

Date: 29th June 2020
Our Ref: 14/351

Department of Planning, Infrastructure & Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Lillian Charlesworth - Specialist Planning Officer, Regional Assessments

Dear Madam,

**Re: Epiq Lennox (Pacific Pines Estate), Lennox Head - MP 07_0026 MOD 7
Response to Submissions & Additional Information**

Reference is made to the Department of Planning, Industry & Environment (**DPIE**) letter dated 23 October 2019 and the government agency submissions received for the proposed Modification to MO07_0026, relating to Lot 5 DP 1239938 within the Epiq Estate Lennox Head.

This letter serves to assist the DPIE and associated Government Agencies in the review of our response to the submissions raised for Mod 7 as outlined within **Table 1**.

Five (5) submissions were received from Government Agencies during the initial referral period for Modification 7 (Mod 7). Submissions were received from the following government agencies.

- Ballina Shire Council;
- Office of Environment & Heritage;
- Roads & Maritime Service;
- Department of Primary Industries; and
- Transport for NSW.

In reviewing the suite of comments received within the government agency submissions, specific regard was made to the key issue being associated with the perimeter road and those matters integrated with this point. As Ballina Shire Council will be the consent authority for the future dwellings, it was deemed to be prudent to address this issue directly with Ballina Shire Council. Furthermore, the primary issues raised by other government agencies revolved around points initiated by Council.

Through a series of meetings coordinated with Ballina Shire Council to discuss the issues raised and the subsequent completion of further technical work and modifications to the proposed development, Council has identified subject to the design changes made and suitable conditions being imposed by the DPIE, Council does not object to the proposed modification. A copy of Council's correspondence responding to the latest design as included within this submission is provided within **Attachment 4** of this documentation.

Further, in responding to the government agency submissions, the originally proposed subdivision and building design, bulk earthworks, landscape treatment and design guidelines have been modified to reflect the projects response. We also highlight the proposal is also planned to be completed in stages, with each stage to be determined through consultation with Ballina Shire Council prior to the lodgement of the Construction Certificate of the subdivision works.

The modified documentation is contained within the following attachments.

- **Attachment 1** – Modified Subdivision layout and Civil Design Package (NDC)
- **Attachment 2** – Updated Design Plans & Design Specification (TVS Architects)
- **Attachment 3** – Landscape Concept Design Report (O2LA)
- **Attachment 4** – Ballina Shire Council Letters dated 28 June 2019 & 7 February 2020
- **Attachment 5** – GeoLINK Ecological Advice & Freshwater Wetland mapping (NDC)
- **Attachment 6** – Bushfire Assessment Report (Bushfire Certifiers)

Table 1: Government Agency Submissions & Project Response

Government Agency	Agency Comments	Proponent Response
Ballina Shire Council	1. Perimeter Road (Council access and maintenance)	<p>It is acknowledged that the proposed layout does not include a 20 m buffer and therefore does not satisfy the requirements of the approved Environmental Management Plan (EMP) and Condition B10 of the Concept Approval. Section 6.1.1 of the EMP states that a 20m buffer be applied to retained areas of freshwater wetland within the Conservation Zone, not a 20 m buffer to the entire Conservation Zone. Mapping of the freshwater wetland was last undertaken in April 2020 and is provided in the ecological response to Ballina Shire Council's submission within Attachment 5 of this letter.</p> <p>The intent of any buffer is to minimise negative impacts upon sensitive receiving areas. In this case, protection of the Freshwater Wetland EEC within the Conservation Management Zone (CMZ) which also contains threatened Square-stemmed Spike-rush (SSSR) and Hairy Joint Grass (HJG) is required. Reference is made to the fact the 20m buffer as contained under the existing Concept Plan Approval provides for the construction of a local access road upon Super Lot 5 which was to service the previously approved aged care housing designation for SL5. In this respect, the buffer did not comprise of a 20m landscaped buffer.</p> <p>Reference is made to the fact the 20m buffer nominated by Condition B10 permitted a public road. Based on the Council road standard, a 4m grassed verge would be provided on the outer side of the public road abutting the CMZ. In this instance, the proposal provides a minimum 5m grassed area in addition to the access track and grass verge resulting in a minimum 11.43m setback to the CMZ and freshwater wetland.</p> <p>A proposed track within a 5m-8m reserve plus a no build zone has been incorporated into the current design. The 5m buffer will comprise a 3m wide gravel access track (with localised widenings) and 2 m wide vegetated strip (refer Attachment 1). The proposed</p>

		<p>access track would have less nutrient runoff than a local access perimeter road. In this respect, the intent of the 20m buffer would be met through the ability to achieve the Epiq Estate stormwater management plan through the building setback & 5-8m reserve area which equates to a minimum 10m buffer. Further reference to commentary on the stormwater management for the project is provided under Point 4 of this letter.</p> <p>Regard is also made to crime prevention and the design of the proposed perimeter maintenance access. In this respect, the track will have lockable bollards erected at each end where the track connects to the public road network. Further, an option also exists to incorporate a fence and gate at the road frontage to provide further access restrictions is deemed appropriate by Council. This measure will clearly delineate access and use of the track is not for public access. Furthermore, the utilisation of a gravel finish discourages the use of the access track for skateboards or scooters which may occur with a concrete surface, thereby reducing the attraction for children to utilise the track.</p> <p>With respect to surveillance, the adjoining residential housing will have the primary open space orientated to the CMZ and as such to the track. The elevated position of the open space and housing permits view lines over the CMZ. This position is illustrated in the plans provided within Attachment 1, whereby the elevation of the dwelling and the associated fencing which due to its permeability permits a view line from the residential property of the track and CMZ. Importantly, natural surveillance is also offered from residents residing within housing located in Release 5 who will have their view from the elevated ridge westwards over the CMZ and the access track alignment.</p> <p>We submit the proposed access track satisfies many of requirements of a perimeter road such as:</p> <ul style="list-style-type: none"> • providing Ballina Shire Council access for the full interface between the subject land and the CMZ for maintenance purposes; • minimises private property adjoining the conservation zone and the potential to extend residential footprints; • reduces potential for garden escapees; • reduces illegal dumping of rubbish and green waste given the design of the track which improves the visibility and delineation of the private land/public land interface; and • preserves the ability for the estate to satisfy the underlying approved stormwater management plan for Epiq Lennox.
	2. Outstanding Restoration Works and Bushfire Assessment	<p>Upon approval from Commonwealth Department of Environment and Energy (DoEE) for additional infill plantings within the conservation zone, revisions may be made to areas of proposed revegetation to ensure that adequate setbacks for bushfire are met and APZs can be achieved. This point has been addressed with Ballina Shire Council with no objections raised (refer to Council letters dated 28 June 2019 & 7 February 2020 within Attachment 4).</p>

		<p>GeoLINK propose to modify the approved Conservation Zone Management Plan to include planting of rainforest species within the north-western corner of the central conservation zone adjacent to Super Lot 5. The area is currently grassland.</p> <p>The aim of infill plantings is to establish rainforest in areas that are not suitable as freshwater wetland or threatened Hairy Joint Grass (HJG) habitat to reduce weed control efforts in the long term. Establishing rainforest may also provide surrogate HJG habitat along edges and ecotones.</p> <p>Previous recommendations (to undertake infill plantings within the conservation zone) have been approved in principle by the client, OEH and Ballina Shire Council. However, the Federal Department of Environment and Energy (DoEE) has not yet provided support for any proposed infill plantings. If DoEE or the NSW Rural Fire Service do not approve of the proposed rainforest planting, this area will remain as grassland.</p> <p>A revised Bushfire Assessment (Attachment 6) has been prepared having due regard to the scenario of the CMZ area located adjoining the south-western corner of SL5 not being maintained and remaining grassland. The 10m setback for proposed residential housing to the bushfire hazard consists of a variable width asset protection zone within the rear boundaries of the proposed residential lot and the 5-8m wide access track for Ballina Shire Council consisting of a gravel access path and managed shoulders. The access and shoulders is not considered under the bushfire assessment as a hazard under the PBP 2006.</p> <p>In this regard, the proposed 10m managed land buffer for the building envelopes has been determined to be adequate for compliance with Table A2.5 PBP 2006.</p>
	3. Mosquito Risk	<p>As indicated above, if approval from DoEE is obtained for additional infill plantings within the conservation zone, areas of proposed revegetation can be modified to ensure that these are set back the prescribed 25m from the proposed development to satisfy mosquito requirements if deemed necessary by Ballina shire Council and the Department of planning & Environment.</p>
	4. Potential impacts of filling on the Hydrology of the Conservation Zone	<p>The Revised Stormwater Assessment & Management Plan, Pacific Pines Estate, prepared by Gilbert and Sutherland, (July 2014) was approved by BSC on 6 August 2014.</p> <p>This Plan outlines the philosophy for stormwater management across the greater Epiq Estate. The majority of stormwater generated by the development is to be discharged to the Water Quality Control Pond (WQCP) which is located to the west of Montwood Drive. Water generated by the development to the east of Montwood Drive is to be discharged to the Conservation Management Zone (CMZ) from which it passes through the existing box culverts installed under Montwood Drive.</p>

		<p>All previous stages of the Epiq Estate have been designed and constructed generally in accordance with this Plan. It is noted that several gross pollutant traps (GPT's) in addition to those identified in the Plan, have been installed as part of previous stages. These devices will improve the quality of the water entering the Conservation Zone and also remove devices previously proposed within the zone.</p> <p>The proposed Super Lot 5 development has been redesigned to provide an access track around the perimeter of the site. This track will be constructed 3m wide in accordance with BSC standards. Energy dissipators have been provided outside the CMZ as required by Council and are detailed on the attached engineering plan 14351-S5-SK-DR-01-B. An additional drain has been proposed adjacent to the west side of Montwood Drive to address Council's concerns regarding the drainage of low lying areas of the CMZ. The location and configuration of this drain has been developed in consultation with Ballina Shire Council.</p>
	5. Site Access	<p>Left in / Left out entry onto Montwood Drive is now proposed. Pursuant to Ballina Shire Council's letter of 28 June 2019 contained within Attachment 4, the proposal provides a central island in Montwood Drive to prevent right turn movements and restrict access to left in / left out only.</p>
	6. Stormwater Conveyance – Points of Discharge	<p>Reference is made to the response provided for Point 4</p>
	7. Stormwater Conveyance – Overland Flow Path	<p>As suggested by Ballina Shire Council the issues raised regarding overland flow paths have been overcome by providing perimeter access within Super Lot 5 and dedicating the nominated drainage easements.</p>
	8. Proposed Park	<p>We submit the placement of a park for the residents contains sufficient merit to retain the designated open space area. The park would provide a passive area within the development, whilst acknowledging the close proximity to the sports fields, and open space in Release 3. Notwithstanding this, design issues raised by Council have been addressed by switching the majority of the car parking from the eastern side to the west of the park and the park adopting a more regular configuration which will also assist with maintenance. Ballina Shire Council has reviewed the modified design tendered to Council in June 2019 in preparing their advice contained within Attachment 3.</p> <p>Reference is made to the fact an additional park has now been provided in response to further consultation with DPIE as outlined in further detail within the DPIE response within in Table 1. The park is illustrated within the design plans contained within Attachments 2 & 3 of this RtS.</p>

	9. Staging	<p>We concur a separate set of conditions should be provided for each Super Lot (i.e. Super Lots 5 & 7). We raise no objection to the conditions for Modification 6 and Modification 7 being contained in separate stages under the project approval in the same manner as completed for Stages 1C and 1D, as these developments will not be undertaken at the same time.</p> <p>As outlined within this letter, the proponent is seeking to release the lots/residential dwellings in sub-stages. As the specific staging is not known at this time, it is proposed each sub-stage shall be approved by Ballina Shire Council prior to the issuing of a Construction Certificate for that sub-stage to be developed. The person acting on the Project Approval is to provide Ballina Shire Council with a written request for approval of each sub-stage, including:</p> <ul style="list-style-type: none"> • a description of all the works (civil infrastructure and other) and facilities (i.e. open space) proposed for that sub-stage and how those proposed works connect / relate to existing infrastructure works; and • a list of all the conditions of consent that are required to be complied with for that sub-stage.
	10. Conditions	Should conditions from the original approval be reapplied, no objections are raised to ensure the conditions refer to current legislation, standards and practices.
Department of Environment & Heritage	1. Impacts on Conservation Zone Management	<p>The project team have discussed revising the proposed layout of Super Lot 5 and propose to include a vehicular access track to separate residential lots from the CMZ in lieu of a perimeter road. The access track located completely within Lot 5 will satisfy OEH concerns regarding access to the CMZ for firefighting as well as personnel/ contractors responsible for implementing weed control, revegetation and rehabilitation. Access is also available from the southern and western sides of the CMZ.</p> <p>We highlight Ballina Shire Council's acceptance of the revised subdivision layout with no perimeter road, however incorporating the maintenance access driveway. Reference is made to the correspondence provided within Attachment 4. In this regard, Council has stated;</p> <p><i>As indicated in our submission to NSW Planning and Environment, it is Council's preference for the subdivision layout to incorporate a perimeter road between Super Lot 5 and the conservation management zone. Notwithstanding this, it is accepted that reasonable environmental outcomes can still be achieved through your proposed subdivision design.</i></p> <p><i>Subject to the above design changes and suitable conditions being imposed by the Department of Planning and Environment, Council does not object to the proposed modification.</i></p>

	<p>2. Indirect Impacts on Biodiversity</p>	<p>OEH states that potential indirect biodiversity impacts not considered in the ecological assessment report may arise from the following sources:</p> <p><i>a) Elevated nutrient and pollution levels derived from uncontrolled and untreated stormwater runoff from the backyards of 33 proposed residential lots adjoining and draining directly into the conservation zone;</i></p> <p>Higher nutrient and pollution levels are likely per square metre from an impermeable perimeter road than from private backyards. As indicated above however, a narrower access track with vegetated strip is now proposed which will satisfy this concern. The development is also able to still satisfy the Stormwater Assessment & Management Plan, Pacific Pines Estate, prepared by Gilbert and Sutherland, (July 2014) previously approved by BSC on 6 August 2014.</p> <p><i>b) Weed infestations caused or exacerbated by future potential unlawful dumping of garden waste generated in the backyards of 33 residential lots proposed to adjoin the conservation zone;</i></p> <p>The proposed access track will negate this concern as Council will access this area for maintenance. Importantly, the permeable fencing at the rear of the proposed lots which share a boundary to the public reserve, combined with opportunities for natural surveillance achieved to the proposed lots from Release 5 shall provide a recognised deterrent for any future landowner seeking to unlawfully dump garden waste.</p> <p>Education and signage should also be encouraged.</p> <p><i>c) Gradual informal expansion and encroachment of residential backyards (e.g. manicured lawns) of proposed adjoining residential into the conservation zone; and</i></p> <p>The proposed access track design and elevated nature of the residential lots will negate this concern. The proposed access reserve will include a maintenance access track and vegetated strip plus a retaining wall which will physically prevent extension of privately manicured lawns. Regard should be made to the design plans provided within Attachment 1 of this submission.</p> <p>Further reference is given to the view path to Super Lot 5 from Stage 1A & Stage 5 of the Epiq Estate where surveillance of the perimeter of Super Lot 5 is available for the full interface of the lot within the CMZ.</p> <p><i>d) Proliferation of informal walking paths emanating from the backyards of proposed adjoining residential lots into the conservation zone.</i></p> <p>The design of the proposed access maintenance track and interface with the residential lots will negate this concern. The 5m reserve area will include a gravel surface, thereby discouraging recreational scooters/skateboards etc from utilising this area. Reference is also made to the pedestrian pathway network which services both the subject land and Epiq Estate provides a more direct route to the key</p>
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	3. Stormwater Impacts on Management of Threatened Entities	<p>The proposed stormwater management design is in accordance with the approved masterplan for the site. Stormwater runoff is treated within the Water Quality Control Pond with no objections raised by Ballina Shire Council.</p> <p>Reference is made to the response prepared by GeoLINK prepared Attachment 5 of this submission.</p>
NSW Rural Fire Service		<p>Reference is made to the revised Bushfire Report provided within Attachment 6 of this submission. The assessment has been prepared having regard to the modified layout which has been amended to accord with Ballina Shire Council's comments as addressed earlier in this submission.</p> <p>With respect to the NSW RFS identifying the need for a perimeter road, we note the bushfire consultant undertook a pre-lodgement brief with the NSW RFS with specific regard to the modified layout not including a perimeter road. The NSW RFS has provided a supplementary comment on 15 January 2020 advising details of the brief submitted to the NSW RFS proposed no perimeter road and confirm that this was reviewed by the RFS and accepted.</p>
Transport for NSW (Note: same comments provided for Mod 6)	<ul style="list-style-type: none"> Analysis on how public transport demand will be affected by population change from the development and how it will be managed. Documentation 	<ul style="list-style-type: none"> Reference is made to the traffic assessment provided within the Modification Proposal. In this regard, the modification does not seek to modify the approved road standard, footpath network and public transport accessibility already approved for the Epiq Estate as the modifications themselves do not significantly alter the population for the estate. In this regard, the Engineering Services Report addresses the road network based on traffic volumes generated by the development which have been supported by Ballina Shire Council based on the adoption of the recommendations nominated by Council in letter dated 28 June 2019.

	<p>demonstrating local bus operator (Blanch's) has been consulted surrounding future bus routes and to ensure bus capable infrastructure will be provided.</p> <ul style="list-style-type: none"> • Pedestrian facilities should include links to public transport and address: <ul style="list-style-type: none"> ○ DDA compliance, i.e, footpaths should be 1.8m wide minimum near retail facilities to meet Austroads guidelines for wheelchair accessibility. ○ The 1.8m standard be provided to connect to the existing footpaths at the boundaries of the site and continuous footpaths are provided to existing and planned bus stops. • The proponent is proposing to provide 1.3m wide footpaths on one side of the road only. With the increase in density, TfNSW supports footpaths on both sides of the road around mixed use and retail facilities. 	<ul style="list-style-type: none"> • The Concept Plan for the Epiq Estate has been approved under the Major Project with designated bus routes and associated bus bays. The current proposed modification does not alter the accessibility to these bus bays, nor impact the accessibility for buses to service the Estate. • Blanch Bus services currently services Lennox Head via North Creek Road (Service 641). The proposed modification does not alter or restrict the ability for a bus service to access the Epiq Estate. With respect to the population of the estate, the modification does not significantly alter the current population yield for Super Lot 5, hence no impact on the demand or capacity of the bus service will result in this instance. • Pedestrian access from the proposed land uses on Super Lot 5 will be DDA compliant. This proposal does not modify the site grades in a manner which impacts the future ability for pedestrian access from the subject site to the already approved bus set down within the Estate. In this regard, the subdivision will connect to the approved and already constructed footpath network which was developed in earlier stages of the Epiq Estate. Reference is made to approved Concept Plan (Plan C6) which demonstrates the approved pedestrian/cycleway for the Estate. • As illustrated for Mod 6, a 1.8m footpath is now proposed along the western side of Road 1 and Road 4 in Super Lot 7 in front of the live/work lots. Dual footpaths are not proposed along Road 1 as the 2.5m footpath to the east of the larger commercial lots is considered to provide pedestrian access to the sites. Dual footpaths along the front of the live/work lots along Road 4 are not proposed as the road only has a single frontage in this location
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Department of Industry	The Department has advised it has no comments	No response required.
Department of Planning, Infrastructure & Environment	<p>Density The Department considers the overall density of the proposed residential development is excessive in comparison to development permitted for the site under the provisions of Ballina Local Environmental Plan 2012. As a minimum, the lot sizes proposed should comply with the minimum lot size permitted for the land under clause 4.1 A of the BLEP2012.</p>	<p>By way of background to the subdivision proposal, consultation via a pre-lodgement meeting was held with the Department of Planning, Infrastructure and Environment on 18 August 2017 to discuss proposed modification to our Major Project (MP07_0026). The Department had provided the specific instruction requiring Ballina Shire Council support for the lot size proposed within the Modification.</p> <p>Pursuant to the outcomes of the pre-lodgement meeting and subsequent communication with DPIE, Clarence Property consulted with Ballina Shire Council, to outline the sought amendment and secure Council's position in respect to the minimum lot size planned for Super Lots 5 & 7. To this end, Clarence Property presented the modified proposal to Ballina Shire Council Elected Councillors and staff on 29 November 2017. The presentation outlined the proposed subdivision design and also detailed the intended built form and staged sequencing of the integrated release of the dwellings and subdivision.</p> <p>Through this process and subsequent communication between Ballina Shire Council and the Department, no objection was raised to the planned minimum lot size.</p> <p>With specific regard to the Department's issue with the density of the development, we note as the land is zoned R3, multi-dwellings are permissible under the Ballina LEP 2012. Under the LEP a potential yield of 166 dwellings may be achieved utilising the dwelling density of 1 dwelling/250m² which applies to the Lennox Head locality under the Ballina Development Control Plan. In regard to the subdivision layout, reference is made to the fact a higher density is achievable through a strata title proposal. Accordingly, we submit the development achieves a lesser density than would otherwise be achievable under the Ballina LEP 2012.</p> <p>Notwithstanding the aforementioned points, the modified layout has reduced the lot yield to 133 lots, being a reduction of 12 lots from the originally proposed layout lodged with Mod 7 to DPIE. The reduction in the number of lots has afforded the opportunity for the inclusion of additional parkland area within the development. A new park, being 960m² in area is now provided within the south-western portion of the site fronting the primary access road into the subdivision. The park will also connect to the north-south oriented open space network which will afford residents with direct pedestrian connectivity to Snapper Drive.</p> <p>The reduction in the number of residential lots has also created the opportunity to provide additional on-street car parking for the development. In this respect, 55 on-street parking spaces are provided, being an increase of nine (9) spaces when compared to the originally lodged submission. Of critical importance is the re-distribution of the proposed parking areas within the layout so as to service all areas of the subdivision.</p> <p>Reference is made to the discussion concerning the implementation of an upright kerb for the project. In this respect, it is agreed an upright kerb will restrict the areas utilised for parking to be within the designated on-street parking bays or within the driveway for the proposed dwellings and therefore shall be applied in this instance.</p>

	<p>Subdivision Layout Department's preference that a perimeter road be provided along the eastern and southern boundaries of the site, as this would allow for the asset protection zones (APZ) to be located on the road reserve rather than within backyards.</p> <p>The Department does not support APZs within the backyards of proposed lots 24 to 56, as it increases the likelihood that the APZ will not be maintained to a standard required by Planning for Bushfire and, as the APZ spans the entire backyard, limits residents use of their backyard. Additionally, provision of a perimeter road will allow for easier access for emergency services and locate dwellings further away from the bushfire hazard.</p>	<p>Reference is made to the fact the NSW Rural Fire Service has endorsed the assessment by Bushfire Certifiers Pty Ltd, thereby endorsing the current subdivision layout.</p> <p>This position is also adopted by Ballina Shire Council who have identified in letters dated 28 June 2019 and 7 February 2020 (Attachment 4), no objection to the current subdivision layout.</p> <p>With respect to APZ's within the rear yards of the lots 24-56, the following comments are provided by Bushfire Certifiers Pty Ltd,</p> <ul style="list-style-type: none"> • <i>Having APZs in owners backyards would be the location of the majority of APZs approved for dwellings under the PBP. (Note: The Epiq Concept Plan 07_0026 approval provides APZ's within the rear yards of lots within Releases 2, 3 & 5).</i> • <i>An APZ within a backyard can still support an in ground pool, managed gardens and generally rear yard activities.</i> • <i>Perimeter roads were discussed in detail with NSW RFS via the bushfire design brief process and concurrence was received that not having a perimeter road in this particular case would adequately allow the performance criteria to be complied with.</i> <p>Reference should also be made to the Bushfire Hazard Assessment provided in Attachment 6 which illustrates the access track within the CMZ will provide access to the rear of the lots which would also be accessible for emergency vehicles. As a result, access to the front and rear of Lots 21-58 is achievable at all times.</p>
	<p>The proposed layout must be redesigned to remove double frontage lots along Montwood Drive and Snapper Drive. Dwellings which adjoin these roads must, where possible, address the roads as their primary frontage.</p>	<p>Ballina Shire Council has identified through the pre-lodgement process for all lots to be accessed from the internal road network. In this regard, all future dwellings are designed so as to prevent any direct vehicular access from Montwood Drive and Snapper Drive.</p>
	<p>Allotment sizes must be large enough to allow compliance with Ballina Shire Development Control Plan 2012 (DCP), including provisions related to required building height plans for lots adjoining public land</p>	<p>All dwellings proposed within the development will be compliant with the building height plane when taken from the adjoining conservation management zone.</p> <p>The modified layout illustrated in design plans by TVS and O2LA (Attachments 2 & 3) has responded in a positive manner how the development is articulated to both Snapper Drive and Montwood Drive. The layout for the respective street frontages has been modified so as to permit the placement of Dwelling Design C which adopts a minimum 7m frontage compared to the original scheme which concentrated Dwelling Design A with a 5m frontage. The result</p>

	<p>and maximum garage widths along the facade, where vehicle access is from the primary road.</p>	<p>in this respect is to decrease the density in the key areas of the site, with a specific focus on the dwellings locating adjacent to the intersection of Montwood Drive and Snapper Drive in the north-western corner of the site.</p> <p>The amended lot layout and associated design guidelines (Attachment 2) has also provided scope to increase the setback of a number of dwellings. This provides scope to permit two vehicles to be parked in the driveway for each lot, thus improving the parking supply for the project. The attached layout identifies those dwellings where off-street parking is capable of occurring. We note 64 dwellings are designed to cater for two (2) cars parked within the driveway, whilst 17 dwellings provide space for a single vehicle in addition to the double or single garage afforded to the differing unit type.</p> <p>With respect to the façade of the dwellings being dominated by the garages, reference is made to the fact the development is a terrace style project and thus the linear nature of the layout is planned to support the proposed built form product which again is aimed at the affordable housing market for Lennox Head. Notwithstanding this, the design has achieved only one side of the street for Road B having garages fronting the street. This is achieved through the rear loaded access arrangements for Blocks 15-20.</p> <p>The result in this instance is to reduce the perceived dominance of the garages for each dwelling dominating the primary vehicular access through the development, with only one minor section of the layout between Blocks 7, 8 & 21 containing garages on both side of the internal road network.</p> <p>To address this, reference is made to the fact Block 21 has increased the dwelling setback from the street to afford greater design articulation and landscaping within the front setback area, which again reduces the dominance of the garages fronting the road network.</p> <p>We submit the proposed architectural form, modified site layout and reduced density together with the planned landscape treatment will result in a residential development which exceeds the numeric and performance design requirements of the Ballina Development Control Plan.</p>
	<p>Clarification is required in relation to the proposed Super Lot 5 boundary which appears to extend into the adjoining conservation land.</p>	<p>The boundary for Super Lot 5 does not extend into the CMZ. In this respect, we note as part of the works for the Epiq Estate, an access track will be provided within the boundary of Super Lot 5. The track is illustrated in Drawing 14351-S5-DA-C1-00 (Rev E). In this regard, we note the proposed modification does not propose to amend the boundary of the CMZ.</p>
	<p>Bushfire Clarification is required in relation to the footprint of the dwellings adjoining the eastern and southern site boundaries complying with the APZ setback.</p>	<p>All dwellings are designed/setback to accord with the APZ stipulated by Bushfire Certifiers Pty Ltd and endorsed by the NSW Rural Fire Service.</p> <p>The courtyard (i.e. paved area) are in some instances within the 10m APZ, with no issues of compliance raised by either Bushfire Certifiers Pty Ltd or NSW Rural Fire Service under the Planning for Bushfire Guidelines as the paving is not a structure.</p>

	<p>Earthworks Clarification is required as to whether there is opportunity to improve the relationship between the lots and Montwood and Snapper Drive, to provide direct access to the lots from the two roads.</p>	<p>Direct access to Snapper and Montwood Drives will require significant earthworks. To achieve suitable building pads the lots adjacent to Snapper Drive will need to be raised in height by some 2m and the lots adjacent to Montwood Drive subsequently lowered by 1.5m. This will result in retaining walls behind the lots by approximately the same height (i.e. isolating the lots from the rest of the development).</p> <p>We submit this is not a preferred design outcome for the development with specific reference to its presentation to the public domain (streetscape) and would also compromise the pedestrian connectivity through the development.</p> <p>Notwithstanding the above, the subdivision bulk earthworks have been revised to reduce the scale of the retaining walls and improve stormwater drainage. Additional fill will be required to reduce the height of the walls primarily along the northern end of the site adjacent to Snapper Drive. The revised design will gradually step the site down in a north to south direction and is expected to require approximately 46,000m³ of additional fill to be imported. This has reduced the maximum height of the wall from 2.2m (with the original layout) to 1.2m along Snapper Drive. Introducing gradual steps has increased the available fall across the site and improved the stormwater drainage. Additional minor walls will also be required throughout the site to facilitate the gradual step down. All retaining walls will be contained within private lots with the exception of the overland flow paths and sewer pump station site along the southern end of the site.</p>
	<p>Proposed Park The proposed park should comprise a more regular shaped allotment to maximise useability of the park and reduce fragmentation due to adjacent parking.</p>	<p>Consultation has occurred with Ballina Shire Council in relation to the inclusion of a public park. Council as the ultimate owner of the public asset has concurred the placement of a park for the residents contains sufficient merit to retain the designated open space area for a passive space within the development, whilst acknowledging the close proximity to the district sports fields, and furthermore open space provided in Release 3.</p> <p>The design of the originally lodged park has been modified to address design issues raised by Council, thereby resulting in the park adopting a more regular configuration which will also assist with on-going maintenance.</p> <p>Following further consultation with DPIE, the proponent has agreed the development should be afforded a “green lung” which breathes greater open space area into the development and opens up the subdivision from the entrance on Montwood Drive south through to Block 21. The inclusion of the new park provides a central node for residents to meet & play in addition to the other open space parks in the Epiq Estate. The inclusion of the park is seen as contributing significant benefits to the project through the resulting density, passive recreational opportunities, resulting streetscape treatment as presented by O2LA (Attachment 3),</p>
	<p>Traffic Clarification must be provided as to whether there is sufficient capacity in the road network to accommodate both the density increase proposed as part of</p>	<p>Ballina Shire Council has constructed the extension of Hutley Drive North to the Coast Road. This link was completed in June 2020 and provides a direct link from the Epiq Estate to the external road network, being Byron Bay Road (MR535) which connects Ballina through to Byron Bay. Now the link road is completed, the former constraints with surrounding road network (as identified in the initially lodged Engineering Services Report) no longer apply.</p>

	<p>this modification and MOD 6 (which is also currently under assessment).</p>	<p>Further to the construction of the Hutley Drive North works, the Concept Plan contains an existing condition B7A which states:</p> <p><i>B7A Limits on Land Release</i></p> <p><i>1) The concept plan is modified such that no subdivision certificate may be issued for lots beyond Stage 5 for further development once the approved capacity of 7,456 vehicles per day on the local road network (Montwood Drive & Henderson Lane) is met or exceeded until such time as Hutley Drive is extended north from the site to North Creek Road.</i></p> <p>Clarence Property are fully aware of the terms of Condition B7A, however reference is now made to the fact the Hutley Drive North extension has been completed and provides a direct connection to Byron Bay Road (MR545), thereby releasing future development from the traffic capacity nominated within Condition B7A.</p>
	<p>Freshwater EEC Mapping Outline the external boundaries of the 2008 and 2019 boundaries for the Freshwater Wetland EEC</p>	<p>Attachment 5 of the RtS contains advice from project ecologists GeoLINK and NDC Drawing 14351-S5-DA-EV-1 which addresses the external boundaries of the freshwater wetland EEC as per information submitted with the original DA approval in 2008 and the external boundaries of the freshwater wetland EEC as further mapped in April 2020 by GeoLINK.</p> <p>The NDC plans provides scaled measurements & notation that clearly shows the distance in metres from the rear property boundary of each of lots 21 to 58 to the nearest boundary of the freshwater wetland EEC in 2008 and 2020.</p>

We trust this letter outlines our response to the issues raised within the Department of Planning, Industry & Environment.

Should Council have any questions, please do not hesitate contacting Damian Chapelle of this office.

Yours sincerely,

NEWTON DENNY CHAPELLE



DAMIAN CHAPELLE

Town Planner. BTP CPP.



Attachment 1

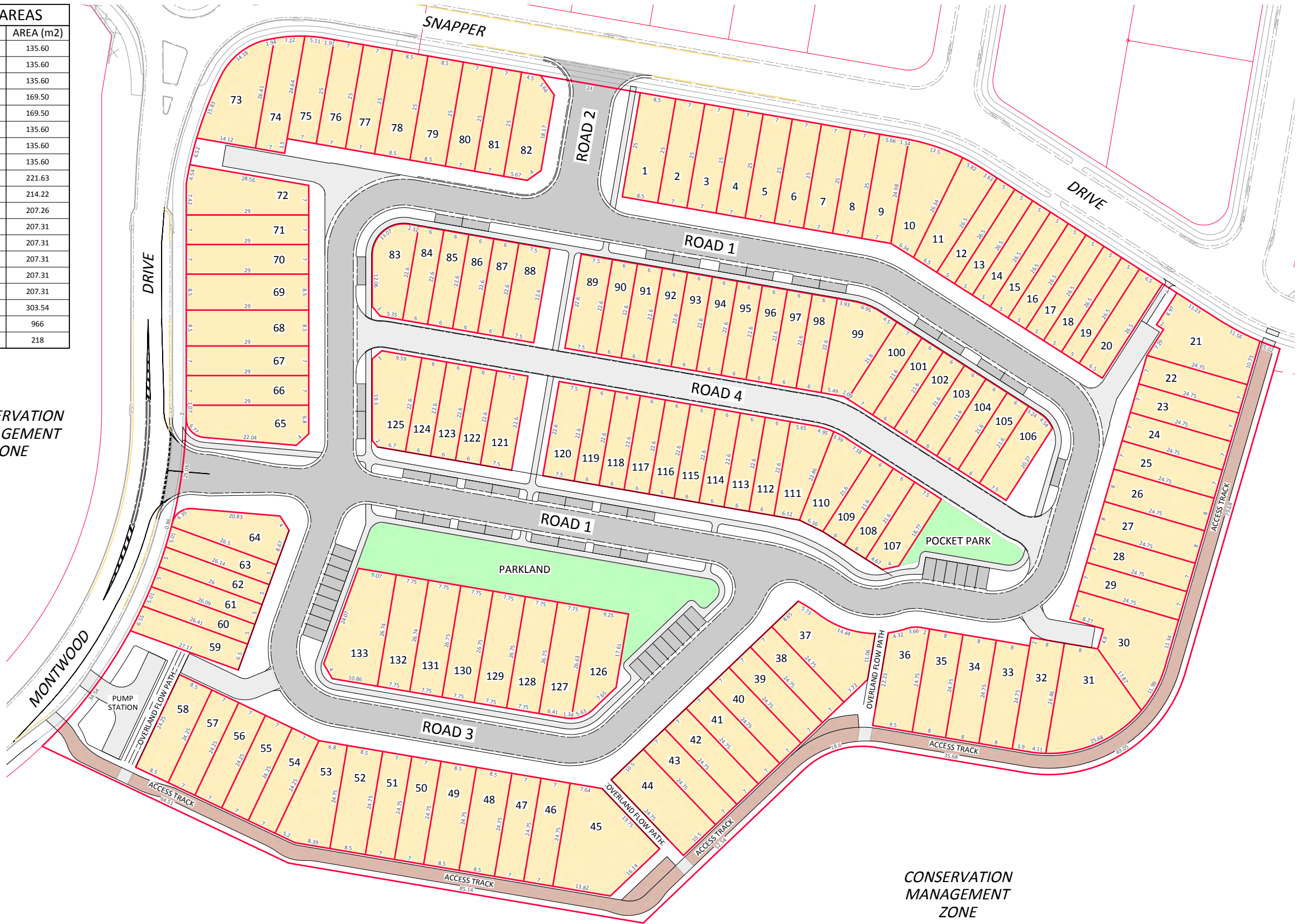
**Modified Subdivision Layout &
Civil Design Package
*Newton Denny Chapelle***

LOT AREAS	
LOT No.	AREA (m2)
1	212.50
2	175.00
3	175.00
4	175.00
5	175.00
6	175.00
7	175.00
8	175.00
9	175.00
10	253.06
11	210.93
12	132.50
13	132.50
14	132.50
15	132.50
16	132.50
17	132.50
18	132.50
19	132.50
20	172.25
21	313.00
22	173.25
23	173.25
24	173.25
25	173.25
26	198.00
27	198.00
28	173.25
29	173.25
30	349.63
31	370.73
32	213.60
33	198.00
34	198.00
35	198.00
36	227.60
37	289.39
38	173.25
39	173.25
40	173.25
41	173.25
42	173.25
43	173.25
44	259.87
45	425.02
46	173.25
47	173.25
48	210.37
49	210.37
50	173.25
51	173.25
52	210.37
53	250.97
54	169.25
55	169.25
56	169.25
57	169.25
58	206.13

LOT AREAS	
LOT No.	AREA (m2)
59	173.94
60	131.17
61	130.14
62	130.25
63	131.50
64	214.98
65	239.23
66	203.00
67	203.00
68	246.50
69	246.50
70	703.00
71	703.00
72	274.03
73	278.16
74	191.78
75	174.39
76	175.00
77	175.00
78	212.50
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81	175.00
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83	189.75
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92	135.60
93	135.60
94	135.60
95	135.60
96	135.60
97	135.60
98	135.60
99	243.69
100	151.20
101	129.60
102	129.60
103	129.60
104	129.60
105	129.60
106	160.18
107	158.00
108	129.60
109	129.60
110	184.10
111	188.83
112	135.60
113	135.60
114	135.60
115	135.60
116	135.60

LOT AREAS	
LOT No.	AREA (m2)
117	135.60
118	135.60
119	135.60
120	169.50
121	169.50
122	135.60
123	135.60
124	135.60
125	221.63
126	214.22
127	207.26
128	207.31
129	207.31
130	207.31
131	207.31
132	207.31
133	303.54
PARKLAND	966
POCKET PARK	218

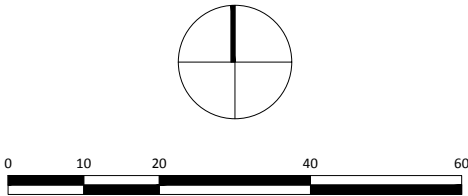
CONSERVATION
MANAGEMENT
ZONE



CONSERVATION
MANAGEMENT
ZONE

REV DATE DESCRIPTION
A 26.06.20 FIRST ISSUE

SOURCE PLAN:
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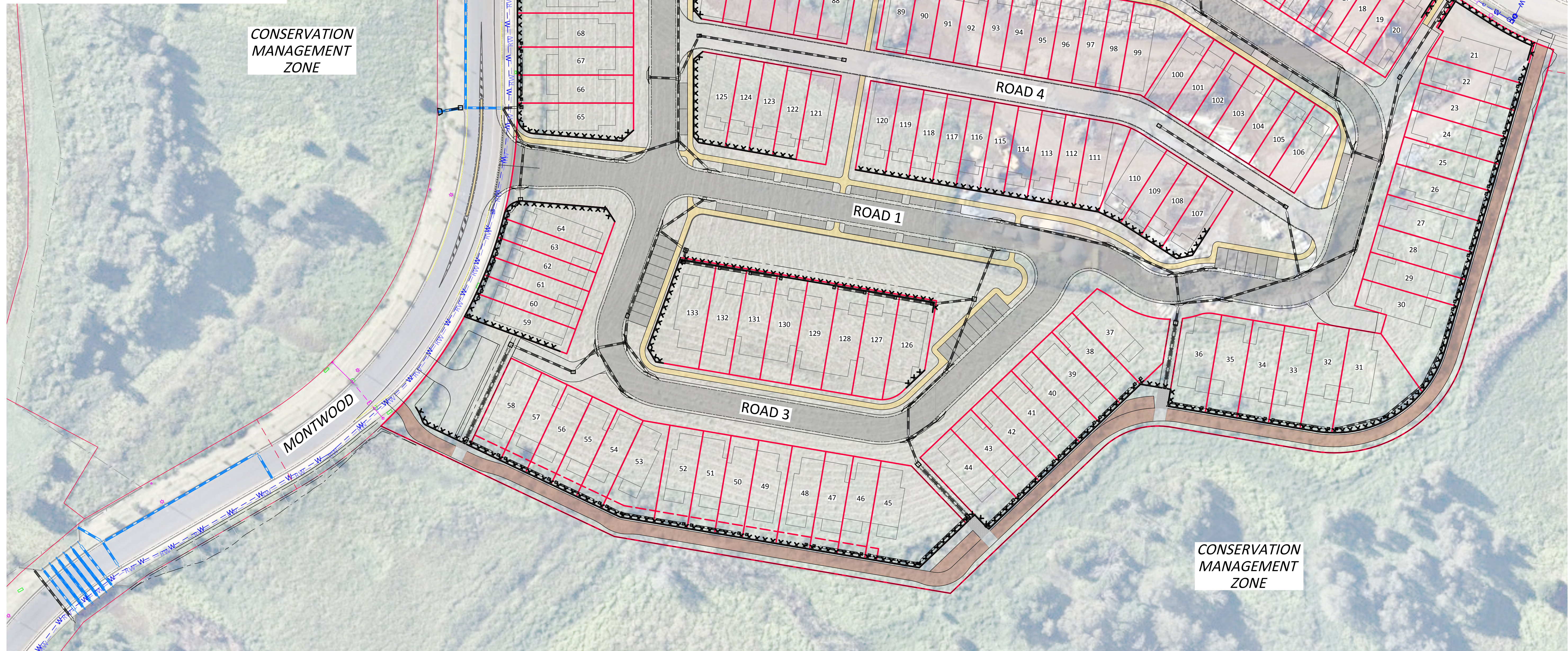
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LISMORE 31 Carrington St. Lismore 2480 PH: 6622 1011
CASINO 100 Barker St. Casino 2470 PH: 6662 5000
ABN: 86 220 045 469

**EPIQ ESTATE - SUPER LOT 5
LOT LAYOUT**
CLIENT: CLARENCE PROPERTY
LOCATION: LOT 5 DP1239938
CNR SNAPPER DRIVE AND MONTWOOD DRIVE
LENNOX HEAD, NSW, 2478
DATE: 26.06.2020
SCALE: 1:1000 @ A3
DRAWN: D. YOUNG
REF: 14351-S5-IN-PL-01

© C O P Y R I G H T
N E W T O N D E N N Y C H A P E L L E

- LEGEND:**
- PROPERTY BOUNDARY
 - PROPOSED PROPERTY BOUNDARY
 - EXISTING SEWER LINE
 - EXISTING WATER LINE
 - EXISTING RECYCLED WATER LINE
 - EXISTING DRAINAGE LINE
 - EXISTING UNDERGROUND POWER
 - CURRENT ARCHITECTURAL LAYOUT
 - PROPOSED RETAINING WALL
 - PROPOSED DRAINAGE NETWORK
 - PROPOSED TRAFFICABLE SURFACE - ASPHALT
 - PROPOSED TRAFFICABLE SURFACE - CONCRETE
 - PROPOSED TRAFFICABLE SURFACE - GRAVEL
 - PROPOSED FOOTPATH SURFACE - CONCRETE

- NOTE:**
- AERIAL IMAGE FROM NEARMAP, FLOWN ON THE 11/04/2020.
 - DWELLING OUTLINES SHOWN ARE INDICATIVE. REFER TO ARCHITECTURAL PLANS.



SITE PLAN
SCALE 1:500

FOR APPROVAL

REV	DESCRIPTION	BY	APP.	DATE
E	FOR APPROVAL	DY	CP	24.06.20
D	FOR APPROVAL	DY	CP	27.05.20
C	FOR APPROVAL	DY	CP	01.07.19
B	FOR APPROVAL	DY	CP	10.08.18
A	FOR CLIENT REVIEW	DY	CP	08.05.18

SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING			
Full Size 1:500 ; Half Reduction 1:1000 SCALE (m)			

HORIZ. DATUM	MGA94
VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018

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Client
CLARENCE PROPERTY

**EPIQ ESTATE - LENNOX HEAD, NSW, 2478
SUPER LOT 5
SITE PLAN**

Reference No.
140351

Drawing No.
14351-S5-DA-AD-00

REVISION
E

LEGEND:

- PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING RECYCLED WATER LINE
- EXISTING DRAINAGE LINE
- EXISTING UNDERGROUND POWER

CONTOURS
DESIGN (0.25m INTERVALS)

- BULK EARTHWORKS
- RETAINING WALL
 - BULK EARTHWORKS PAD
 - BULK EARTHWORKS CUT
 - BULK EARTHWORKS FILL
 - POTENTIAL HABITABLE FINISHED FLOOR LEVEL
REFER ARCH. PLANS
 - LEVEL CHANGES THROUGH BUILDING
REFER ARCH. PLANS
 - 100mm CHANGE THROUGH YARD - (50mm STEP FROM
HOUSE TO PATIO, 50mm STEP FROM PATIO TO YARD)
 - 100-500mm CHANGE THROUGH YARD - (50mm STEP FROM
HOUSE TO PATIO, 10% MAX. FALL FROM PATIO TO WALL)
 - 500mm CHANGE THROUGH YARD - (50mm STEP FROM
HOUSE TO PATIO, 450mm FALL FROM PATIO TO WALL)

NOTE:

1. LEVELS SHOWN ARE TO FINISHED CIVIL WORKS ONLY. DETAILED
EARTHWORKS TO BE SHOWN AS PART DWELLING CONSTRUCTION PLANS.

EXISTING RELEASE 3
DEVELOPMENT

SNAPPER DRIVE

DRIVE

MONTWOOD

CONSERVATION
MANAGEMENT
ZONE

CONSERVATION
MANAGEMENT
ZONE

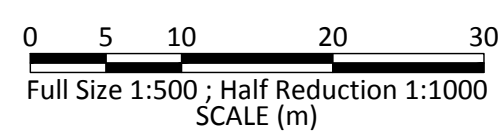
BULK EARTHWORKS VOLUMES
EXISTING SURFACE (AS PART OF STAGE 1B FILLING WORKS)
TO FINISHED DESIGN SURFACE
TOPSOIL STRIP ASSUMED = 250mm
TOPSOIL STRIP AND REMOVE = 10,650m³
CUT = 600m³
FILL = 47,000m³
IMPORT FILL = 46,400m³

PLAN

SCALE 1:500

FOR APPROVAL

SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING



HORIZ. DATUM	MGA94
VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018

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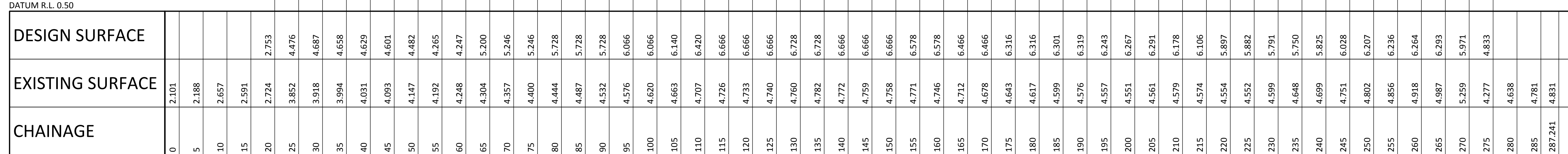
Client
CLARENCE PROPERTY

EPIQ ESTATE - LENNOX HEAD, NSW, 2478
SUPER LOT 5
BULK EARTHWORKS
PLAN

Reference No.
140351

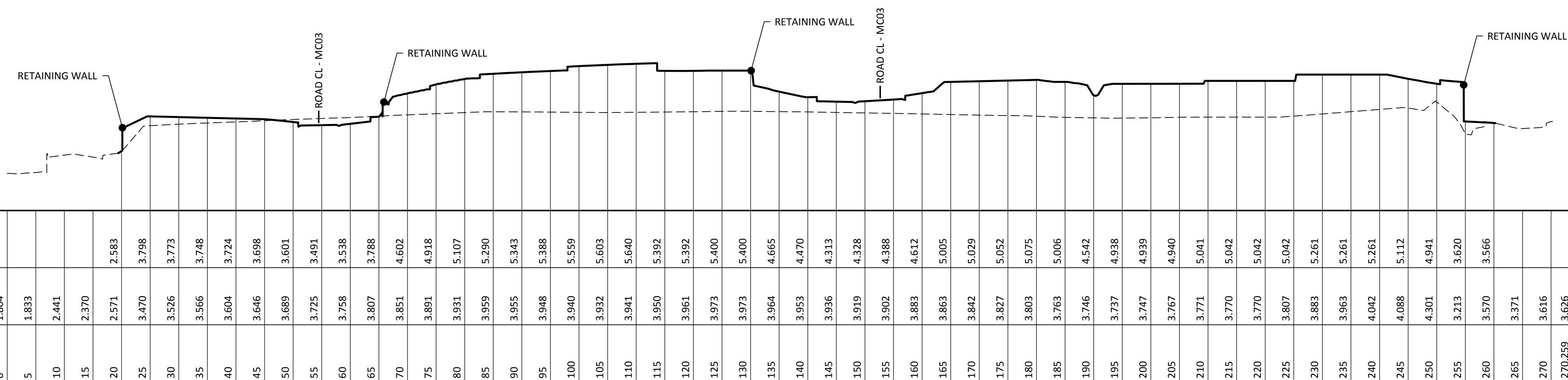
DRAWING No.
14351-S5-DA-BE-01

REVISION
E



BULK EARTHWORKS SECTION - SECTION B

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VERTICAL SCALE 1:100

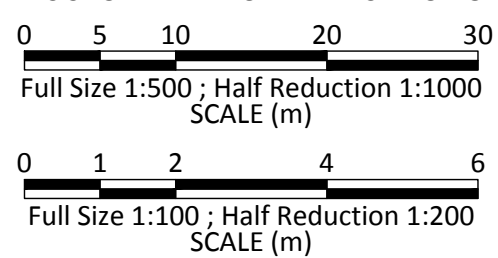


BULK EARTHWORKS SECTION - SECTION A

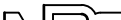
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

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C	FOR APPROVAL		DY	CP	01.07.19
B	FOR APPROVAL		DY	CP	10.08.18
A	FOR CLIENT REVIEW/		DY	CP	08.05.18
REV	DESCRIPTION		BY	APP.	DATE
	REVISIONS				

SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING



HORIZ. DATUM	MGA94
VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018


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Client
CLARENCE PROPERTY

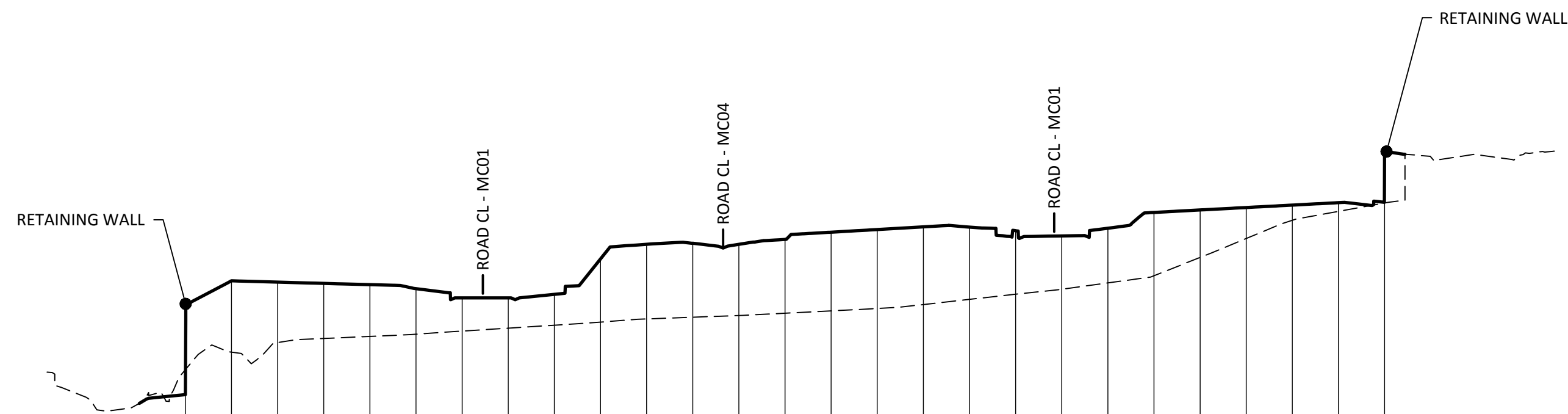
EPIQ ESTATE - LENNOX HEAD, NSW, 2478
SUPER LOT 5
BULK EARTHWORKS
SECTIONS - SECTION A & SECTION B

Reference No.	140351
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DRAWING No.
14351-S5-DA-BE-11

REVISION
E

FOR APPROVAL



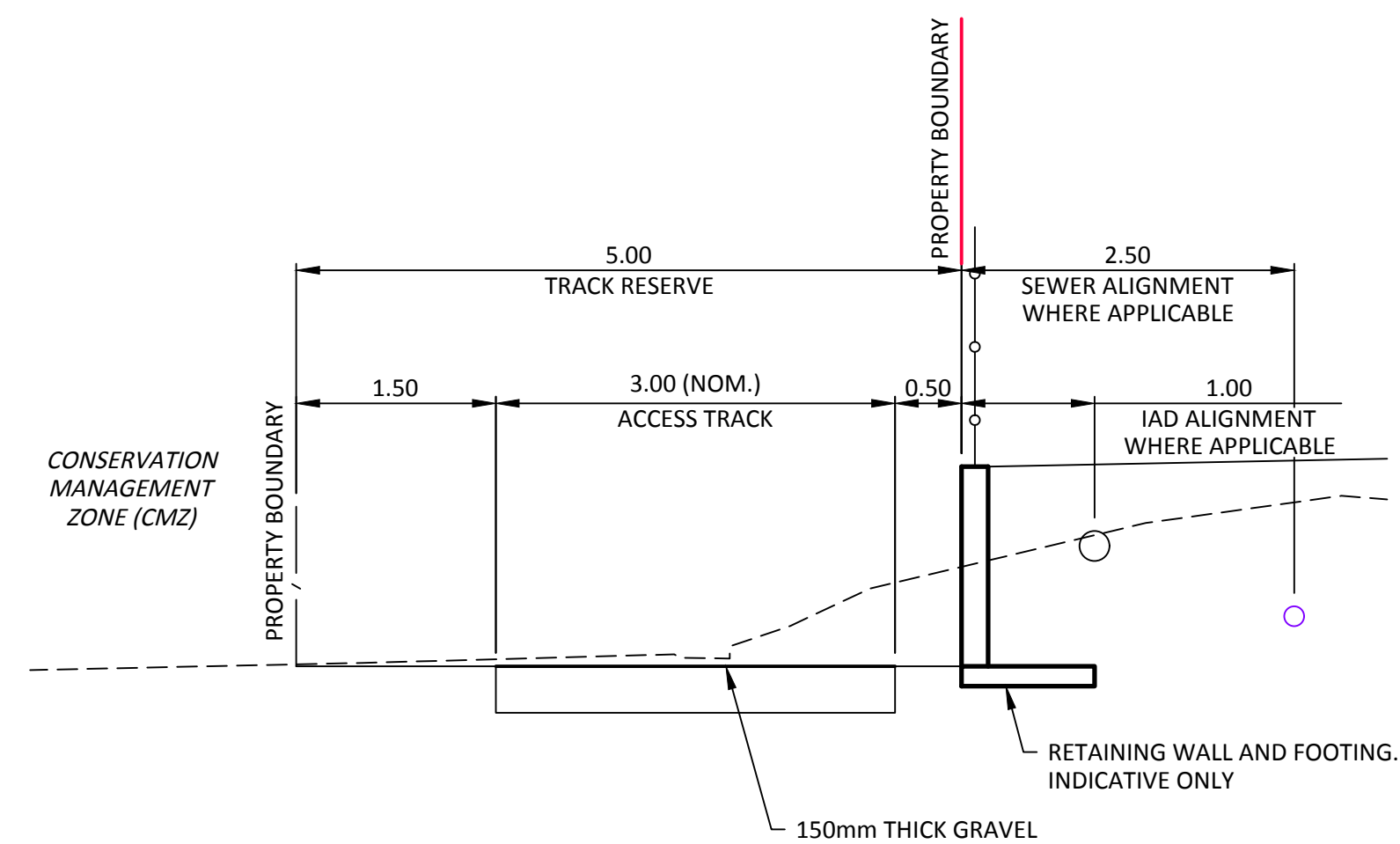
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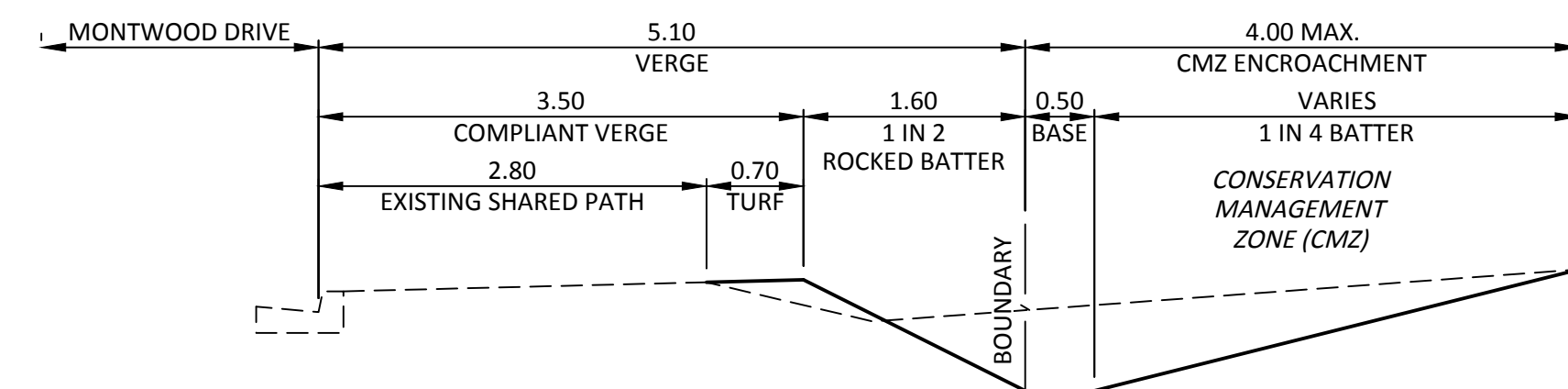
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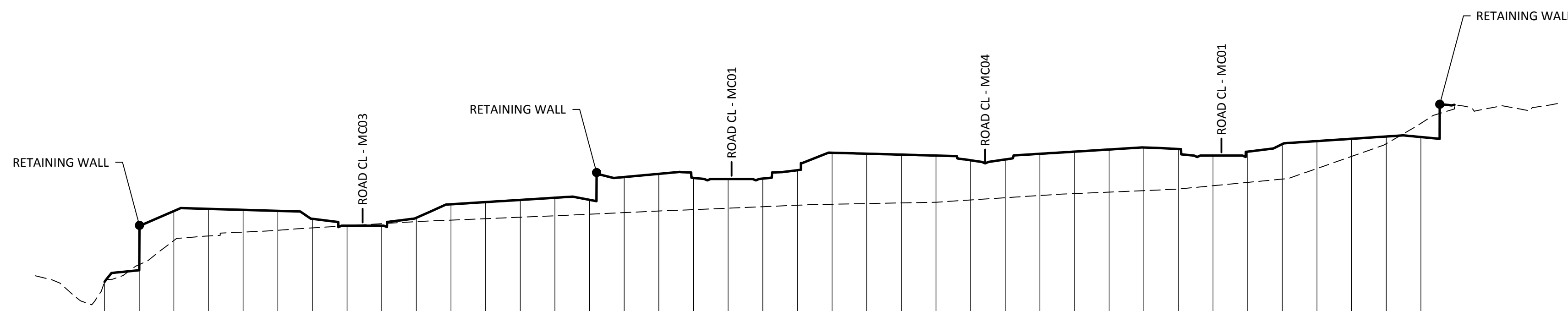
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SCALE 1:50



TYPICAL SECTION - CMZ DRAINAGE CHANNEL

SCALE 1:50



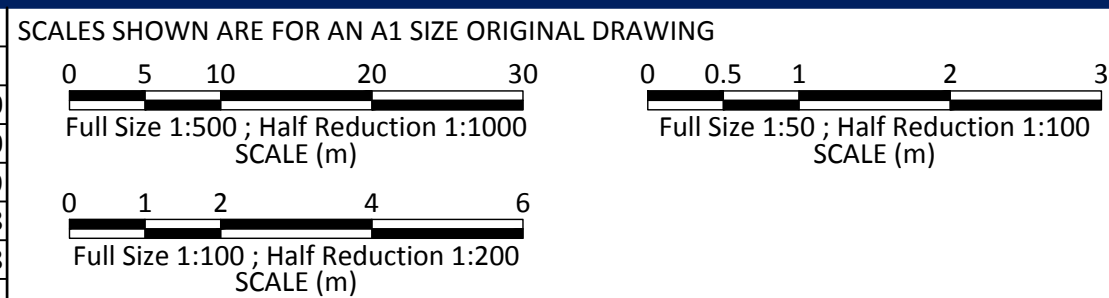
DATUM R.L. 0.00

DESIGN SURFACE


DESIGN SURFACE

[illegible]

EXISTING SU

[illegible]

HORIZ. DATUM	MGA94
VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018


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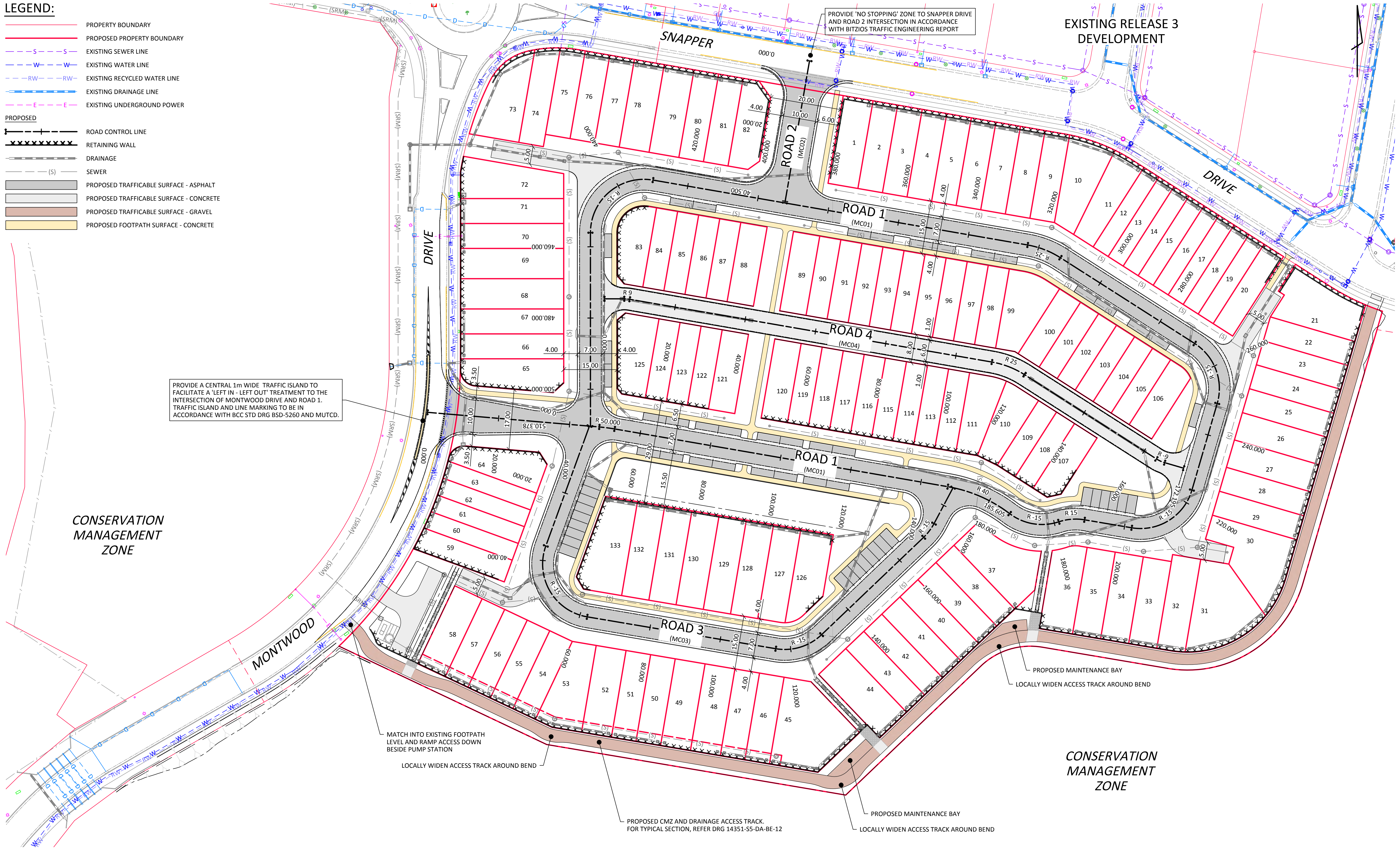
EPIQ ESTATE - LENNOX HEAD, NSW, 2478
SUPER LOT 5
BULK EARTHWORKS
SECTIONS - SECTION C & SECTION D

Reference No.	
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DRAWING No.

REVISION

- LEGEND:**
- PROPERTY BOUNDARY
 - PROPOSED PROPERTY BOUNDARY
 - EXISTING SEWER LINE
 - EXISTING WATER LINE
 - EXISTING RECYCLED WATER LINE
 - EXISTING DRAINAGE LINE
 - EXISTING UNDERGROUND POWER
 - PROPOSED**
 - ROAD CONTROL LINE
 - RETAINING WALL
 - DRAINAGE
 - SEWER
 - PROPOSED TRAFFICABLE SURFACE - ASPHALT
 - PROPOSED TRAFFICABLE SURFACE - CONCRETE
 - PROPOSED TRAFFICABLE SURFACE - GRAVEL
 - PROPOSED FOOTPATH SURFACE - CONCRETE



PLAN
SCALE 1:500

FOR APPROVAL

REV	DESCRIPTION	BY	APP.	DATE
E	FOR APPROVAL	DY	CP	24.06.20
D	FOR APPROVAL	DY	CP	01.07.19
C	CMZ TRACK ADDED & PARKING AMENDED. FOR APPROVAL	DY	CP	17.04.19
B	FOR APPROVAL	DY	CP	10.08.18
A	FOR CLIENT REVIEW	DY	CP	08.05.18

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20	30		
Full Size 1:500 ; Half Reduction 1:1000 SCALE (m)			

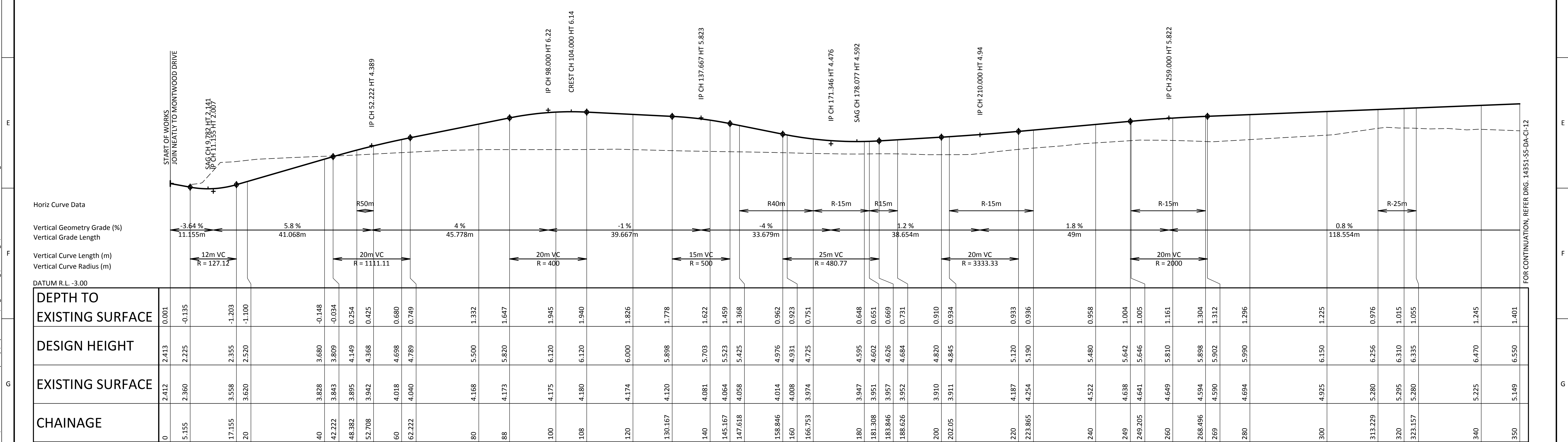
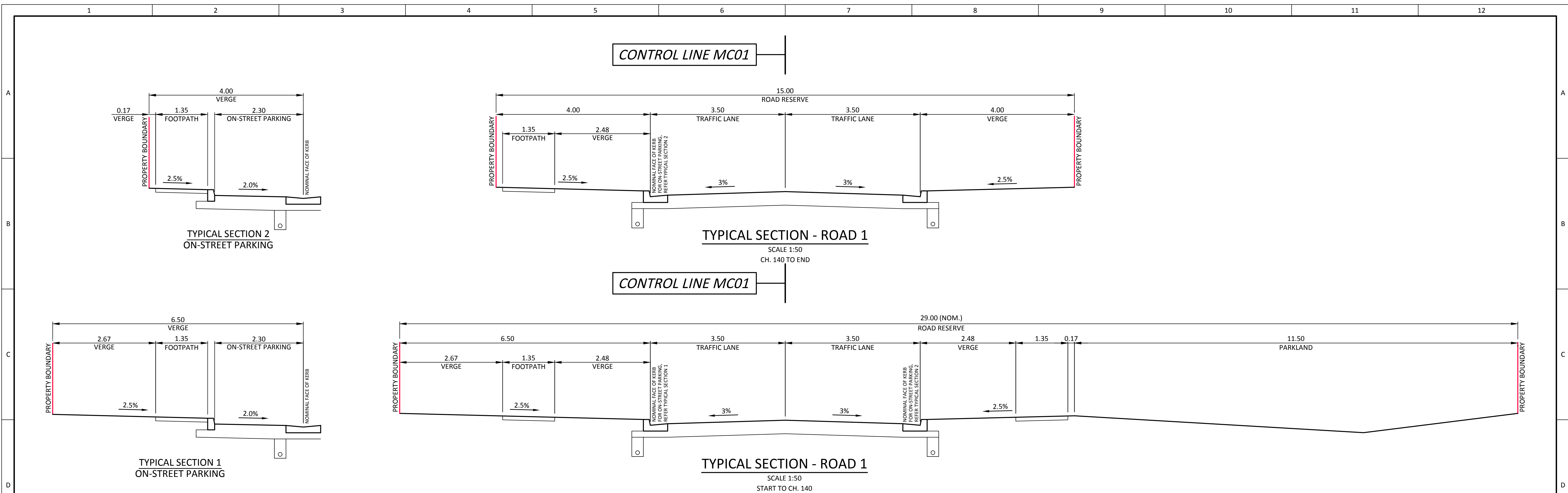
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VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018

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CLARENCE PROPERTY
Client
CLARENCE PROPERTY

EPIQ ESTATE - LENNOX HEAD, NSW, 2478 SUPER LOT 5 CIVIL WORKS PLAN			
Reference No. 140351	DRAWING No. 14351-S5-DA-CI-01	REVISION E	

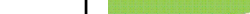



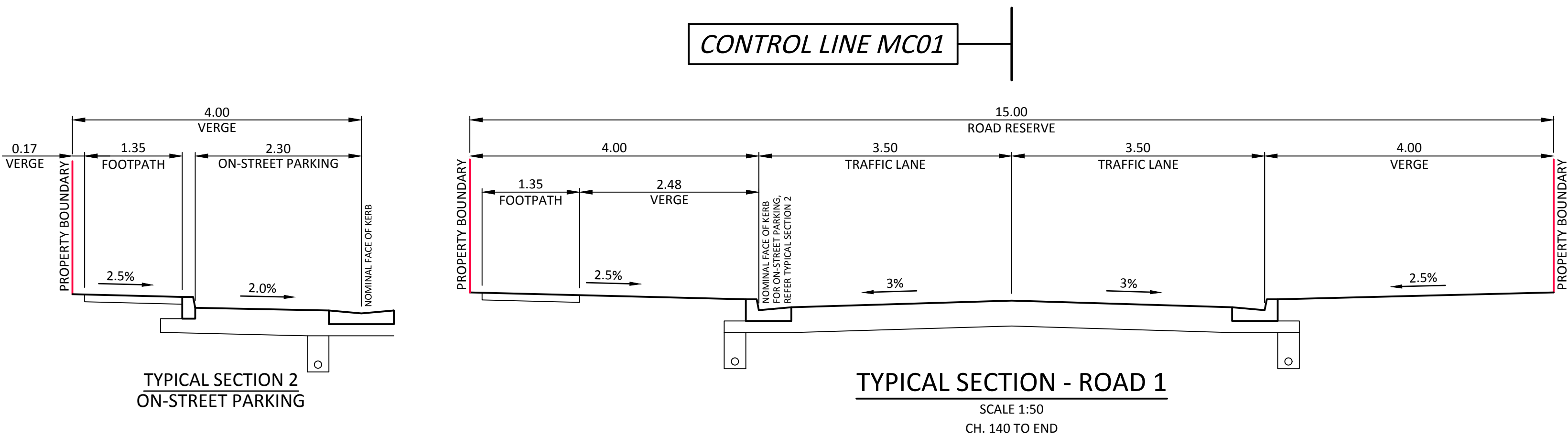
LONGITUDINAL SECTION MC01

HORIZONTAL SCALE 1:500

VERTICAL SCALE 1:100

FOR APPROVAL

H					SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING				HORIZ. DATUM		MGA94		<div> Newton Denny Chapelle Surveyors Planners Engineers Email: office@newtondennychapelle.com.au</div> <div>Lismore Suite 1 31 Carrington St. Lismore 2480 T: 66 221011 F: 66 224088 Casino 100 Barker St. Casino 2470 T & F - 66 625000</div>	<div>CLARENCE PROPERTY</div>	EPIQ ESTATE - LENNOX HEAD, NSW, 2478			
					VERT. DATUM		AHD		SUPER LOT 5									
	D FOR APPROVAL				DY	CP	24.06.20	SURVEY		NDC		CIVIL WORKS						
	C FOR APPROVAL				DY	CP	27.05.20	DRAWN		D.YOUNG		LONGITUDINAL SECTION - MC01						
	B FOR APPROVAL				DY	CP	10.08.18	DESIGN		D. YOUNG								
	A FOR CLIENT REVIEW				DY	CP	08.05.18	APPROVED		C. PICKFORD								
	REV DESCRIPTION				BY	APP.	DATE	DATE		08.05.2018								
REVISIONS				SCALES				APPROVALS				Reference No. 140351		DRAWING No. 14351-S5-DA-CI-11		REVISION D		




SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING

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SCALE (m)

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SCALE (m)

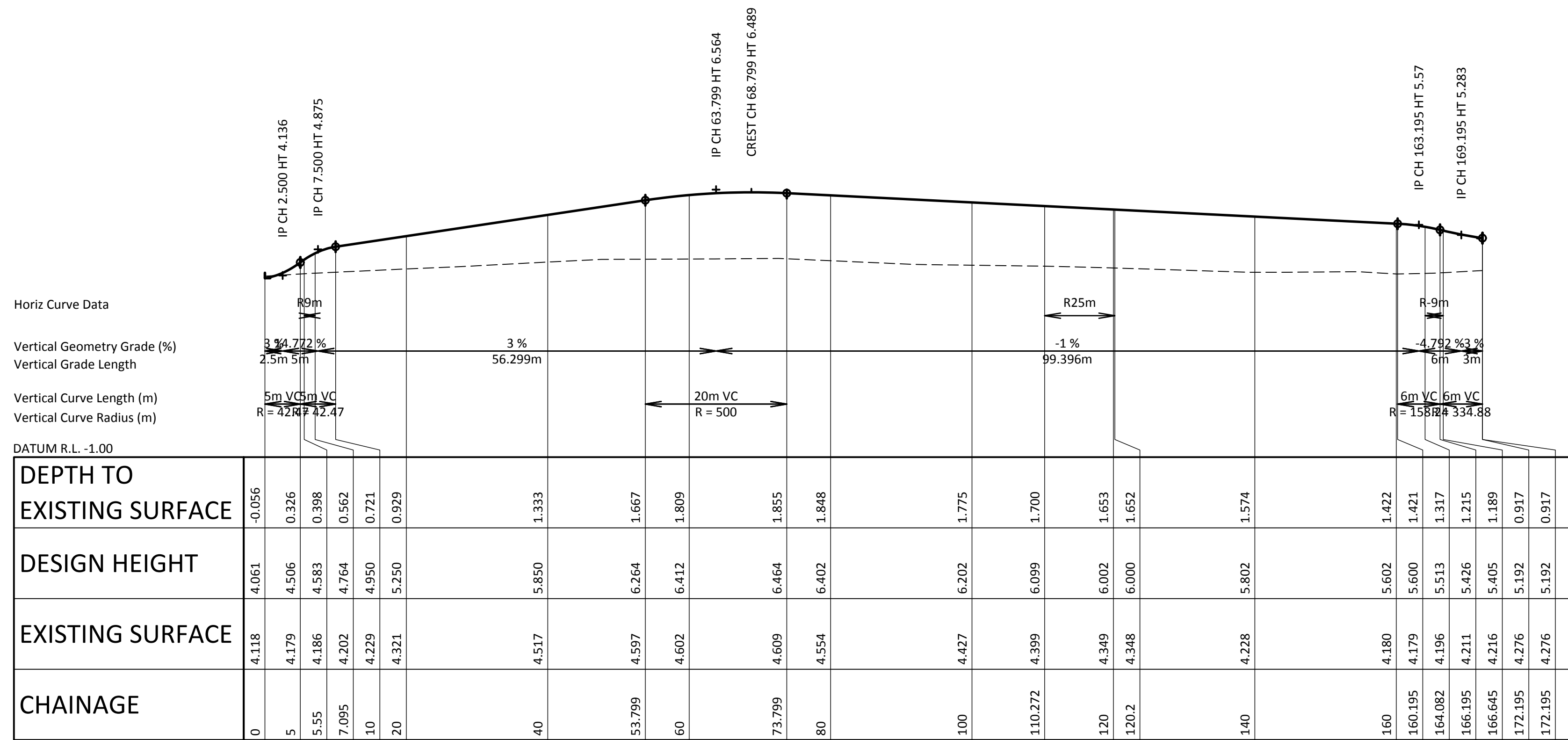
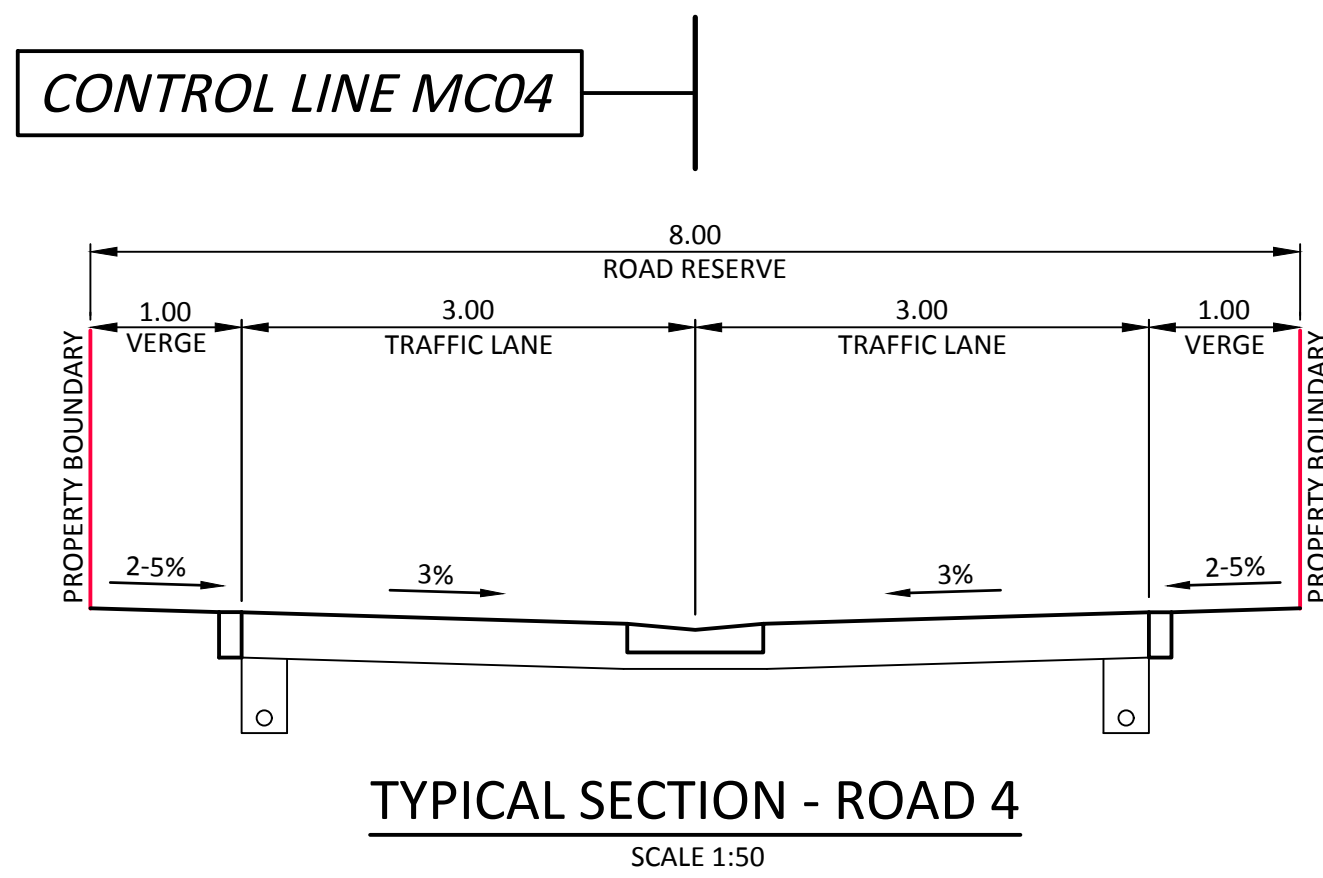
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SCALE (m)

SCALES

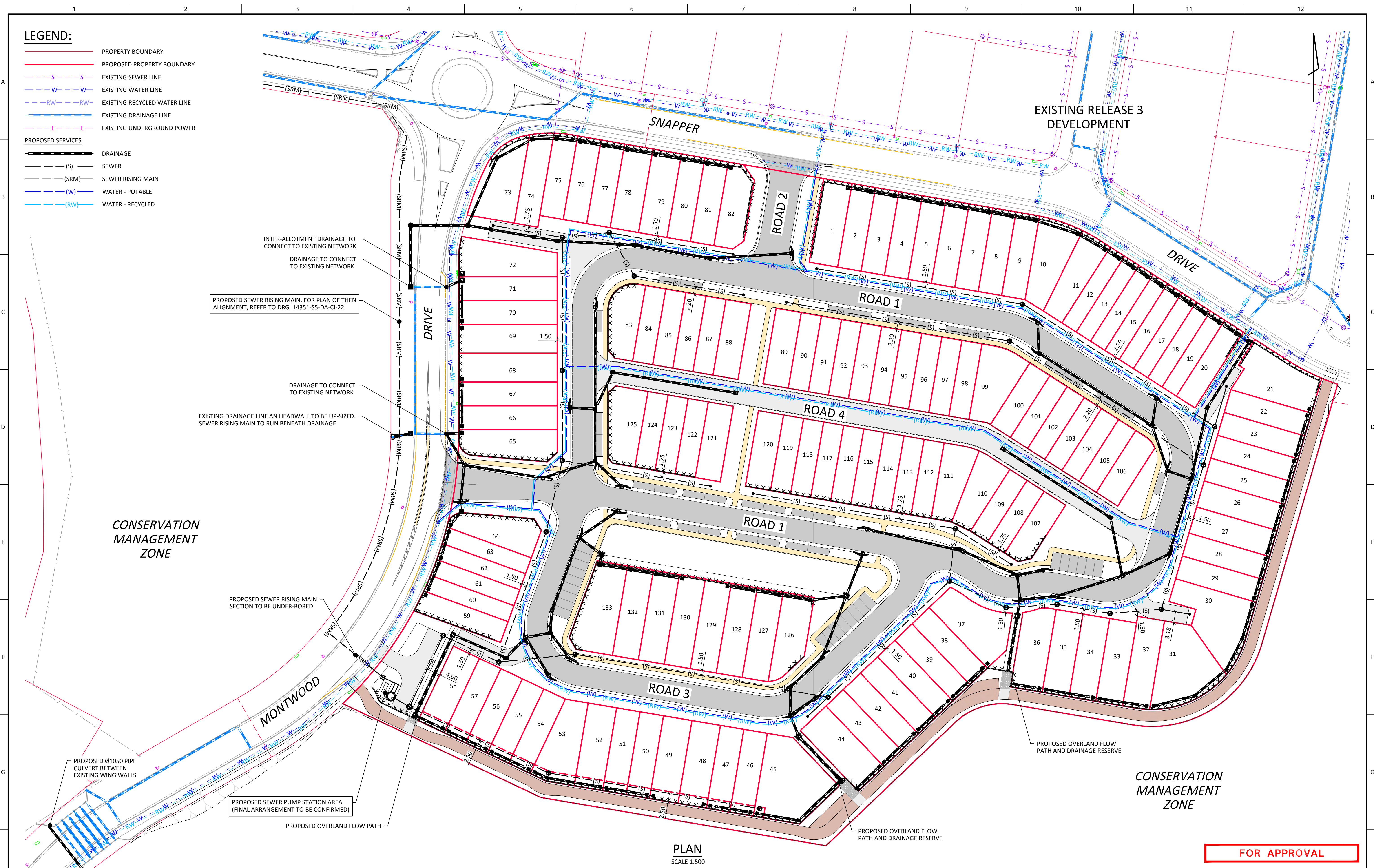

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**CLARENCE
PROPERTY**
 Client
CLARENCE PROPERTY

Reference No. 140351	DRAWING No. 14351-S5-DA-CI-12	REVISION D
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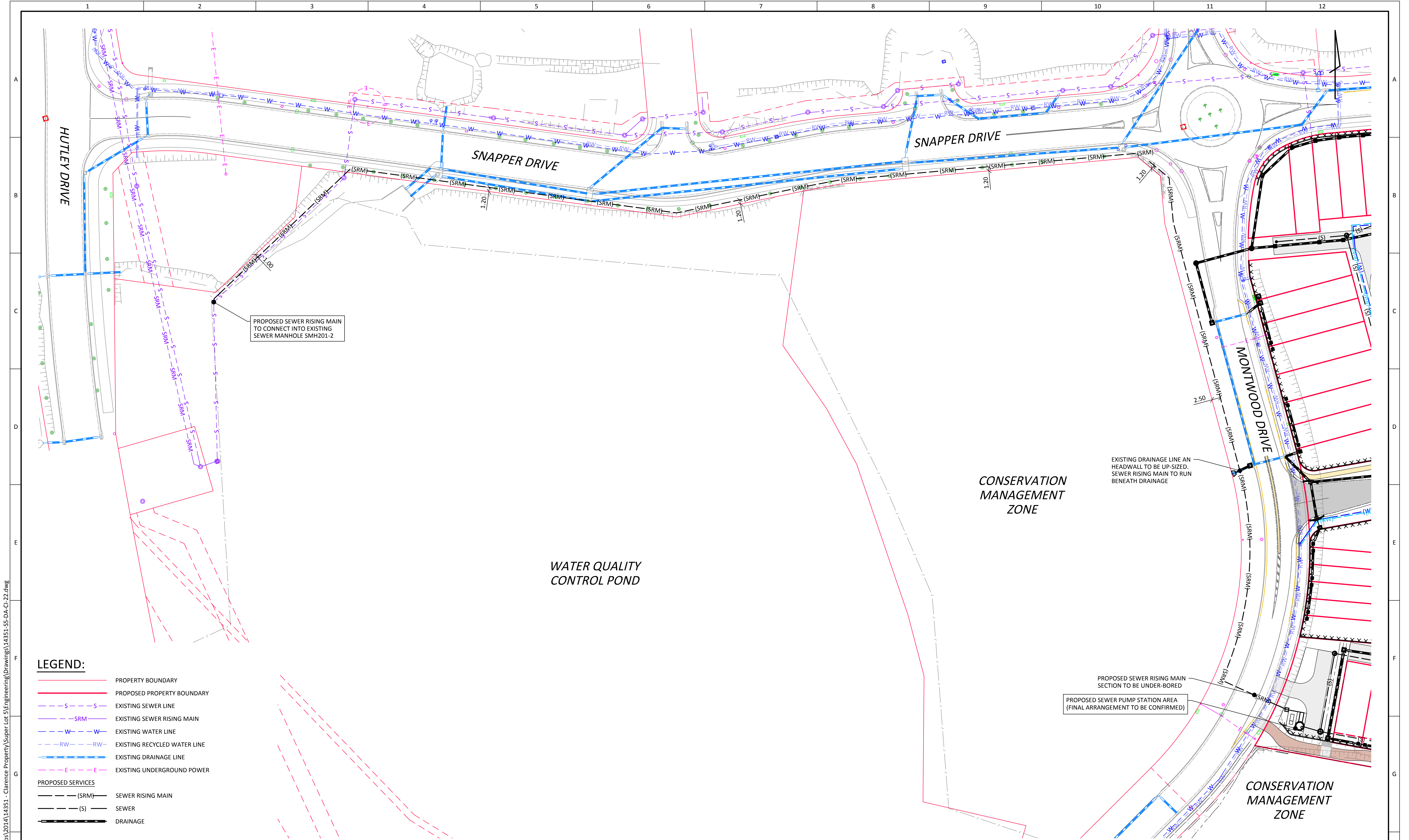


					SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING					<div><div><div>HORIZ. DATUM</div><div>MGA94</div></div><div><div>VERT. DATUM</div><div>AHD</div></div><div><div>SURVEY</div><div>NDC</div></div><div><div>DRAWN</div><div>D.YOUNG</div></div><div><div>DESIGN</div><div>D. YOUNG</div></div><div><div>APPROVED</div><div>C. PICKFORD</div></div><div><div>DATE</div><div>08.05.2018</div></div></div>		<div><div><div><div>NDC</div><div>Newton Denny Chapelle</div><div>Surveyors Planners Engineers</div></div><div><div>Email: office@newtondennychapelle.com.au</div><div>Lismore Suite 1 31 Carrington St. Lismore 2480 T: 66 221011 F: 66 224088 Casino 100 Barker St. Casino 2470 T & F : 66 625000</div></div></div></div>		<div><div><div><div><div></div><div>CLARENCE PROPERTY</div></div></div></div></div>		<div>EPIQ ESTATE - LENNOX HEAD, NSW, 2478 SUPER LOT 5 CIVIL WORKS LONGITUDINAL SECTION - MC04</div>		<div>REVISION D</div>	
<div><div><div><div>05102030</div><div>Full Size 1:500 ; Half Reduction 1:1000 SCALE (m)</div></div><div><div>01246</div><div>Full Size 1:100 ; Half Reduction 1:200 SCALE (m)</div></div><div><div>00.5123</div><div>Full Size 1:50 ; Half Reduction 1:100 SCALE (m)</div></div></div></div>																			
<div><div><div>D</div><div>FOR APPROVAL</div><div>DY</div><div>CP</div><div>24.06.20</div></div><div><div>C</div><div>FOR APPROVAL</div><div>DY</div><div>CP</div><div>27.05.20</div></div><div><div>B</div><div>FOR APPROVAL</div><div>DY</div><div>CP</div><div>10.08.18</div></div><div><div>A</div><div>FOR CLIENT REVIEW</div><div>DY</div><div>CP</div><div>08.05.18</div></div></div>																			
<div><div><div>REV</div><div>DESCRIPTION</div><div>BY</div><div>APP.</div><div>DATE</div></div></div>																			
<div>REVISIONS</div>					<div>SCALES</div>					<div>APPROVALS</div>									



H	E	FOR APPROVAL	BY	CP	24.06.20	<div>SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING</div> <div><div><div>0</div><div>5</div><div>10</div><div>20</div><div>30</div></div><div>Full Size 1:500 ; Half Reduction 1:1000 SCALE (m)</div></div>	HORIZ. DATUM	MGA94	<div><div><div><div></div><div></div><div></div></div><div>NDC</div></div><div>Newton Denny Chapelle</div><div>Surveyors Planners Engineers</div><div>Email: office@newtondennychapelle.com.au</div></div> <div>Lismore Suite 1 31 Carrington St. Lismore 2480 T: 66 221011 F: 66 224088 Casino 100 Barker St. Casino 2470 T & F : 66 625000</div>	<div><div><div></div><div></div><div></div></div><div>CLARENCE PROPERTY</div></div>	EPIQ ESTATE - LENNOX HEAD, NSW, 2478 SUPER LOT 5 CIVIL SERVICES PLAN		
	D	FOR APPROVAL	BY	CP	27.05.20		VERT. DATUM	AHD					
	C	FOR APPROVAL	BY	CP	01.07.19		SURVEY	NDC					
	B	FOR APPROVAL	BY	CP	10.08.18		DRAWN	D.YOUNG					
	A	FOR CLIENT REVIEW	BY	CP	08.05.18		DESIGN	D. YOUNG					
	REV	DESCRIPTION	BY	APP.	DATE		APPROVED DATE	C. PICKFORD 08.05.2018					
	REVISIONS						SCALES						

Plot Date: 24 Jun, 2020 CAD File Name: K:\Jobs\2014\14351 - Clarence Property\Super Lot 5\Engineering\Drawings\14351-S5-DA-CI-22.dwg



PLAN
SCALE 1:500

REV	DESCRIPTION	BY	APP.	DATE
E	FOR APPROVAL	DY	CP	24.06.20
D	FOR APPROVAL	DY	CP	27.05.20
C	FOR APPROVAL	DY	CP	01.07.19
B	FOR APPROVAL	DY	CP	10.08.18
A	FOR CLIENT REVIEW	DY	CP	08.05.18

SCALES SHOWN ARE FOR AN A1 SIZE ORIGINAL DRAWING			
Full Size 1:500 ; Half Reduction 1:1000 SCALE (m)			

HORIZ. DATUM	MGA94
VERT. DATUM	AHD
SURVEY	NDC
DRAWN	D.YOUNG
DESIGN	D. YOUNG
APPROVED DATE	C. PICKFORD 08.05.2018

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**CLARENCE
PROPERTY**

Client
CLARENCE PROPERTY

EPIQ ESTATE - LENNOX HEAD, NSW, 2478 SUPER LOT 5 CIVIL SERVICES - SEWER RISING MAIN PLAN			Reference No. 140351	DRAWING No. 14351-S5-DA-CI-22	REVISION E
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Attachment 2

Updated Design Plans & Design Specification

TVS Architects

TERRACE HOMES SUPER LOT 5 - EPIQ ESTATE

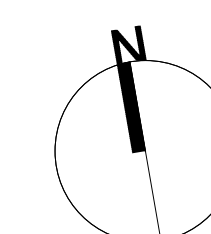
- 01 COVER SHEET
- 02 SITE PLAN
- 03 SITE LAYOUT PLAN - GROUND FLOOR
- 04 SITE LAYOUT PLAN - LEVEL I
- 05 STREET ELEVATIONS
- 06 INTERNAL STREET ELEVATIONS & SECTIONS
- 07 INTERNAL STREET ELEVATIONS & SECTIONS
- 08 SECTIONS
- 09 MATERIAL PALETTE
- 10 TYPICAL UNIT TYPE A & B
- 11 TYPICAL UNIT TYPE C & D
- 12 TYPICAL UNIT TYPE E
- 13 TYPICAL SECTION TO CMZ ACCESS TRACK



**CLARENCE
PROPERTY**

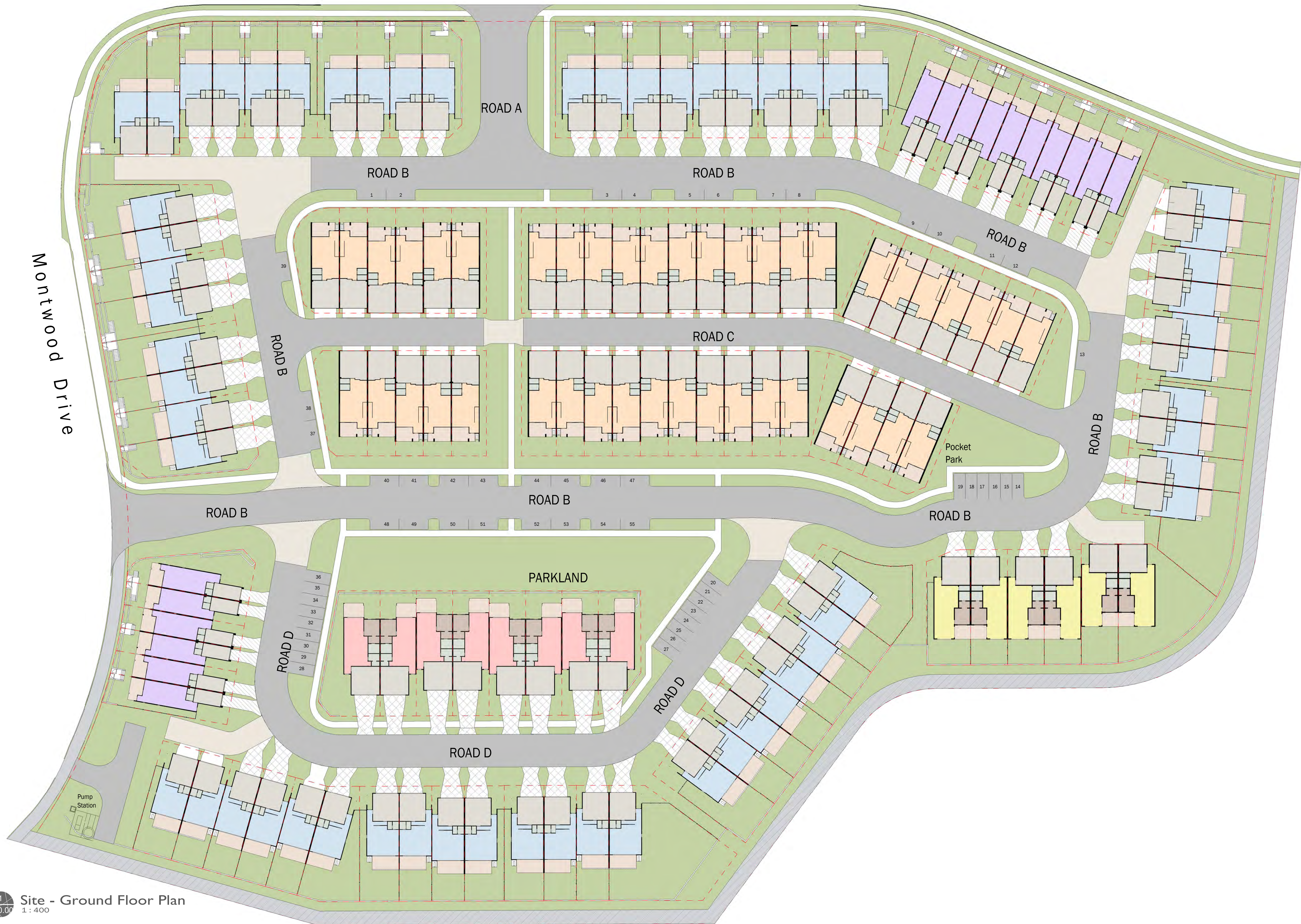


**TV
S**



Snapper Drive

Montwood Drive



Legend	
	Type A - Living Area
	Type B - Living Area
	Type C - Living Area
	Type D - Living Area
	Type E - Living Area
	Garage
	Wet Area
	Bedroom
	Terrace/Balcony

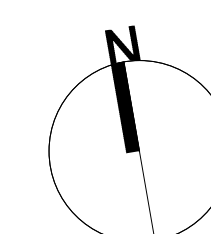
1 Site - Ground Floor Plan
1:400



0 2 4 6 8 10
Scale (m) 1:100 @A1
Scale (m) 1:200 @A3

Proposed Terrace Home Development EPIQ – SUPER LOT 5, LENNOX HEADS

Site Layout Plan - Ground Floor
5551.15.03.G



6/25/2020 9:42:41 AM ©TVS architects

Snapper Drive

Montwood Drive

ROAD A

ROAD B

ROAD B

ROAD B

ROAD C

ROAD B

ROAD B

ROAD B

ROAD B

ROAD B

PARKLAND

ROAD D

ROAD D

ROAD D

Legend	
	Type A - Living Area
	Type B - Living Area
	Type C - Living Area
	Type D - Living Area
	Type E - Living Area
	Garage
	Wet Area
	Bedroom
	Terrace/Balcony

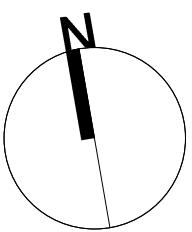
Site - Level I Floor Plan
1 : 400

 CLARENCE
PROPERTY

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Scale (m) 1 : 100 @A1
Scale (m) 1 : 200 @A3

Proposed Terrace Home Development
EPIQ – SUPER LOT 5, LENNOX HEADS

Site Layout Plan - Level I
5551.15.04.G



TV
S

6/25/2020 9:43:08 AM ©TVS architects



1 Snapper Drive Elevation
1 : 400



3 Block I Elevation
1 : 100



4 Montwood Drive Elevation
1 : 400



6 Block 10 Elevation
1 : 100



1 Internal Site Elevation/Section - A
1 : 400



3 Internal Site Elevation/Section - A (Block 1 Elevation)
1 : 100



4 Internal Site Elevation/Section - B
1 : 400



5 Internal Site Elevation/Section - B (Block 18, 19 Elevation)
1 : 100



1 Internal Site Elevation - C
1:400



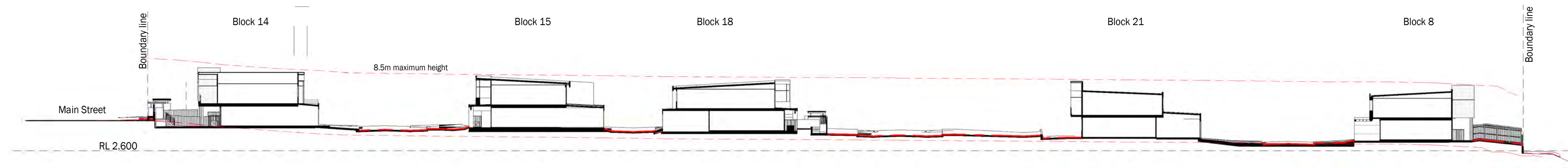
4 Block 21 Elevation
1:100



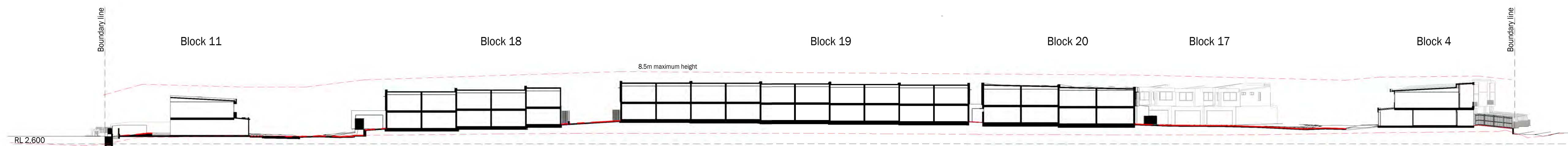
2 Internal Site Elevation - D
1:400



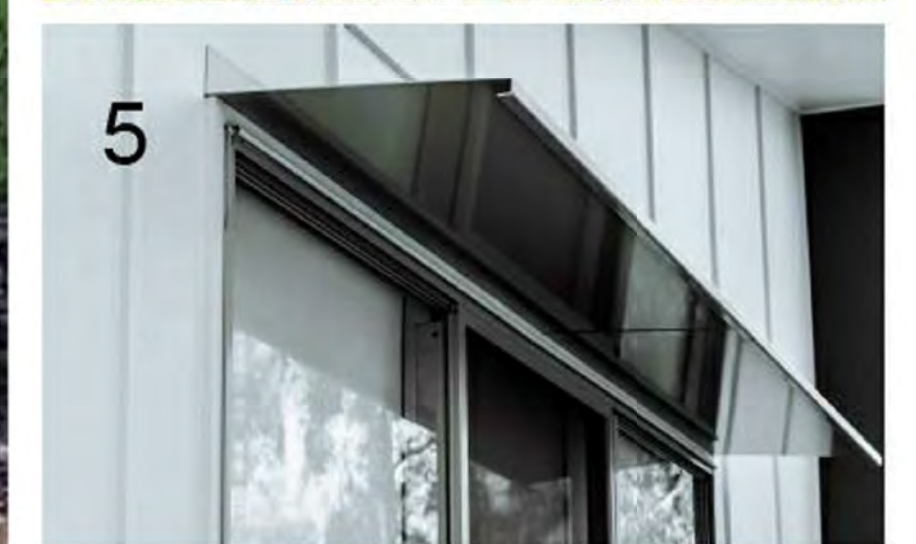
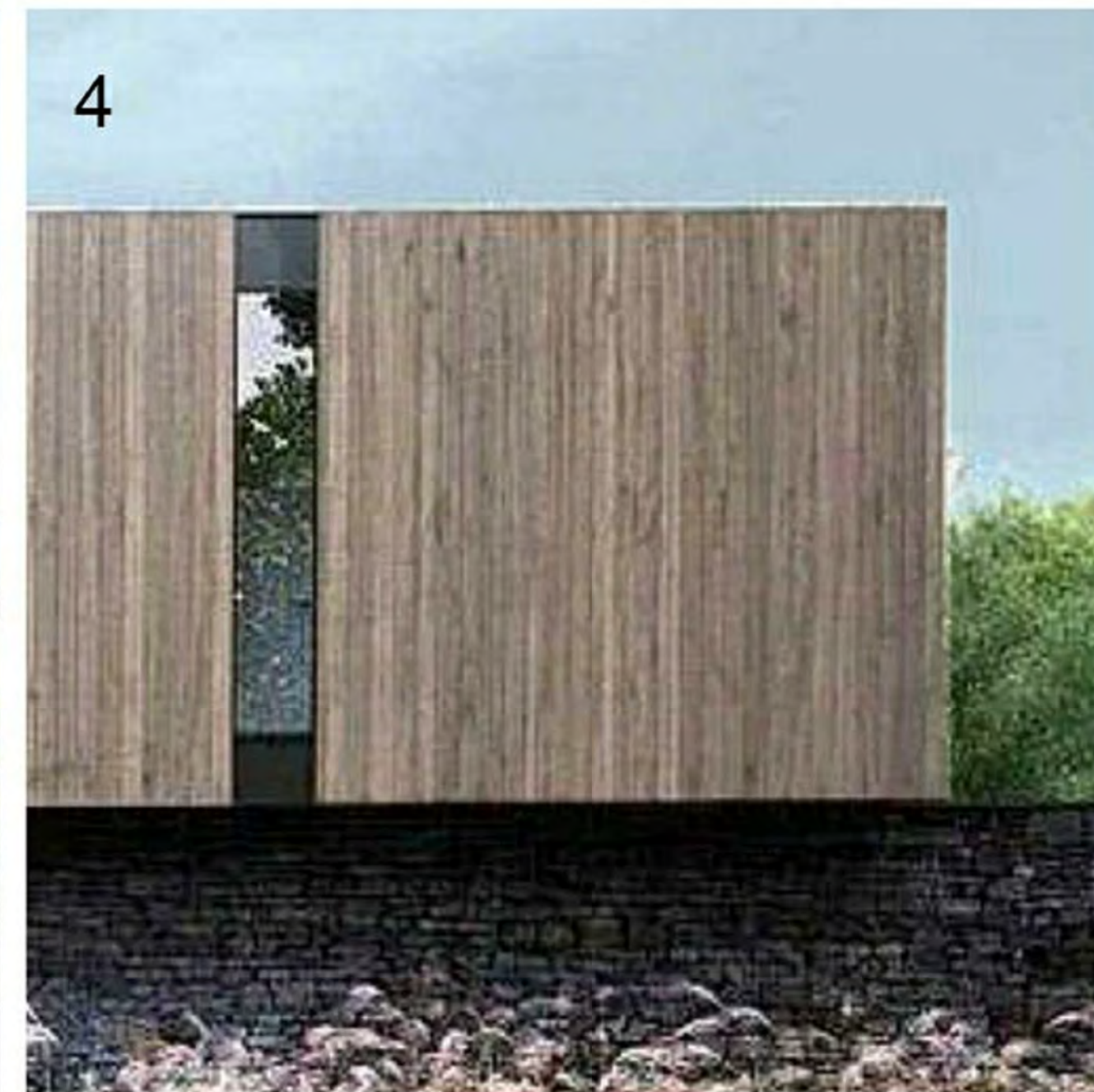
5 Internal Site Elevation - D (Block 15 & 18)
1:100



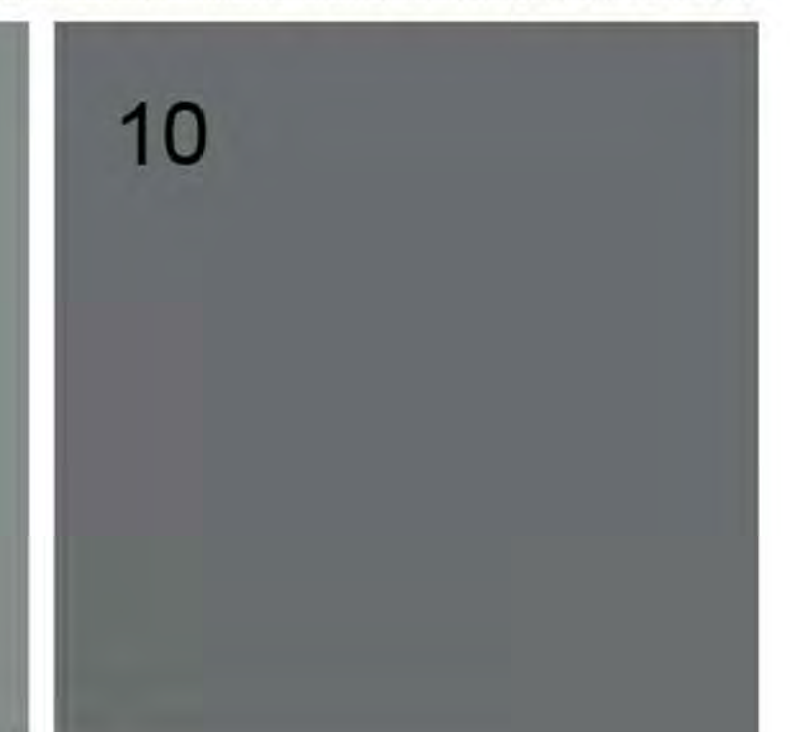
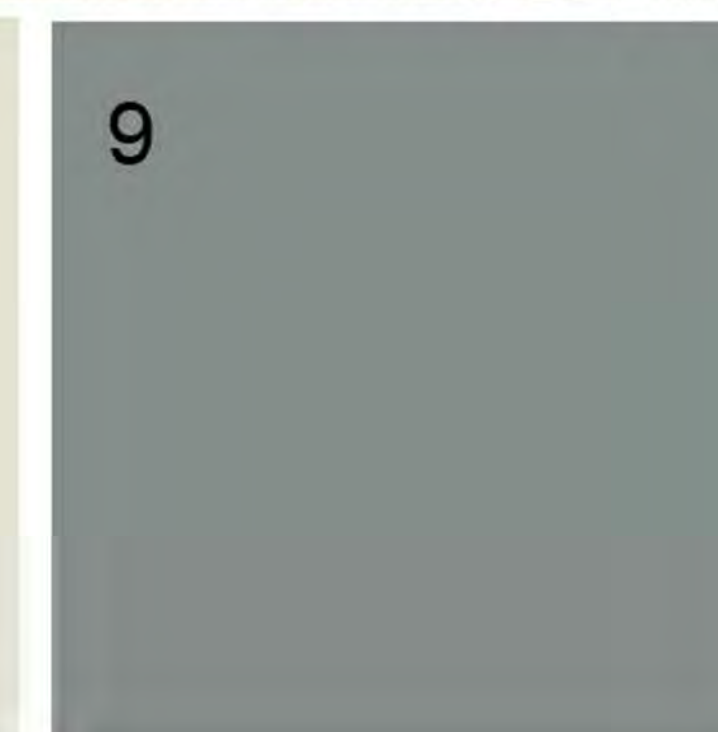
1 Site Section A
1 : 400

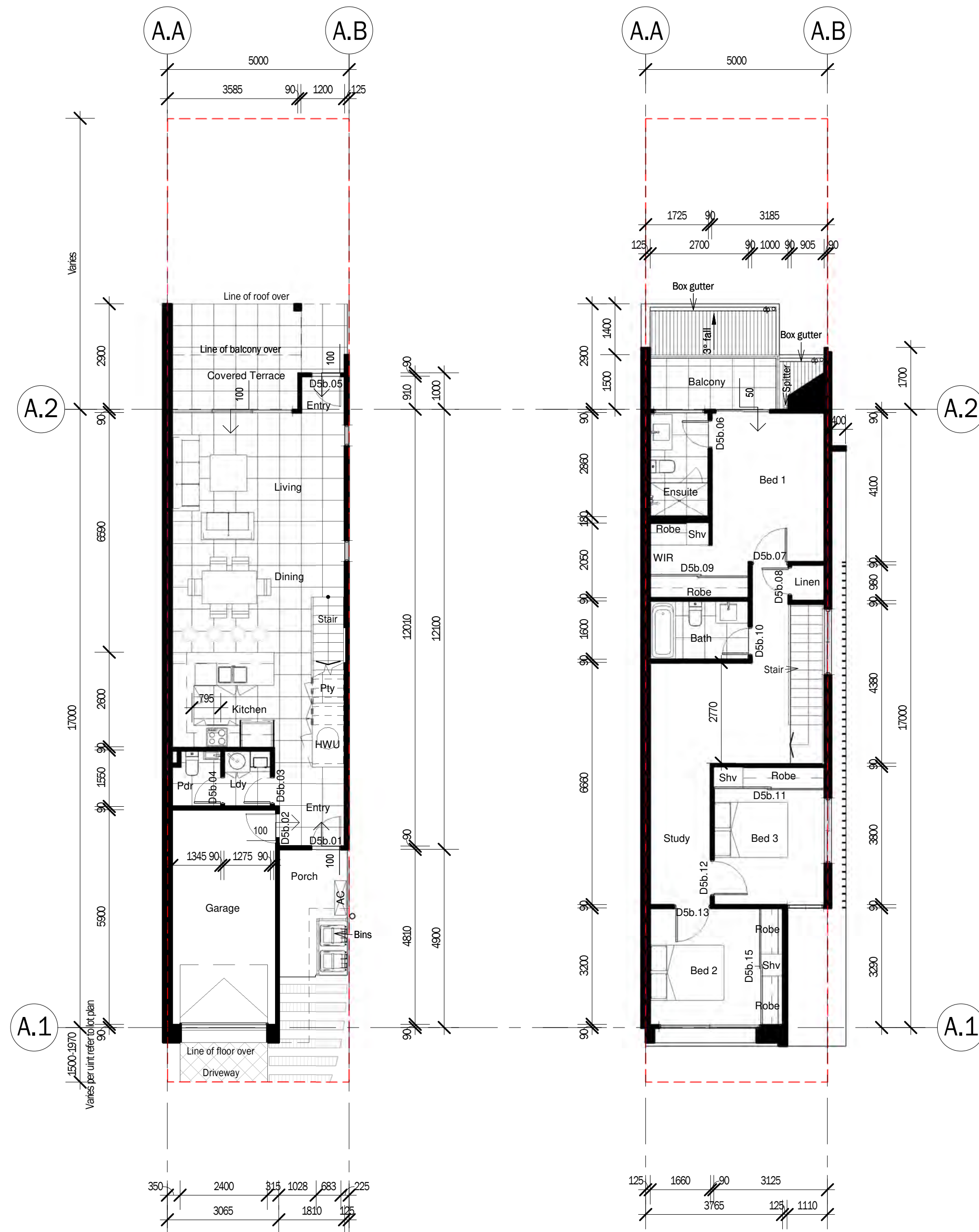


2 Site Section B
1 : 400



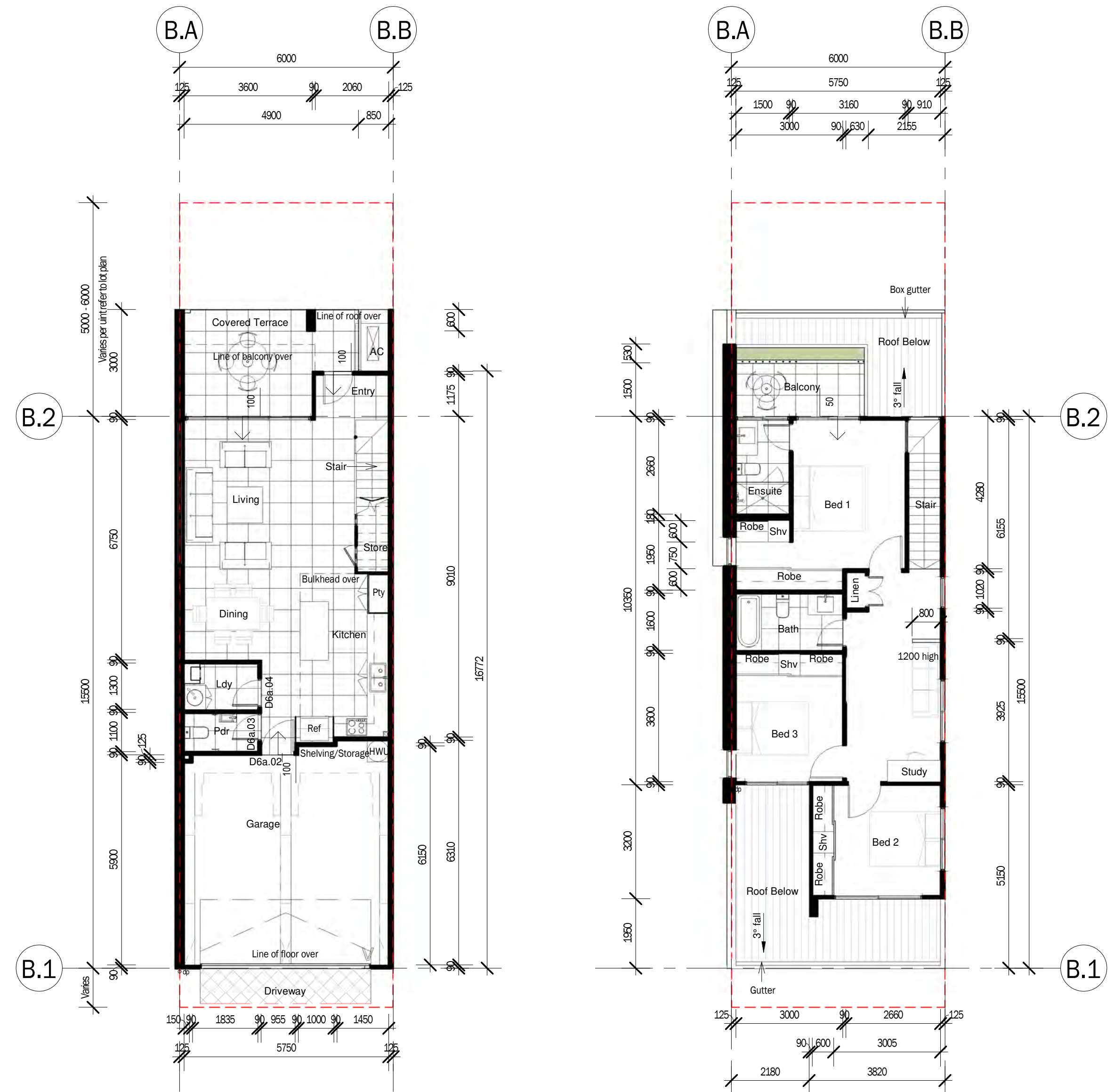
1. Weatherboard cladding – (Dulux - Vivid White)
2. Vertical timber cladding - (Grey Stained)
3. Vertical timber cladding - (Natural)
4. Aluminium façade cladding & battens (Driftwood)
5. Aluminium sun hoods (Colorbond range)
6. Natural sandstone cladding (Rough cut, freeform textured)
7. Dulux - Vivid White
8. Colorbond - Surfmist
9. Colorbond - Windspray
10. Colorbond - Basalt





1 Typical Type A (5m) - Ground Floor 1:100 2 Typical Type A (5m) - Upper Floor 1:100

Type A - 5m Townhouse	
Name	Area
GF Living	58.57 m ²
Garage	18.36 m ²
Terrace	13.08 m ²
L1 Living	76.85 m ²
Balcony	5.51 m ²
	172.38 m ²



3 Typical Type B (6m) - Ground Floor 1:100 4 Typical Type B (6m) - Upper Floor 1:100

Type B - 6m Townhouse	
Name	Area
Terrace	13.43 m ²
GF Living	59.02 m ²
Garage	36.86 m ²
L1 Living	69.89 m ²
Balcony	5.91 m ²
	185.11 m ²



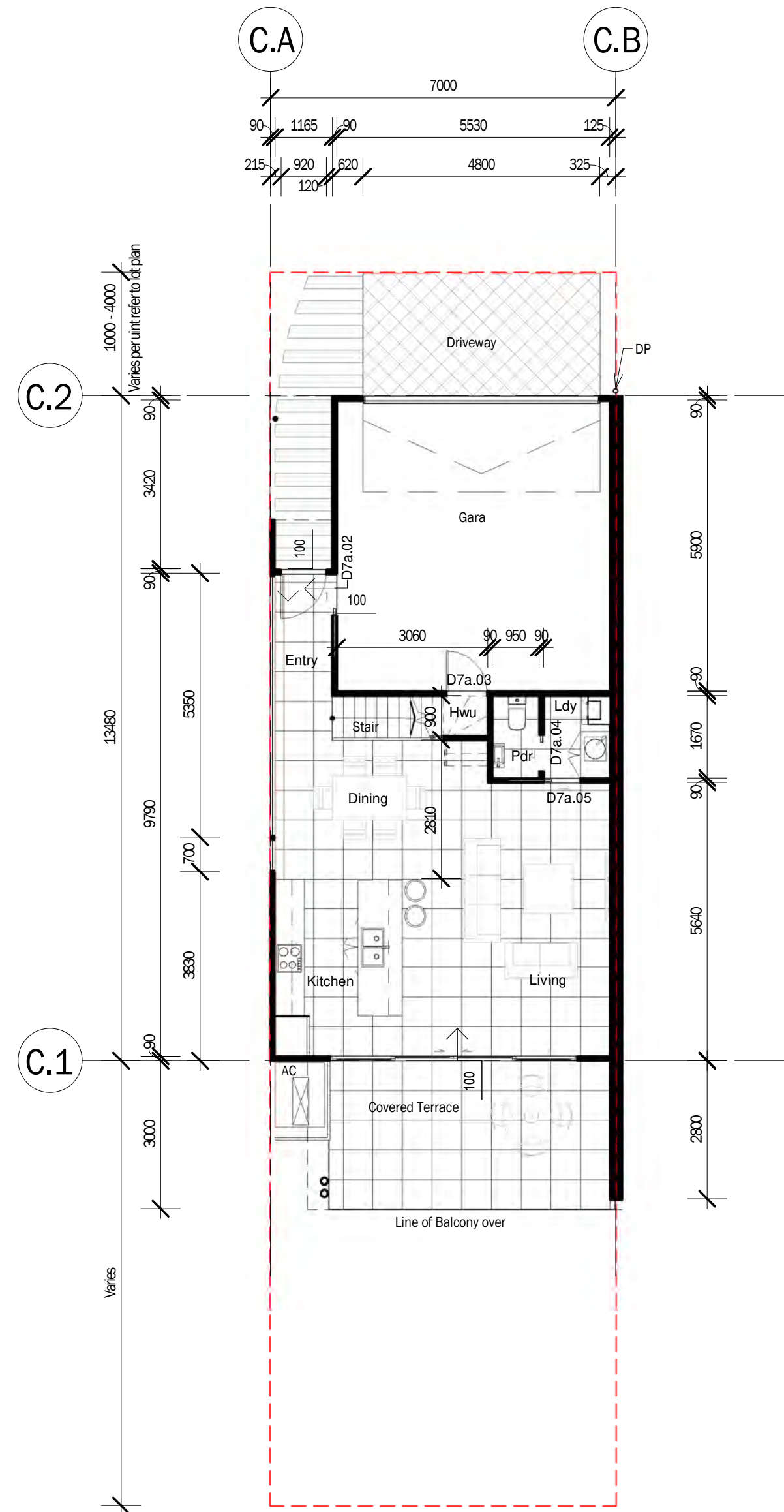
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Proposed Terrace Home Development EPIQ – SUPER LOT 5, LENNOX HEADS

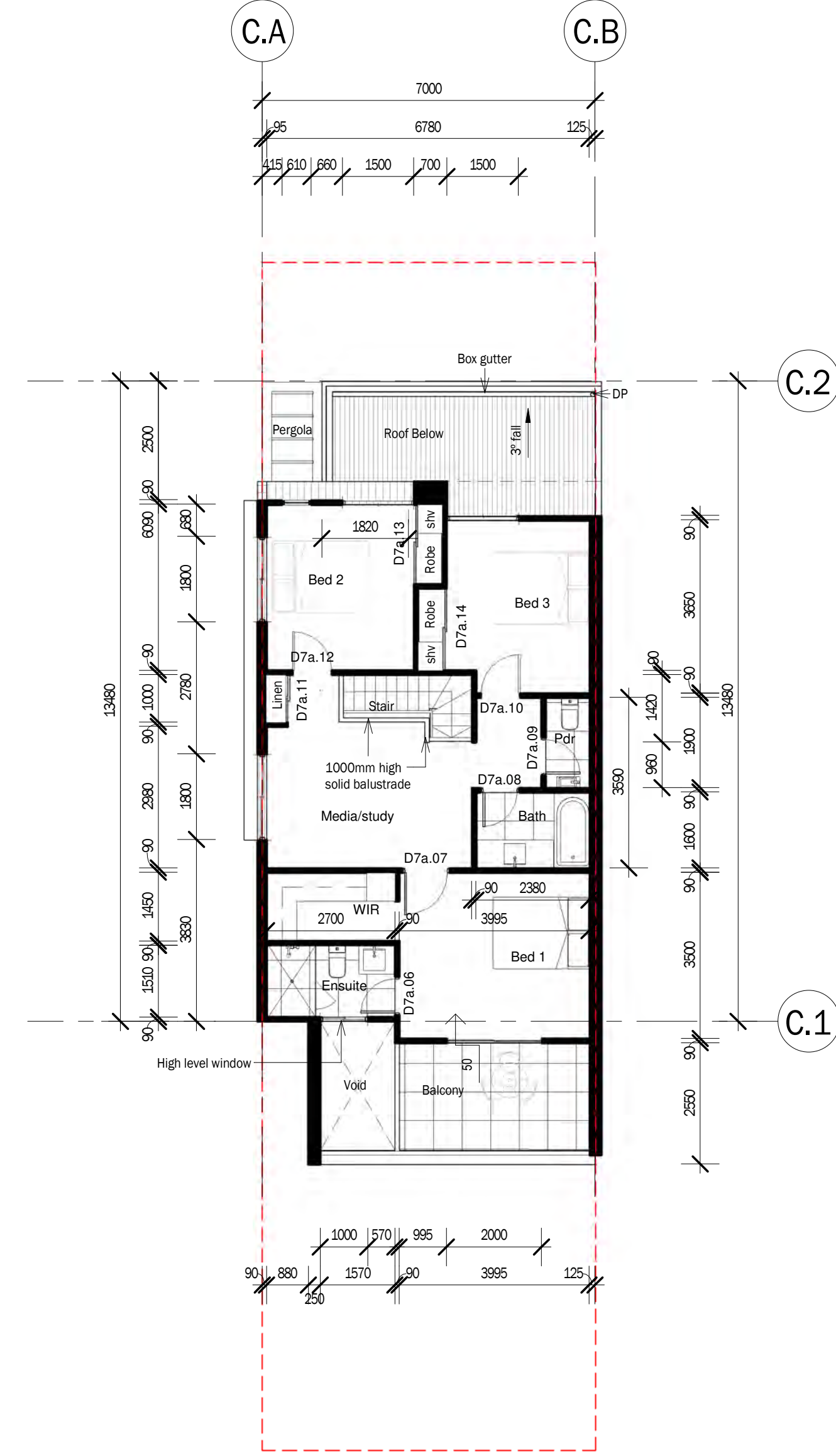
Typical Units Type A & B
5551.15.10.C



6/25/2020 9:45:04 AM ©TVS architects

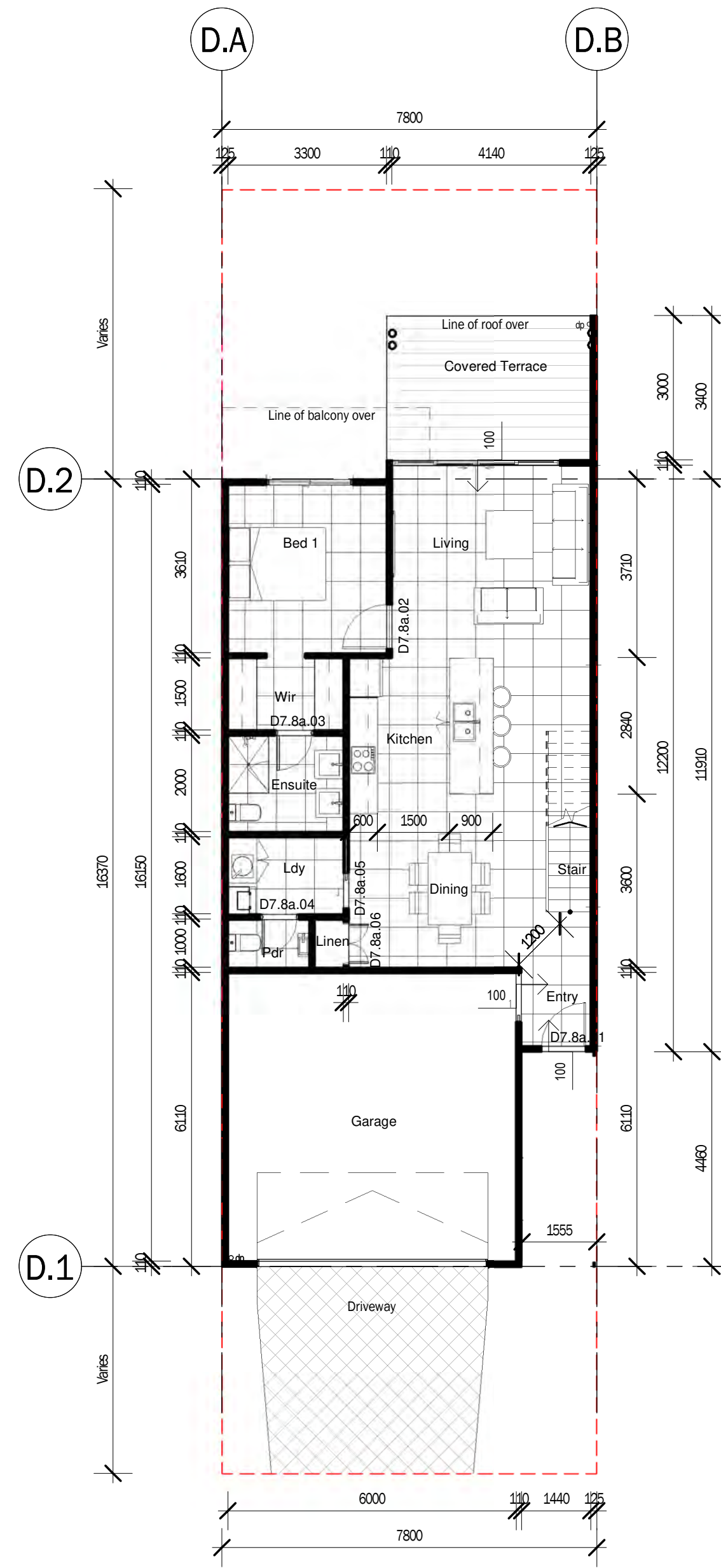


5 Typical Type C (7m) - Ground Floor
1 : 100

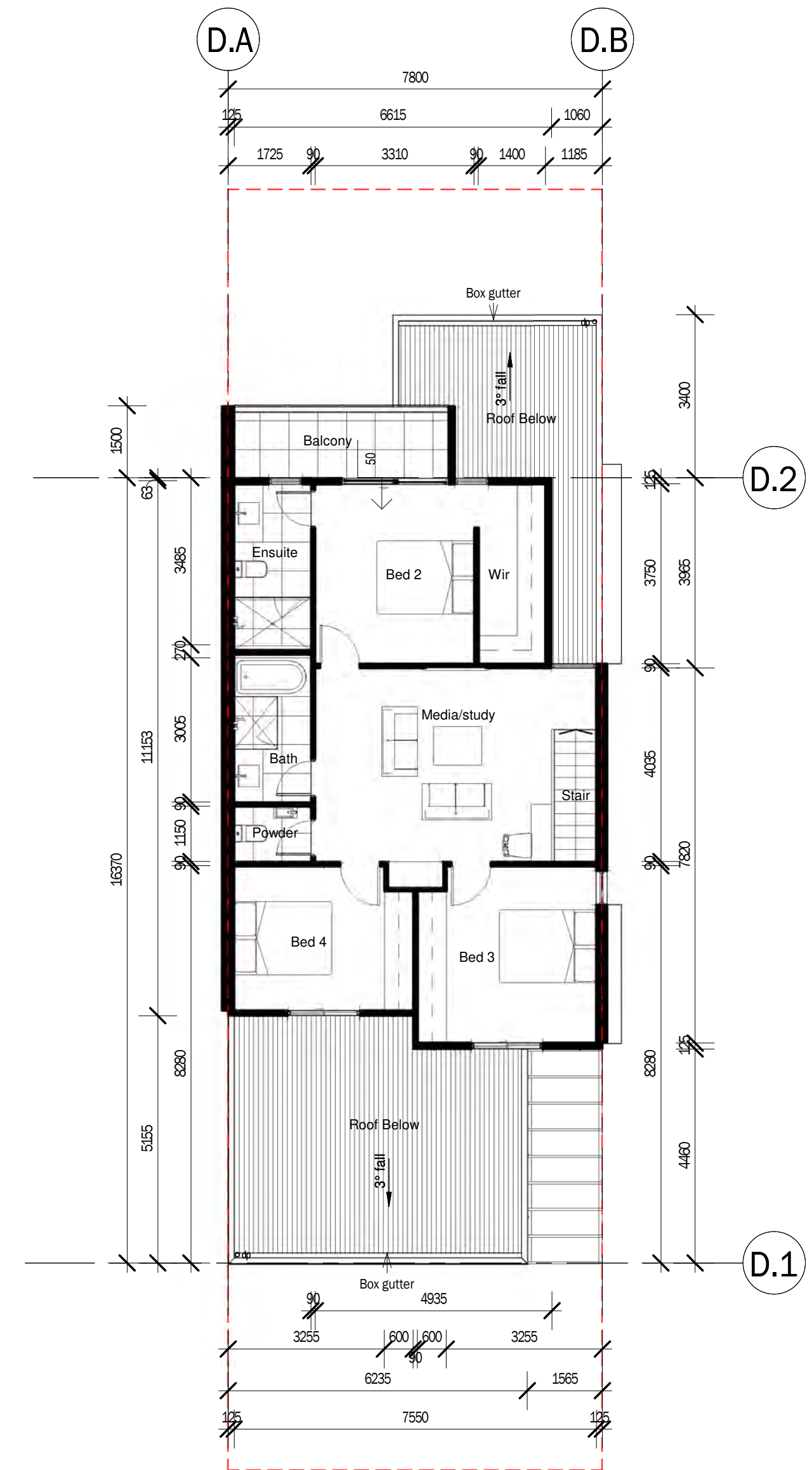


1 Typical Type C (7m) - Upper Floor
1 : 100

Type C - 7m Townhouse	
Name	Area
Garage	34.19 m ²
GF Living	55.77 m ²
Terrace	17.45 m ²
L1 - Living	74.80 m ²
Balcony	6.32 m ²
	188.51 m ²

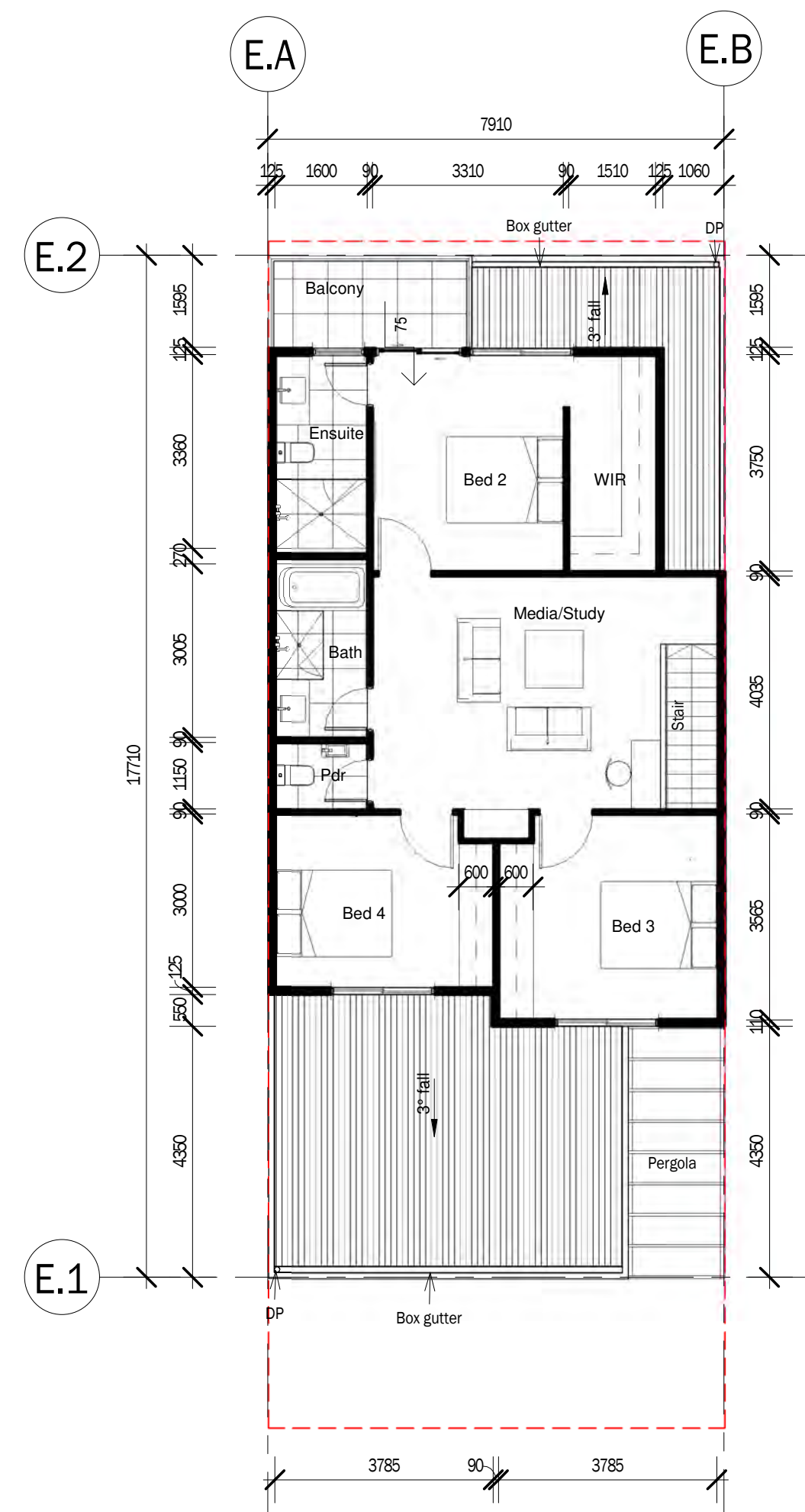
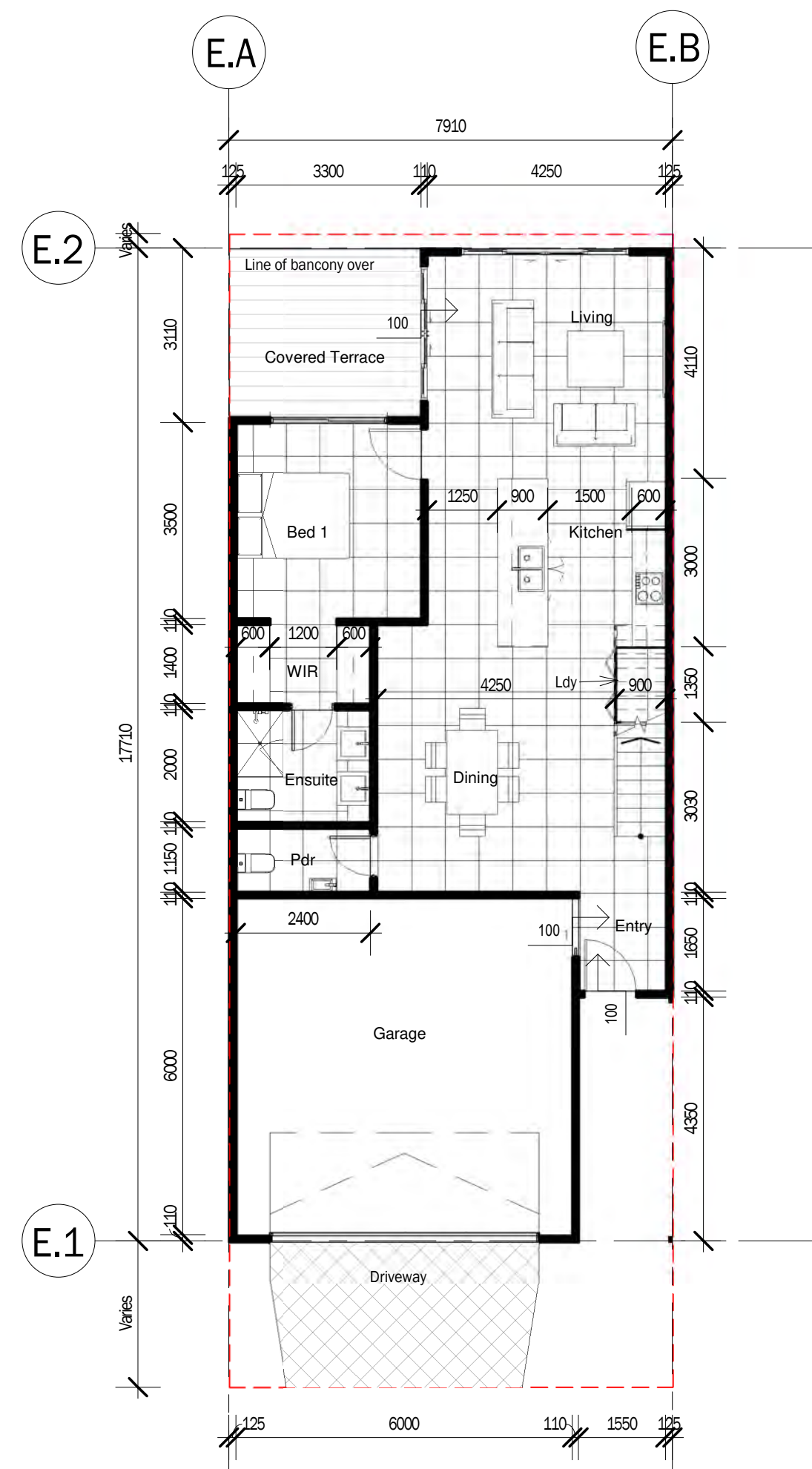


2 Typical Type D (7.8m) - Ground Floor
1 : 100



3 Typical Type D (7.8m) - Upper Floor
1 : 100

Type D - 7.8m Townhouse	
Name	Area
GF Living	84.36 m ²
Garage	38.10 m ²
Terrace	13.13 m ²
Balcony	6.48 m ²
L1 - Living	83.36 m ²
	225.42 m ²



1 Typical Type E (7.91m) - Ground Floor
1 : 100

2 Typical Type E (7.91m) - Upper Floor
1 : 100

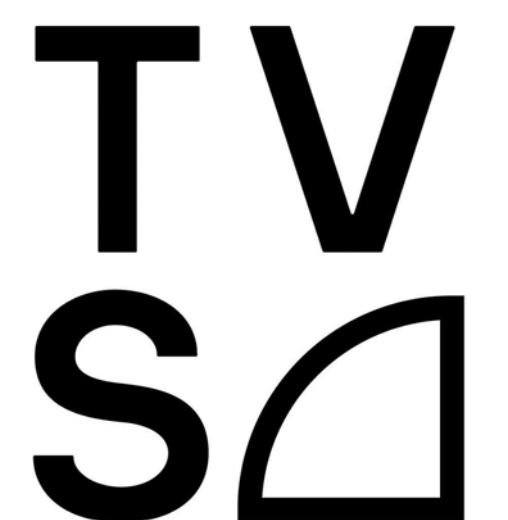
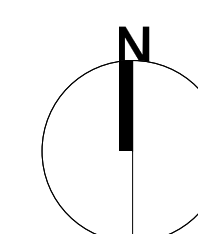
Type E - 7.91m Townhouse	
Name	Area
Balcony	5.64 m ²
Garage	38.10 m ²
GF Living	84.43 m ²
L1 - Living	83.05 m ²
	211.21 m ²



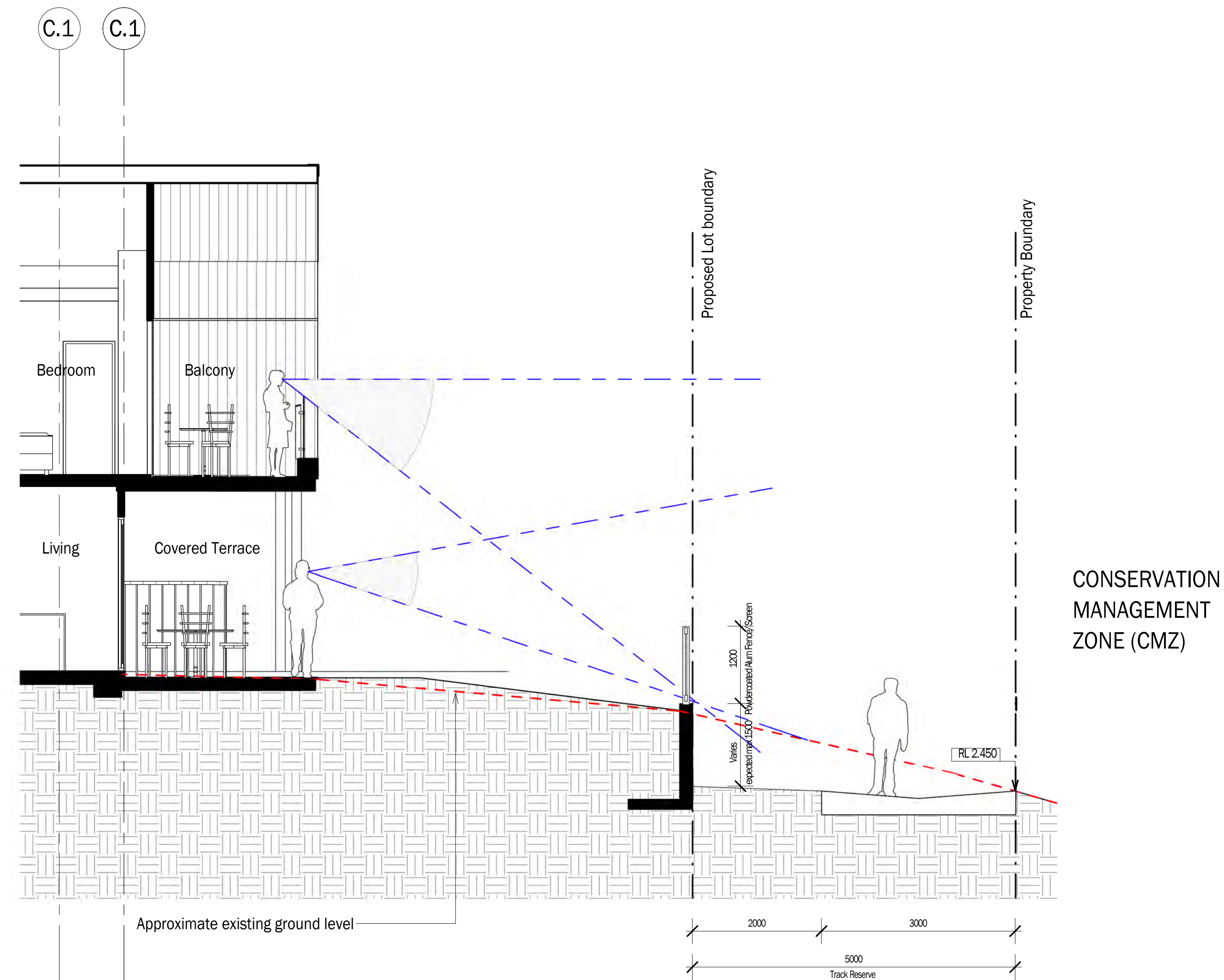
0 2 4 6 8 10
Scale (m) 1 : 100 @A1
Scale (m) 1 : 200 @A3

Proposed Terrace Home Development EPIQ – SUPER LOT 5, LENNOX HEADS

Typical Unit Type E
5551.15.12.A



6/25/2020 9:48:41 AM ©TVS architects



1 Typical section through rear yards backing onto CMZ Access Track
1:50

DESIGN SPECIFICATION INTEGRATED DEVELOPMENT

SUPER LOT 5 EPIQ ESTATE



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INTRODUCTION

This Specification has been prepared to create a high quality, contemporary and environmentally conscious built environment, which will underpin the value of Epiq as a desirable place to live.

This Design Specification provides the development of a contemporary 'beach' style architecture that is environmentally friendly, emphasising a mixture of materials with a coastal colour palette, and the use of native plantings to attract bird life and reduce the need for watering.

The Specification explains the design 'intent' and subsequent "solution" applied to this integrated housing project.

These design specifications have been adopted for the site pursuant to the Part 3A approval application to EPIQ. As such, the prescriptive requirements of the Ballina Local Environmental Plan and Ballina Development Control Plan do not have effect where inconsistent with these specifications.

THE DESIGN

LEGISLATION

All care has been taken to ensure the Specification complies with current building legislation.

DESIGN PROCESS

TVS Architects have been engaged to develop this design specification.

SITE PLANNING

Dwellings are designed to respond to the natural characteristics of the site and surroundings. The design has considered:

- Dwelling orientation;
- Topographic characteristics;
- Points of access;
- Solar access;
- Views and vistas;
- The relationship to adjoining allotments (existing or proposed).

APPROVAL BY PRIVATE CERTIFIER

The developer shall seek approval to construct from a private certifier.

DRAWINGS FOR CONSTRUCTION

a) Site plan

All site plans are to be at a scale of 1:400 at A1 or 1:800 at A3 and must show the following minimum information:

- North point;
- Excavation, fill & finished ground levels;
- Retaining walls (location, extent and type);
- Driveway location, finish, and parking provisions;
- Fencing (extent, location); and
- All setbacks and the location of all buildings and structures on the land.

b) Floor plans

All floor plans are at a scale of 1:100 at A1 or 1:200 at A3 and show the following minimum information:

- Lot numbers
- Internal layouts of rooms, windows, openings;
- Extent of roof overhangs; and
- Setback dimensions.

c) Elevations and sections

All elevations are at a scale of 1:100 at A1 or 1:200 at A3 and show the following minimum information:

- Existing natural and proposed ground level;
- Finished floor levels;
- Maximum building height extent;
- Roof form; and
- General materials and colour selections (including external walls, roofing and fencing).

d) Street front fencing details

- Plans show stepped dimensions of planters;
- Top of wall heights per retaining wall; and
- Fencing (extent, location, height and type).

DWELLING DESIGN

ARCHITECTURAL DESIGN

Intent:

Dwelling design shall consider the local climatic conditions, coastal location and adjoining dwellings and be representative of 'contemporary beach architecture'.

Solution:

A contemporary approach to design for climate and environment has been created through the development of appropriate design for the coastal location incorporating:

- Architectural elements designed to capture the prevailing summer breezes;
- Eaves, overhangs and window shading for sun and rain protection;
- The inclusion of covered balconies, courtyards and / or walkways to provide streetscape variety;
- Open plan living, blending interior with exterior;
- A selection of materials to reflect coastal architecture and provide variation of facades; and
- A series of considered Architectural forms the employ careful articulation of walls, roof lines and materials to minimise building bulk.

EXTERNAL WALL FINISHES

Intent:

External wall finishes must be of a scale, form and material that is reflective of a 'contemporary beach architecture'.

Solution:

A balanced mix of materials has been used to provide a product reflective of contemporary beach architecture.

Wall cladding materials include:

- Masonry to planters & fences (honed / split face block, render & paint finish, coloured concrete breeze block);
- Horizontal cladding - Weatherboards or similar (paint finish);
- FC cladding with timber battens;
- Vertical grooved fibre cement 'timber look' wall sheeting (paint finish or raw); and
- Aluminium 'timber look' cladding materials.

With a maximum of 70% of any one material used to support the scale, texture or form of the wall finishes to provide variation in scale and appearance.

Colour selections include:

- Neutral, muted tones; and
- Contemporary coastal tones.

ROOFING

Intent:

Roofing is of a scale, form and construction that is reflective of 'contemporary beach architecture', including: pitch; materials; and design innovation.

Solution:

Roof form:

- Modern and contemporary forms with a variety of steeply and shallow pitched roofs
- Vertical articulation using changes in roof form and shape have been incorporated to add interest to the streetscape.

Roof materials:

- Colorbond roof sheeting;
- Translucent roof sheeting and
- Non-reflective.

Eaves:

- Buildings have a minimum eave width of 300mm where possible; and
- Where architectural style dictates suitability, a zero eaves line has been adopted and is complimented with appropriate sun shading devices to windows.

Gutters, parapet capping, flashings and downpipes:

- All gutters, parapet capping and flashings to match roof colour; and
- Downpipes to match the adjacent wall colour to complement the dwelling design and not be conspicuous.

BUILDING HEIGHT

Intent:

Buildings and structures must not cause significant loss of amenity to adjacent land and dwellings.

SITE COVER

Intent:

Dwellings must demonstrate variation in the development envelope, and must provide adequate opportunity for the absorption of stormwater within allotments.

SOLAR AND DAYLIGHT ACCESS

Intent:

Orientate buildings to maximise northern aspect and where possible, provide townhouses with direct winter sunlight into living areas, habitable rooms, balconies or external private spaces and yards.

Solution:

In general,

- The dwellings do not exceed 2 storey in form and 8.5m in height above the proposed ground line to the highest part of the roof; and
- The dwellings do not exceed two storeys.

Solution:

The maximum site cover of a dwelling on an allotment are as follows:

- Lot size smaller than 155m²: 95% overall site coverage.
- Lot size greater than 155m²: 85% overall site coverage.

Solution:

- Aligning roadways parallel to the natural contours of the site enables safe, direct access to vehicles and maximises “on grade” pedestrian movement and maximises north aspect.
- Maximise yard spaces to properties with restricted northern aspect.
- Townhouses with south facing living areas have access to direct northern daylight to upper bedrooms.

STREET ADDRESS

Intent:

Dwellings must address the public realm to contribute to the streetscape character and enable passive surveillance.



Entry gates and entrances

Solution:

- Pedestrian entrances to the dwellings open on to the primary access street or public open space; or
- Letterbox location is integrated at the entry gate of each dwelling or alternatively to be located within 0.5m of front or back boundary.

FRONT SETBACKS

Intent:

Dwellings addressing the public streets must be setback from Montwood Drive & Snapper Drive street frontage as outlined adjacent.

Dwellings to have varying setbacks to neighbouring lots:

- To create a high quality streetscape; and
- To ensure acceptable access to dwellings from roadways;

Solution:

Dwellings comply with the following setbacks on site:

- Dwellings addressing Montwood Drive to have a minimum 3m setback;
- Dwellings addressing Snapper Drive to have a minimum 4m setback;
- Blocks 1-14 & 21 (excluding lots 21, 22, 23, 31, 32, 54, 57, 58, 73 & 74), to have a minimum setback of 5.4m from garage face to primary street to allow for 2 car visitor parking on driveway;
- Blocks 1-14 & 21 (excluding lots 21, 31, 32, 36, 53, 54, 73, 74 & 126) to have a minimum 1.5m front setback from garage face to front lot boundary;
- Blocks 15 - 20 to have a minimum setback of 1m from garage face to rear laneway;
- Blocks 15-19 to have a minimum 3.0m front setback from covered terrace to front lot boundary; and
- Block 20 (excluding lot 107) to have a minimum 2.0m front setback from covered terrace to front lot boundary.

SIDE SETBACKS

Intent:

Dwellings to have a setback from side, rear and secondary road boundaries to avoid overshadowing and to enhance privacy.

Solution:

- In general, for lots at ends of blocks, the setback shall be a minimum of 900mm to side boundaries; and
- An average minimum of 900mm to secondary road boundaries.

REAR SETBACKS

Intent:

Structures must be setback from rear boundaries to facilitate a corridor of vegetation and to create a visual separation for privacy.

Solution:

- Blocks 15–20 minimum setback of 0m to rear boundary at laneway.
- Dwellings backing on to proposed Lot 150 (NDC Plan P9 - Proposed Subdivision Stage 1C, Dated 04.07.19) shall have a minimum 10m setback measured from the building line to the outer boundary of proposed Lot 150 being the common boundary with the Conservation Management Zone.
- Type C dwellings to have a minimum glazing setback of 3.0m; and
- for Type E dwellings, a minimum setback of 0m to the Asset Protection Zone; and
- Balcony setbacks of 2m minimum; and
- No hardstand to be within 1m of the rear setback to allow for a corridor of landscaping for additional privacy

VEHICLE ACCOMMODATION

Intent:

Residents' vehicles must be accommodated on-site with minimal visual obtrusiveness and adequate provision for vehicle manoeuvring. The location and treatment of garages, garage doors and carports must contribute positively to the primary streetscape.



Vehicle Accommodation

DRIVEWAYS

Intent:

Safe, functional and attractive vehicle access is vital for access and egress to the home and presentation and amenity of the adjacent streetscape.

Solution:

Vehicle space provided:

- A minimum of two (2) on site car parking spaces shall be provided for all allotments;
- Type A dwelling – One garage space and one stacked off street parking space to be provided
- Type B, C, D & E dwellings – Double garage to be provided

Materials:

- Garage door materials shall complement and incorporate the design details of the main dwelling and overall site, including materials, colour & design; and
- Garage door frames to be similar colour palette to the featuring wall colour surrounding it.

Streetscape:

- Where allotments have two access roads, garages are rear loaded onto laneways and secondary road frontages

Solution:

Driveway widths are:

- Double driveways: 4.8m maximum at the property boundary; and
- Single driveways: 3.0m maximum at the property boundary.
- Crossover to comply with council regulations.

Driveway material to be:

- Concrete finish, exposed aggregate or coloured asphalt.

CORNER ALLOTMENTS

Intent:

Dwellings are to address primary streets, secondary streets, and adjoining public spaces. The primary and secondary facades are to have complementary elements.



Corner Allotments

Solution:

- Windows, balconies, verandas, and/or screening devices shall be incorporated into elevations facing street frontages and public spaces to articulate building form;
- All walls facing primary and secondary street frontages shall have windows, change in material and/or feature elements to provide interest and articulation; and
- Laundries and clothes drying facilities, shall not be located along the primary or secondary street frontages except where it is the dwellings only private open space.

ANCILLARY STRUCTURES

Intent:

Ancillary structures must be visually attractive and blend with the building and landscape design.

Solution:

- Garden sheds shall not be visible from the street and shall be no larger than 10 square metres;
- External antennae if required, shall be located at the rear of the dwelling and extend no more than 2.0m above the roof ridgeline;
- Roof, wall and window mounted air conditioning units will not be visible from the street or public areas; and
- Air conditioners to be located in designated enclosures at dwelling lower floor and screened from public view; and
- Clotheslines, hot water and gas systems, shall be located where they are not visible from the street or public areas.
- Garbage bins shall be located where possible within a screened enclosure.

FENCING - PRIMARY STREET FRONTAGE

Intent:

Front fences must not dominate the streetscape amenity. Residences must be visible from the street through fences with medium height and semi-permeable structure.



Semi-transparent vertical battens

Solution:

Fencing shall only be incorporated in the front yard for the following reason:

- To provide privacy around outdoor living spaces located in the front yard or side yard in the case of corner lots.

Front fences are to be a combination of the following finishes:

- Painted and rendered masonry, honed or split faced masonry
- Powder coat finish to aluminium horizontal or vertical battens or similar; and
- Gates to complement adjacent fencing types.

Fences facing the street are constructed to compliment the overall street frontage, retaining walls, planters and the dwelling design and shall not exceed 1.65m in height from the higher of either street level or top of retaining wall.

Fencing to front yard can run the full length of the front boundary line providing the following solutions are met:

- Vertical articulation through planter boxes or change in stepped retaining walls; and
- Colour and material finishes must complement the design and detailing of the dwelling.
- Overall fence design should be visually permeable with a minimum of 25% visual permeability of the total length of the front boundary.
- Front street fencing shall be either a minimum of 1.0m for fall prevention; or maximum 1.5m on top of retaining wall for articulation and privacy.

FENCING - SECONDARY STREET FRONTAGE

Intent:

Fences used in conjunction with landscaping shall provide necessary screening of living areas and allow passive surveillance of the streetscape.

Solution:

Raw masonry, metal or timber are not incorporated along the boundary line of secondary street frontages.

Fencing is constructed to compliment the overall street frontage, retaining walls, planters and the dwelling design and shall not exceed 1.65m in height from the higher of either public street level or top of retaining wall.

Soft landscaping designed to provide screening, individuality and privacy to the dwellings.

FENCING - SIDE AND REAR BOUNDARY

Intent:

Side boundary fencing must provide privacy for private open space and service areas as well as demarcation of lot boundaries.

Solution:

- Where allotment has a front fence, the side and rear fence where facing the street shall have similar fencing design; and
- Provide a visual change in height, fence orientation, stepping in material or introduction of another material at least once every 12m.
- All other internal yard fencing along boundary between lots are to be 1.8m high and shall provide privacy to adjacent lots. Construction to be either solid masonry, lapped timber paling fence, hebel power fence or similar; and
- Side fences shall not extend past the front face of the adjacent corresponding building unless in conjunction with an approved front or rear fence.
- Lots backing on to Conservation Management Zone to have fences with open type palings or similar and to be designed in a way that provides casual surveillance of the path from both ground and first floor levels of the dwellings.

RETAINING WALLS

Intent:

Wherever possible, retaining walls should be terraced and / or landscaped to not appear overbearing. Retaining walls shall have a level of detail that reflects the design and construction of the dwelling.

Solution:

Retaining wall requirements:

- Retaining walls over 1.2m high at public street frontages may be terraced or stepped to coordinate with architectural design as required;
- Where possible, retaining walls shall not exceed 1.5m in height from public street level, even though retaining wall could be visually higher within private courtyard.
- Retaining walls can align to boundary line; and
- Where fencing is required on top of retaining walls the design of the fencing and retaining wall shall be integrated; and
- Where possible, retaining walls to be aligned with lot boundaries with provision for landscaping on private lots.
- Shared retaining walls between two or more dwellings shall be centred on boundary line including fencing on top.

SUSTAINABILITY

WATER EFFICIENCY

Intent:

To reduce reliance on existing Council water supply.

NATIVE PLANTING

Intent:

To attract wildlife, reduce watering and garden maintenance and avoid adding to the spread of “environmental weeds”.

PHOTOVOLTAIC SOLAR PANELS

Intent:

To reduce load demand on electrical supply infrastructure.

Solution:

- All shower heads, taps and toilets shall be a minimum AAA rating.
- All dwellings are plumbed to the council dual reticulation water supply network.

Solution:

- Include a minimum 3 native plant species in garden plantings from the attached planting list.
- Limiting plantings to those on the attached planting list is encouraged but is not mandatory.

Solution:

- The inclusion of Photovoltaic solar panels on dwellings is encouraged.

DEFINITIONS

Ancillary Structures	Out buildings including sheds of no more than 10m ² and pools.
Building Height	The measured height of a dwelling from the proposed ground line to the highest part of the roof. Each dwelling has a maximum height of 8.5m and a maximum 2 storey build.
Corner Allotment	Any allotment bounded by two or more roadway frontages where the roads intersect or join, dedicated parkland or unconstructed road reserve.
Outermost Projection	The extremity of a building including roof overhangs and facia, but excluding gutters and downpipes.
Primary Street Frontage	The frontage of an allotment or corner allotment determining the allotment address.
Rear Boundary	Any boundary line or part thereof which coincides with another allotment and is generally paralleled with the nominated 'frontage boundary'.
Secondary Street Boundary	The frontage of a corner allotment, which abuts a second street, not the frontage determining the allotment address.
Setbacks	The minimum distance from any allotment boundary to a building. Refers to a line or lines, parallel to a boundary of a lot beyond which a building shall not encroach. Setbacks are measured to the solid building wall. Setback does not apply to eaves, gutters, overhangs, screens, lightweight pergola and roof structures and/or feature elements.
Site Cover	The portion of an allotment which is covered by a building or other structure having an impervious roof, excluding balconies, sunshades, eaves, entry gate structure, landing and stairs.

RECOMMENDED PLANT SPECIES

RECOMMENDED PLANT SPECIES – STREETSCAPE TREES

Trees
BUCKINGHAMIA celsissima
CUPANIOPSIS anacardioides
HARPULLIA pendula
LIVISTONA australis
LOPHOSTEMON confertus
WATERHOUSEA floribunda
XANTHOSTEMON chrysanthus

RECOMMENDED PLANT SPECIES – PRIVATE YARDS

Trees	Hedges	Shrubs & Ground Covers	Shrubs & Ground Covers
ACMENA smithii	BAECKEA linifolia	AUSTROMYRTUS dulcis	METROSIDEROS ‘Fiji Fire’
ATRACTOCARPUS fitzalanii	BANKSIA robur	BANKSIA ‘Coastal Cushion’	MYOPORUM ellipticum
BANKSIA integrifolia	ERIOSTEMON myoporoides	BAECKEA virgata ‘Compacta’	MYOPORUM parvifolium
BACKHOUSIA citriodora	GREVILLEA ‘Robyn Gordon’	CAREX appressa	SCAEVOLA calendulacea
BUCKINGHAMIA celsissima	LEPTOSPERMUM polygalifolium	CARPOBROTUS glaucescens	VIOLA hederacea
CUPANIOPSIS anacardioides	MELALEUCA ‘Claret Tops’	CASURINA ‘Cousin It’	WESTRINGIA ‘Jervis Gem’
ELAEOCARPUS reticulatus	METROSIDEROS ‘Fiji Fire’	CALLISTEMON ‘Better John’	
HARPULLIA pendula	METROSIDEROS ‘Little Dugald’	CALLISTEMON ‘Green John’	
HIBISCUS tiliaceus ‘Rubra’	SYZYGIUM ‘Bush Christmas’	CRINUM pedunculatum	
METROSIDEROS excelsa	SYZYGIUM ‘Resilience’	DORYANTHES excelsa	
PANDANUS tectorius	WESTRINGIA ‘Wynyabbie Gem’	DORYANTHES palmeri	
TRISTANIOPSIS laurina ‘Luscious’		GREVILLEA ‘Bronze Rambler’	
CUPANIOPSIS anacardioides		LEPTOSPERMUM ‘Pacific Beauty’	
ELAEOCARPUS reticulatus		LOMANDRA hystrix	
WATERHOUSEA floribunda		LOMANDRA longifolia	
XANTHOSTEMON chrysanthus		MELALEUCA thymifolia	



Attachment 3

Landscape Concept Design Report

02LA



EPIQ ESTATE

LANDSCAPE CONCEPT DESIGN REPORT

PREPARED BY



PROJECT ADDRESS

EPIQ Estate
Lennox Head

CONTACT

02 Landscape Architecture
(07) 3831 0681

DOCUMENT NUMBER

333 SD-LR001 F
Date: 29/05/2020

ACKNOWLEDGEMENTS

This document presents work from 02 Landscape Architecture in association with TVS Architects.

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01 Introduction

DESIGN INTENT

The landscape concept for Pacific Pines focusses on the following key objectives:

1. Articulation along existing roads
2. Pedestrian connectivity
3. Reflection of local character and integration with the overall masterplanned development

The interface with Montwood Drive & Snapper Drive utilizes several landscape elements to maximise articulation & interest whilst promoting casual surveillance of the streetscape. These are identified below:

1. Pedestrian access points to each home provides activation to the street, assists in providing surveillance to the streetscape and provides convenient access to amenities within the residential community (eg parkland & retail centre)
2. Visual relief & interest by staggering the arrangement of retaining walls/fences and utilising a combination of solid & semi-transparent materials
3. Terraced retaining walls to reduce the scale of walling
4. Integrated design of street trees & canopy trees
5. Continuous understorey planting at street frontages to provide a lateral buffer/privacy & visually soften built form
6. Breaks between tranches are used as punctuation points to maximise tree planting & provide further visual softening

Pedestrian connectivity:

1. Primary spines alongside the east-west road provide a direct connection to Montwood Drive, while the north-south linear park provides a direct connection to Snapper Drive. Broad verges maximise opportunity for street tree planting and root volume

thereby maximising shade & reinforcing the 'spines'

2. Secondary pedestrian spines are provided along select roads and connect to the primary spines
3. Canopy trees provide shade for pedestrians & streetscape whilst also visually soften the built form

Other design elements within the development include the following:

1. Threshold treatments in roadway to delineate/reinforce entries whilst providing visual relief to roadway materials
2. Narrowing of roadway provides visual relief whilst providing opportunities for tree planting
3. A planted buffer is provided abutting the conservation zone. This comprises canopy trees & understorey
4. Plant species character reflects Ballina Shire Council requirements and the development masterplan

02 Conceptual Process

CONCEPTUAL DIAGRAM PEDESTRIAN CIRCULATION

LEGEND



MAIN PEDESTRIAN
CONNECTION



SECONDARY PEDESTRIAN
CONNECTION



03 Plans

LANDSCAPE CONCEPT PLAN MASTERPLAN

LEGEND

-  LARGE FEATURE TREE AT PROMINENT CORNERS & SITE ENTRIES
-  BOULEVARD TREES TO MAIN INTERNAL ROAD
-  STREET TREES
-  SMALL COLUMNAR TREE
-  FOOTPATH
-  ROAD THRESHOLD AT PROMINENT CORNERS & SITE ENTRIES



04 Character Images

HARDWORKS



FENCES ALONG MONTWOOD DRIVE & SNAPPER DRIVE: STAGGERED ALIGNMENT & COMBINATION OF SOLID & SEMI-TRANSPARENT FENCES MATERIALS



SEMI-TRANSPARENT FENCE PANELS



CANOPY TREES, SHRUBS & GROUND COVERS AS CONTINUOUS PLANTING BEDS AT THE STREET FRONTAGES AND WITHIN YARDS OF LOTS



TERRACED RETAINING WALLS TO ASSIST IN TAKING UP LEVEL CHANGE WHILST PROVIDING VISUAL RELIEF FOR WALLING



TERRACED RETAINING WALLS TO PRIVATE COURTYARDS



ROAD THRESHOLDS AT PROMINENT CORNERS & SITE ENTRIES

TREES



ARAUCARIA columnaris
H: 20-30m W: 6-8m



ATRACTOCARPUS fitalanii
H: 6-10m W: 2-4m



BANKSIA integrifolia
(Coastal Banksia)
H: 8-15m W: 3-10m



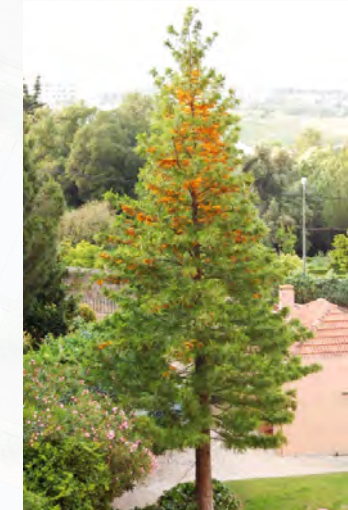
BACKHOUSIA citriodora
H: 6-8m W: 3-4m



CUPANIOPSIS anacardioides
(Tuckeroo)
H: 8-12m W: 4-8m



ELAEOCARPUS reticulatus
(Blueberry Ash)
H: 10-15m W: 5-7m



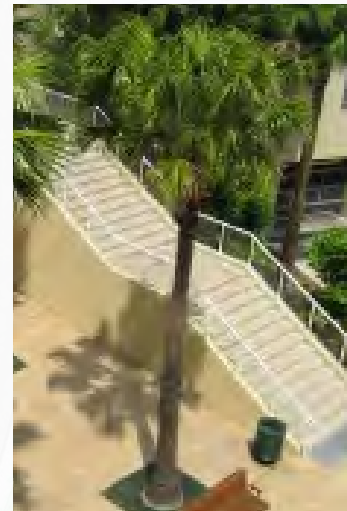
GREVILLEA robusta
H: 15-30m W: 8-10m



HARPULLIA pendula
H: 6-8m W: 6-10m



HIBISCUS tiliaceus 'Rubra'
H: 8-10m W: 8-10m



LIVISTONA australis
H: to 30m W: 4-5m



LOPHOSTEMON confertus
H: 15-20m W: 8-10m



METROSIDEROS excelsa
(New Zealand Xmas Bush)
H: 8-12m W: 6-8m



PANDANUS pedunculatus
(Screw Palm)
H: 10-15m W: 6-8m



WATERHOUSEA floribunda
H: 15-20m W: 6-8m

UNDERSTOREY



AUSTROMYRTUS dulcis
(Midyim Berry)



BANKSIA 'Coastal Cushion'



BAECKEA virgata
'Compacta'



BANKSIA robur
(Swamp Banksia)



CAREX appressa



CARPOBROTUS glaucescens



CASURINA 'Cousin It'



CALLISTEMON 'Lil John'



CRINUM pedunculatum
(River Lily)



DORYANTHES excelsa
(Gynea Lily)



DORYANTHES palmeri



GREVILLEA 'Bronze
Rambler'



GREVILLEA 'Robyn Gordon'



LEPTOSPERMUM fl. vascens
'Pacific Beauty'



LEPTOSPERMUM
polygalifolium



LOMANDRA hystrix



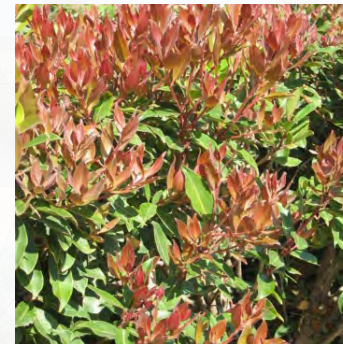
LOMANDRA longifolia



MELALEUCA 'Claret Tops'



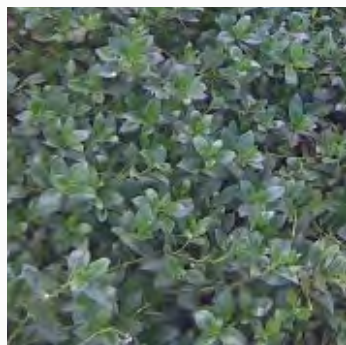
MELALEUCA thymifolia



METROSIDEROS 'Fiji Fire'



METROSIDEROS 'Lil John
Dugald'



MYOPORUM ellipticum



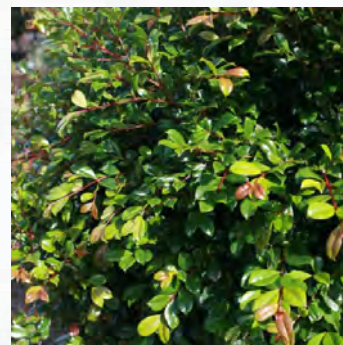
MYOPORUM parvifolium
(Creeping Boobialla)



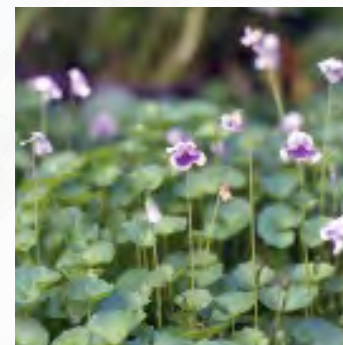
SCAEVOLA calendulacea



SYZYGIUM australe
'Bush Christmas'



SYZYGIUM australe
'Resilience'



VIOLA hederacea



WESTRINGIA 'Jervis Gem'

Attachment 4

**Council Correspondence dated
28 June 2019 & 7 February 2020**

Ballina Shire Council

enquiries refer
Peter Drew
in reply please quote
19/46386



28 June 2019

Mr Damian Chapelle
Newton Denny Chapelle

By email - dchapelle@newtondennychapelle.com.au

Dear Damian

Re: Modification 7 - Epiq Lennox (Pacific Pines Estate), Lennox Head Major Project Approval 07_0026 MOD 7

I refer to your letter dated 23 May 2019 in response to matters raised in Council's submission to NSW Planning and Environment on proposed modification 6 to Major Project Approval 07_0026 MOD 7 at EPIQ Lennox.

As indicated in our submission to NSW Planning and Environment, it is Council's preference for the subdivision layout to incorporate a perimeter road between Super Lot 5 and the conservation management zone. Notwithstanding this, it is accepted that reasonable environmental outcomes can still be achieved through your proposed subdivision design.

The information provided generally addresses Council's previous concerns in relation to this proposed modification. Accordingly, Council raises no objection to this modification as depicted in Plan of Drainage Works (Drawing No. 14351-S5-SK-DR-01 Rev B – dated 28.03.19) prepared by Newton Denny Chapelle, subject to suitable conditions being imposed by the Department of Planning and Environment and the following design changes being made prior to the issue of any approval.

- The proposed gravel access track around the southern and eastern perimeter of Super Lot 5 being increased to 3m in width with an additional 0.5m clearance on each side to facilitate access for maintenance vehicles.
- Provision of a central island in Montwood Drive to prevent right turn movements and restrict access to left in / left out only.

Subject to the above design changes and suitable conditions being imposed by the Department of Planning and Environment, Council does not object to the proposed modification.

Detailed assessment of subsequent Construction Certificates(s) for the proposed subdivision and development application(s) for the 'proposed small lot integrated housing' development will be undertaken by Council at a later stage. Given that there is intention to adjust the approach to the management of the conservation area adjoining Super Lot 5, I note the housing applications will need to be considered having regard for the circumstances associated with the conservation area that are applicable at the time.

If you have any enquiries in regard to this matter please contact Peter Drew on telephone 6686 1254.

Yours faithfully

Matthew Wood
Director
Planning and Environmental Health Division

enquiries refer
Peter Drew
in reply please quote
19/99845



7 February 2020

Mr Damian Chapelle
Newton Denny Chapelle

By email - dchapelle@newtondennychapelle.com.au

Dear Damian

Re: Modification 7 - EPIQ Lennox (Pacific Pines Estate), Lennox Head Major Project Approval 07_0026 MOD 7

I refer to your letter dated 27 November 2019 inviting Council to comment on the Department of Planning, Industry and Environment letter dated 23 October 2019 on proposed modification 6 to Major Project Approval 07_0026 MOD 6 at EPIQ Lennox. I apologise for the delay in Council's response.

As you are aware, Council has raised various issues for consideration and address in relation to the development proposed under Modification 7, including matters relating to the interface between residential development and the conservation area adjoining super lot 5.

With respect to the address of the various issues raised, and notwithstanding some differences in view about preferred outcomes, Council's correspondence dated 28 June 2019 recognised that reasonable environmental outcomes can be achieved through the proposed subdivision design. In that correspondence, Council did not raise objection to the proposed modification (subject to application of appropriate conditions and address to design parameters for the gravel access track and Montwood Drive).

Council confirms that its view remains as expressed in the 28 June 2019 with the information previously provided by Newton Denny Chapelle on 23 May 2019 generally addressing the original concerns raised by Council in relation to this proposed modification.

Noting the matters raised by the Department in relation to Montwood Drive and the capacity of the road network, the following additional comments are provided:

- Having the lots address Montwood Drive in terms of urban design is considered to be a good urban design outcome. However, provision of vehicular access from lots to Montwood Drive is not supported by Council. Montwood Drive is the primary southern connector road for the whole Pacific Pines/Epiq development and its efficiency for traffic carrying capacity purposes is a primary concern. In this regard, approval of vehicular access onto Montwood Drive in this location would compromise the traffic efficiency of Montwood Drive and is therefore opposed.

- With respect to the broader road network, Council is currently undertaking works to extend Hutley Drive North to join with Byron Bay Road. These works are fully funded in Council's budget and are programmed to be completed in April 2020. Based on the traffic assessment undertaken in relation to the Epiq development and Council's analysis of the road network, Council is satisfied that once the above works are completed, there will be sufficient capacity in the road network to accommodate both the density increase proposed as part of this modification and MOD 6 (which is also currently under assessment) and all other development approved as part of the Pacific Pines/Epiq/MP 07_0026 development.

Thank you for your correspondence inviting comment and feedback from Council.

If you have any enquiries in regard to this matter please contact Peter Drew on 6686 1254.

Yours faithfully

A handwritten signature in dark ink that reads "Matthew Wood". The signature is written in a cursive, flowing style.

Matthew Wood
Director
Planning and Environmental Health Division



Attachment 5

**GeoLINK Ecological Advice &
NDC Freshwater Mapping**

20 May 2020
Ref No.: 1675-1590

The General Manager
Ballina Shire Council
PO Box 450
BALLINA NSW 2478

Attention: Ms Michelle Niles

Dear Ms Niles

Re: Epiq Lennox MP 07_0026 MOD 7 Super Lot 5

In regard to comments by Ballina Shire Council (BSC) and the Office of Environment and Heritage (OEH) now Department of Planning, Infrastructure and Environment (DPIE) on Modification 7 for Major Project Approval 07_0026, I provide the following information with regard to potential biodiversity impacts.

BSC (letter of 9 November 2018)

1 Perimeter Road (council access and maintenance)

It is acknowledged that the proposed layout does not include a 20 m buffer and therefore does not comply with the requirements of the approved Environmental Management Plan (EMP) and Condition B10 of the Concept Approval. Section 6.1.1 of the EMP states that a 20 m buffer be applied to retained areas of freshwater wetland within the Conservation Zone, not a 20 m buffer to the entire Conservation Zone. Mapping of the freshwater wetland was last undertaken in April 2020 and is provided in **Attachment 1**, with comparison to 2008 mapping.

The intent of any buffer is to minimise negative impacts upon sensitive receiving areas. In this case, protection of the Freshwater Wetland EEC within the Conservation Zone which also contains threatened Square-stemmed Spike-rush (SSSR) and Hairy Joint Grass (HJG) is required.

A proposed track within a 5 m buffer plus a 5 m no build zone has been incorporated into the current design. The 5 m buffer will comprise a 3 m wide access track and 2 m wide vegetated strip. The proposed track would have less nutrient runoff and less suspended solids than a perimeter road.

The proposed track satisfies many of the requirements of a perimeter road such as:

- provides access,
- minimises private property adjoining the conservation zone and the potential to extend residential footprints,
- reduces potential for garden escapees,
- reduces illegal dumping of rubbish and green waste.

2 Outstanding Restoration Works and Bushfire Assessment

If approval from Commonwealth Department of Agriculture, Water and the Environment (DAWE) is obtained for additional infill plantings within the conservation zone, the bushfire assessment report concludes that APZs can still be achieved.

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www.geolink.net.au



3 Mosquito Risk

As indicated above, if approval from DAWE is obtained for additional infill plantings within the conservation zone, areas of proposed revegetation can be modified to ensure that these are set back from the proposed development to satisfy mosquito requirements.

4 Potential impacts of filling on the Hydrology of the Conservation Zone

The Revised Stormwater Assessment & Management Plan, Pacific Pines Estate, prepared by Gilbert and Sutherland, (July 2014) was approved by BSC on 6th August 2014. This Plan outlines the philosophy for stormwater management across the greater Epiq Estate. The majority of stormwater generated by the development is to be discharged to the Water Quality Control Pond which is located to the west of Montwood Drive. Water generated by the development to the east of Montwood Drive is to be discharged to the conservation zone from which it passes through the existing box culverts installed under Montwood Drive.

All previous stages of the Epiq Estate have been designed and constructed generally in accordance with this Plan. It is noted that several gross pollutant traps (GPT's) in addition to those identified in the Plan, have been installed as part of previous stages. These devices will improve the quality of the water entering the conservation zone.

The proposed SL5 development has been redesigned to provide an access track around the perimeter of the site. This track will be constructed 3 m wide in accordance with BSC standards and serve the dual purpose of a drain. The water from the proposed stormwater outlets will be collected to the natural flow path identified by in Plate 2 of Council's correspondence. The proposed combined path/drain will convey the flows and be located close to bed level in this location. Energy dissipaters/ rock protection will be used to slow the flows prior to their entry into the conservation zone.

OEH (letter of 7 November 2018)

In regard to OEH's comments on Modification 7 for Major Project Approval 07_0026, I provide the following information:

1 Impacts on Conservation Zone Management

OEH Recommendation 1

As indicated above, the project team have discussed revising the proposed layout of Super Lot 5 and propose to include an access track to separate residential lots from the conservation zone instead of a perimeter road. The access track will satisfy OEH concerns regarding access to the conservation zone for fire fighting as well as personnel/ contractors responsible for implementing weed control, revegetation and rehabilitation. Access is also available from the southern and western sides of the conservation zone.

2 Indirect Impacts on Biodiversity

OEH states that potential indirect biodiversity impacts not considered in the ecological assessment report may arise from the following sources:

- a) Elevated nutrient and pollution levels derived from uncontrolled and untreated stormwater runoff from the backyards of 33 proposed residential lots adjoining and draining directly into the conservation zone;*

Higher nutrient and pollution levels are likely per square metre from an impermeable perimeter road than from private backyards. As indicated above however, a narrower access track with vegetated strip is now proposed which will satisfy this concern.

- b) Weed infestations caused or exacerbated by future potential unlawful dumping of garden waste generated in the backyards of 33 residential lots proposed to adjoin the conservation zone;*

The proposed access track will negate this concern. Education and signage should also be encouraged.

- c) *Gradual informal expansion and encroachment of residential backyards (eg. manicured lawns) of proposed adjoining residential into the conservation zone; and*

The proposed access track will negate this concern. Furthermore, the 5 m buffer area will include an access track and vegetated strip plus a retaining wall which will physically prevent extension of privately manicured lawns.

- d) *Proliferation of informal walking paths emanating from the backyards of proposed adjoining residential lots into the conservation zone.*

The proposed access track will negate this concern. Furthermore, the 5 m buffer area will include an access track and vegetated strip plus a retaining wall which will physically prevent informal walking paths emanating from private backyards.

OEH Recommendation 2

Recommendation 1 has not been fully adopted therefore the above information is provided to address indirect impacts of the proposed modification.

If the approach is supported, the ecological assessment can be updated to include five-part tests in accordance with section 7.3 of the *Biodiversity Conservation Act 2016* for HJG, SSSR, Swamp Oak Floodplain Forest and Freshwater Wetland EEC.

3 Stormwater Impacts on Management of Threatened Entities

OEH Recommendation 3

The proposed stormwater management design is in accordance with the approved masterplan for the site. Stormwater runoff is treated within the Water Quality Control Pond.

Should you require any further information about this matter, please feel free to contact me.

Yours sincerely

GeoLINK



Veronica Silver

Senior Ecologist/ Planner/ BPAD Accredited (No. 16289)

Copy to: Clarence Property/ Newton Denny Chapelle



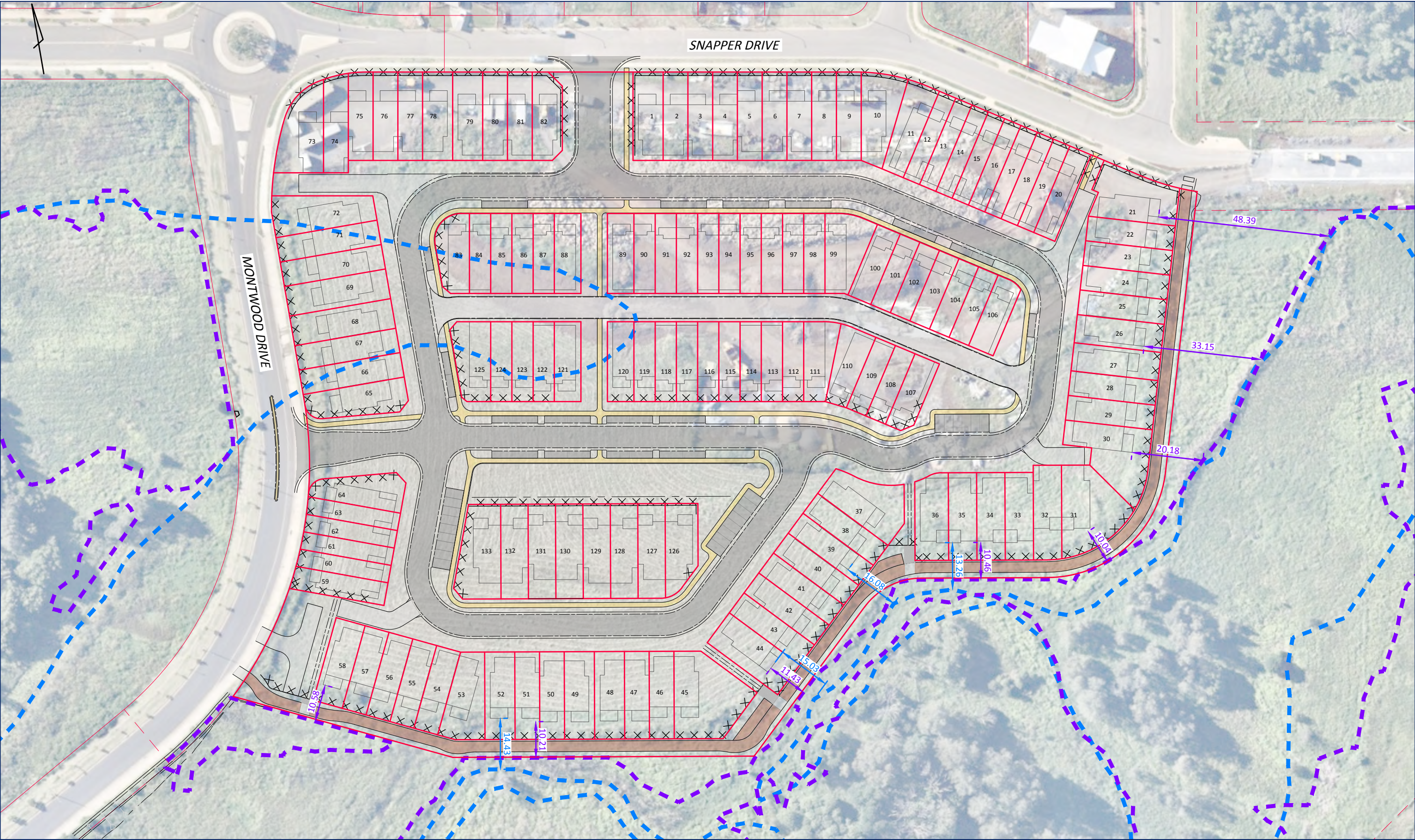
LEGEND

- | | |
|--|--|
| The site | Freshwater Wetland EEC 2020 |
| Conservation Zone | Freshwater Wetland EEC 2008 |

0 140 Metres



Freshwater Wetland EEC 2008 and 2020



REV	DATE	DESCRIPTION
A	27.05.20	FOR INFORMATION
B	30.06.20	UPDATED LAYOUT

SOURCE PLAN: <https://www.nearmap.com>
CAD File Name: K:\Jobs\2014\14351 - Clarence Property\Super Lot 5\Engineering\Drawings\14351-S5-DA-EV-01.dwg

LEGEND:

- FRESHWATER WETLAND EEC - 2008
- FRESHWATER WETLAND EEC - 2020



NDC
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**EPIQ ESTATE - SUPER LOT 5
WETLAND MAPPING**

CLIENT: CLARENCE PROPERTY
LOCATION: SUPER LOT 5
CNR SNAPPER DRIVE & MONTWOOD AVENUE
LENNOX HEAD

DATE: 27.05.2020
SCALE: 1:1000 @ A3

DRAWN: D. YOUNG
REF: 14351-S5-DA-EV-01

© C O P Y R I G H T
© N E W T O N D E N N Y C H A P E L L E

Attachment 6

Bushfire Assessment Report

Bushfire Certifiers

BUSH FIRE ASSESSMENT REPORT

Lot 5 DP 1239938

Montwood Drive Lennox Head

Proposed 145-lot residential use and concept

Prepared for: Clarence Property Corporation Limited

Prepared by:

Peter Thornton

BPAD-L3 ACCREDITED PRACTITIONER

Date: 16 August 2018 amended

Ref: 18/273

BCA Check Pty Ltd
t/as Bushfire Certifiers
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Building Surveyor MAIBS



DOCUMENT CONTROL

Revision No.	Date	Description	Prepared	Checked	Authorised
A	16.08.2018	Final	Peter Thornton	SJT	Peter Thornton
B	30.03.2019	Draft amendment	Peter Thornton	SJT	Peter Thornton
C	12.04.2019	Amended Final	Peter Thornton	SJT	Peter Thornton

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1.0 EXECUTIVE SUMMARY

This report has been prepared for the proposed 145-lot residential subdivision known as Epiq Super Lot 5 (Stage 1B) at Lot 5 DP 1239938, Montwood Drive Lennox Head against the requirements of Planning for Bushfire Protection, 2006 (PBP2006).

Whilst, the subject allotment is not mapped as being bushfire prone, the revegetation of the conservation land to the south and southeast of the proposed subdivision has been taken into consideration in the bushfire threat assessment as potentially being a bushfire hazard.

The bushfire report dated 16th August 2018 has been amended to address the following –

1. NSW RFS request for further information dated 12th November 2018.
2. Identifying the proposed 5m accessway and associated shoulders as not being a bushfire hazard and included in the separation distance to the indicative building locations being 5m from the rear boundary for the lots on the bushfire hazard interface.
3. An amended assessment relating to the proposed remnant rainforest re-vegetation in the area in the northwest corner of the reserve as shown in the plan prepared by Geolink (see Figure 9).

The report provides further details of the bushfire design brief prepared by this office dated 15th August 2016 with concurrence received from Alan Bawden NSW RFS on 13th October 2016 in relation to the vegetation classification, removal of perimeter road and s4.1.3(1) PBP2006 requirements.

The concept plan provided identifies a nominal 10m distance to the bushfire hazard from the rear building line setback. In this regard the report demonstrates compliance with Table A2.5 PBP2006.

The 10m setback to the bushfire hazard consists of a 5m asset protection zone within the subject property boundaries with the rear boundaries adjusted to provide a 5m wide access way for Ballina Shire Council consisting of a concrete access path and managed shoulders as shown in Figure 3 (larger image in appendix). This 5m width of pathway and shoulders is not considered to be a bushfire hazard for the purposes of an assessment pursuant to PBP2006.

The following table is provided as a summary of the recommendations and method of assessment for each consideration relating to Planning for Bushfire Protection 2006.

MEASURE	RECOMMENDATION	METHOD OF ASSESSMENT
APZ Required	Each allotment is to be maintained as an inner protection area (IPA).	Acceptable Solution
Water Supply	Street hydrants are to comply with s4.1.3 PBP2006.	Acceptable Solution
Electricity Supply	New electricity supply to be in accordance with s4.1.3 PBP2006.	Acceptable Solution
Gas Supply	Gas supply to comply with PBP2006.	Acceptable Solution
Construction Standards	Future dwellings are capable of being sited to receive <29kW/m ² & are to be assessed in accordance with s4.15 or s100B for subdivision.	Acceptable Solution
Landscape	Landscaping is to comply with Appendix 5 of PBP2006.	Acceptable Solution
Access	See performance solution. Consent consideration to s142 Local Government Regulation.	Performance Solution

The report makes the following summary of recommendations for the development.

1. Any future dwellings on the proposed lots are to be assessed in accordance with s4.15 of the Environmental Planning and Assessment Act 1979 or s100B of the Rural Fires Act 1997 for subdivision.
2. At the commencement of works and in perpetuity each allotment is to be managed and maintained as an Asset Protection Zone (APZ) to prevent the spread of a fire towards the buildings in accordance with the requirements of Standards for Asset Protection Zones (RFS 2005) (see Appendix C).
3. Water, electricity and gas services shall comply with s4.1.3 of Planning for Bushfire Protection 2006.
4. Landscaping is to be undertaken in accordance Appendix 5 of Planning for Bushfire Protection 2006 and managed and maintained in perpetuity.

2.0 INTRODUCTION

2.1 GENERAL

The purpose of this report is to establish suitable measures to provide bushfire mitigation measures in order for Council to make determination of the proposed 145-lot residential subdivision known as Epiq Super Lot 5 (Stage 1B) at Lot 5 DP 1239938, Montwood Drive Lennox Head against the requirements of Planning for Bushfire Protection, 2006.

Whilst the subject allotment is not mapped as being bushfire prone, the revegetation of the conservation land to the south and southeast of the proposed subdivision has been taken into consideration in the bushfire threat assessment as potentially being a bushfire hazard.

2.2 SIGNIFICANT ENVIRONMENTAL FEATURES

An assessment is to be undertaken, if applicable, with regard to:

- State Environmental Planning Policy No. 44 (Koala Habitat Protection)
- Biodiversity Conservation Act 2016 (NSW)
- Local Land Services Act 2013 (NSW)
- Land Management (Native Vegetation) Code 2017 (NSW)
- National Parks and Wildlife Act 1974 (NSW)
- Environmental Protection and Biodiversity Conservation Act 1999 (Cwlth).

This report does not consider the above legislation and in this regard this report should be read in conjunction with the Statement of Environmental Effects submitted with the application to the consent authority.

2.3 REPORT DETAILS

Report Reference No.:	18/273
Property Address:	Lot 5 DP 1239938, Montwood Drive Lennox Head
Client:	Clarence Property Corporation Limited
Local Government Area:	Ballina Shire Council
Proposal:	145-lot residential subdivision
Drawings:	TVS Architects, Site plan Dwg. No.5551.1S.02.0 dated 03.08.2018
Report Prepared By:	Peter Thornton MFireSafeEng Building Surveyor (MAIBS) BPAD – L3 Accredited Practitioner

3.0 PROPOSED DEVELOPMENT

The applicant is proposing a 145-lot residential subdivision known as Epiq Super Lot 5 (Stage 1B) at Lot 5 DP 1239938, Montwood Drive Lennox Head with no Special Fire Protection Purpose (SFPP) development proposed.

The subdivision will include public roads that will be constructed to Ballina Shire Council construction design requirements.

The proposed modification will seek to undertake amendments to the Concept Approval (MP 07_0026). The key changes proposed for the approved development:

- *Amending the development concept for Super Lot 5 from 'retirement community' to 'small lot integrated housing';*
- *Establishing detailed design guidelines for the proposed subdivision and development of Super Lot 5 to supersede the current retirement community design guidelines; and*
- *Amending the lot layout and road network to respond to the revised proposal.*

These matters are described in more detail below.

3.1.1 Modify Super Lot 5 to Provide Small Lot Integrated Housing

The proposal seeks to subdivide and develop Super Lot 5 to provide small lot integrated housing on torrens title allotments, rather than seniors or retirement living. The rationale for the change relates to the following:

- a. Since the time of the original approval, two large seniors living developments have been approved in the Ballina / Lennox Head area – Palm Lakes Resort at North Creek Road Ballina (partly occupied and under construction) and GemLife Lennox Head at Skennars Head Road (to be constructed). These facilities provide a range of 'resort style' selfcare seniors living units and supplement the current supply of 'standard' selfcare accommodation opportunities provided by St Andrews Village, Crowley Village and the RSL Lifecare. As such, there is limited market demand for further accommodation of this kind at the current time.*
- b. Our clients are aware that there is significant demand for affordable entry level housing options in locations which are readily accessible to services and infrastructure. This is evidenced by the high level of demand for the early subdivision releases within Epiq Lennox.*
- c. Super Lot 5 is ideally located adjacent to shopping and sporting facilities to cater for relatively higher density integrated small lot housing. As such the proposal will cater for all age groups.*

The modified proposal seeks to provide subdivide the subject land into 145 torrens title

allotments with sizes ranging between 123m² to 672m², with a 'typical' area ranging between 125m² to 225m². Internal public roads and pedestrian pathways will be provided in generally a modified grid pattern, whilst on-street parking is also afforded within the public road design.

*It is intended the allotments will be sold on a 'house and land package' basis, with each property constructed with a 2 storey attached or semi-detached dwelling. Four separate unit types are proposed depending on available lot frontage as illustrated within the design package contained within **Attachment 1**.*

The current modification seeks to adopt design guidelines for these dwellings, which will then form the basis of the assessment of future development application/s to Ballina Shire Council. Given the nature of the subdivision, clear design guidelines are considered critical to guide the integrated development of Super Lot 5, including matters such as:

- Car parking;*
- Building design;*
- Site and open space design;*
- Lot size and subdivision;*
- Street design; and*
- Connectivity to neighbourhood retail centre.*

The design guidelines will ensure the desired architectural and operational features of this form of development are embodied into an integrated housing package.



Figure 1: Location of proposed subdivision

Source: NSW Govt Six Maps

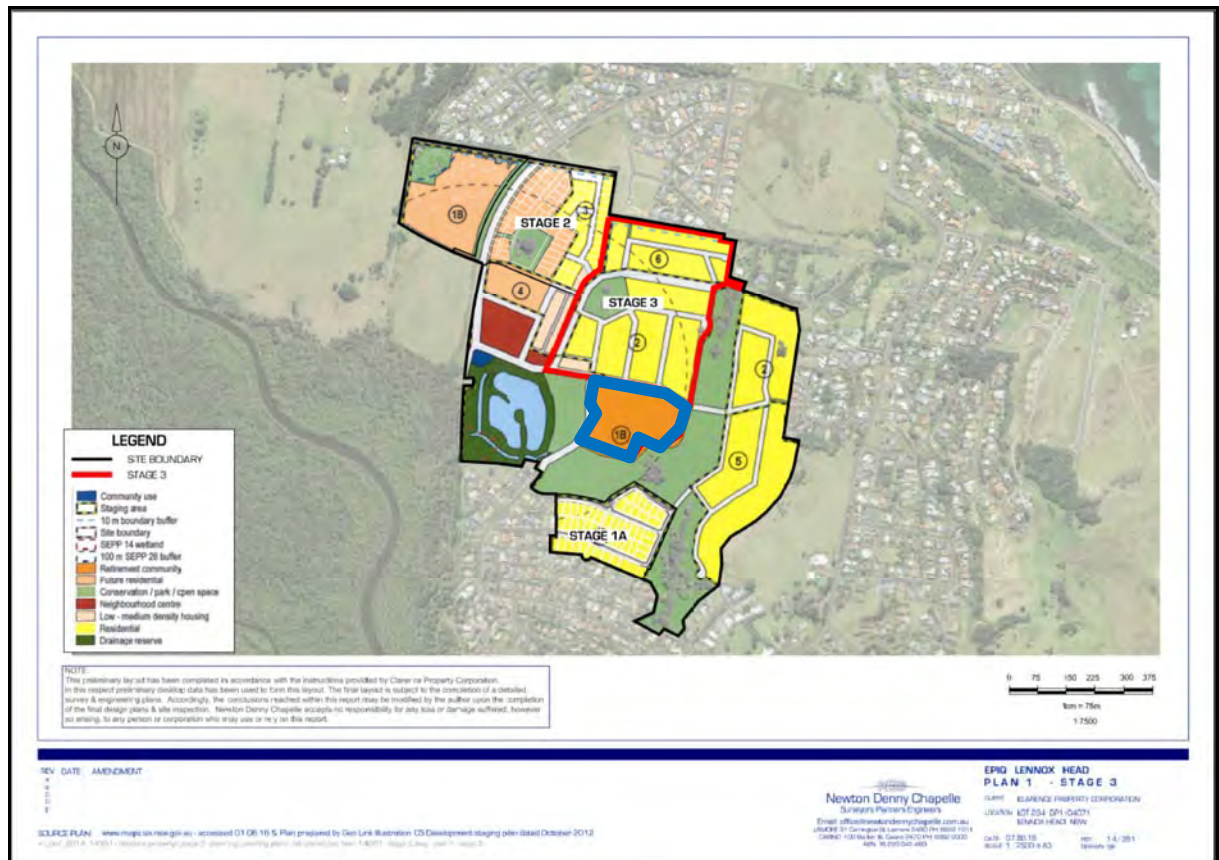


Figure 2: Super Lot 5 (now known as Stage 1B) – Blue outline

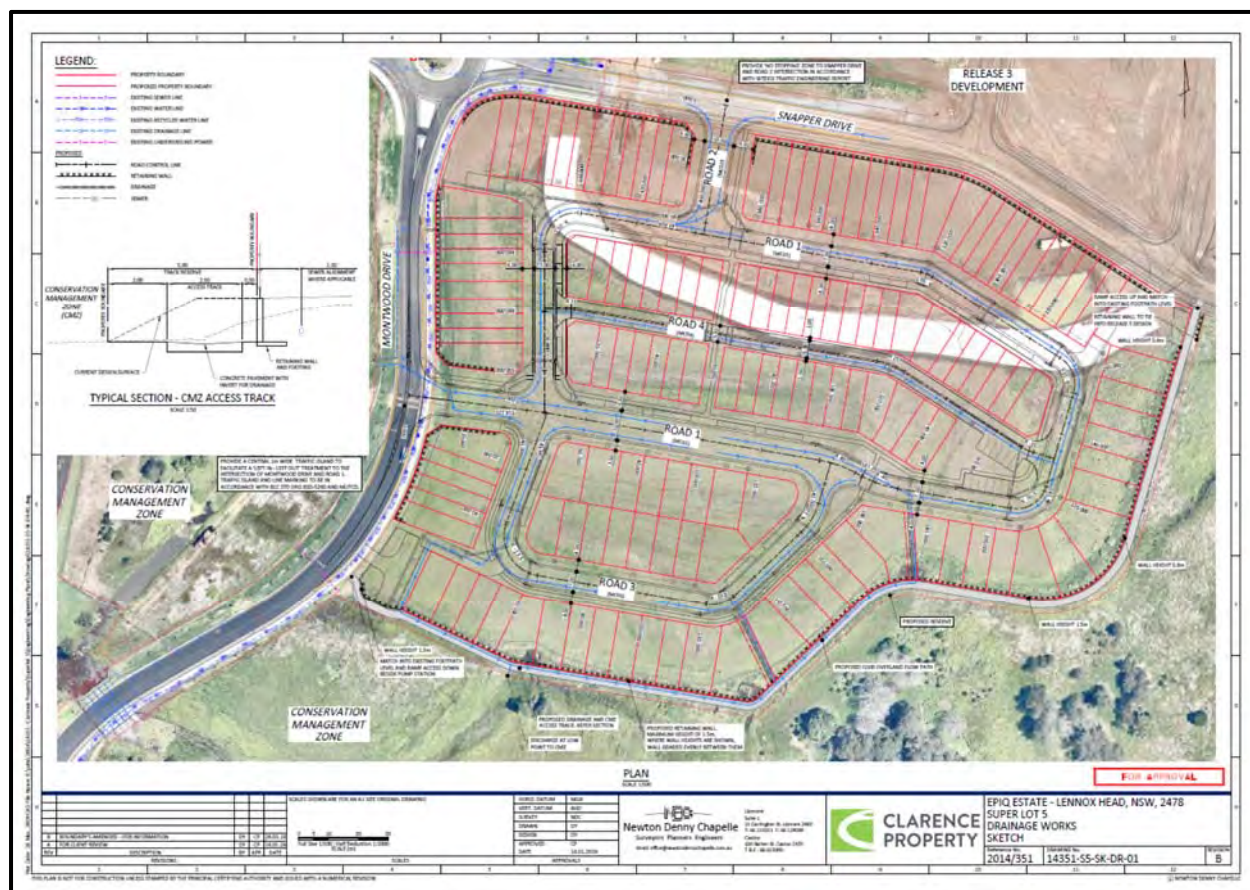


Figure 3: Plan of subdivision of Super Lot 5 (larger image in Appendix A).

4.0 BUSHFIRE THREAT ASSESSMENT

The bushfire mapping shows the proposed development is not located on mapped bushfire prone land (see Figure 4).

Aerial mapping and inspection of the site shows the mapping is accurate however does not take account of revegetation which is considered in this assessment.



Figure 4: Bushfire prone land map with subdivision not on mapped bushfire prone land
Planningportal.nsw.gov.au



Freshwater wetland to the south and southeast.



Remnant vegetation to the southeast



Figure 5: Current aerial image (boundary approximate)

TerraServer, 03.07.2018

An inspection of the subject site was undertaken to establish the hazard classification that will most likely influence the bushfire behaviour. The inspection identified that the proposed conservation area as outlined in the Environmental Management Plan (EMP) prepared by GeoLINK UPR 1675-1132, v10 dated July 2013 identified on site.

The hazard that will impact the Super Lot 5 (stage 1b) will be the revegetation of the conservation land to the south and southeast that requires the management of hairy joint grass, freshwater wetland, rainforest and small patch of swamp forest. The slopes varied from upslope to 0-5° downslope in relation to the proposed development area however it was generally located on flat topography. The area of conservation is identified in the EMP Illustrations 3.2 provided in Attachment 1.

It was noted the Pacific Pines Conservation Zone Management Plan v6 February 2017 establishes the existing regeneration of the swamp sclerophyll forest will be minimal in area in comparison to the littoral rainforest, grassland and freshwater wetland regeneration. In turn, this area of forest and the location amongst the other vegetation classifications will not be the dominant vegetation that will determine the bushfire behaviour at the hazard interface.

For the subdivision of Super Lot 5 it is considered that the proposed freshwater wetland revegetation will influence the bushfire behaviour given the area of forested wetland (existing and proposed) is shown to be approximately 0.4ha and the freshwater wetland is located at the development interface as shown in Figure 6. Confirmation of the vegetation classifications has been received by the consultant ecologist Veronica Silver (Geolink Pty Ltd).

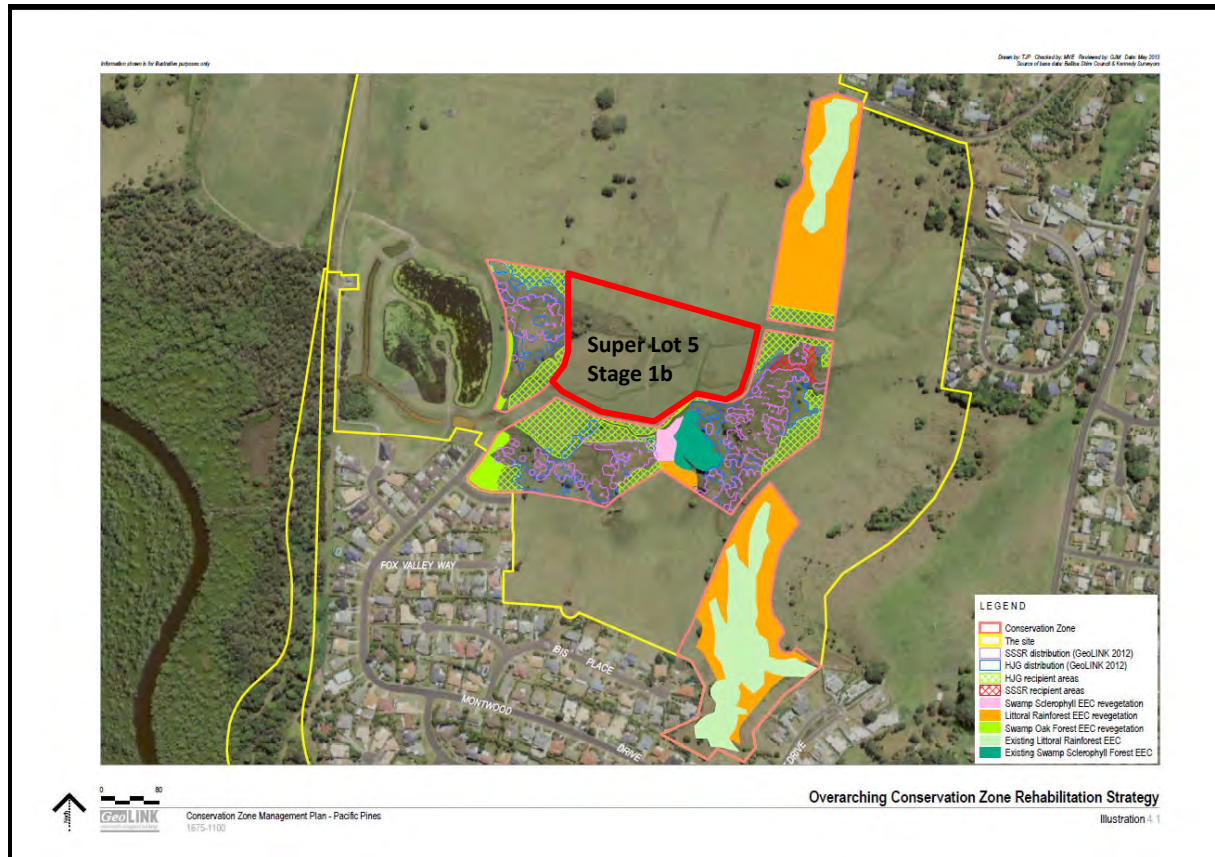


Figure 6: Revegetation plan.

In response to initial NSW RFS advice following consultation with the response was that *"the NSW RFS would require specific detail on the revegetation of the riparian corridor adjoin the residential lots"*. In this regard this office was provided with the Vegetation Monitoring Report prepared by Geolink dated August 2015 with first issue though dated 14th September 2015. The relevant excerpts relating to the forested wetland and the on-going maintenance to ensure it remains treeless in these areas as shown in Figure 7 is provided in Appendix B.

The future development is proposed as residential unit development and is not classified as a retirement village or the like. In turn, Planning for Bushfire Protection 2006 does not classify this type of development as a Special Fire Protection Purpose.

In this regard the asset protection zones (APZs) for this type of development of Super Lot 5, based on the Conservation Zone Management Plan and the dominant area of freshwater wetland will be a minimum 10m pursuant to Table A2.5 of Planning for Bushfire Protection 2006.

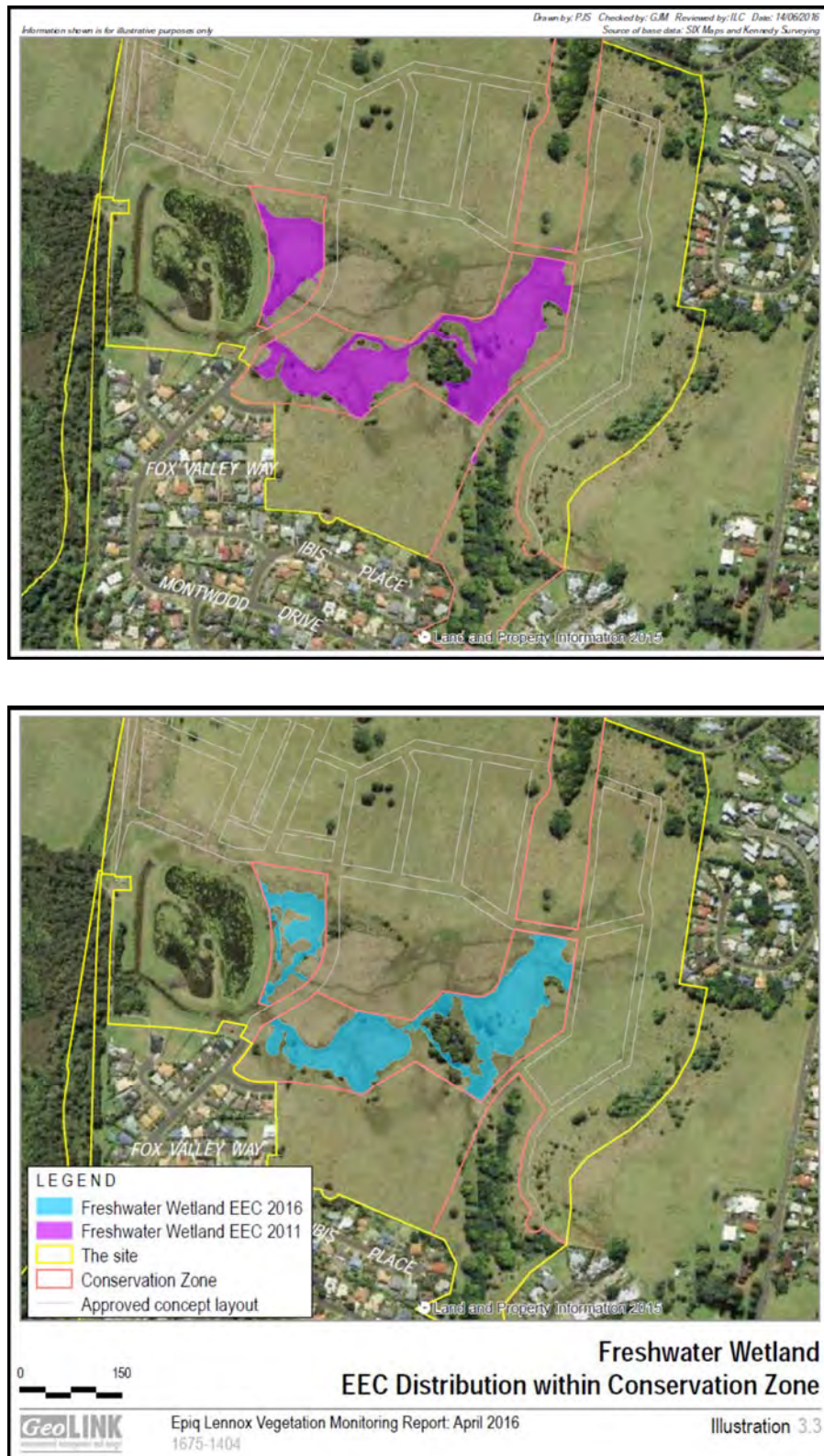


Figure 7: Location of freshwater wetlands

It was noted that the Final EMP prepared by Geolink dated 16/07/2013 s5.4 (see Figure 8) identifies asset protection zones (APZs) for Super Lot 5 that are for Special Fire Protection Purpose developments (except grassland) however this does not relate to the proposed use being subject to this report.

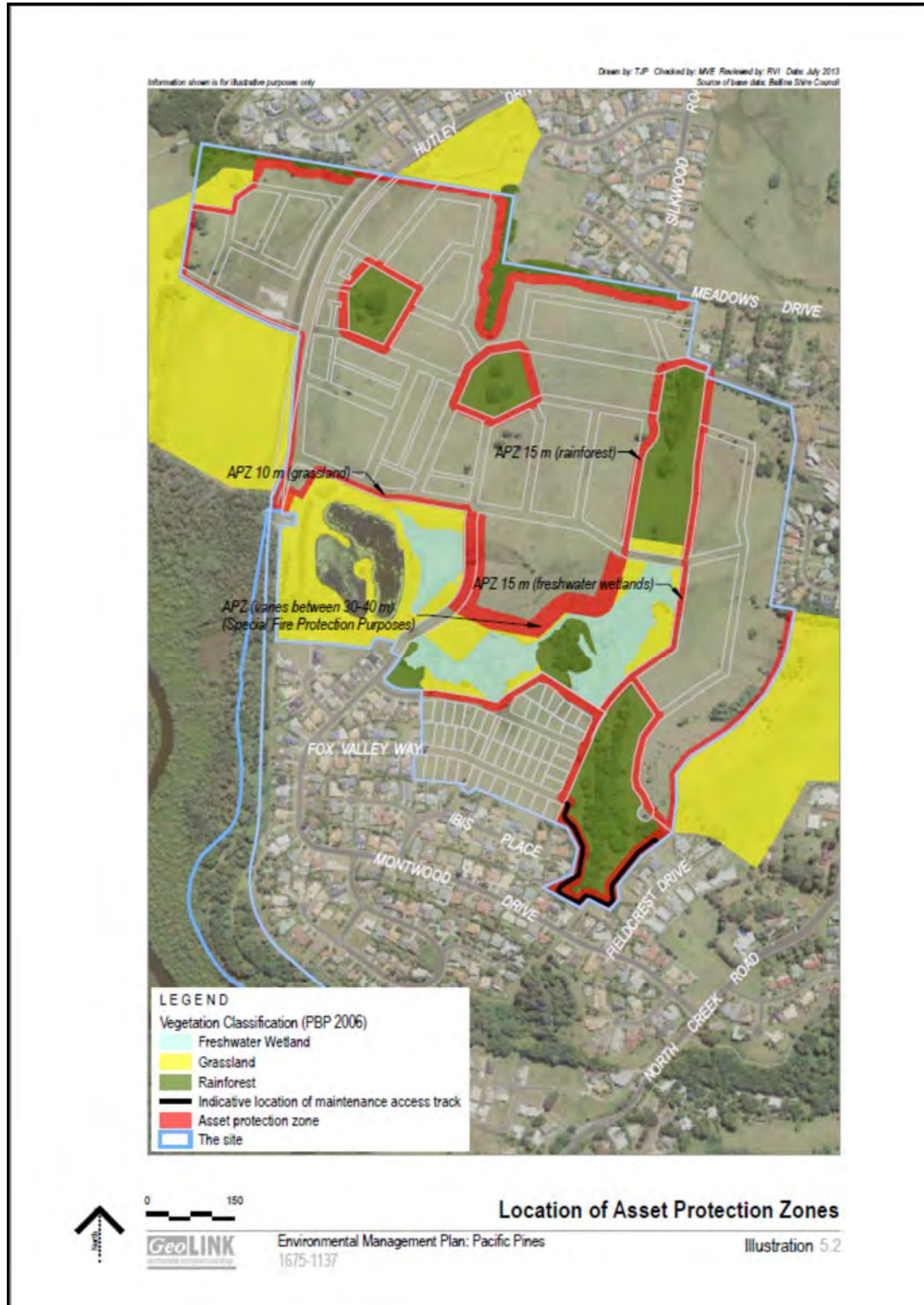


Figure 8: Geolink APZs outlined in the Environmental Management Plan prepared by Geolink dated 16/07/2013 s5.4.

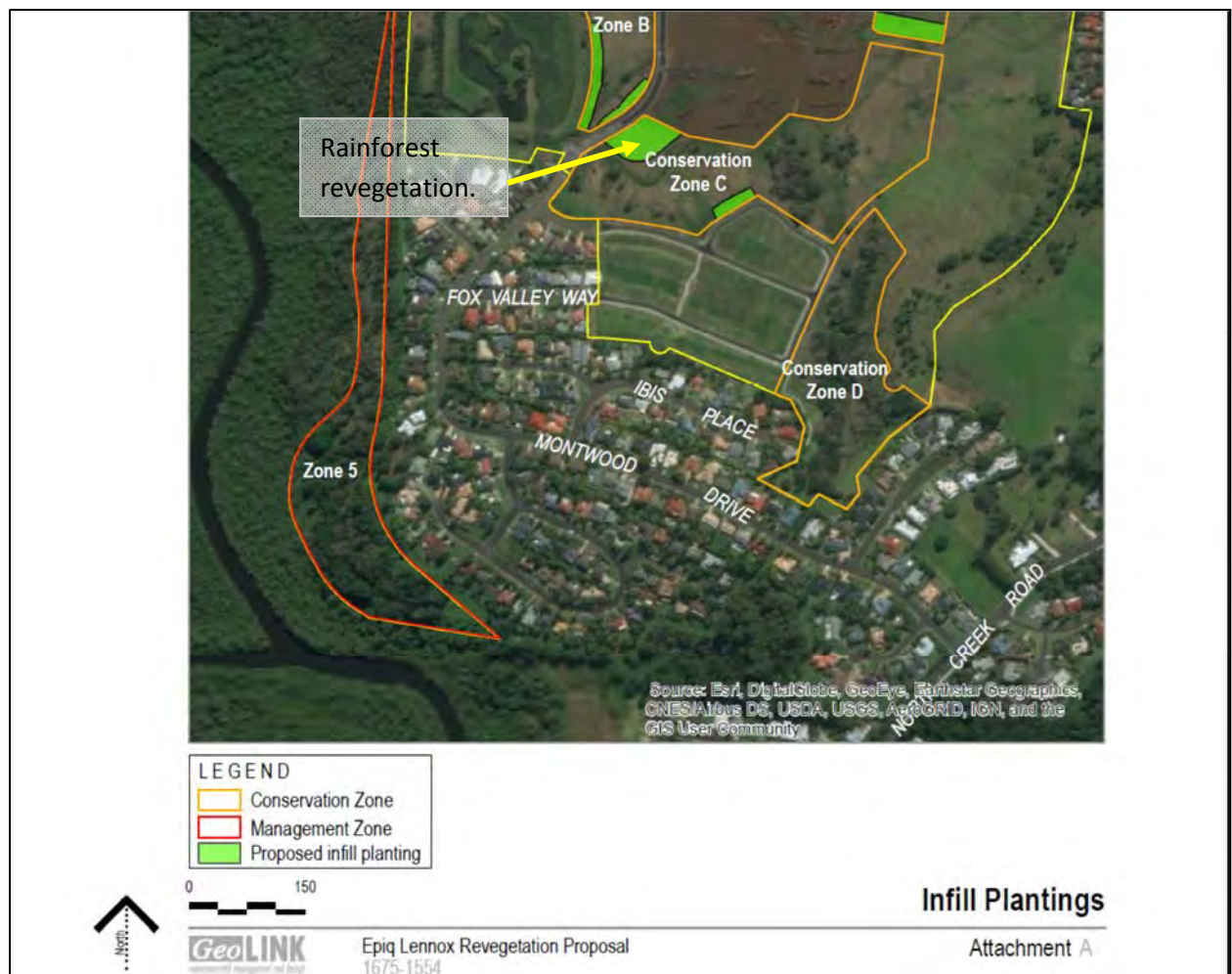


Figure 9 – Latest plan from Geo-link identifying small area to the southwest to be revegetated with rainforest vegetation.

Figure 9 is a plan from Geo-link identifying a small area to the southwest will be revegetated with rainforest vegetation forming part of a vegetation management plan. This is confirmed by Geolink in an email dated 9th April 2019 which advises –

GeoLINK propose to modify the approved Conservation Zone Management Plan to include planting of rainforest species within the north-western corner of the central conservation zone adjacent to super lot 5. The area is currently grassland.

The aim of infill plantings is to establish rainforest in areas that are not suitable as freshwater wetland or threatened Hairy Joint Grass (HJG) habitat to reduce weed control efforts in the long term. Establishing rainforest may also provide surrogate HJG habitat along edges and ecotones.

Previous recommendations (to undertake infill plantings within the conservation zone) have been approved in principle by the client, OEH and Council. However, the Federal Department of Environment and Energy (DoEE) has not yet provided

support for any proposed infill plantings. If DoEE or the NSW Rural Fire Service do not approve of the proposed rainforest planting, this area will remain as grassland.

In this regard the proposed 10m managed land buffer the potential building envelopes will be adequate for compliance with Table A2.5 Planning for Bushfire Protection 2006.

Table 1: Bushfire Threat Assessment

Aspect	Veg. Slope	Dominant Vegetation Formation Class (Table A2.1 PBP2006)
North	n/a	Future subdivision – non-hazard.
East	0°	Freshwater wetland.
South	0°	Freshwater wetland.
Southwest	0°	Freshwater wetland/remnant rainforest
West	0°	Freshwater wetland.

5.0 ASSET PROTECTION ZONES AND CONSTRUCTION STANDARDS

Asset Protection Zones are areas established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard. The asset protection zone incorporates an Inner Protection Area (IPA) having reduced fuel loadings of approximately 3t/ha.

At the commencement of works and in perpetuity each allotment is to be managed and maintained as an Asset Protection Zone (APZ) to prevent the spread of a fire towards the buildings in accordance with the requirements of Standards for Asset Protection Zones (RFS 2005) (see Appendix C). The building line to the boundary adjacent to the conservation area is to be a minimum 10m.

Table 2: Summary Bushfire Threat Assessment

Aspect	Veg. Slope	Vegetation Class	Setback from Hazard	Complies A2.5 PBP2006 and <29kW/m ² received.
North	n/a	n/a	-	Yes
East	0°	Freshwater wetland.	10m	Yes
South	0°	Freshwater wetland.	10m	Yes
Southwest	0°	Freshwater wetland/Grassland	10m	Yes
West	0°	Freshwater wetland.	10m	Yes

6.0 WATER AND UTILITY SERVICES

6.1 WATER SERVICES

The development will be required to have street hydrants to council requirements pursuant to clause 142 Local Government Regulation which will provide adequate coverage and pressure and flows for fire brigade intervention in a bushfire event.

6.2 ELECTRICITY SERVICES

Electricity services shall comply with s4.1.3 of Planning for Bushfire Protection 2006.

6.3 GAS SERVICES

Should a gas service be installed the following aspects will require consideration:

- Reticulated or bottled gas installed and maintained in accordance with AS 1596 with metal piping used.
- Fixed gas cylinders to be kept clear of flammable material by a distance of 10m and shielded on the hazard side of the installation
- Gas cylinders close to the dwelling are to have the release valves directed away from the building and at least 2m from flammable material with connections to and from the gas cylinder being of metal.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to the buildings are not used.

7.0 ACCESS

A bushfire design brief prepared by this office dated 15th August 2016 (amended) with concurrence received from NSW RFS on the 13th October 2016. The following is provided and is consistent with the bushfire design brief.

The applicant is proposing an internal road network that will allow egress away from the bushfire hazard that has mapped the subject property as being designated bushfire prone land. There will be provided a fire hydrant system to AS 2419.1-2005 it being noted that the site is serviced by the NSW Fire Brigade.

Perimeter Roads

As stated in section 4.1.3(1) PBP2006 a perimeter road is the preferred option in subdivision design. The primary purpose of the perimeter road is to;

- Provide fire-fighters with easier access to structures, allowing more efficient use of firefighting resources;

Comment:

There will be access through the subject properties that allow fire fighters easy access to the structures. It is also noted that street hydrants will be provided with compliant coverage and will allow fire fighters to stage any fire-fighting from the street.

- Provide a safe retreat for firefighters;

Comment:

Given the potential street hydrant locations and the short intervals between access points allowing fire hydrant hoses to cover all areas of the structure when staged from the public road.

- Provide a clear control line from which to conduct hazard reduction or back burning operations.

Comment:

Consideration in relation to perimeter roads needs to take the bushfire hazard and risk into account. When the hazard is high in relation to vegetation type i.e. forest, slopes and fire runs then a bushfire will have the potential to have a high level of intensity and rate of spread. In these circumstances it is critical to have perimeter roads to enable firefighters to be able to work adjacent to the hazard in order to create clear control lines to undertaken hazard reduction or back burning operations to minimize the fire intensity at the development interface.

The bushfire hazard potentially impacting the proposed subdivision is not considered to be high risk given it is predominantly freshwater wetland and grassland. These vegetation types and the limited size of the hazard will not have significantly sustained fire fronts and will unlikely require back burning.

Further, the direct fire run backing on to the development is approximately 100-150m in length at the widest points and is disconnected from the primary hazard further to the west. The growth stage through the treed area from a point ignition

will limit the intensity of the bushfire at the development interface. Therefore, the likely need to back burn or undertaken hazard reduction with this size and type of hazard is negligible. It is also noted, although freshwater wetlands can dry out the likelihood of reaching a curing point as outlined in PBP2006 methodology is less than any other vegetation type given the catchment area.

There is a small area (0.4ha) of forested wetland in the central portion of the conservation zone however it is not considered to be the most dominant vegetation to influence bushfire behaviour at the APZ interface. This area is remnant in size, it being noted that remnant APZs are less than that for freshwater wetlands pursuant to Appendix 2 PBP2006

It is noted that the consent authority is required to have consideration to s142 Local Government Regulation for a house fire event and in this regard the required specification for this consideration will allow adequate fire brigade intervention.

It is therefore considered that a perimeter road in the location of Super Lot 5 is not required to meet the objectives of s4.1.3 PBP2006 and the aim of PBP2006 which is to “minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment”.

8.0 LANDSCAPING

The majority of buildings adversely impacted upon in a bushfire event happen through ember attack and in this regard combustible material surrounding the buildings e.g. landscaping, can play a significant part during the event. Adequate management of landscaping is critical to the survivability of an asset and for occupant safety during a bushfire.

It is recommended that landscaping is undertaken in accordance Appendix 5 of Planning for Bushfire Protection 2006 and managed and maintained for the life of the development.

9.0 CONCLUSION

This assessment demonstrates that whilst requirements of Planning for Bushfire Protection 2006 do not apply directly given that the proposed buildings which are not located on bushfire prone land consideration has been given to PBP2006 pursuant to an assessment against s4.15 of the Environmental Planning and Assessment Act 1979.

The recommendations in the executive summary of this report have been provided in consultation with the NSW RFS and are considered to be compliant with the performance criteria of Planning for Bushfire Protection 2006 based on the future hazard as described.

DISCLAIMER

This report was prepared for the purposes and exclusive use of the stated client to accompany an application to Ballina Shire Council for a proposed residential subdivision and is not to be used for any other purpose or by any other person or Corporation. BCA Check Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or Corporation who may use or rely on this report in contravention of the terms of this clause.

Reporting has been based on the relevant Council and Rural Fire Service Guidelines, however, recommendations given in this report are based on our site investigation at the time of reporting. In some cases site conditions may change dramatically within a few years due to rapid vegetation re-growth and invading weed species.

The report has been established to reduce the risk of ignition to the building and to promote occupant safety and this is dependent on the property and structure being maintained in perpetuity to the recommendations in this report and the standards of Planning for Bushfire Protection 2006. It is noted however that the report and the recommendations within cannot and do not propose that the building or occupants will not be adversely impacted upon given that bushfire is a natural phenomenon and cannot fully be predicted as can occupant behavior.

REFERENCES

ABCB, (2016), The Building Code of Australia, *Australian Building Codes Board Canberra*, Volume 2.

NSW Rural Fire Service and Planning NSW (2006), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners*. Rural Fire Service NSW Australia.

Standards Australia, (2009), AS3959 *Construction of buildings in bushfire prone areas*, Australian Standards, Sydney.

LEGISLATION

Environmental Planning and Assessment Act 1979 and Regulations 2000. *New South Wales*. Parliamentary Counsel's Office, NSW Government Information Service.

APPENDIX A: Proposed Subdivision Plans

SNAPPER DRIVE



No.	Unit Type
33	Type A - 5m
63	Type B - 6m
34	Type C - 7m
15	Type D - 8.5m
145	Total
On Street Parking Provided	
45	



Terrace Homes Development
 EPIG - Lennax Florida

LOT AREA TABLE			
Lot No.	Area m ²	Lot No.	Area m ²
1	218.0	51	203.0
2	142.3	52	209.9
3	142.3	53	217.0
4	142.3	54	217.0
5	142.3	55	217.0
6	170.7	56	221.3
7	170.7	57	211.0
8	142.3	58	197.0
9	142.3	59	136.4
10	142.3	60	136.4
11	142.3	61	137.6
12	295.0	62	277.6
13	248.7	63	249.2
14	145.5	64	145.0
15	145.5	65	145.0
16	145.5	66	145.0
17	145.5	67	173.8
18	174.4	68	174.8
19	174.4	69	145.0
20	145.5	70	145.0
21	145.5	71	145.0
22	145.5	72	249.5
23	320.4	73	431.5
24	672.4	74	988.0
25	320.4	75	141.9
26	720.0	76	142.3
27	221.6	77	142.3
28	221.6	78	142.3
29	221.6	79	170.7
30	321.5	80	170.7
31	459.69	81	142.3
32	334.8	82	142.3
33	377.2	83	142.3
34	211.9	84	142.3
35	211.9	85	211.2
36	211.7	86	174.2
37	227.0	87	124.4
38	414.9	88	174.4
39	286.7	89	124.4
40	222.6	90	124.4
41	121.0	91	124.4
42	393.4	92	124.4
43	377.5	93	145.7
44	420.0	94	145.7
45	333.0	95	124.4
46	228.1	96	124.4
47	228.4	97	124.4
48	228.6	98	124.4
49	228.0	99	124.4
50	237.2	100	124.4
		101	124.4
		102	124.4
		103	100.1
		104	160.0
		105	124.4
		106	124.4
		107	124.4
		108	124.4
		109	124.4
		110	203.0
		111	140.2
		112	126.4
		113	181.5
		114	178.9
		115	123.2
		116	123.2
		117	123.2
		118	123.2
		119	123.2
		120	123.2
		121	123.2
		122	144.2
		123	144.2
		124	123.2
		125	123.2
		126	123.2
		127	123.2
		128	123.2
		129	180.0
		130	282.1
		131	209.0
		132	150.3
		133	150.3
		134	150.3
		135	150.3
		136	309.0
		137	320.0
		138	233.7
		139	153.3
		140	153.3
		141	153.3
		142	153.3
		143	163.8
		144	153.3
		145	162.7

NOTE: This preliminary layout has been completed in accordance with the instructions provided by Westlawn Property Trust. In this respect, preliminary platting data has been used to form this layout. The final layout is subject to the completion of a Detailed survey. Subdivision Survey Plans and/or Engineering plans. Accordingly, this plan may be modified by the author upon the completion of the final Survey & EIR inspection. Newton Dining Chapelle accepts no responsibility for any loss or damage suffered, however so arising, to any person or corporation who rely on or rely on this Plan.



1000

SOURCE PLAN: n/a

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APPENDIX B: Excerpts from Vegetation Monitoring Report, dated 14.09.2015

Vegetation Monitoring Report: August 2015

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<i>UPR</i>	<i>Description</i>	<i>Date Issued</i>	<i>Issued By</i>
1675-1387	First issue	14/09/2015	VJS

In addition to this data, the following specific data will be collected for HJG and SSSR (when present):

- Foliage vigour within the quadrat using the following scoring method (1-dead, 2-poor condition/ discoloured, 3-minor discoloration, 4-good condition, 5-excellent condition).
- Photographs of example HJG and SSSR individuals within the quadrat.

2.4 Translocation Areas for HJG and SSSR

Baseline data for translocated areas of HJG/ SSSR will be collected during the peak growth period (February to May) two years after translocation to allow for establishment. All subsequent monitoring of the success of translocation will be based on this baseline cover level measured at this point. Therefore, this data was not collected as part of the current monitoring event.

HJG translocation (seed collection and direct seeding) within the Conservation Zone was undertaken in the period of May to July 2015. SSSR translocation (collection and division of propagules for SSSR translocation) within the Conservation Zone has been undertaken and planting of propagules will be undertaken later in 2015 when propagules have matured and are ready for planting.

Monitoring sites for collection of this baseline data were established randomly in representative translocation areas (refer to **Illustration 2.1**). Monitoring will be conducted along (10 m x 2 m) belt transects, containing 20 x 1 m x 1 m quadrats laid out contiguously, with ten quadrats on either side of a centre line. Data collection will follow the methodology outlined for monitoring of treeless vegetation in **Section 2.2.3**.

2.5 Mapping of HJG and SSSR Distribution and Freshwater Wetlands EEC

Collection of pre-construction baseline data mapping the distribution of HJG and SSSR and the Freshwater EEC boundary within the Conservation Zone was collected in 2011 and not collected for the current monitoring event. The first post-construction mapping of the distribution of HJG, SSSR and the Freshwater Wetland within the Conservation Zone is scheduled to occur in the peak growth season for these species in February to May 2016.

The mapping methodology is as follows:

- HJG and SSSR distribution:
 - Line transects 5 m apart were walked within the Conservation Zone, with all locations of SSSR and HJG marked with a GPS. Where larger areas of HJG and SSSR were encountered, GPS points were taken every 2-3 m to allow for the distribution of occurrences to be identified. A GIS map layer of the distribution of threatened species within the Conservation Zone was generated.
- Freshwater wetlands EEC boundary:
 - Mapping of the boundary of the Freshwater Wetlands EEC within the Conservation Zone was undertaken by on ground tracking of the location of the boundary with a GPS. This was supplemented by aerial photograph interpretation of the area. A GIS map layer of the location of the boundary was generated.

2.6 Weeds

A pre-construction weed audit was undertaken in March 2015 across the site to inform weed control priorities, map infestations and to identify any new infestations of noxious and environmental weeds. This will be conducted prior to construction commencing and then annually thereafter.

In addition to the weed audit data collected, the density of weeds within monitoring quadrats/ transects was also collected to provide more detailed information on weed infestations occurring at the site.

The extent of these weed infestations was recorded with a GPS and a simple map showing the locations of priority weeds was prepared.

2.7 Revegetation Areas

Monitoring data was collected on the state of the revegetation areas in June 2015 to provide information on the current success of the revegetation plantings. Information collected was qualitative and consisted of information such as the health of plants, evidence of damage or death of plants, the need to replace tree guards or mulch, and the degree of weed infestation. This data will feed into maintenance requirements for the revegetation areas, including weed control and replacement plantings.



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Location of Monitoring Quadrats and Transects

Epiq Lennox Vegetation Monitoring Report: August 2015

Illustration



Plate 3.9 Transect 1 – Photo point

3.2.2 Transect 2 – Freshwater Wetlands EEC with HJG/ SSSR

Transect 2 is located at 557077: 6812778 (transect start); 557084: 6812782 (transect end) (GDA 94, Zone 56) (refer to **Illustration 2.1** and **Plate 3.10**) and monitors existing area of Freshwater Wetlands EEC and HJG/ SSSR within the Conservation Zone.

Table 3.31 Transect 2 – Flora Species Cover

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
A	Vasey Grass*	<i>Paspalum urvelli</i>	5	0.4	n/a	n/a
	-	<i>Commelina</i> sp.	5	0.2	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.4	n/a	n/a
	Spotted Knotweed	<i>Persicaria decipiens</i>	10	0.4	n/a	n/a
	Sida*	<i>Sida rhombifolia</i>	5	0.4	n/a	n/a
	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.3	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.1	n/a	n/a
	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	5	1.1	n/a	n/a

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
B	Hairy Joint-grass ^A	<i>Arthraxon hispidus</i>	15	0.4	seeding profusely	3
	a Sedge	<i>Cyperus</i> sp.	5	0.1	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.2	n/a	n/a
	Spotted Knotweed	<i>Persicaria decipiens</i>	5	0.6	n/a	n/a
	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	5	1.2	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.8	n/a	n/a
	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.4	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.4	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.5	n/a	n/a
C	Hairy Joint-grass ^A	<i>Arthraxon hispidus</i>	10	0.3	seeding heavily	4
	Swamp Ricegrass	<i>Leersia hexandra</i>	60	0.4	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.4	n/a	n/a
	-	<i>Fimbristylis</i> sp.	5	0.8	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.5	n/a	n/a
	Spotted Knotweed	<i>Persicaria decipiens</i>	5	0.4	n/a	n/a
	Hairy Joint-grass ^A	<i>Arthraxon hispidus</i>	25	0.4	seeding heavily	4
	-	<i>Commelina</i> sp.	5	0.3	n/a	n/a
D	Colombian Waxweed*	<i>Cuphea carthagenensis</i>	5	0.2	n/a	n/a
	-	<i>Commelina</i> sp.	5	0.3	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.2	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	60	0.6	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.9	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Tropical Chickweed*	<i>Drymaria cordata</i>	5	0.2	n/a	n/a
	-	-	-	-	-	-

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
E	Flax-leaf Fleabane*	<i>Conyza bonariensis</i>	5	0.4	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	35	0.5	seeding heavily	4
	-	<i>Fimbristylis</i> sp.	5	0.4	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.3	n/a	n/a
	Vasey Grass*	<i>Paspalum urvelli</i>	5	0.7	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.6	n/a	n/a
	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	5	1.1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
F	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	10	0.5	seeding	4
	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.3	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Vasey Grass*	<i>Paspalum urvelli</i>	5	0.7	n/a	n/a
	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	10	0.4	seeding heavily	3
	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
	Sow Thistle*	<i>Sonchus oleraceus</i>	5	0.3	n/a	n/a
G	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.6	n/a	n/a
	-	<i>Fimbristylis</i> sp.	5	0.5	n/a	n/a
	Vasey Grass*	<i>Paspalum urvelli</i>	5	0.9	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.5	seeding	4
	Swamp Ricegrass	<i>Leersia hexandra</i>	75	0.5	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	75	0.5	n/a	n/a

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
I	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.9	n/a	n/a
	Flax-leaf Fleabane*	<i>Conyza bonariensis</i>	5	0.7	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.1	n/a	n/a
	Sow Thistle*	<i>Sonchus oleraceus</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.3	seeding	4
	Square-stemmed Spike-rush*	<i>Eleocharis tetraquetra</i>	5 (1 stem)	0.4	seeding	4
	Swamp Foxtail	<i>Leersia hexandra</i>	75	0.5	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	10	0.8	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
J	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.1	n/a	n/a
	Common Spike-rush	<i>Eleocharis equisetina</i>	5	0.3	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.3	seeding	4
	Square-stemmed Spike-rush*	<i>Eleocharis tetraquetra</i>	5	0.4	seeding	4
	Vasey Grass*	<i>Paspalum urvillei</i>	5	1.1	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	75	0.7	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
K	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.1	n/a	n/a
	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
	Common Spike-rush	<i>Eleocharis equisetina</i>	5	0.2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.2	seeding	4
	Swamp Ricegrass	<i>Leersia hexandra</i>	60	0.5	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	10	0.9	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
L	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.4	seeding	4
	Vasey Grass*	<i>Paspalum urvillei</i>	15	1.2	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.5	n/a	n/a
	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.2	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.1	n/a	n/a
	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
M	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	85	0.5	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	10	0.8	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.3	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.3	seeding	4
	Sow Thistle *	<i>Sonchus oleraceus</i>	5	0.2	n/a	n/a
N	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.4	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.2	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Gotu Cola	<i>Centella asiatica</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	15	0.3	seeding heavily	4
O	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.2	n/a	n/a
	-	<i>Erigeron</i> sp.	5	0.4	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.2	n/a	n/a
	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
	-	<i>Commelina</i> sp.	5	0.1	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.8	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	10	0.4	seeding	4

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
P	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	5	1	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.4	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	0.9	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.2	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.2	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	20	0.4	seeding heavily	4
Q	Austral Bracken	<i>Pteridium esculentum</i>	5	0.1	n/a	n/a
	Spotted Knotweed	<i>Persicaria strigosa</i>	5	0.2	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	60	0.5	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	10	1.1	n/a	n/a
	Sida	<i>Sida rhombifolia</i>	5	0.2	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.1	n/a	n/a
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
	a Clover*	<i>Trifolium</i> sp.	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	30	0.4	seeding heavily	4
	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.5	n/a	n/a
R	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	5	1	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.2	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	10	1	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	25	0.4	seeding	4
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Spotted Knotweed	<i>Persicaria decipiens</i>	10	0.5	n/a	n/a
S	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.2	n/a	n/a
	Vasey Grass*	<i>Paspalum urvillei</i>	5	1	n/a	n/a



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Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
	Gotu Cola	<i>Centella asiatica</i>	5	0.1	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	70	0.4	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.1	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	20	0.3	seeding	4
T	Spotted Knotweed	<i>Persicaria decipiens</i>	5	0.4	n/a	n/a
	Swamp Ricegrass	<i>Leersia hexandra</i>	65	0.4	n/a	n/a
	Swamp Foxtail	<i>Pennisetum alopecuroides</i>	10	0.4	n/a	n/a
	Austral Bracken	<i>Pteridium esculentum</i>	5	0.2	n/a	n/a
	Gotu Cola	<i>Centella asiatica</i>	5	0.1	n/a	n/a
	Farmer's Friend*	<i>Bidens pilosa</i>	5	0.1	n/a	n/a
	Vasey Grass*	<i>Paspalum urvelli</i>	5	0.5	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	5	0.3	seeding	4

* Exotic species or invasive native species

* Threatened flora species listed under the TSC Act and/ or the EPBC Act

3.2.2.1 General comments

- Presence of dead plants: nothing of significance.
- Regeneration of HJG and SSSR: refer to **Table 3.31**.
- Degree of weed infestation: (moderate weed infestation – particularly weed grasses).
- Condition/ health of community: this area of vegetation has undergone moderate past disturbance (e.g. cattle grazing) and is currently in medium condition (moderate weed infestation – particularly weed grasses).
- Presence of threatened flora: HJG and SSSR.



Plate 3.10 Transect 2 – Photo point

3.2.3 Transect 3 – Freshwater Wetlands EEC with HJG/ SSSR

Transect 2 is located at 557377: 6812943 (transect start); 557371: 6812953 (transect end) (GDA 94, Zone 56) (refer to **Illustration 2.1** and **Plate 3.11**) and monitors existing area of Freshwater Wetlands EEC and HJG/ SSSR within the Conservation Zone.

Table 3.32 Transect 3 – Flora Species Cover

Quadrat	Common Name	Scientific Name	Cover %	Height (m)	Reproduction	Foliage Vigour (class)
A	Swamp Ricegrass	<i>Leersia hexandra</i>	60	0.3	n/a	n/a
	Vasey Grass*	<i>Paspalum urvelli</i>	15	1.1	n/a	n/a
	Fireweed*	<i>Senecio madagascariensis</i>	5	0.3	n/a	n/a
	a Sedge	<i>Cyperus</i> sp.	5	0.2	n/a	n/a
	Common Spike-rush	<i>Eleocharis equisetina</i>	5	0.2	n/a	n/a
	Hairy Joint-grass*	<i>Arthraxon hispidus</i>	20	0.3	seeding	3
	Swamp Buttercup	<i>Ranunculus undosus</i>	5	0.1	n/a	n/a
B	Vasey Grass*	<i>Paspalum urvelli</i>	10	1	n/a	n/a
	Sow Thistle*	<i>Sonchus oleraceus</i>	5	0.2	n/a	n/a

APPENDIX C: Standards for Asset Protection Zones (RFS 2005)

for asset protection zones

protection

NSW RURAL FIRE SERVICE



STANDARDS FOR ASSET PROTECTION ZONES

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INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

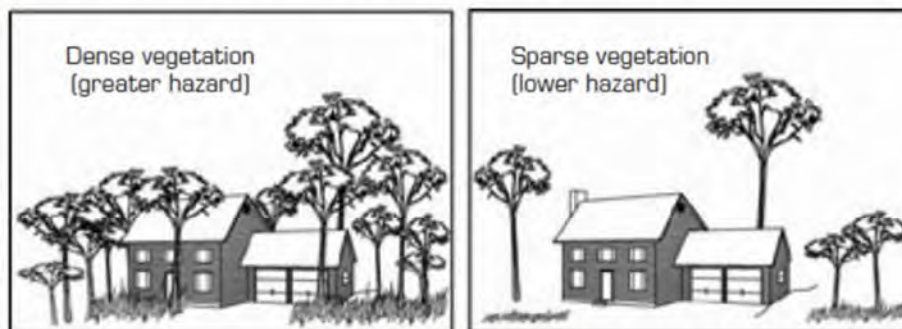
STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

Subdivided land or construction of a new dwelling

If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

Existing asset

If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

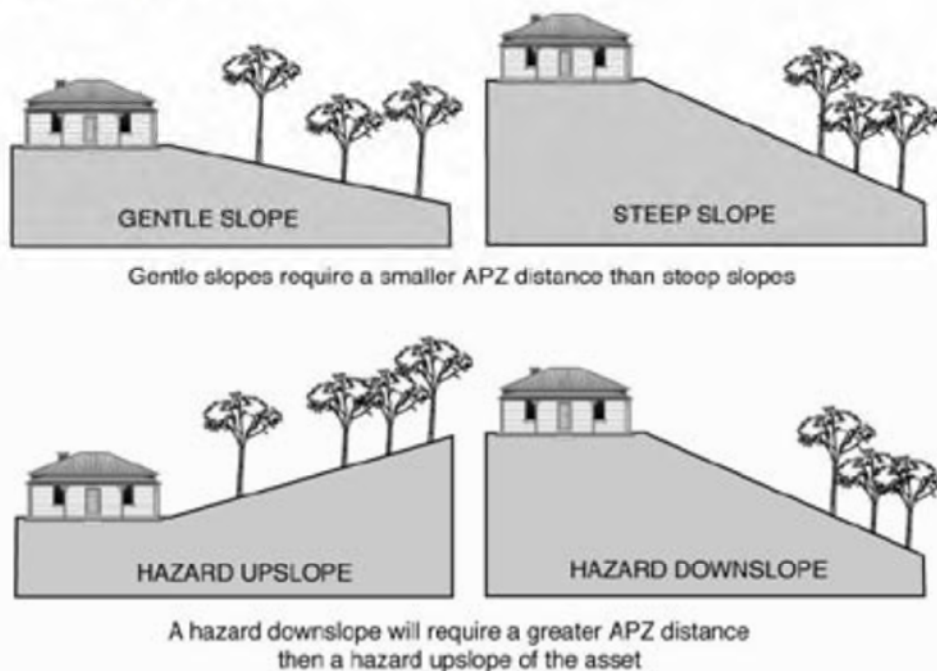
If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.

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Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

Subdivided land or construction of a new dwelling

If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

Existing asset

If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

Fuels can be controlled by:

1. raking or manual removal of fine fuels

Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

2. mowing or grazing of grass

Grass needs to be kept short and, where possible, green.

3. removal or pruning of trees, shrubs and understorey

The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

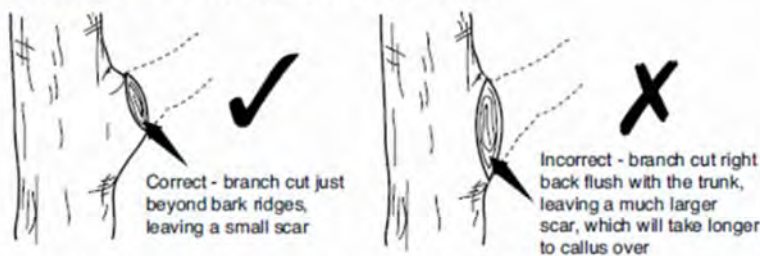
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at www.agric.nsw.gov.au/noxweed/;
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3. Remove or thin understorey plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in accordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



There are three primary methods of pruning trees in APZs:

1. Crown lifting (skirting)

Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

2. Thinning

Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

3. Selective pruning

Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees)* for more information on tree pruning.

4. Slashing and trittering

Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

5. Ploughing and grading

Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

6. Burning (hazard reduction burning)

Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning*, or contact your local RFS for advice.

7. Burning (pile burning)

In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

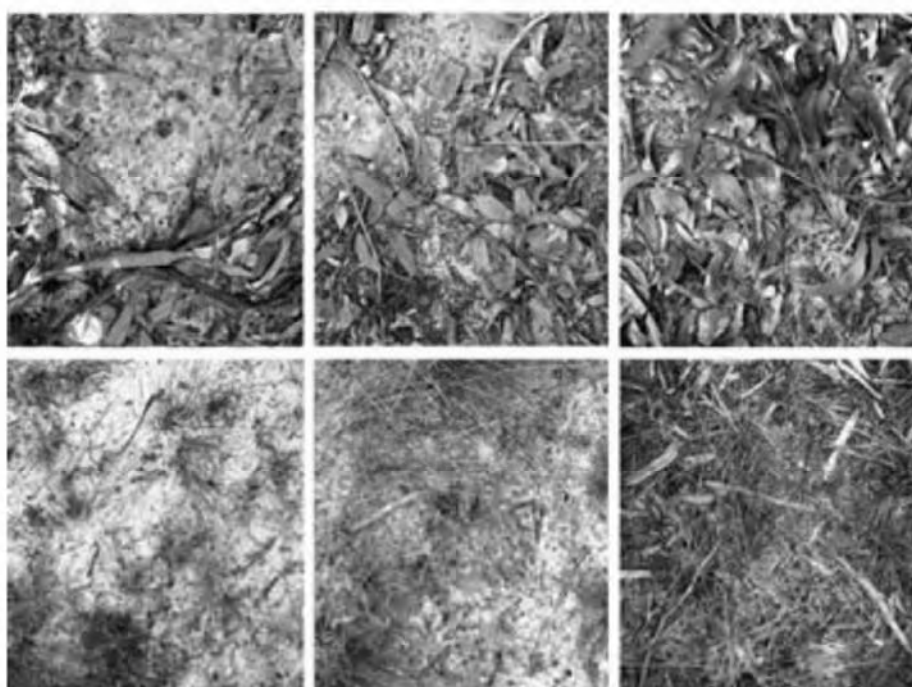
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



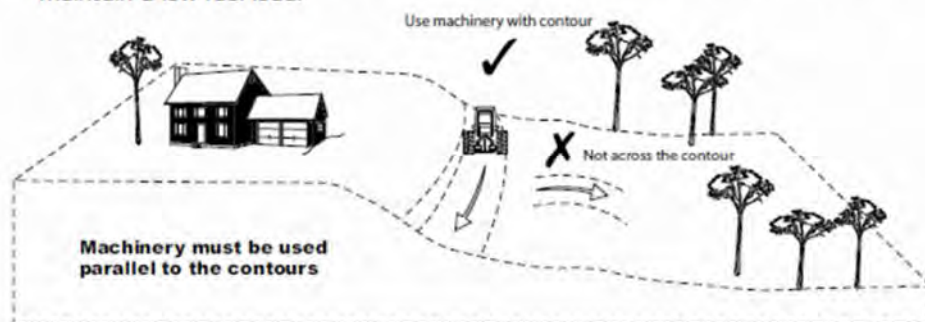
50%

75%

100%

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.



STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

Layout of gardens in an APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting "pencil pine" type trees next to buildings, as these are highly flammable.



Removal of other materials

Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

Other protective features

You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without "ribbons" hanging from branches or trunks; and
- dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees*.

WIND BREAKS

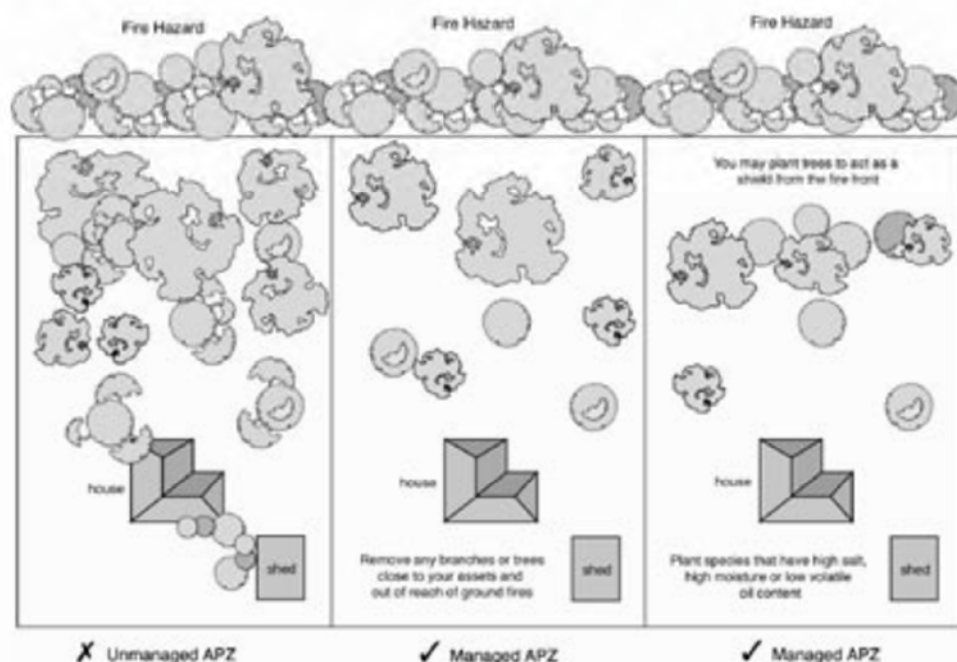
Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.

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HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at www.rfs.nsw.gov.au.

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre.
Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737
(Monday to Friday, 9am to 5pm), or
- the NSW RFS website at www.rfs.nsw.gov.au.

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