.
2 *D* is the stem diameter measured immediately above root buttress.
3 The SRZ for trees less than o.15 metres diameter is 1.5 metres.
4 The SRZ formula and graph do not apply to palms, other monocots, cycads and tree ferns.
5 This does not apply to trees with an asymmetrical root plate.

Appendix 5

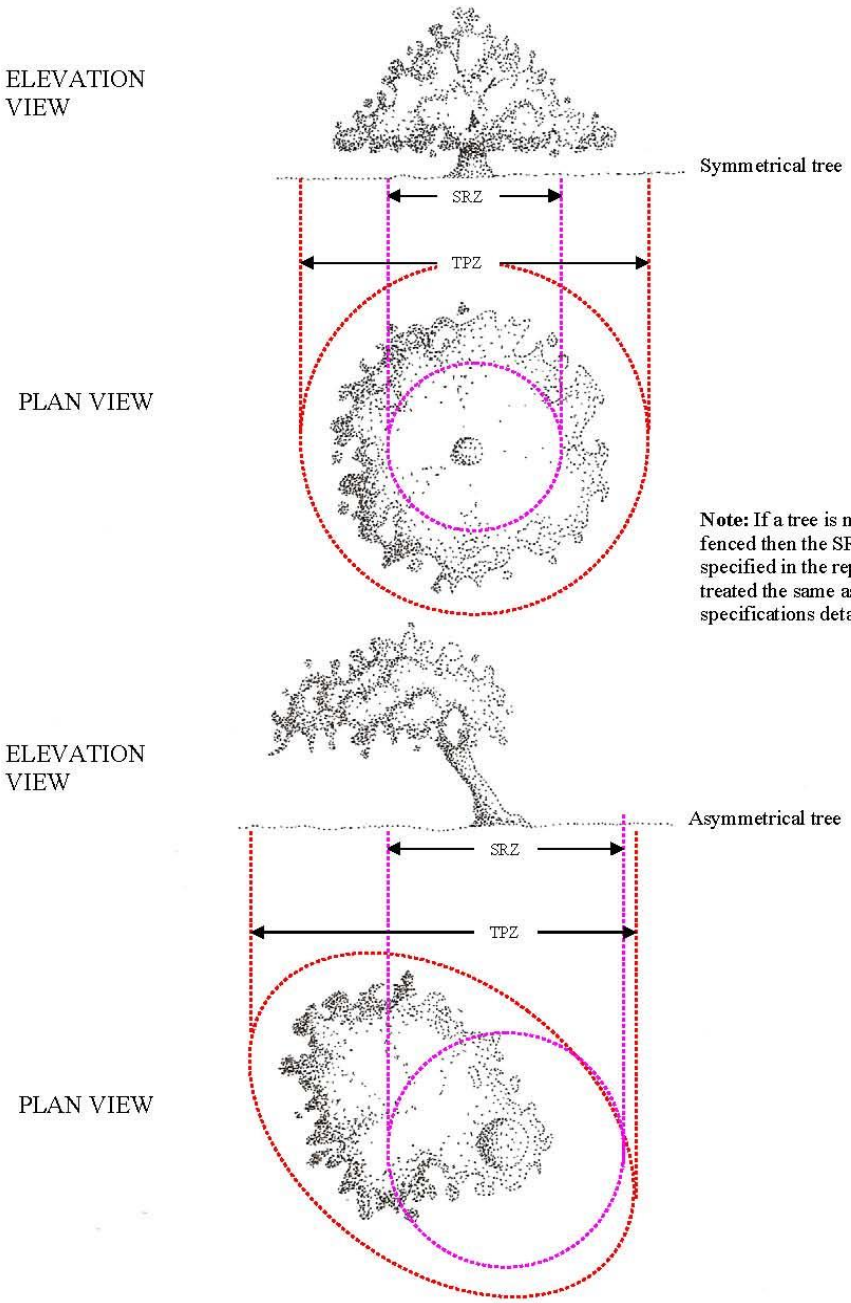


Figure 1: Indicative Tree Protection Zone (TPZ) and Root Protection Zone (SRZ)
Drawn: P. Vezgoff ©

Appendix 6

Tree structure information diagram

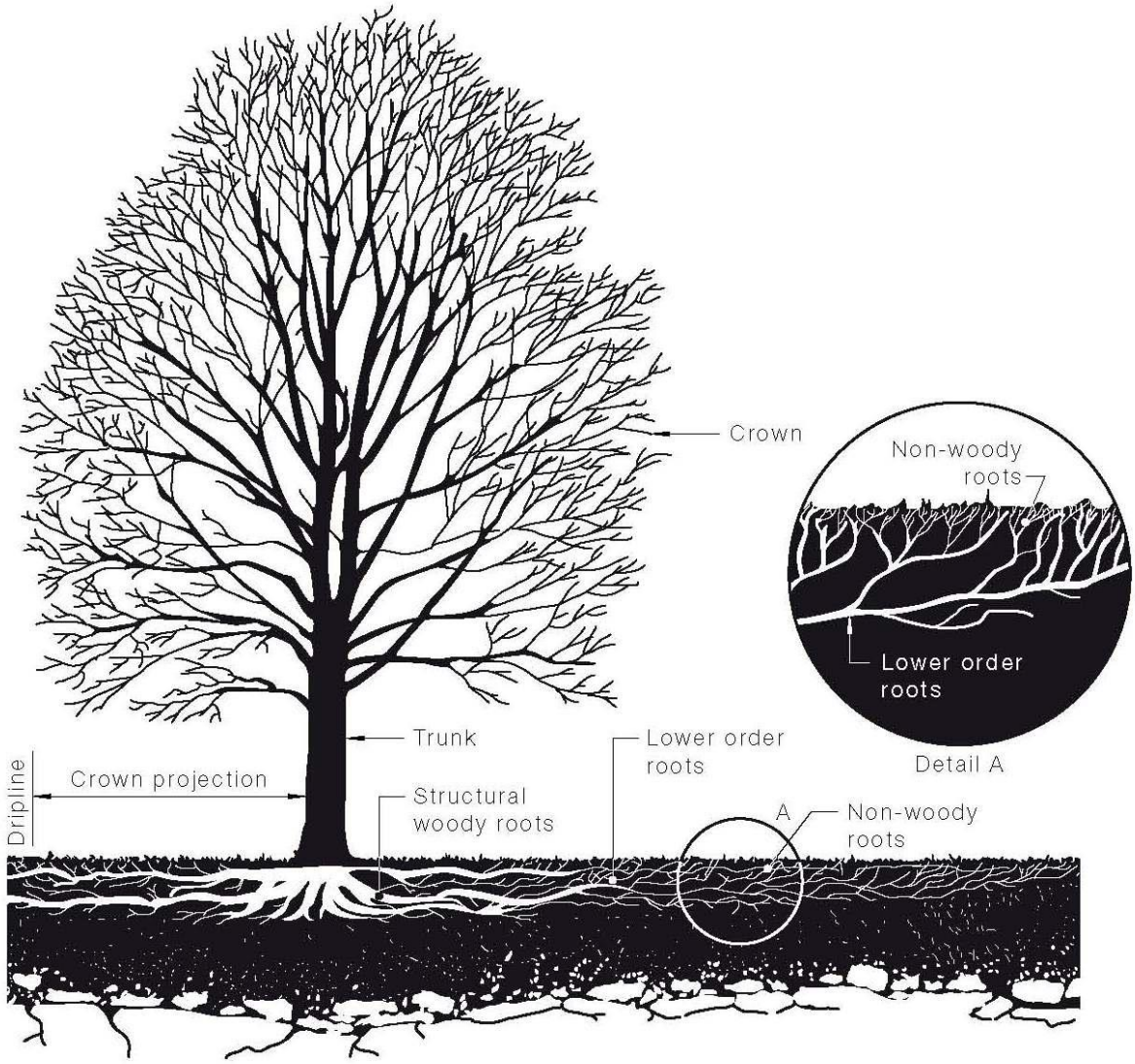


Figure 2: Structure of a tree in a normal growing environment (AS 4970, 2009.).

Appendix 7

Explanatory Notes

- **Mathematical abbreviations:** > = Greater than; < = Less than.

- **Measurements/estimates:** All dimensions are estimates unless otherwise indicated. Less reliable estimated dimensions are indicated with a '?'.

- **Species:** The species identification is based on visual observations and the common English name of what the tree appeared to be is listed first, with the botanical name after in brackets. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations. Where there is some doubt of the precise species of tree, it is indicated with a '?' after the name in order to avoid delay in the production of the report. The botanical name is followed by the abbreviation sp if only the genus is known. The species listed for groups and hedges represent the main component and there may be other minor species not listed.

- **Height:** Height is estimated to the nearest metre.

- **Spread:** The maximum crown spread is visually estimated to the nearest metre from the centre of the trunk to the tips of the live lateral branches.

- **Diameter:** These figures relate to 1.4m above ground level and are recorded in centimetres. If appropriate, diameter is measure with a diameter tape. 'M' indicates trees or shrubs with multiple stems.

- **Estimated Age:** Age is estimated from visual indicators and it should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records or local knowledge.

- **Distance to Structures:** This is estimated to the nearest metre and intended as an indication rather than a precise measurement.

Appendix 8

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Sydney

Curriculum Vitae

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EDUCATION and QUALIFICATIONS

- 2013 / 2018 – ISA TRAQ qualification
- 2007 – Diploma of Arboriculture (AQF Cert V) Ryde TAFE. (Distinction)
- 1997 – Completed Certificate in Crane and Plant Electrical Safety
- 1996 – Attained Tree Surgeon Certificate (AQF Cert II) at Ryde TAFE
- 1990 – Completed two month intensive course on garden design at the Inchbald School of Design, London, United Kingdom
- 1990 – Completed patio, window box and balcony garden design course at Brighton College of Technology, United Kingdom
- 1989 – Awarded the Big Brother Movement Award for Horticulture (a grant by Lady Peggy Pagan to enable horticulture training in the United Kingdom)
- 1989 – Attained Certificate of Horticulture (AQF Cert IV) at Wollongong TAFE

INDUSTRY EXPERIENCE

Moore Trees Arboricultural Services **January 2006 to date**
Tree Consultancy and tree ultrasound. Tree hazard and risk assessment, Arborist development application reports
Tree management plans.

Woollahra Municipal Council **Oct 1995 to February 2008**
ARBORICULTURE TECHNICAL OFFICER
August 2005 – February 2008
ACTING COORDINATOR OF TREES MAINTENANCE
June – July 2005, 2006
TEAM LEADER
January 2003 – June 2005
September 2000 – January 2003
HORTICULTURALIST
October 1995 – September 2000

Northern Landscape Services **July to Oct 1995**
Tradesman for Landscape Construction business

Paul Vezgoff Garden Maintenance (London, UK) **Sept 1991 to April 1995**

CONFERENCES AND WORKSHOPS ATTENDED

- International Society of Arboriculture Conference (Canberra May 2017)
- QTRA Conference, Sydney Australia (November 2016)
- TRAQ Conference, Auckland NZ / Sydney (2013/2018)
- International Society of Arboriculture Conference (Brisbane 2008)
- Tree related hazards: recognition and assessment by Dr David Londsdale (Brisbane 2008)
- Tree risk management: requirements for a defensible system by Dr David Londsdale (Brisbane 2008)
- Tree dynamics and wind forces by Ken James (Brisbane 2008)
- Wood decay and fungal strategies by Dr F.W.M.R. Schwarze (Brisbane 2008)
- Tree Disputes in the Land & Environment Court – The Law Society (Sydney 2007)
- Barrell Tree Care Workshop- Trees on construction sites (Sydney 2005).
- Tree Logic Seminar- Urban tree risk management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar presented by Dr F.W.M.R. Schwarze (Sydney 2004)
- Inaugural National Arborist Association of Australia (NAAA) tree management workshop- Assessing hazardous trees and their Safe Useful Life Expectancy (SULE) (Sydney 1997).

ATTACHMENT 3 - SITE INSPECTION PHOTOS

Date: 18 September 2018
Description: Existing dwelling and detached garage on the subject site as viewed from Coast Street.

Date: 18 September 2018
Description: Existing dwelling on the subject site as viewed from Coast Street.

Date: 18 September 2018
Description: Adjoining dwelling to the East of the subject site.

Date: 18 September 2018
Description: Rear elevation of the existing dwelling as viewed from site of proposed lots 201 and 202.

Date: 18 September 2018
Description: Adjoining dwelling to the rear of the subject site.

Date: 18 September 2018
Description: Adjoining dwelling to the rear of the subject site.

Date: 18 September 2018
Description: Adjoining dwelling on battle-axe lot to the East of proposed Lots 201 and 202.

Date: 18 September 2018
Description: Adjoining dwelling on battle-axe lot to the East of proposed Lots 201 and 202.

Date: 18 September 2018
Description: View to the West of proposed lots 201 and 202.

Date: 18 September 2018
Description: Structures to be demolished on the subject site.

Date: 18 September 2018
Description: Vegetation on the subject site to the rear of the existing dwelling.

Date: 18 September 2018
Description: View North east of adjoining dwelling from site of proposed Lot 201.

Date: 18 September 2018
Description: Outbuilding to the rear of existing dwelling to be demolished.

Date: 18 September 2018
Description: Adjoining dwelling to the West as viewed from rear of existing dwelling on proposed Lot 101.

Date: 18 September 2018
Description: Existing vegetation to the rear of the existing dwelling on the site of proposed Lot 202.

Date: 18 September 2018
Description: View to the rear of the existing dwelling of site of proposed Lot 201 and 202.

Date: 18 September 2018
Description: Adjoining dwelling to the West as viewed from Coast Street. Existing dwelling on the subject site is to the left of the photo.

Attachment 4: WDCP 2009 compliance table

CHAPTER A1 – INTRODUCTION

8 Variations to development controls in the DCP

The applicant proposes variations to Clauses 4.1.2(1) of Chapter B1. The variation request is considered justified and supportable. See considerations at Chapter B1 Residential Development table below.

CHAPTER A2: ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Development controls to improve the sustainability of development throughout Wollongong are integrated into the relevant chapters of this DCP.

Generally speaking, the proposal could be considered to be consistent with the principles of Ecologically Sustainable Development.

CHAPTER B1 – RESIDENTIAL DEVELOPMENT

4.0 General Residential controls

Controls/objectives	*Comment*	*Compliance*
4.1 Maximum Number of Storeys		
• Battle axe allotments - 1 storey • R2 where development occurs within the 8m rear setback the development is limited to single storey.	Proposed Unit 2A: Two (2) Storeys (6.365m overall height) Proposed unit 2B:Two (2) Storeys (5.035m overall height)	No -refer to considerations below
• Built form that has a positive impact on the visual amenity of the area and addresses site constraints and overlooking of neighbouring properties	Rear Setback: Unit 2A: 9.38m to first floor Unit 2B: 7.82m (single storey component) The proposed dwellings will have minimal impact on the visual amenity of the area and on the amenity of the adjoining properties.	Yes Yes
Justification for Number of Storeys Variation: The applicant has proposed two (2) storey dwellings, Units 2A and 2B on proposed Lot 2 a battle-axe allotment requesting a variation to Council's controls. A copy of the variation request statement is provided at **Attachment 5**. It is considered that the variation can be supported for the following reasons: • It is considered that the proposed development will have minimal impact on the streetscape and the natural setting of the area. The proposed dwellings are separated by distance and roof form from each other and the existing dwelling on the relatively large site. This separation of the buildings is consistent with the built environment of the adjacent and surrounding land. The proposed dwellings fit below the tree canopy line and are screened from the street by existing dwelling to be retained, adjoining development and existing mature vegetation. • The variation for Unit 2B is considered to be a minor point encroachment as can be seen in Figure 1 below with the remainder of the dwelling presenting as a single storey development.		Variation request considered and is supported

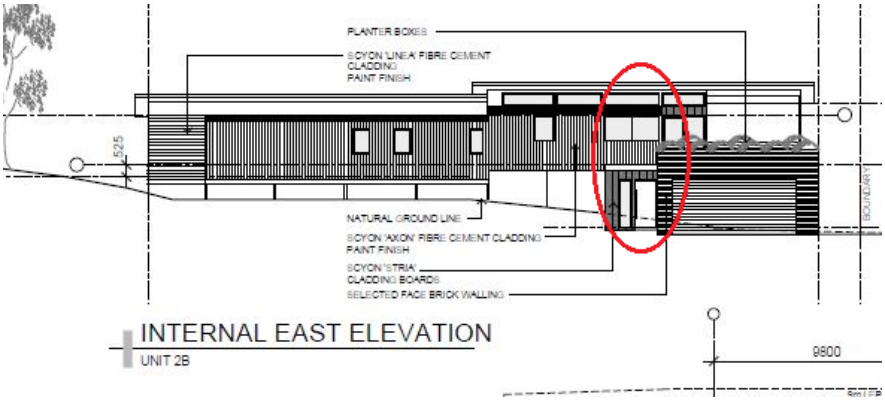

Figure 1: Extent of side setback variation highlighted in yellow.

- The proposed development will have minimal impact on the adjoining dwellings in terms of overlooking for the following reasons:
    - The upper level windows on the eastern elevation of Unit 2A consist of highlight windows within the hallway and bedroom window. Windows on the upper level of the rear elevation consist of bathroom windows.
    - Unit 2B presents as a single storey dwelling to the adjoining property to the West due to the topography of the site which results in a cross fall to the East.
    - Reasonable setbacks consisting of 1m (West) for Unit 2B and 0.95m to the ground floor and 4.07m to the first floor (East) for Unit 2A have been maintained to the side boundaries.
    - The private open space and living areas have been set on the ground floor of Unit 2A and have been screened to the East by landscaping and privacy screens to minimise overlooking.
- The proposed development will have minimal impact on the adjoining dwellings in terms of overshadowing for the following reasons:
    - Reasonable setbacks have been proposed to the site boundaries.
    - Reasonable separation distances have been maintained between the proposed dwellings and the adjoining dwellings to the North, East and West.
    - Reasonable building heights have been proposed. The proposed dwellings are approximately 2.635m for Unit 2A and 3.965m for Unit 2B below the 9m maximum building height.
    - The proposal complies with bulk and scale controls.
- The proposed dwelling has been designed to be sympathetic to and address site constraints.
- It is considered that the building character and form of the proposed dwelling is reasonable in this circumstance. There are dwellings of similar bulk and scale within the immediate vicinity of the subject site.
- Although the numerical requirements have not been strictly met in this circumstance it is considered that the objectives of the clause have been met ensuring minimal impact on the street scene and on the amenity of the adjoining dwellings. It is considered that the maximum number of storeys of the proposed dwellings is acceptable in this circumstance in order to satisfy the objectives of the clause.

4.2 Front Setbacks		
• Infill 6m min or dependent on street character	Proposed Lot 1: 12m (Existing dwellings front setback is to remain unchanged).	Yes
• Less than 6 metres where the prevailing street character permits and the future desired character of the area is not prejudiced.	Unit 2A: 47.58m from the Coast Street boundary.	Yes
	Unit 2B: 39.57m to the Coast Street boundary	Yes
• Garages and carports 5.5m min		
4.3 Side and Rear Setbacks		
• Wall Setback: 0.9m min	Unit 2A	
• 3m where the wall height exceeds 7m	Proposed to Wall: 0.95m (East)	Yes
	1.09m (West)	Yes
• Eave Setback: 0.45m	Unit 2B	
• Rear Setback 8m	Proposed to Wall: 1.79m (East)	Yes
	1m (West)	Yes
	Rear setbacks	
	Unit 2A: 9.84m	Yes
	Unit 2B: 7.82m	Yes
4.4 Site Coverage		
The maximum site coverage for a dwelling, dual occupancy, and combined maximum coverage for a principle dwelling and secondary dwelling, is as follows:	Proposed site coverage:	
	Lot 1: 13.4% (105.7m²/790.3m²).	Yes
	Lot 201: 21.5% (99.44m²/462m²).	Yes
	Lot 103: 42.7% (179.4m²/420m²).	Yes
• 55% of the area of the lot, if the lot has an area less than 450m².		
• 50% of the area of the lot, if the lot has an area of at least 450m² but less than 900m².		
• 40% of the area of the lot, if the lot has an area of at least 900m².		
4.5 Landscaped Area		
• Minimum Required 20% permeable area capable of growing trees, shrubs, groundcover and/or lawn.	Proposed Lot 1: Approximately 59.9%.	Yes
	Proposed Lot 201: Approximately 41%	Yes
	Proposed Lot 202: Approximately 33.7%	Yes
• 50% behind the building line to the primary road	The proposed development satisfies the objectives of Council's landscaped area controls and policies.	
• Integrated with drainage design	Council's Landscape Officer has raised no objections to the proposed landscaping.	
4.6 Private Open Space		
• 24m² of private open space must be directly accessible from the living	Unit 2A has a 24m² area of private open space in the form of a deck recessed	Yes

areas; min width of 4m and no steeper than 1:50. • Not to be located on side boundaries or front yards without variation.	into the Eastern elevation of the ground floor with direct connectivity to the living areas. This deck is setback 1.5m form the Eastern side boundary and does not project closer than the Eastern elevation of the dwelling which has an Eastern side setback of 0.95m. A 1.5m wide landscaping bed with screen planting has been provided along Eastern elevation of the private open space for Unit 2A so as to minimise privacy impacts. A design condition as at **Attachment 6** requires the replacement of the 1.2m high balustrade with a 1.5m high solid balustrade or privacy screen so as to minimise privacy impacts on the adjoining property to the East. A second area of lawn is located to the rear of Unit 2A providing a further area of private open space. Unit 2B has a 24m² area of private open space in the form of a deck over the lower ground floor garage. This deck does not project forward of the building line of Unit 2B and has been oriented North on the lot so as to maximise solar access. It is considered that the private open space will have minimal impact on the adjoining property to the West in terms of overlooking as Unit 2B presents as a single storey dwelling to the West due to the topography of the site. A condition at **Attachment 6** requires a continuous hedge along the entire length of the Western side of the Private Open Space for Unit 2B so as to minimise privacy impact on the adjoining property to the West. The proposed development satisfies the objectives and standards of Council's private open space controls.	
<u>4.7 Solar Access Requirements</u>		
• Windows to living rooms of adjoining dwellings must receive at least 3hrs continuous sunlight between 9.00am - 3.00pm on 21 June. • At least 50% of the private open areas of adjoining residential properties must receive at least 3hrs	The proposed dual occupancy development will have minimal impact on adjoining properties in terms of Solar Access as reasonable setbacks and building heights have been maintained. The dwellings have been oriented so as to maximise the amount of sunlight received by the living areas and private	Yes

continuous sunlight between 9.00am - 3.00pm on June 21.	open space. It is considered that the proposed development can receive a reasonable amount of sunlight to private open space areas.	
4.8 Building Character and Form		
• Design, height and siting of a new dwelling-house or secondary dwelling must respond to its site context • New dwelling-houses within established residential areas should be sympathetic with the existing character of the immediate locality. • All residential buildings must be designed with building frontages and entries clearly addressing the street frontage. • Where garages are proposed on the front elevation they must be articulated from the front façade. • Where the garage door addresses the street they must be a maximum of 50% of the width of the dwelling.	The proposed development will have minimal impact on the established residential character of the area. The proposed dwelling frontages and entries for Unit 2A though set well to the rear of the existing dwelling clearly have been orientated to address Coast Street. Unit 2B is predominantly screened from Coast Street by the existing dwelling to be retained on the subject site. The entries of Unit 2B have been oriented to address the Right of Way accessing the dwelling. The open parking space for the existing dwelling is screened from the streetscape. The proposal is considered to satisfy the built form requirements	Yes
4.9 Fences		
• Fences must be constructed to allow natural flow of stormwater or runoff. • Fences within front and secondary building lines should be mainly constructed of transparent fence materials. • Any fence or related retaining wall within the front setback from the primary road frontage must be a max 1.2m in height	Existing front boundary fencing/walls are to be retained. A condition at **Attachment 6** requires the development to be provided with fencing not exceeding 1.8m on side and rear boundaries.	Yes
4.10 Car parking and Access		
• 2 spaces per dwelling with a GFA of greater than 125m² • Car parking spaces may be open hard stand space, driveway, carport or a garage. • Garage door facing roads–not greater than 50% of the width of the dwelling. • Garages must be setback min of	The proposal includes a double garage in each dwelling and an open hard stand space for the existing dwelling. It is considered the proposed garages satisfy AS2890. The proposed garages are setback greater than 5.5m from the front boundary. The proposed dwelling frontages and entries for Unit 2A though set well to	Yes Yes

5.5m from front boundary. • Driveways shall be separated from side boundaries by a minimum of 1m. • Driveways shall have a max cross-over width of 3m.	the rear of the existing dwelling clearly have been orientated to address Coast Street. Council's Development Engineering Officer has raised no objections to the proposed access arrangements. The proposed development satisfies the objectives of Council's Car Parking and Access controls and policies.	
<u>4.11 Storage Facilities</u>		
• 3 bedroom- 10m³ storage volume to 5m² storage area	The proposed development will provide adequate storage facilities.	Yes
<u>4.12 Site Facilities</u>		
• letterboxes in an accessible location • air-con, satellite dishes and other ancillary structures to be located away from street frontage, not in a place where they are a skyline feature and adequately setback	The necessary site facilities have been provided and are acceptable in this circumstance.	Yes
<u>4.13 Fire Brigade Servicing</u>		
• All dwellings located within 60m of a fire hydrant	The subject site can be adequately serviced by fire fighting vehicles in this circumstance.	Yes
<u>4.14 Services</u>		
• Encourage early consideration of servicing requirements	Water, electricity, sewage and telephone services are available to the site	Yes
<u>4.15 Development near the coastline</u>		
• Must minimise built intrusions into coastal landscape • Retain views to the ocean from roads and public spaces • Maintain buildings consistent with coastal character	Not Applicable	Yes
<u>4.16 View sharing</u>		
• To protect and enhance view sharing, significant view corridors • A range of view sharing measures to be considered for building design	The proposed development will have minimal impact on view corridors of existing development.	Yes
<u>4.17 Retaining walls</u>		
• To ensure well designed retaining walls that are structurally sound	The proposed retaining walls are considered acceptable in this circumstance.	Yes

4.21 Additional controls for Dual Occupancies minimum site width • Provide sites adequate for buildings, car parking, POS, landscaping • Sites must not be significantly constrained by flood, geotechnical or other environmental hazards	The subject site has a minimum width of 20.134m. The minimum depth of the subject site 76.609m. Proposed Lot 2 on which it is proposed to locate the proposed dual occupancy has a minimum site width of 20.134m and minimum depth of 38.832m. The proposed development satisfies the objectives of Council's additional controls for dual occupancies site width in this circumstance.	Yes
4.22 Additional controls for Dual Occupancies –building character and form • Controls for corner allotments • Controls for garages proposed on the front elevation • Design compatibility between each dual occupancy in relation to alterations and additions • Existing garages and outbuildings can not be used as a dual occupancy	The proposed development satisfies the objectives and standards of Council's additional controls for dual occupancies – building character and form in this circumstance.	Yes
4.23 Additional Controls for Dual Occupancy's – Deep Soil Zones • A minimum of half of the landscaped area must be provided as a deep soil zone. The deep soil zone may be located in any position on the site, subject to this area having a minimum dimension of 3m. The deep soil zone must be located outside the minimum private open space required.	Lot 201 (Unit 2A) Deep Soil Zone: 5.5m wide and 12.85% of site area. Lot 202 (Unit 2B) Deep Soil Zone: 4.8m wide and 10.65% of site area. The deep soil zones have been densely planted with trees and shrubs and/or include the retention of existing mature trees. Council's Landscape Officer has raised no objections to the proposed landscaping.	Yes Yes

CHAPTER B2 – RESIDENTIAL SUBDIVISION

Controls/objectives	*Comment*	*Compliance*
5 Topography & natural landform		
	It is considered that the proposed subdivisions takes into account the site constraints and will have minimal impact on the significant features of the site in this circumstance.	Yes
6 Subdivision layout – aspect & solar access orientation		
	The proposed lots allow for reasonable siting of the proposed dwellings to satisfy the objectives of Council's boundary setback requirements so as to have minimal impact on the adjoining properties in terms of overshadowing and to allow reasonable solar access to the proposed dwellings. It is considered that the proposed subdivision lot layout satisfies the objectives of clause 6 subdivision lot layout – aspect and solar access orientation in this circumstance.	Yes
7 Minimum allotment size requirements		
The minimum allotment size for the subdivision of land under Part 4.1 of WLEP2009 is 449m². The proposed phase 2 two (2) lot Torrens title subdivision will result in Lot sizes of 790.3m² for Lot 1 and 761.27m² excluding the access handle for Lot 2 which are both compliant with the clause. Phase 4 of the proposal involves a two (2) lot Torrens title subdivision of the newly constructed dual occupancy. Subclause 4.1(4C) identifies that clause 4.1 does not apply in relation to the subdivision of an existing dual occupancy. A draft condition relating to the issue of an occupation certificate for the detached dual occupancy prior to the application for the phase 4 Torrens title subdivision so that the proposal satisfies subclause 4.1(4C) is included at **Attachment 6**.		Yes
8 Lot width & depth requirements		
	The Phase 2 two (2) lot Torrens title subdivision will result in lot width of 18.139m and depth of 37.777m for the front lot (Lot 1) and a battle axe allotment with a maximum width of 20.134m and minimum depth of 38.832m The minimum lot size does not apply to the proposed subdivision of the dual occupancies once constructed to create the proposed lots 201 and 202 therefore it is considered that the minimum lot widths and depths are not required for the Phase 4 two (2) lot Torren title subdivision of Units 2A and 2B.	Yes

	Advice received from Council's Development Engineering Officer indicates there are no issues with the proposed lots widths and depths.	
9 Battle-axe allotments		
	The proposed Phase 2 Torrens Title subdivision will create a battle-axe allotment, Lot 2. The lot configuration is considered acceptable in this circumstance. The access handle is 2m in width and has direct connectivity to Coast Street. Advice received from Council's Development Engineering Officer is such that there are no issues with the proposed access arrangements. The proposed Phase 4 Torrens Title subdivision will create two (2) battle-axe allotments, Lots 201 and 202. The lot configurations are considered acceptable in this circumstance. The access handle for each lot is 1m in width with direct connectivity to Coast Street. Advice received from Council's Development Engineering Officer is such that there are no issues with the proposed access arrangements. A road pavement with a minimum width of 3.5m is maintained for the length of the proposed Right of Carriage Way accessing the proposed lots. A 1m landscaping strip has been provided along the entire Eastern side of the road pavement. Council's Landscape Officer has raised no issues with the proposed landscaping. Advice provided by Council's Development Engineering Officer indicates there are no issues with the proposed battle-axe lots.	Yes
10 Building envelopes		
	It is considered that a suitable building envelope is available on the proposed lots with natural site constraints and flooding matters having been taken into account. The proposed lots allow for reasonable siting of the proposed dwellings to satisfy the objectives of Council's boundary setback requirements so as to have minimal impact on the adjoining properties in terms of overshadowing and to allow reasonable solar	Yes

	access to the proposed dwellings.	
13 Cut and fill land re-shaping works		
	The proposal involves earthworks to facilitate the proposed development. The application submission was referred to Council's Geotechnical, Development Engineering and Environment Officers for comment and no objections were raised subject to conditions. It is considered that the earthworks will have minimal detrimental impact on environmental functions and processes, neighbouring uses items and features of the surrounding land.	Yes
17 Street tree planting		
	The application submission was referred to Council's Landscape Officer and no street tree planting was considered necessary in this circumstance.	N/A
33 NSW fire brigade access - fire hydrants		
	It is considered that the subject site can be adequately serviced by fire fighting vehicles in this circumstance. A condition at **Attachment 6** requires hydrant servicing provision should a hydrant be required under the NSW Fire & Rescue guidelines. It is noted that a condition of the NSW Rural Fire Services Bushfire Safety Authority as at **Attachment 6** is that water for fire-fighting purposes be provided in accordance with the requirements of Planning for Bushfire Protection 2006.	Yes
34 Bush fire protection		
	Details of the application submission were referred to the NSW Rural Fire Service for a bushfire safety authority under Section 100B of the Rural Fires Act 1997 as the application submission proposed subdivision on bushfire prone land. Advice received indicates the proposal is considered conditionally satisfactory and the Bushfire Safety Authority issued.	Yes

35 Stormwater drainage (including water sensitive urban design infrastructure)		
	The proposed development satisfies the objectives of Council's stormwater drainage controls in this circumstance. Advice provided by Council's Development Engineering Officer indicates there are no issues with the proposal subject to conditions.	Yes
37 Servicing arrangements		
	Conditions at **Attachment 6** require the submission of documentary evidence from the relevant authorities relating to the connection of electricity, telecommunications, water and sewage to service the proposed lots.	Yes
38 Monetary contributions towards the provision of public services and amenities		
	A condition for S94A development contributions is included at **Attachment 6.**	Yes
40 Street numbering		
	A condition in regards to street numbering is included at **Attachment 6.**	Yes

CHAPTER D1: THIRROUL

Chapter D1 indicates that for the treed upper slopes of Thirroul moderately pitched roof lines are preferred, new dwellings on sloping sites should be stepped down the slope to minimise disturbance of the natural contours and designed to fit below the tree canopy line.

The proposal provides for retention of the existing dwelling, Torrens title subdivision creating a battle-axe allotment to the rear and dual occupancy development on the newly created rear lot on the subject site. The proposed dual occupancy dwellings are considered generally consistent with the future desired character of the leafy upper slopes of Thirroul proposing clad dwellings with moderately pitched iron roofing separated by distance and roof form from each other and the existing dwelling on the relatively large site. This separation of the buildings is consistent with the built environment of the adjacent and surrounding land. The proposed dwellings are considered to have been stepped to follow the cross fall of the site and minimise disturbance of the natural contours and fit below the tree canopy line.

Development within the vicinity of the subject site is characterised by residential development within a leafy setting. Adjoining development consists of a double storey dwelling to the West. The adjoining lot to the East has been subdivided and has a two (2) storey dwelling on the front lot and a two (2) storey dwelling on the rear, battle-axe allotment created by the subdivision. Site Inspection Photos are provided at **Attachment 3** to the assessment report. Further examples of larger being subdivided to create battle-axe allotments with large dwellings constructed on the rear lot can be found within close proximity to the site as can be seen at **Figure 1** of the assessment report.

The proposed development is a permissible use in the R2 zone and satisfies controls for dual occupancy development under Wollongong Development Control Plan 2009. The proposal is

considered to not detract from the existing character of Thirroul and is compatible with the desired future character for the locality.

CHAPTER E3: CAR PARKING, ACCESS, SERVICING/LOADING FACILITIES AND TRAFFIC MANAGEMENT

Council's Development Engineering Officer has reviewed the proposal in relation to this chapter and provided a satisfactory response commenting that the number of parking spaces, access arrangements and manoeuvring are acceptable. Conditions have been included at **Attachment 6** relating to these matters.

CHAPTER E6: LANDSCAPING

The proposed landscape plan was referred to Council's Landscape Officer for comment with referral advice indicating the proposal as satisfactory subject to conditions.

CHAPTER E7: WASTE MANAGEMENT

It is considered that the proposed development satisfies the objectives of this Chapter. Council's street waste collection service is to be utilised.

CHAPTER E12 GEOTECHNICAL ASSESSMENT

The application has been reviewed by Council's Geotechnical Officer in relation to site stability and the suitability of the site for the development. Appropriate conditions have been recommended and are included at **Attachment 6**.

CHAPTER E13 FLOODPLAIN MANAGEMENT

Council's Development Engineering Officer has assessed the application in this regard against the submitted flood study and has not raised any issues subject to draft conditions.

CHAPTER E14 STORMWATER MANAGEMENT

Council's Development Engineering Officer has assessed the application in this regard against the submitted concept stormwater drainage plan and has not raised any issues subject to draft conditions.

CHAPTER E16 BUSHFIRE MANAGEMENT

Council records indicate that the subject site is located within a bushfire prone area therefore the proposal has been assessed having regard to the provisions of Planning for Bushfire Protection (PBP) 2006.
Details of the application submission were referred to the NSW Rural Fire Service as required under Section 100B of the NSW Rural Fires Act 1997 for a Bushfire Safety Authority. Advice received indicates the proposal is considered conditionally satisfactory.

The NSW Rural Fire Service recommended conditions are contained in the conditions at **Attachment 6** of this report.

CHAPTER E17 PRESERVATION AND MANAGEMENT OF TREES AND VEGETATION

The application proposes the removal of several trees to facilitate the proposal. Council's Landscape and Environment Officers have assessed the application submission, which included an Arborist Report in conjunction with an independent Arborist Report commissioned by Council's Landscape Officer. Conditionally satisfactory referral advice was received and conditions as at **Attachment 6** specify trees to be removed, trees to be retained, compensatory plantings and tree protection and management.

CHAPTER E18 THREATENED SPECIES

The application submission has been assessed in regards to threatened species. It is noted that particular consideration was given to Tree 12 (Magenta Lilly Pilly) and Tree 21 (Wallangarra White Gum) both threatened species and Tree 21 (Lemon Scented Gum). Initial concerns were raised regarding the proposed removal and/or impacts on these trees. Amended Architectural Plans,

Landscape Plans, documentation and Arborist Report identifying all trees on the site, impacts on all trees including trees on adjoining properties, protection of Tree 20 and compensatory planting were provided by the applicant. These amended plans and documentation have been reviewed by Council's Environment Officer in conjunction with the independent Arborist Report commissioned by Council's Landscape Officer and are considered to resolve concerns raised.

It was noted by Council's Environment Officer that although Tree 12 (Magenta Lilly Pilly) and Tree 21 (Wallangarra White Gum) are both threatened species, Tree 12 is considered a planted specimen based on its habit, location and review of aerial photos and Tree 21 is not considered endemic to the area therefore a 5 part test as per Section 7.3 of the Biodiversity Conservation Act is not required.

CHAPTER E19 EARTHWORKS (LAND RESHAPING WORKS)

The proposal involves earthworks to facilitate the proposed development. A geotechnical report and information regarding the earthworks to reshape the land were submitted with the application.

The application submission was referred to Council's Geotechnical, Development Engineering and Environment Officers for comment and no objections were raised subject to conditions. It is considered that the earthworks will have minimal detrimental impact on environmental functions and processes, neighbouring uses items and features of the surrounding land.

CHAPTER E21 DEMOLITION AND ASBESTOS MANAGEMENT

The proposal will require demolition works. Appropriate conditions are included in **Attachment 6** of this report to minimise impacts and ensure that demolition is carried out to Council's and Work Safe NSW requirements.

CHAPTER E22 SOIL EROSION AND SEDIMENT CONTROL

Conditions are included in **Attachment 6** in this regard so as to minimise the impacts of the proposed works on the environment.

APPENDIX 2

VARIATION TO DEVELOPMENT CONTROLS

DEVELOPMENT APPLICATION FOR PROPOSED TWO LOT TORRENS TITLE SUBDIVISION, CONSTRUCTION OF A DUAL OCCUPANCY ON REAR LOT AND TORRENS TITLE SUBDIVISION ON REAR LOT WITH DUAL OCCUPANCY.

2 COAST STREET THIRROUL

VARIATION UNDER CLAUSE 4.6

WOLLONGONG LOCAL ENVIRONMENT PLAN 2009

The objectives of this clause are as follows:

- *to provide an appropriate degree of flexibility in applying certain development standards to particular development,*
- *to achieve better outcomes for and from development by allowing flexibility in particular circumstances.*

A variation is permitted if It can be demonstrated that:

- *compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and*

WOLLONGONG DEVELOPMENT CONTROL PLAN 2009

DEVELOPMENT CONTROL

4.1 Number of Storeys

"The maximum building height is set by the Local Environmental Plans generally

a) R2 Low Density Residential Zones permit a maximum height of 9m – a maximum of 2 storeys

b) R3 Medium Density Residential Zones permit a maximum of height of 13m a maximum 3 storeys.

The number of storeys acceptable will be dependant on the surrounding development, the future desired character of the area, the impacts that the proposed development has on solar access, privacy, visual amenity and overshadowing."

4.1.1 Objectives

a) To encourage buildings which integrate within the streetscape and the natural setting whilst maintaining the visual amenity of the area.
b) To minimise the potential for overlooking on adjacent dwellings and open space areas.
c) To ensure that development is sympathetic to and addresses site constraints.
d) To encourage split level stepped building solutions on steeply sloping sites.
e) To encourage a built form of dwellings that does not have negative impact on the visual amenity of the adjoining residences.
f) To ensure ancillary structures have appropriate scale and are not visually dominant compared to the dwelling.
g) To ensure appropriate correlation between the height and setbacks of ancillary structures.
h) To encourage positive solar access outcomes for dwellings and the associated private open spaces.

4.8.2 Development Controls

Clause 1. Dwelling houses on battleaxe allotments are restricted to 1 storey unless it can be demonstrated that the proposed development achieves the objectives in Clause 4.1.1 and complies with the maximum height maps in the LEP.

Response:

A variation is sought to construct two-storey dwellings on a rear battle-axe allotment.

Proposed Lot 2 slopes from west to east with a fall over the site of approx. 4m in a width of approx. 20m. the buildings have been designed around the site constraints in particular ensuring that on each side boundary the dwellings present as single level and that the two storey component of each dwelling has been located sympathetically to the natural and built setting.

Unit 2A

Unit 2A has been designed to have a two-storey portion containing the bedrooms only. All living and high use areas have been located on the lower level of the residence.

The upper storey has been located towards the centre of Lot 2 adjoining the proposed subdivision line with Unit 2B. The floor level of unit 2B is higher than the upper level of unit 2A.

The closest adjoining neighbour to unit 2A is located at 16A Seafoam Avenue, a two-storey residence located on a battle-axe subdivision. The garage level of this residence is located under the main floor level utilising the site slope. Refer to figure 1 indicating proximity of 16a Seafoam Avenue to the proposed residence.

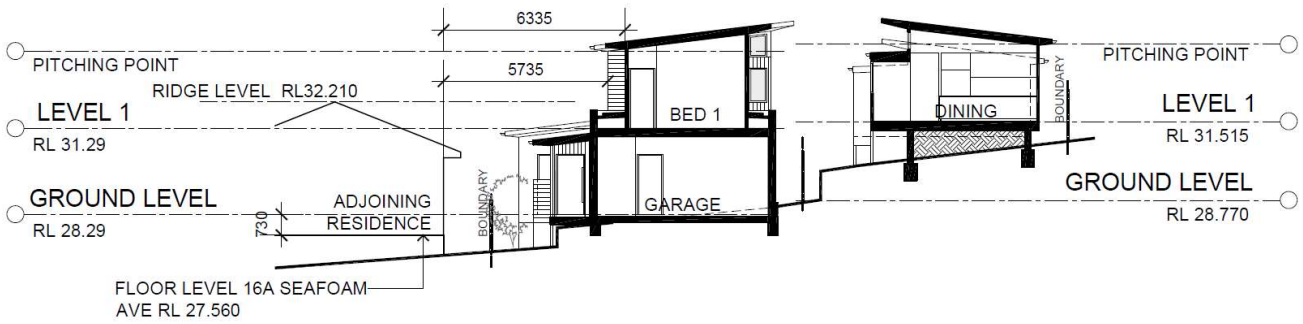

Figure 1. Site Cross Section – 16a Seafoam Avenue indicated as 'Adjoining residence'.

The upper level windows of unit 2A located to the eastern boundary adjoining the residence located to the east at 16A Seafoam Avenue, consist of two (2) hallway windows with a sill height of 1.5m and one (1) window located at the top of the stairwell these windows are located approx. 4.1m front the eastern boundary.

There is also a single bedroom window facing the eastern boundary, this window is located approx. 4.7m from the eastern boundary and will have views to the roof of 16A Seafoam Ave.
Refer to Figure 2 for window locations.

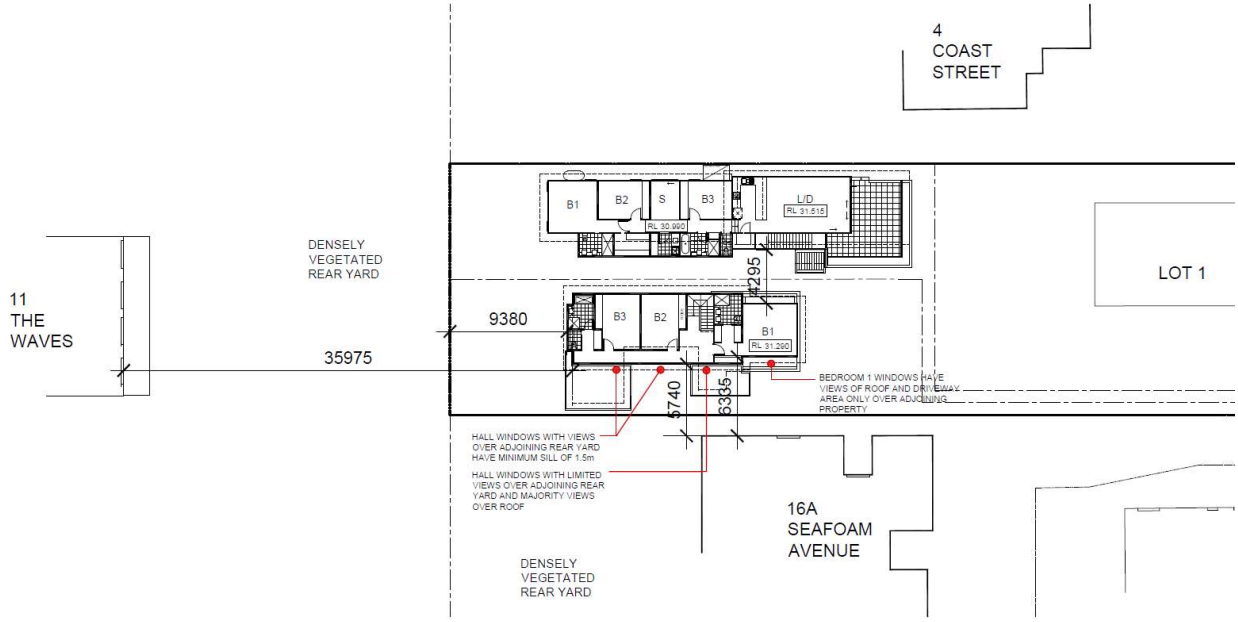

Figure 2. Location of windows with potential to overlook 16a Seafoam Avenue

The setback from the level 1 of unit 2A to the eastern boundary is a minimum of 4.07m. The setback to the southern boundary is a minimum of 9.3m and the setback to the western boundary adjoining 4 Coast Street is 9.3m. The main bedroom is located to the front of the dwelling on the northern side with main windows oriented to the north to maximise solar access with no views to the living areas or private open space areas of 16A Seafoam Ave. Distance to the existing residence to the north on Lot 1 is over 23m away.

The shadow diagrams accompanying this application demonstrate that the second storey on a battle-axe allotment allows for mid-winter solar access in accordance with Wollongong DCP requirements.

The design of Unit 2A meets the objectives of the control in that it is: integrated well into the natural setting and doesn't impact on visual amenity, minimises overlook on adjacent dwellings, is split level on a sloping site where the eastern elevation is one storey, articulated to minimise visual impact on adjacent dwellings; and maximises solar access outcomes.

Unit 2B

Unit 2B has a portion of habitable areas located over the non-habitable store room and the garage.
Unit 2B has been designed to take advantage of the site slope which falls approx. 2.4m over the 7.5m building zone.
The site slope enables parking at the lower level and habitable floor levels located close to natural ground level on the western boundary.
This design has been incorporated to integrate the building into the natural setting, does not have any adverse impact on overshadowing or overlooking to adjacent lots inclusive of the proposed unit 2A and takes advantage of the site slope to step the dwelling.
This variation should be allowable as it complies with the objectives of the control.

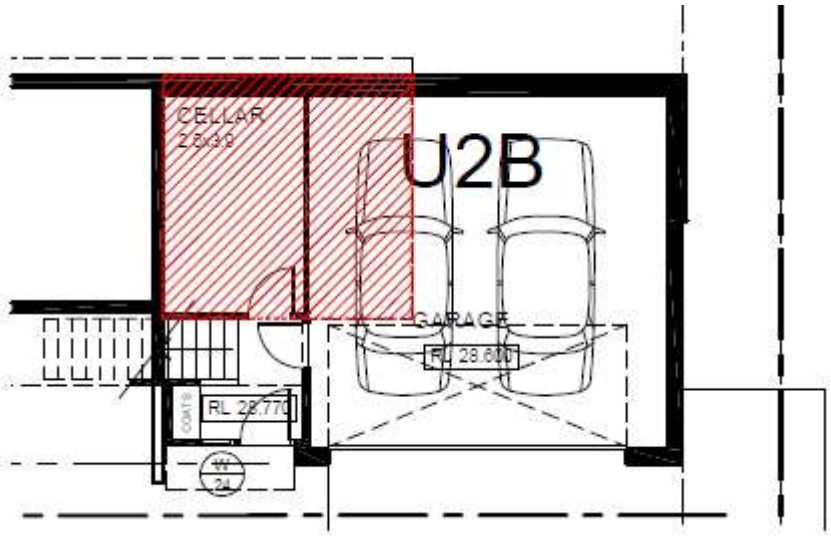

Figure 3. Location of two storey area over garage and store room – Unit 2B

Attachment 6: Conditions

The development proposed is integrated development and approval is required from the approval bodies listed below:

NSW Rural Fire Service (RFS)
Pursuant to s100B – authorisation under the Rural Fires Act 1997 – General Terms of Approval issued by the NSW RFS dated 19 October 2018 as attached shall form part of this Notice of Determination.

Conditions imposed by Council as part of this Integrated Development Consent are:

Approved Plans and Specifications

1 The development shall be implemented substantially in accordance with the details and specifications set out on Job No DML 17/028 Drawing A-02-B to A-06-B dated 25 February 2019, A-01-C, SD-01-C and SD-02-C dated 27 March 2019 and L-02-A dated 17 February 2019 prepared by Develop My Land and any details on the application form, and with any supporting information received, except as amended by the conditions specified and imposed hereunder.

General Matters

2 **Phased Development**
The development is to be undertaken in four (4) phases comprising the following:

Phase 1: Demolition of existing garage and tree removal.
Phase 2: Subdivision – Torrens title – two (2) residential lots (Lots 1 and 2) including access and services infrastructure.
Phase 3: Construction of a detached dual occupancy on Lot 2.
Phase 4: Subdivision – Torrens title – two (2) residential lots (Lots 201 and 202) of existing dual occupancy.

Separate Construction Certificates required for **Phases 2 and 3** with conditions as relevant to each phase to be met.

Separate Subdivision Certificates required for **Phases 2 and 4** with conditions as relevant to each phase to be met.

3 **Phase 2 Subdivision**
The Phase 2 subdivision creating Lot 1 and Lot 2 must be registered prior to the issue of the Construction Certificate for the **Phase 3** dual occupancy development. Proof of registration must be provided to Principal Certifying Authority.

4 **Protection of Public Infrastructure**
Council must be notified in the event of any existing damage to any of its infrastructure such as the road, kerb and gutter, road shoulder, footpath, drainage structures and street trees fronting the development site, prior to commencement of any work.

Adequate protection must be provided for Council infrastructure prior to work commencing and during building operations.

Any damage to Council's assets shall be made good, prior to the issue of any Occupation Certificate or commencement of the operation.

5 **Geotechnical**
a All work is to be in accordance with the geotechnical recommendations contained in the report dated 24 August 2018 by Construction Sciences and any subsequent geotechnical report required to address unanticipated conditions encountered during construction.
b Foundation systems are to be designed for Class P soils with all footings to be founded within the underlying hard natural clay or as recommended by the geotechnical consultant.
c All excavations for foundations are to be inspected by the geotechnical consultant and certified that the ground has been suitably prepared for the placement of footings.

6 **Building Work - Compliance with the Building Code of Australia**
All building work must be carried out in compliance with the provisions of the Building Code of Australia.

7 **Construction Certificate**
A Construction Certificate must be obtained from Council or an Accredited Certifier prior to work commencing.

A Construction Certificate certifies that the provisions of Clauses 139-148 of the Environmental Planning and Assessment Amendment Regulations, 2000 have been satisfied, including compliance with all relevant conditions of Development Consent and the Building Code of Australia.

Note: The submission to Council of two (2) copies of all stamped Construction Certificate plans and supporting documentation is required within **two (2)** days from the date of issue of the Construction Certificate, in the event that the Construction Certificate is not issued by Council.

8 **Mailboxes**
The developer must install mailboxes along street frontage of the property boundary in accordance with Australia Post Guidelines. Prominent house numbers are to be displayed, with a minimum number size of 150 mm in height for each number and letter in the alphabet. The developer must install minimum two (2 No.) reflective paint house number on face of kerb along street frontage of the property to assist emergency services/deliveries/visitors

9 **Occupation Certificate**
An Occupation Certificate must be issued by the Principal Certifying Authority prior to occupation or use of the development. In issuing an Occupation Certificate, the Principal Certifying Authority must be satisfied that the requirements of section 6.9 of the Environmental Planning and Assessment Act 1979, have been complied with as well as all of the conditions of the Development Consent.

10 **Tree Management**
The developer shall retain existing trees indicated on Concept Landscape Plan by DML Dwg. No. L01 Issue B dated 17 February 2019 consisting of tree numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 19 and 20. Total number: sixteen (16 No.).

Any branch or root pruning which has been given approval, must be carried out by a qualified arborist in accordance with Australian Standard AS4373 (2007).

All tree protection measures are to be installed in accordance with Australian standard AS4790-2009 Protection of Trees on development Sites.

Recommendations in arborist's report Ref. No. D3347A dated August 2018 Amended February 2019 by Allied Tree Consultancy Author Matthew Reed and checked by Warwick Varley to be implemented including and not restricted to: project arborist being present during work within Structural Root Zone (SRZ) and supervising work within Tree Protection Zones (TPZ), site induction with reference to tree protection, referring matters to project arborist, re routing of sub surface utilities to avoid TPZs, hand excavation within TPZ near tree roots, remedial tree pruning, deadwooding, fencing and signage, sediment buffer, stem protection, establishing TPZs, mulching and watering and root hormone application if required. Soil levels within the TPZ must remain the same.

The developer shall remove existing trees numbered 12, 13, 14, 18, 21 and 22. Total number: six (6 No.) No other trees shall be removed without prior written approval of Council.

Prior to the Issue of the Construction Certificate

11 **Overland Flows from Adjoining Properties**
Stormwater flows from adjoining properties shall be accepted, contained and directed to the proposed stormwater management system on site. Finished ground/surface levels (including structures such as kerbs, walls etc.) shall be no higher than the existing upslope adjacent ground levels. Fences provided along the upslope boundaries shall include a suitable and continuous gap

under the fence to allow for surface runoff. Overflow paths shall be maintained to cater for flows in excess of the capacity of the underground stormwater system.

12 **Privacy Screen**

The 1.2m high solid balustrade along the Eastern elevation of the private open space for Unit 2A shall be replaced by a 1.5m high solid balustrade or privacy screen for the entire length of the Eastern elevation of the private open space for Unit 2A.

These details shall be reflected on the Construction Certificate plans and supporting documentation for the endorsement of the Principal Certifying Authority prior to the issue of the Construction Certificate.

13 **Structural Engineering Details**

Structural engineering details prepared by a suitably qualified and experienced structural engineer (with appropriate insurance coverage) shall be submitted to the Principal Certifying Authority prior to the release of the Construction Certificate addressing the following matters:

a Footings;
b reinforced concrete slabs;
c retaining walls;
d structural steelwork;
e wall bracing and tie-down requirements;
f the structural engineer, in producing a design is to complement the Geotechnical Engineer's Stability Report (Refernce No.5017190061 LT:mrw dated 24 August 2018 prepared by Network Geotechnics Pty Ltd) to make a clear statement that "any structure designed and erected in accordance with the plans and specifications will achieve the performance requirements described in Clause 1.3 of AS2870 (1996) and any other relevant codes and standards."

14 **Present Plans to Sydney Water**

Approved plans must be submitted online using Sydney Water Tap, available through www.sydneywater.com.au to determine whether the development will affect Sydney Water's sewer and water mains, stormwater drains and/or easements, and if further requirements need to be met.

The Certifying Authority must ensure that Sydney Water has issued an approval receipt prior to the issue of a Construction Certificate.

Visit www.sydneywater.com.au or telephone 13 20 92 for further information.

15 **Endeavour Energy Requirements**

The submission of documentary evidence from Endeavour Energy to the Principal Certifying Authority is required confirming that satisfactory arrangements have been made with Endeavour Energy for the provision of electricity supplies to the development, prior to the release of the Construction Certificate.

Note: Applications should be made to Customer Connections – South Coast, Endeavour Energy PO Box 811 Seven Hills NSW 1730.

16 **Telecommunications**

The submission of documentary evidence from an approved telecommunications carrier to the Principal Certifying Authority confirming that underground telecommunication services are available for this development is required prior to the issue of the Construction Certificate.

17 **Obscure Glazing for all Bathroom and WC Windows**

The bathroom and WC windows for each dwelling in the development shall be frosted or opaque glass. This requirement shall be reflected on the Construction Certificate plans.

18 **Provision of Planter Boxes**

The provision of planter boxes is required along the outer western edges of the balconies/terrace areas for Units U2B in the development. Minimum dimensions of planter boxes to be 750mm deep x 1200mm wide. The planter box drainage must be connected to the stormwater drainage

system. This requirement is to be reflected on the Construction Certificate plans and final landscape plan.

19 **Fencing**

The development is to be provided with fencing and screen walls at full cost to the applicant/developer as follows:

a where a screen wall faces the road, pedestrian walkway, reserve or public place that wall shall be constructed of the same brickwork as that used in the external wall of the building;

b rear and side property boundaries (behind the building line) and private rear courtyards are to be provided with minimum 1.8 metre high brick, timber lapped and capped, palisade or colorbond fences;

c any new fences or screens constructed on the site shall be of a type that will not obstruct the free flow of surface runoff from adjoining properties and be compatible with stormwater drainage requirements;

d comply with the principles in Appendix 5 of Planning for Bush Fire Protection 2006 and Standards for Asset Protection Zones (NSW Rural Fire Service) and recommendations included in Bushfire Assessment report by Harris Environmental Author Kate Harris dated 3 Aug 2018; and;

e fencing to suit character of local area.

This requirement is to be reflected on the Construction Certificate plans.

20 The parking dimensions, internal circulation, aisle widths, kerb splay corners, head clearance heights, ramp widths and grades of the car parking areas are to be in conformity with the current relevant Australian Standard AS2890.1, except where amended by other conditions of this consent. Details of such compliance are to be reflected on the Construction Certificate plans.

21 **Structures Adjacent to Driveway**

Any proposed structures adjacent to the driveway shall comply with the requirements of the current relevant Australian Standard AS2890.1 (figure 3.2 and 3.3) to provide for adequate pedestrian and vehicle sight distance. This includes, but is not limited to, structures such as signs, letterboxes, retaining walls, dense planting etc. This requirement shall be reflected on the Construction Certificate plans.

22 The depth and location of all services (ie gas, water, sewer, electricity, telephone, traffic lights, etc) must be ascertained and reflected on the Construction Certificate plans and supporting documentation.

23 **Landscaping**

The submission of a final Landscape Plan to the Principal Certifying Authority, prior to the release of the Construction Certificate. The final Landscape Plan shall address the following requirements:

a planting of indigenous plant species typical of the Illawarra Region such as: *Syzygium smithii* (formerly Acmena smithii) Lilly pilly, *Archontophoenix cunninghamiana* Bangalow palm, *Backhousia myrtifolia* Grey myrtle, *Elaeocarpus reticulatus* Blueberry ash, *Glochidion ferdinandii* Cheese tree, *Livistona australis* Cabbage palm tree, B*rachychiton acerifolius* Illawarra Flame Tree. A further list of suitable suggested species for the Thirroul area may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping;

b a schedule of proposed planting, including botanic name, common name, expected mature height and staking requirements as well as number of plants and pot sizes;

c the location of all proposed and existing overhead and underground service lines. The location of such service lines shall be clear of the dripline of existing and proposed trees;

d any proposed hard surface under the canopy of an existing trees shall be permeable and must be laid such that the finished surface levels match the existing level. Permeable paving is to be installed in accordance with the manufacturer's recommendations;

e the developer shall ensure that proposed planting is child friendly and must **not** include any of the types of plants listed below: **i)** plants known to produce toxins; **ii)** plant with high allergen properties; **vi)** any weed or potential weed species; and;

f landscaping to the site is to comply with the principles in Appendix 5 of Planning for Bush Fire Protection 2006 and Standards for Asset Protection Zones (NSW Rural Fire Service), take into consideration PBP 2018 and recommendations included in Bushfire Assessment report by Harris Environmental Author Kate Harris dated 3 August 2018;

g an area of Private Open Space to be developed for Unit 2A associated with living spaces;

h retaining walling near trees 8 – 11 to be retained, and furthermore some portion of existing sandstone stone walling to be retained/refurbished/ re used within new works exhibiting high degree of workmanship;

i where turf is proposed adjacent to built structures and garden beds the applicant shall install a 110mm wide brick mowing edge with concrete footing to minimise maintenance; and;

j any fill material should not cover topsoil. Topsoil shall be removed, stockpiled, ameliorated and replaced over any fill material to a minimum depth of 100mm.

The completion of the landscaping works as per the final approved Landscape Plan is required, prior to the issue of Occupation Certificate or commencement of the development.

24 The submission of certification from a suitably qualified and experienced landscape designer and drainage consultant to the Principal Certifying Authority prior to the release of the Construction Certificate, confirming that the landscape plan and the drainage plan are compatible.

25 The implementation of a landscape maintenance program in accordance with the approved Landscape Plan for a minimum period of 12 months to ensure that all landscape work becomes well established by regular maintenance. Details of the program must be submitted with the Landscape Plan to the Principal Certifying Authority prior to release of the Construction Certificate.

26 **Compensatory Planting**

The developer must make compensatory provision for the trees required to be removed as a result of the development. In this regard, six (6 No.) 75 litre container advanced mature plant stock shall be placed within the property boundary of the site in appropriate locations. The suggested species are to be selected from the following list: *Elaeocarpus reticulatus* Blueberry ash, *Livistona australis* Cabbage palm tree, or B*rachychiton acerifolius* Illawarra Flame Tree. A further list of suitable suggested species may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping.

27 **Tree Protection Measures**

The existing trees are to be retained upon the subject property and any trees on adjoining properties shall not be impacted upon during the excavation or construction phases of the development. This will require the installation and maintenance of appropriate tree protection measures, including (but not necessarily limited to) the following:

a Installation of Tree Protection Fencing - Protective fencing shall be 1.8 metre cyclone chainmesh fence, with posts and portable concrete footings. Details and location of protective fencing must be indicated on the architectural and engineering plans to be submitted to the Principal Certifying Authority prior to release of the Construction Certificate.

b Mulch Tree Protection Zone: Areas within a Tree Protection Zone are to be mulched with minimum 75 mm thick 100% recycled hardwood chip/leaf litter mulch.

c Irrigate: Areas within the Tree Protection Zone are to be regularly watered in accordance with the arborist's recommendations.

The submission of a final Site Plan to the Principal Certifying Authority indicating required tree protection fencing is required, prior to the release of the Construction Certificate.

28 **Bushfire Attack Level (BAL)**

a Construction of the new dwellings on proposed Lot 201 and 202 shall comply with the Sections 3 and 5 (BAL 12.5) 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' and section A3.7 Addendum Appendix 3 of 'Planning for Bush Fire Protection'.

The construction requirements for BAL 12.5 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' and section A3.7 Addendum Appendix 3 of 'Planning for Bush Fire Protection' for the new dwellings on proposed Lot 201 and 202 shall be reflected on the Construction Certificate plans and supporting documentation for the endorsement of the Principal Certifying Authority prior to the issue of the Construction Certificate.

b The existing building on proposed Lot 1 is required to be upgraded to improve ember protection. This is to be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.

These details shall be reflected on the Construction Certificate plans and supporting documentation for the endorsement of the Principal Certifying Authority prior to the issue of the Construction Certificate.

29 **Engineering Plans and Specifications - Retaining Wall Structures Greater than One (1) Metre**

The submission of engineering plans and supporting documentation of all proposed retaining walls greater than 1m to the Principal Certifying Authority for approval prior to the issue of the Construction Certificate. The retaining walls shall be designed by a suitably qualified and experienced civil and/or structural engineer. The required engineering plans and supporting documentation shall include the following:

a A plan of the wall showing location and proximity to property boundaries;
b An elevation of the wall showing ground levels, maximum height of the wall, materials to be used and details of the footing design and longitudinal steps that may be required along the length of the wall;
c Details of fencing or handrails to be erected on top of the wall;
d Sections of the wall showing wall and footing design, property boundaries and backfill material. Sections shall be provided at sufficient intervals to determine the impact of the wall on existing ground levels. The developer shall note that the retaining wall and footing structure must be contained wholly within the subject property;
e The proposed method of subsurface and surface drainage, including water disposal;
f Reinforcing and joining details of any bend in the wall at the passing bay of the accessway;
g The assumed loading used by the engineer for the wall design.
h Flows from adjoining properties shall be accepted and catered for within the site. Finished ground and top of retaining wall levels on the boundary shall be no higher than the existing upslope adjacent ground levels.

30 **Roof Water Connection to Kerb**

Connection across footways shall be by means of one or two (maximum), sewer grade UPVC pipe(s), 100mm diameter pipes with a continuous downslope gradient to the kerb. Connection to the kerb shall be made with a rectangular, hot dipped galvanised mild steel weephole(s) shaped to suit the kerb profile, with each weephole having the capacity equal to a 100mm diameter pipe. Alternatively, a maximum of two 150mm x 100mm hot dipped galvanised steel pipes may be used across footways, with the 150mm dimension being parallel to the road surface to suit the kerb profile.

31 **Property Addressing Policy Compliance**

Prior to the issue of any construction certificate, the developer must ensure that any site addressing complies with Council's **Property Addressing Policy** (as amended). Where appropriate, the developer must also lodge a written request to Council's **Infrastructure Systems & Support – Property Addressing (**propertyaddressing@wollongong.nsw.gov.au**),** for the site addressing prior to the issue of the construction certificate. Please allow up to 3-5 business days for a reply. Enquiries regarding property addressing may be made by calling 4227 8660.

32 **Roofwater Drainage**

All roof gutters and downpipes shall be designed to cater for a 1 in 100 year ARI storm event in accordance with the current version of AS 3500.3 - Plumbing and Drainage (Stormwater Drainage). Details of gutter/downpipe sizes and downpipe locations shall be reflected on the Construction Certificate plans.

33 **Stormwater Drainage Design**

A detailed drainage design for the development must be submitted to and approved by the Principal Certifying Authority prior to the release of the Construction Certificate. The detailed design is to form part of the construction certificate drawings. The detailed drainage design must satisfy the following requirements:

a be prepared by a suitably qualified civil engineer in accordance with Chapter E14 of Wollongong City Council's Development Control Plan 2009, Subdivision Policy, conditions listed under this consent, and generally in accordance with the concept plan/s lodged for development approval, prepared by OPTIMA Consulting Engineers, Dwg No. OCE12998/C01/DA, issue A, dated July 2018.

b Include details of the method of stormwater disposal. Stormwater from the development must be piped to the existing Council's culvert.

c Engineering plans and supporting calculations for the stormwater drainage system are to be prepared by a suitably qualified engineer and be designed to ensure that stormwater runoff from upstream properties is conveyed through the site without adverse impact on the development or adjoining properties. The plan must indicate the method of disposal of all stormwater and must include rainwater tanks, existing ground levels, finished surface levels on all paved areas, estimated flow rates, invert levels and sizes of all pipelines,

d Overflow paths shall be provided to allow for flows of water in excess of the capacity of the pipe/drainage system draining the land. Blocked pipe situations with 1 in 100 year ARI events shall be incorporated in the design. Overflow paths shall also be provided in low points and depressions. Each overflow path shall be designed to ensure no entry of surface water flows into any building and no concentration of surface water flows onto any adjoining property. Details of each overflow path shall be shown on the detailed drainage design.

34 **On-Site Stormwater Detention (OSD) Design**

The developer must provide on-site stormwater detention (OSD) storage for stormwater runoff from the development. The design and details of the OSD system must be provided in conjunction with the detailed drainage design and approved by the Principal Certifying Authority prior to the release of the Construction Certificate. The OSD design and details must satisfy the following requirements:

a Must be prepared by a suitable qualified engineer in accordance with Chapter E14 of the Wollongong DCP 2009.

b Must include details of the Site Storage Requirement (SSR) and Permissible Site Discharge (PSD) values for the site in accordance with Section 12.2.4 of Chapter E14 of the Wollongong DCP2009.

c The OSD facility must be designed to withstand the maximum loadings occurring from any combination of traffic (with consideration to residential and heavy vehicles),

hydrostatic, earth, and buoyancy forces. Details must be provided demonstrating these requirements have been achieved.

d The OSD facility shall incorporate a minimum 900mm x 900mm square lockable grate for access and maintenance purposes, provision for safety, debris control screen, and a suitably graded invert to the outlet to prevent ponding.

e Must include discharge control calculations (i.e. orifice/weir calculations) generally in accordance with Section 12.2.6 and 12.5.4 of Chapter E14 of the Wollongong DCP2009.

f Details of the orifice plate including diameter of orifice and method of fixing shall be provided.

g Must include details of a corrosion resistant identification plaque for location on or close to the OSD facility. The plaque shall include the following information and shall be installed prior to the issue of the occupation certificate:

- The structure is an OSD facility, being part of the stormwater drainage network, and is not to be tampered with.
- Identification number DA-2018/1071;
- Any specialist maintenance requirements.

h Must include a maintenance schedule for the OSD system must, generally in accordance with Chapter E14 of the Wollongong DCP2009.

35 **Designated Overland Flow Paths**

Details of each overland flow path located on the site shall be provided with the detailed drainage design. Each overland flow path shall be capable of catering for the 1 in 100 year storm event flows from the contributing catchment area, and where required, direct these flows to the on-site stormwater detention facility. The overland flow path shall be free of any vegetation and/or structures that are likely to impede natural overland flow, or make provision for such obstructions, so there will be no adverse stormwater impacts upon the subject land and adjoining properties. Full Manning's calculations shall be provided on the capacity of each overland flow path. These requirements shall be reflected on the Construction Certificate plans and supporting documentation.

36 **Council Footpath Reserve Works**

All redundant vehicular crossings and laybacks rendered unnecessary by this development must be reconstructed to normal kerb and gutter or existing edge of carriageway treatment to match the existing. The verge from the back of kerb to the boundary must be removed and the area appropriately graded, topsoiled and turfed in a manner that conforms with adjoining road reserve. The area forward of the front boundary must be kept smooth, even and free from any trip hazards. All alterations of public infrastructure where necessary are at the developer's expense.

All new driveway laybacks and driveway crossings must be designed in accordance with Wollongong City Council Standards. Details and locations are to be shown on the Construction Certificate Plans.

37 **Driveway Width**

The driveway crossover within Council's Road reserve is to be a maximum of 5.5 metres wide. This requirement shall be reflected on the Construction Certificate plans.

38 **Accessway Design**

A concrete accessway must be provided to the rear allotment to the following standards:

a A minimum of 3.0 metre wide with a 1m turf strip either side;

b A minimum of 150mm thick, with a minimum 25MPa compressive strength after 28 days; and

c Reinforced with a minimum SL72 mesh from the kerb for the full length of the access corridor underlain by a minimum 75 mm thickness of DGS20 compacted to 95% of modified density.

d All accessways must be designed so that they have a minimum clearance of 4.5 metres from any overhanging eaves and obstructions.

e Provision for the utility servicing of the rear/battleaxe lots with the installation of service conduits or provision of a minimum 0.5 metre wide unformed strip.

Drainage over the accessway must be contained in a kerb or central dish and conveyed to a public road or piped drainage system. Details of the accessway, including long-section, cross-sections, typical cross-sections and the effect on adjoining land must be provided with the Construction Certificate.

39 **Fire Hydrants**

Each lot must be adequately serviced by a fire hydrant. Section 7 of *Fire Hydrants for Minor Residential Development, Version 2 dated 1 September 2016 produced by NSW Fire & Rescue* outlines the requirements in relation to private fire hydrants. Should a fire hydrant(s) be required under these guidelines, it must be shown on the construction certificate plans.

40 **Development Contributions**

Pursuant to Section 4.17 of the Environmental Planning and Assessment Act 1979 and the Wollongong City-Wide Development Contributions Plan (2018), a monetary contribution of $6,000.00 (subject to indexation) must be paid to Council towards the provision of public amenities and services, prior to the release of any associated Construction Certificate.

This amount has been calculated based on the estimated cost of development and the applicable percentage rate.

The contribution amount will be subject to indexation until the date of payment. The formula for indexing the contribution is:

Contribution at time of payment = $C x (CP2/CP1)

Where:

$C is the original contribution as set out in the Consent

CP1 is the Consumer Price Index; All Groups CPI; Sydney at the time the consent was issued

CP2 is the Consumer Price Index; All Groups CPI; Sydney at the time of payment

Details of CP1 and CP2 can be found in the Australian Bureau of Statistics website – Catalogue No. 6401.0 - Consumer Price Index, Australia.

The following payment methods are available:

METHOD	HOW	PAYMENT TYPE
Online	http://www.wollongong.nsw.gov.au/applicationpayments Your Payment Reference: 1026166	• Credit Card
In Person	Wollongong City Council Administration Building - Customer Service Centre Ground Floor 41 Burelli Street, WOLLONGONG	• Cash • Credit Card • Bank Cheque
PLEASE MAKE BANK CHEQUE PAYABLE TO: Wollongong City Council (Personal or company cheques are not accepted)		

A copy of the Wollongong City-Wide Development Contributions Plan (2018) and accompanying Fact Sheet may be inspected or obtained from the Wollongong City Council Administration Building, 41 Burelli Street, Wollongong during business hours or on Council's web site at www.wollongong.nsw.gov.au

Prior to the Commencement of Works

41 **Tree Removal**

Prior to removal, the trees approved for removal under this development consent shall be closely inspected for native vertebrate fauna occupation, and if occupied by native vertebrate fauna, then

the NSW Wildlife Information, Rescue and Education Service (WIRES) shall be contacted for advice (phone 1300 094 737).

42 **Appointment of Principal Certifying Authority**

Prior to commencement of work, the person having the benefit of the Development Consent and a Construction Certificate must:

a Appoint a Principal Certifying Authority (PCA) and notify Council in writing of the appointment irrespective of whether Council or an accredited private certifier is appointed; and

b notify Council in writing of their intention to commence work (at least two days notice is required).

The Principal Certifying Authority must determine when inspections and compliance certificates are required.

43 **Residential Building Work – Compliance with the Requirements of the Home Building Act 1989**

Building work involving residential building work within the meaning of the Home Building Act 1989 must not be carried out unless the Principal Certifying Authority for the development to which the work relates

a in the case of work to be done by a licensee under that Act:
   i has been informed in writing of the licensee's name, contractor license number and contact address details (in the case of building work undertaken by a contractor under the Home Building Act 1989); and
   ii is satisfied that the licensee has complied with the requirements of Part 6 of the Home Building Act 1989; or

b in the case of work to be done by any other person:
   i has been informed in writing of the persons name, contact address details and owner-builder permit number; and
   ii has been given a declaration signed by the property owner(s) of the land that states that the reasonable market cost of the labour and materials involved in the work is less than the amount prescribed for the purposes of the definition of owner-builder work in Section 29 of the Home Building Act 1989 and is given appropriate information and declarations under paragraphs (a) and (b) whenever arrangements for the doing of the work are changed in such a manner as to render out of date any information or declaration previously given under either of those paragraphs.

Note: A certificate issued by an approved insurer under Part 6 of the Home Building Act 1989 that states that the specific person or licensed contractor is the holder of an insurance policy issued for the purposes of that Part of the Act is, for the purposes of this condition, sufficient evidence that the person has complied with the requirements of that Part of the Act.

44 **Sign – Supervisor Contact Details**

Before commencement of any work, a sign must be erected in a prominent, visible position:

a stating that unauthorised entry to the work site is not permitted;

b showing the name, address and telephone number of the Principal Certifying Authority for the work; and

c showing the name and address of the principal contractor in charge of the work site and a telephone number at which that person can be contacted at any time for business purposes.

This sign shall be maintained while the work is being carried out and removed upon the completion of the construction works.

45 **Temporary Toilet/Closet Facilities**

Toilet facilities are to be provided at or in the vicinity of the work site on which work involved in the erection or demolition of a building is being carried out at the rate of one toilet for every 20 persons or part of 20 persons employed at the site.

Each toilet provided must be:

a a standard flushing toilet; and

b connected to either:

- i the Sydney Water Corporation Ltd sewerage system or
- ii an accredited sewage management facility or
- iii an approved chemical closet.

The toilet facilities shall be provided on-site, prior to the commencement of any works.

46 **Enclosure of the Site**

The site must be enclosed with a suitable security fence to prohibit unauthorised access, to be approved by the Principal Certifying Authority. No building work is to commence until the fence is erected.

47 **Demolition Works**

The demolition works associated with this development shall be carried out in accordance with Australian Standard AS2601 (2001): The Demolition of Structures or any other subsequent relevant Australian Standard and the requirements of the NSW WorkCover Authority.

No demolition materials shall be burnt or buried on-site. The person responsible for the demolition works shall ensure that all vehicles leaving the site carrying demolition materials have their loads covered and do not track soil or waste materials onto the road. Any unforeseen hazardous and/or intractable wastes shall be disposed of to the satisfaction of the Principal Certifying Authority. In the event that the demolition works may involve the obstruction of any road reserve/footpath or other Council owned land, a separate application shall be made to Council to enclose the public place with a hoarding or fence over the footpath or other Council owned land.

48 **Demolition Notification to Surrounding Residents**

Demolition must not commence unless at least two (2) days written notice has been given to adjoining residents of the date on which demolition works will commence.

49 **Consultation with SafeWork NSW – Prior to Asbestos Removal**

A licensed asbestos removalist must give written notice to SafeWork NSW at least five (5) days before licensed asbestos removal work is commenced.

50 **Public Liability Insurance**

All contractors working in Council's road reserve and/or public reserve areas shall take out public liability insurance for a minimum amount of $10 Million. The policy shall specifically indemnify Council from all claims arising from the execution of the works. Written evidence of this insurance shall be supplied to the Principal Certifying Authority and Council (in the event that Council is not the Principal Certifying Authority) prior to the commencement of any such works in any road reserve or public reserve area.

51 **Temporary Sediment Fences**

Temporary sediment fences (eg haybales or geotextile fabric) must be installed on the site, prior to the commencement of any excavation, demolition or construction works in accordance with Council's guidelines. Upon completion of the development, sediment fencing is to remain until the site is grassed or alternatively, a two (2) metre strip of turf is provided along the perimeter of the site, particularly lower boundary areas.

52 **All-weather Access**

An all-weather stabilised access point must be provided to the site to prevent sediment leaving the site as a result of vehicular movement. Vehicular movement should be limited to this single accessway.

53 **Tree Protection Implementation**

The existing trees are to be retained upon the subject property and any trees on adjoining properties shall not be impacted upon during the excavation or construction phases of the development. This will require the installation and maintenance of appropriate tree protection measures, including (but not necessarily limited to) the following:

a installation of Tree Protection Fencing - Protective fencing shall be 1.8 m cyclone chainmesh fence, with posts and portable concrete footings;
b mulch Tree Protection Zone: Areas within a Tree Protection Zone are to be mulched with minimum 75 mm thick 100% recycled hardwood chip/leaf litter mulch;
c irrigate: Areas within the Tree Protection Zone are to be regularly watered in accordance with the arborist's recommendations.

The tree protection fencing shall be installed prior to the commencement of any demolition, excavation or construction works and shall be maintained throughout the entire construction phases of the development.

54 **Supervising Arborist – Tree Inspection and Installation of Tree Protection Measures**

Prior to the commencement of any demolition, excavation or construction works, the supervising arborist must certify in writing that tree protection measures have been inspected and installed in accordance with the arborist's recommendations and relevant conditions of this consent.

55 **Notification to Council of any Damage to Council's Infrastructure**

Council must be notified in the event of any existing damage to any of Council's infrastructure including, but not limited to the road, kerb and gutter, road shoulder, footpath, drainage structures and street trees fronting the development prior to the commencement of work. Adequate protection must be provided to Council infrastructure prior to work commencing and during the construction period. Any damage to Council's assets shall be restored in a satisfactory manner prior to the issue of the Occupation Certificate.

56 **Application for Occupation, Use, Disturbance or Work on Footpath/Roadway**

Any occupation, use, disturbance or work on the footpath or road reserve for construction purposes, which is likely to cause an interruption to existing pedestrian and/or vehicular traffic flows requires Council consent under Section 138 of the Roads Act 1993. An application must be submitted and approved by Council prior to the works commencing where it is proposed to carry out activities such as, but not limited to, the following:

a Digging or disruption to footpath/road reserve surface;
b Loading or unloading machinery/equipment/deliveries;
c Installation of a fence or hoarding;
d Stand mobile crane/plant/concrete pump/materials/waste storage containers;
e Pumping stormwater from the site to Council's stormwater drains;
f Installation of services, including water, sewer, gas, stormwater, telecommunications and power;
g Construction of new vehicular crossings or footpaths;
h Removal of street trees;
i Carrying out demolition works.

57 The arrangements and costs associated with any adjustment to a public utility service shall be borne by the applicant/developer. Any adjustment, deletion and/or creation of public utility easements associated with the approved works are the responsibility of the applicant/developer. The submission of documentary evidence to the Principal Certifying Authority which confirms that satisfactory arrangements have been put in place regarding any adjustment to such services is required prior to any works commencing on site.

58 **Bushfire – Inner Protection Area**

At the commencement of building works and in perpetuity the entire property shall be managed as an inner protection area (IPA) 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'.

59 **Relocation of State Survey Marks**
In accordance with Section 24(1) of the Surveying and Spatial Information Act 2002 a person must not remove, damage, destroy, displace, obliterate or deface any survey mark unless authorised to do so by the Surveyor General. In this regard any proposed construction work that may affect a State Survey Mark cannot be undertaken until a registered surveyor is engaged to arrange its relocation, in accordance with the requirements of the NSW Government Land and Property Information.

60 **Dilapidation Report**
The developer shall submit a Dilapidation Report recording the condition of the existing streetscape, street trees and adjoining properties prior to work commencing and include a detailed description of elements and photographic record.

61 **Works in Road Reserve - Minor Works**
Approval, under Section 138 of the Roads Act must be obtained from Wollongong City Council's Development Engineering Team prior to any works commencing or any proposed interruption to pedestrian and/or vehicular traffic within the road reserve caused by the construction of this development.

The application form for Works within the Road Reserve – Section 138 Roads Act can be found on Council's website. The form outlines the requirements to be submitted with the application, to give approval to commence works under the roads act. It is advised that all applications are submitted and fees paid, five (5) days prior to the works within the road reserve are intended to commence. The Applicant is responsible for the restoration of all Council assets within the road reserve which are impacted by the works/occupation. Restoration must be in accordance with the following requirements:

a All restorations are at the cost of the Applicant and must be undertaken in accordance with Council's standard document, "Specification for work within Council's Road reserve".
b Any existing damage within the immediate work area or caused as a result of the work/occupation, must also be restored with the final works.

62 **Protection of Public Infrastructure**
Council must be notified in the event of any existing damage to any of its infrastructure such as the road, kerb and gutter, road shoulder, footpath, drainage structures and street trees fronting the development site, prior to commencement of any work.

Adequate protection must be provided for Council infrastructure prior to work commencing and during building operations.

Any damage to Council's assets shall be made good, prior to the issue of any Occupation Certificate or commencement of the operation.

During Demolition, Excavation or Construction and Tree Removals

63 **Avoidance of Cruelty and Harm to Fauna**
During tree removal works, all care shall be taken to avoid cruelty and harm to fauna.

64 **Injured Native Fauna**
In the event any native fauna are injured during tree removal works, then the NSW Wildlife Information, Rescue and Education Service (WIRES) shall be contacted (phone 1300 094 737) for assistance.

65 **No Adverse Run-off Impacts on Adjoining Properties**
The design of the development shall ensure there are no adverse effects to adjoining properties as a result of flood or stormwater run-off. Attention must be paid to ensure adequate protection for buildings against the ingress of surface run-off.

Allowance must be made for surface run-off from adjoining properties. Any redirection or treatment of that run-off must not adversely affect any other property.

66 **Copy of Consent to be in Possession of Person carrying out Tree Removal**
The applicant must ensure that any person carrying out tree removal is in possession of this development consent and the approved landscape plan, in respect to the vegetation which has been given approval to be removed in accordance with this consent.

67 **Restricted Hours of Construction Work**
The developer must not carry out any work, other than emergency procedures, to control dust or sediment laden runoff outside the normal working hours, namely, 7.00 am to 5.00 pm, Monday to Saturday, without the prior written consent of the Principal Certifying Authority and Council. No work is permitted on public holidays or Sundays.

Any request to vary these hours shall be submitted to the **Council** in writing detailing:

a the variation in hours required (length of duration);
b the reason for that variation (scope of works);
c the type of work and machinery to be used;
d method of neighbour notification;
e supervisor contact number;
f any proposed measures required to mitigate the impacts of the works.

Note: The developer is advised that other legislation may control the activities for which Council has granted consent, including but not limited to, the Protection of the Environment Operations Act 1997.

68 **Excavation/Filling/Retaining Wall Structures**
Any proposed filling on the site must not:

a encroach onto the adjoining properties, and
b adversely affect the adjoining properties with surface run-off.

69 All proposed cut and filling works must be adequately retained with all battered slopes being no steeper than 2H: 1V and comply with Council's Development Control Plan.

70 If an excavation associated with the erection or demolition of a building extends below the level of the base of the footings of a building on adjoining allotment of land, the person causing the excavation to be made:

a must preserve and protect the adjoining building from damage; and
b if necessary, must underpin and support the building in an approved manner; and
c must, at least seven (7) days before excavation below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation.

71 **Asbestos – Removal, Handling and Disposal Measures/Requirements Asbestos Removal by a Licensed Asbestos Removalist**
The removal of any asbestos material must be carried out by a licensed asbestos removalist if over 10 square metres in area of non-friable asbestos, or if any type of friable asbestos in strict accordance with SafeWork NSW requirements (<http://www.safework.nsw.gov.au>).

72 **Asbestos Waste Collection, Transportation and Disposal**
Asbestos waste must be prepared, contained, transported and disposed of in accordance with SafeWork NSW and NSW Environment Protection Authority requirements. Asbestos waste must only be disposed of at a landfill site that can lawfully receive this this type of waste. A receipt must be retained and submitted to the Principal Certifying Authority, and a copy submitted to Council (in the event that Council is not the Principal Certifying Authority), prior to commencement of the construction works.

73 **Provision of Waste Receptacle**
The developer must provide an adequate receptacle to store all waste generated by the development, pending disposal. The receptacle must be regularly emptied and waste must not be allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and re-usable materials.

74 **BASIX**

All the commitments listed in each relevant BASIX Certificate for the development must be fulfilled in accordance with Clause 97A(2) of the Environmental Planning & Assessment Regulation 2000.

A relevant BASIX Certificate means:

- A BASIX Certificate that was applicable to the development when this development consent was granted (or, if the development consent is modified under section 4.55 of the Environmental Planning & Assessment Act 1979, a BASIX Certificate that is applicable to the development when this development consent is modified); or
- if a replacement BASIX Certificate accompanies any subsequent application for a construction certificate, the replacement BASIX Certificate; and
- BASIX Certificate has the meaning given to that term in the Environmental Planning & Assessment Regulation 2000."

75 **Provision of Taps/Irrigation System**

The provision of common taps and/or an irrigation system is required to guarantee that all landscape works are adequately watered. The location of common taps and/or irrigation system must be implemented in accordance with the approved Landscape Plan.

76 **Screen Planting**

To mitigate impact to adjoining dwelling a continuous hedge is to be established along western boundary for the length of Unit U2B POS Recommended species: *Callistemon viminalis 'Slim'*, *Photinia glabra Rubens, Viburnum tinus, Syzygium australe Aussie Southern, Syzygium, 'Resiliance', Viburnum odoratissimum Dense Fence or Waterhousea floribunda Sweeper*. Minimum spacing 1000mm. Minimum pot size 5 lt.

All planting box areas are to have a waterproofing membrane that can provide a minimum 10 year warranty on product. Protective boarding is to be installed to protect membrane from damage.

All planting box areas to be provided with free draining planter box soil mix.

If selected mulch is decorative pebbles/gravel, the maximum gravel pebble size is 10mm diameter.

A further list of suitable suggested species may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping.

Prior to the Issue of the Occupation Certificate

77 A **Section 73 Certificate must be submitted to the Principal Certifying Authority prior to occupation of the development/release of the plan of subdivision.**

78 **Drainage**

The developer must obtain a certificate of Hydraulic Compliance (using Council's M19 form) from a suitably qualified civil engineer, to confirm that all stormwater drainage and on-site detention works have been constructed in accordance with the approved plans. In addition, full works-as-executed plans, prepared and signed by a Registered Surveyor must be submitted. These plans and certification must satisfy all the stormwater requirements stated in Chapter E14 of the Wollongong DCP2009. This information must be submitted to the Principal Certifying Authority prior to the issue of the final Occupation Certificate.

79 **Restriction on Use – On-site Detention System**

The applicant must create a restriction on use under the Conveyancing Act 1919 over the on-site detention system. The following terms must be included in an appropriate instrument created under the Conveyancing Act 1919 for approval of Council:

"The registered proprietor of the lot burdened must not make or permit or suffer the making of any alterations to any on-site stormwater detention system on the lot(s) burdened without the prior consent in writing of the authority benefited. The expression 'on-site stormwater detention

system' shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater as well as all surfaces graded to direct stormwater to those structures.

Name of the authority having the power to release, vary or modify the restriction referred to is Wollongong City Council."

The instrument, showing the restriction, must be submitted to the Principal Certifying Authority for endorsement prior to the issue of the final Occupation Certificate and the use of the development.

80 **Occupation Certificate**
A Occupation Certificate must be issued by the Principal Certifying Authority prior to occupation or use of the development. In issuing an Occupation Certificate, the Principal Certifying Authority must be satisfied that the requirements of section 6.9 of the Environmental Planning and Assessment Act 1979, have been complied with as well as all of the conditions of the Development Consent.

81 **BASIX**
A final occupation certificate must not be issued unless accompanied by the BASIX Certificate applicable to the development. The Principal Certifying Authority must not issue the final occupation certificate unless satisfied that selected commitments have been complied with as specified in the relevant BASIX Certificate. NOTE: Clause 154B of the Environmental Planning and Assessment Regulation 2000 provides for independent verification of compliance in relation to certain BASIX commitments.

82 **Positive Covenant – On-Site Detention Maintenance Schedule**
A positive covenant shall be created under the Conveyancing Act 1919, requiring the property owner(s) to undertake maintenance in accordance with the Construction Certificate approved On-Site Stormwater Detention System and Maintenance Schedule (application number to be referenced).

The instrument, showing the positive covenant must be submitted to the Principal Certifying Authority for endorsement prior to the issue of the final Occupation Certificate and the use of the development.

83 **On-Site Detention – Structural Certification**
The submission of a certificate from a suitably qualified practising civil and/or structural engineer to the Principal Certifying Authority is required prior to the issue of the final Occupation Certificate. This certification is required to verify the structural adequacy of the on-site detention facility and that the facility has been constructed in accordance with the approved Construction Certificate plans.

84 **Bushfire – Compliance Certificate**
A Compliance Certificate shall accompany any Occupation Certificate for Bushfire construction works as have been completed, verifying that the development has been constructed in accordance with the relevant Bushfire Attack Level (BAL) requirements of the Development Consent and Construction Certificate.

85 **Completion of Landscape Works**
The completion of the landscaping works as per the final approved Landscape Plan is required prior to the issue of Occupation Certificate.

Prior to the Issue of the Subdivision Certificate

86 **Occupation Certificate Prior to Subdivision Certificate**
An Occupation Certificate for the dwelling/s must be issued prior to the release of the Subdivision Certificate for the Torrens Title subdivision. A copy of the Occupation Certificate shall be lodged to Council with the subdivision certificate application.

87 **Fire Hydrant**

Documentary evidence of compliance with section 7 of *Fire Hydrants for Minor Residential Development, Version 2 dated 1 September 2016 produced by NSW Fire & Rescue* is required to be submitted to the Principal Certifying Authority prior to the issue of the Subdivision Certificate. Should a fire hydrant be required, a plumber's certificate showing that the fire hydrant has been provided must be submitted to the Principal Certifying Authority prior to the issue of the Subdivision Certificate. The location of the fire hydrant must be shown on the works-as-executed drawings.

88 **Existing Easements**
All existing easements must be acknowledged on the final subdivision plan.

89 **Existing Restriction as to Use**
All existing restriction on the use of land must be acknowledged on the final subdivision plan.

90 **Encroaching Pipes**
A minimum one (1) metre wide easement to drain water shall be created over any encroaching drainage pipes.

For all drainage easements proposed over the subject lots, a works as executed/survey plan of all stormwater drainage within the site is to be submitted with the Subdivision Certificate Application to confirm this.

91 **88B Instrument Easements/Restrictions**
Any easements or restrictions required by this consent must nominate Wollongong City Council as the authority to vary, modify or release/extinguish the easements or restrictions. The form of the easement(s) or restriction(s) created as a result of this consent must be in accordance with the standard format for easements and restrictions as accepted by the Land and Property Information Office.

92 **Final Documentation Required Prior to Issue of the Phases 2 and 4 Subdivision Certificates**
The submission of the following information/documentation to the Principal Certifying Authority, prior to the issue of a Subdivision Certificate:

a Completed Subdivision Certificate application form and fees in accordance with Council's fees and charges;
b Original Construction Certificates and approved drawings (where issued by an accredited Private Certifying Authority);
c Certificate of Practical completion from Wollongong City Council or an accredited Private Certifying Authority (if applicable);
d Administration sheet prepared by a registered surveyor;
e Section 88B Instrument covering all necessary easements and restrictions on the use of any lot within the subdivision;
f Final plan of Subdivision prepared by a registered surveyor plus four (4) equivalent size paper copies of the plan;
g Original Subdivider/Developer Compliance Certificate pursuant to Section 73 of the Water Board (Corporatisation) Act 1994 from Sydney Water;
h Original Notification of Arrangement from an Endeavour Energy regarding the supply of underground electricity to the proposed allotments;
i Original Compliance Certificate from Telstra or another Telecommunications Service Provider which confirms that the developer has consulted with the Provider with regard to the provision of telecommunication services for the development.
j Payment of section 94 fees (Pro rata) (if applicable).

Operational Phases of the Development/Use of the Site

93 **Loading/Unloading Operations/Activities**
All loading/unloading operations are to take place at all times wholly within the confines of the site or within the road reserve under an approved traffic control plan.

94 **Maintenance of Inner Protection Area**

The Inner Protection Area must be maintained at all times as follows:

- There shall be minimal fine fuel at ground level which could be set alight by a bushfire.
- Use of non combustible ground surfaces such as gravel roads, paved areas, in-ground pools, etc is acceptable.
- Lawn areas shall be maintained low cut and clear.
- Areas under fences, fence posts, gates and trees shall be raked and kept clear of fine fuel.
- Gutters, roofs and roof gullies shall be kept free of leaves and other debris.
- Verandahs, decks, carports, etc shall not be used to store combustible materials and shall be kept free of leaves and other debris.
- Areas within courtyards shall be maintained free of leaves and other debris.
- Reticulated or bottle gas services shall be installed and maintained in accordance with AS 1596.
- Gas cylinder relief valves shall be directed away from the building and away from any hazardous materials such as firewood, etc.
- Trees may be retained within the IPA where:
  - no part of the tree overhangs within two (2) metres of any building.
  - the canopy is discontinuous such that tree crowns are separated by a minimum of 10 metres where the APZ adjoins tall open forest, open forest or low open forest.
  - the canopy is discontinuous such that tree crowns are separated by a minimum of five (5) metres where the APZ adjoins woodland or other vegetation type.
  - they are smooth barked species or, if rough barked, shall be maintained free of decorticating bark and other ladder fuels (rough barked species are not encouraged).
  - a well-watered and maintained vegetable garden may be located within the IPA.
  - no part of a tree shall be closer to a power line than the distances set out in the current edition of "Planning for Bush Fire Protection".
  - the use of local native plants with features that minimise the extent to which they contribute to the spread of bush fires is encouraged within the above constraints.

All communications to be addressed to:

Headquarters
15 Carter Street
Lidcombe NSW 2141

Telephone: 1300 NSW RFS
e-mail: records@rfs.nsw.gov.au

Headquarters
Locked Bag 17
Granville NSW 2142

Facsimile: 8741 5433

The General Manager
Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500

Your Ref: DA-2018/1071
Our Ref: D18/7272
DA18091815153 AJ

ATTENTION: Rodney Thew

19 October 2018

Dear Sir

Integrated Development Application - 2 Coast Street Thirroul 2515

I refer to your correspondence dated 7 September 2018 seeking general terms of approval for the above Integrated Development Application.

The New South Wales Rural Fire Service (NSW RFS) has considered the information submitted. General Terms of Approval, under Division 4.8 of the 'Environmental Planning and Assessment Act 1979', and a Bush Fire Safety Authority, under Section 100B of the 'Rural Fires Act 1997', are now issued subject to the following conditions:

1. The development proposal is to generally comply with the subdivision layout identified on the drawing prepared by Develop My Land numbered DML 17/028, dated 25/08/2018.

Asset Protection Zones

The intent of measures is to provide sufficient space and maintain reduced fuel loads so as to ensure radiant heat levels of buildings are below critical limits and to prevent direct flame contact with a building. To achieve this, the following conditions shall apply:

2. At the issue of subdivision certificate and in perpetuity the entire property shall be managed as an inner protection area (IPA) 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'.

Water and Utilities

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and

electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions shall apply:

3. Water, electricity and gas are to comply with section 4.1.3 of 'Planning for Bush Fire Protection 2006'.

Access

The intent of measures for property access is to provide safe access to/from the public road system for fire fighters providing property protection during a bush fire and for occupants faced with evacuation. To achieve this, the following conditions shall apply:

4. Property access roads shall comply with section 4.1.3 (2) of 'Planning for Bush Fire Protection 2006'.

Design and Construction

The intent of measures is that buildings are designed and constructed to withstand the potential impacts of bush fire attack. To achieve this, the following conditions shall apply:

5. The existing building on proposed Lot 1 is required to be upgraded to improve ember protection. This is to be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.

6. Construction of dwellings on proposed Lots 2A and 2B shall comply with Sections 3 and 5 (BAL 12.5) 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 Bush Fire Protection 2006'.

Landscaping

7. Landscaping to the site is to comply with the principles of Appendix 5 of 'Planning for Bush Fire Protection 2006'.

Should you wish to discuss this matter please contact Anna Jones on 1300 NSW RFS.

Yours sincerely

Martha Dotter
A/Team Leader Development Assessment & Planning

For general information on bush fire protection please visit www.rfs.nsw.gov.au