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24 August 2023

Anthony Aziz
Azzwic
Level 3, 100 Harris Street
Pyrmont NSW 2009

Re: Parking Design Certification, 1130 Pittwater Road, Collaroy NSW

Fernway Engineering has been engaged by the Applicant to certify the proposed parking arrangements associated with the development application at the above address. This letter refers to the plans prepared by MAP Architects, overlayed in **Attachment A**, and the following regulatory design instruments:

- AS2890.1:2004

This review and certification process has been undertaken by an industry-recognised traffic engineering professional, the undersigned.

Development Context

The site was previously developed with a double-storey single domestic dwelling with a double garage and informal car port arrangement accessed via Pittwater Road, being a State Controlled Road.

The proposal is for the construction of a new domestic dwelling, with a double garage similarly accessible via Pittwater Road. In the context of transport, the number of parking spaces, as well as associated driveway widths off Pitwater Road is being reduced under this application. There is no alternative means of vehicular access to the site.

Parking Compliance

The proposed parking arrangements have been assessed in accordance with relevant *AS2890.1:2004* and relevant requirements. A summary of design elements has been provided in Table 1 below.

Table 1: Design Compliance Summary

Design Element	Requirement	Fit for Use	Compliant	Note
DRIVEWAY				
Access Category	1			
Access Width	**AS:** 3-5.5m (combined) + 300mm clearance to objects over 150mm in height.	✓		
Located outside restricted intersection clearances	**AS:** Figure 3.1, AS2890.1		✓	
Pedestrian Sight Splays	**AS:** Figure 3.3, AS2890.1	✓		**Note 2**
Grades (Domestic)	**Maximum:** 25% **Max Transition:** 12.5% for minimum 2m **OR** ground clearance demonstration **Max within 6m of Boundary:** 12.5% if it is sloping down towards a local road, and serves less than 25 spaces.		✓	
Layback Design	As per Council Details		✓	
GARAGE/PARKING SPACE				
Internal Dimensions (min)	5.4m (L) x 2.4m (W) x 2.2m (H)		✓	
Door Opening Clearances	300mm clear to obstacles.		✓	
Max Slope	5%		✓	
NOTES				
Note 1	There is inadequate space to set the garage back to enable the full 2.5m setback on for the southern parking space. This is a common limitation for garages on domestic properties. Several factors were considered to mitigate this minor deviation: 1. The opening of the garage door will create a visual/audible queue to approaching pedestrians 2. As there is little-to-no driveway length, vehicles will not have adequate space to generate any significant speed when exiting the property 3. Domestic users have a high level of familiarity when utilising their parking arrangements.			

	4. Domestic properties generate very low vehicle movements, with a corresponding reduction in the likelihood of an incident. In consideration of these factors, the proposed arrangement is considered fit-for-use.
Note 2	This table is not intended to represent a summary of key design elements and is not an exhaustive list of all design elements assessed in accordance with AS2890.

Swept Path Assessment

The swept path analysis was undertaken using the AutoTURN program, in accordance with the methods of Appendix B of AS2890.1:2004. The analysis concluded that:

- The design vehicle (B85) can enter and exit each parking space in a standard 3-point manoeuvre. A 300mm clearance is maintained for all objects.
- As is standard for domestic dwellings, a reverse manoeuvre is required within the public roadway.

Attachment A shows the results of the swept path tests obtained. The **Black** colour of the swept paths indicates the vehicle body envelope, while the **blue** lines indicate the wheel path and the **Red** lines indicate the 300mm clearance envelope of vehicles).

Driveway Scraping Assessment

To ensure against vehicle scraping along the proposed driveway profile, ground clearance testing has been undertaken using AutoTURN software (the industry standard vehicle swept path assessment software). The 99th percentile vehicle (B99 vehicle) was used to simulate ground clearances in accordance with AS2890 ground clearance testing methodology. Testing was undertaken along each proposed driveway (Sections EE and FF).

The ground clearance assessment determined that:

- A B99 vehicle has no ground-scraping conflicts when entering or exiting the property via the proposed driveway.

This is shown in **Appendix B.**

Driveway Sight Line Assessment

Driveway sight lines have been assessed in accordance with the sight distance requirements of AS2890.1, Figure 3.2. The desktop sight line assessment was carried with the aid of recent aerial imagery and cross-checked against street views.

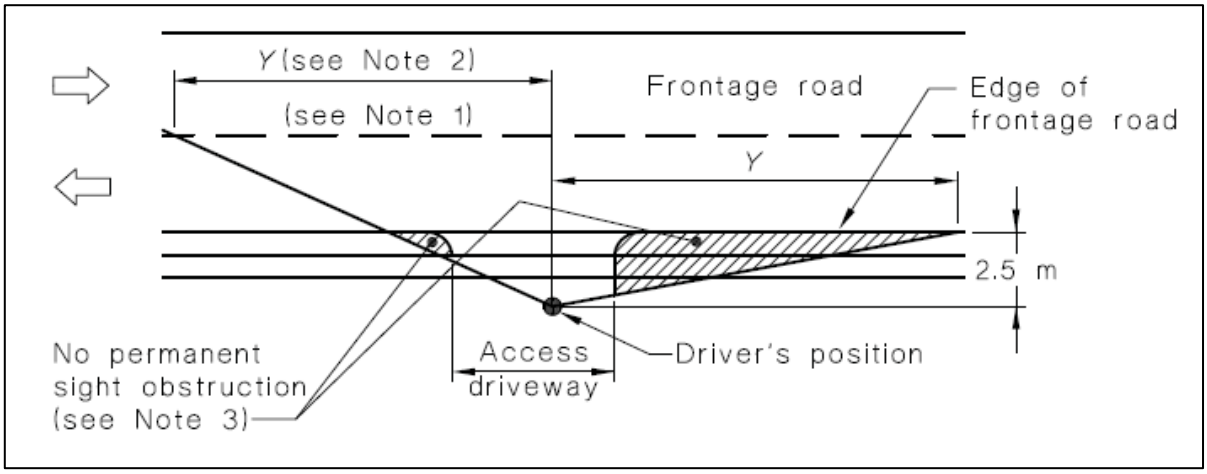


Figure 1: Extract from AS2890.1, Driveway Sightlines

Pittwater Road has a signed speed limit of 60kph. For domestic dwellings, the corresponding minimum sight distance if 55m. As right-turns are physically prevented, sight distance to the south has not been assessed.

To the north, there are no blind corners or vertical crests/dips within 55m, and street furniture is sparse. The minimum 55m is readily achieved. Parking may prevent temporary, partial visibility restrictions as is common in most urban settings. In this case, the kerbside is kept clear for significant periods due to the bus lane. Management of on-street parking is the responsibility of Transport for NSW.

On-Street Parking

The kerb-side area in the vicinity of the site is designated as a Bus Lane, 6am-10am MON-FRI. Outside these times, the kerb-side area is unrestricted.

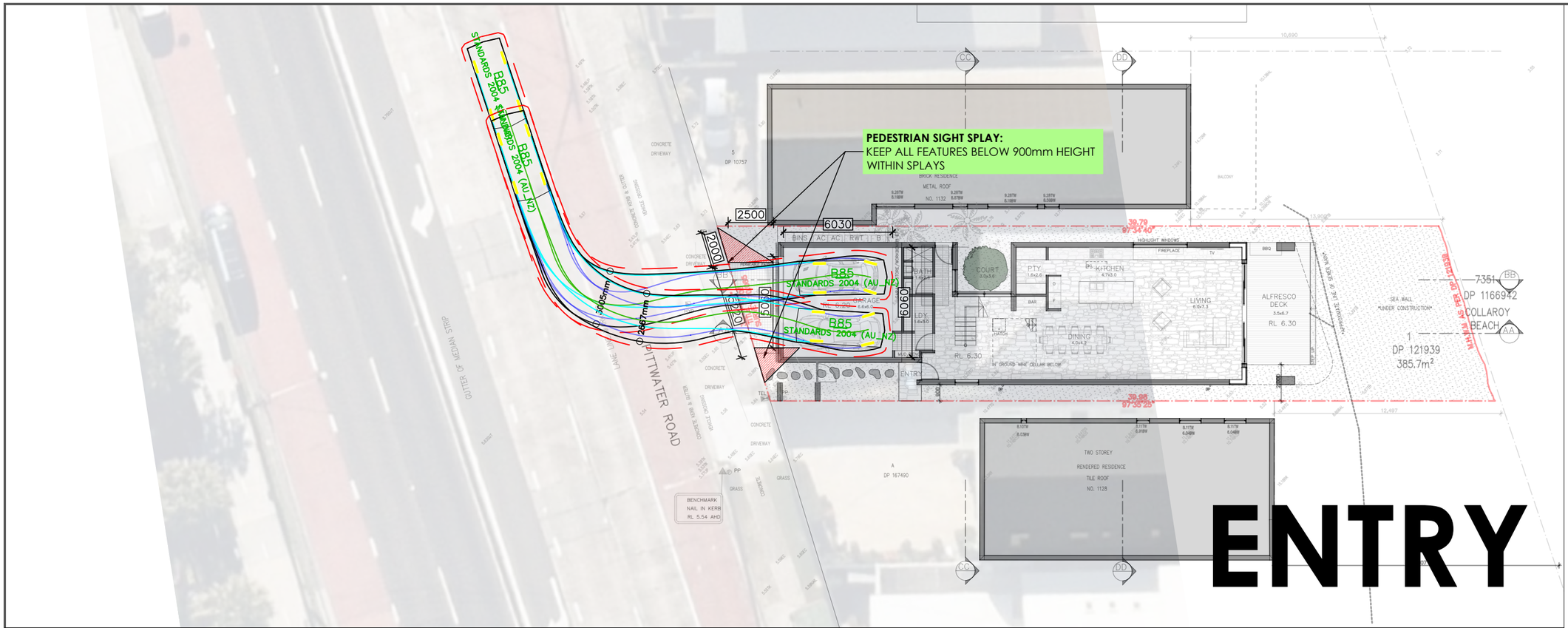
Currently, there is an existing driveway layback extending from the full frontage of the site (#1130), and combining with the adjacent driveway to #1128. The proposal seeks to retain this existing crossover. As a result, there will be no net loss of parking associated with this proposal.

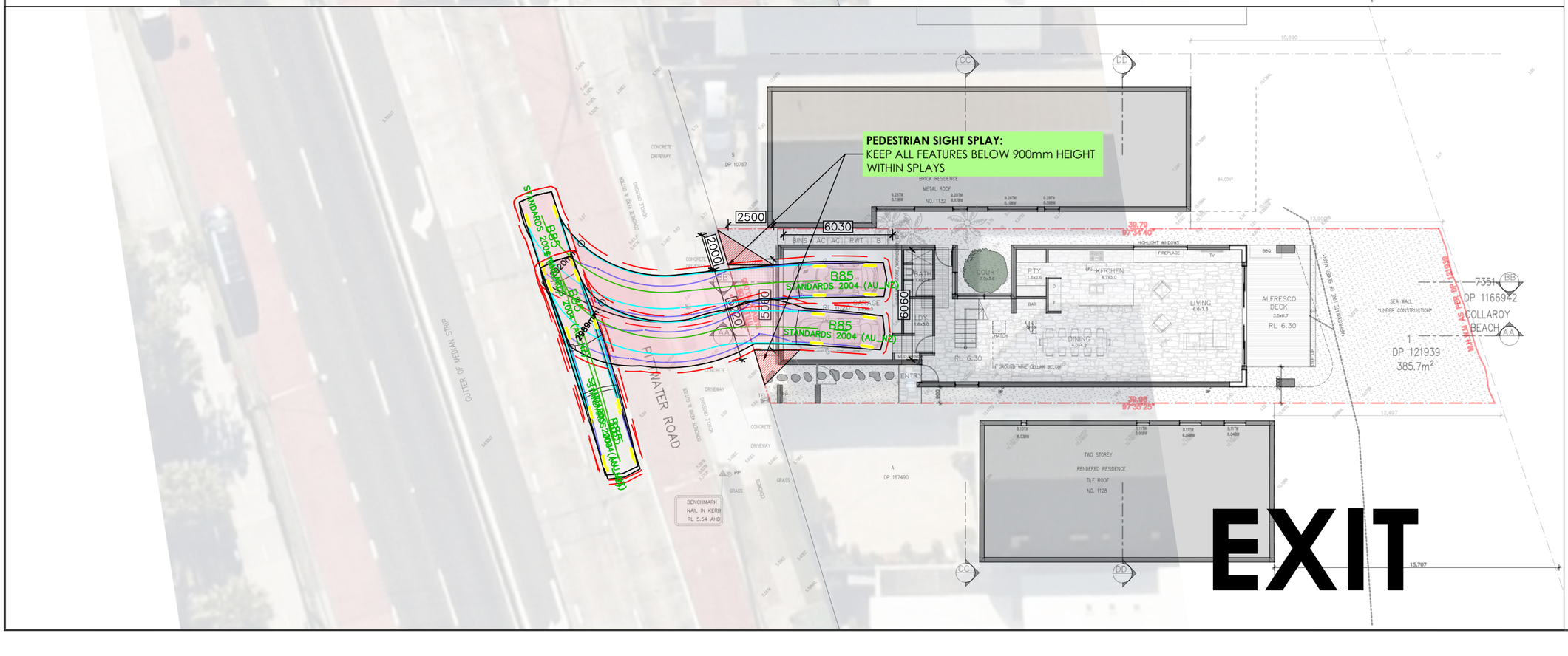
Figure 2: Street View of Site Frontage, facing North (Source: Google Streetview, 2019)

Conclusion

In summary of the above, Fernway Engineering has assessed the parking arrangements associated with the proposed domestic development at 1130 Pittwater Road, Collaroy. Following this assessment, Fernway Engineering confirms that the proposed arrangements comply with the relevant design requirements of AS2890.1:2004. Where any deviations were identified, these were professionally assessed and deemed fit for use.

Appendix A – Swept Path Analsis





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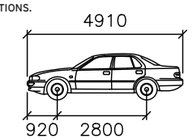
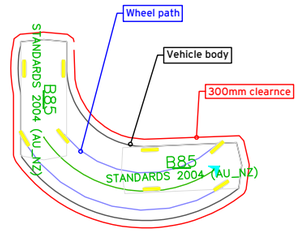


B85

	mm
Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

FORWARDS



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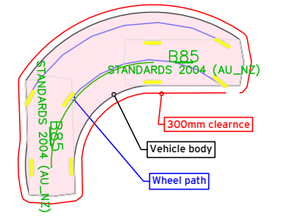


REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

fernway engineering

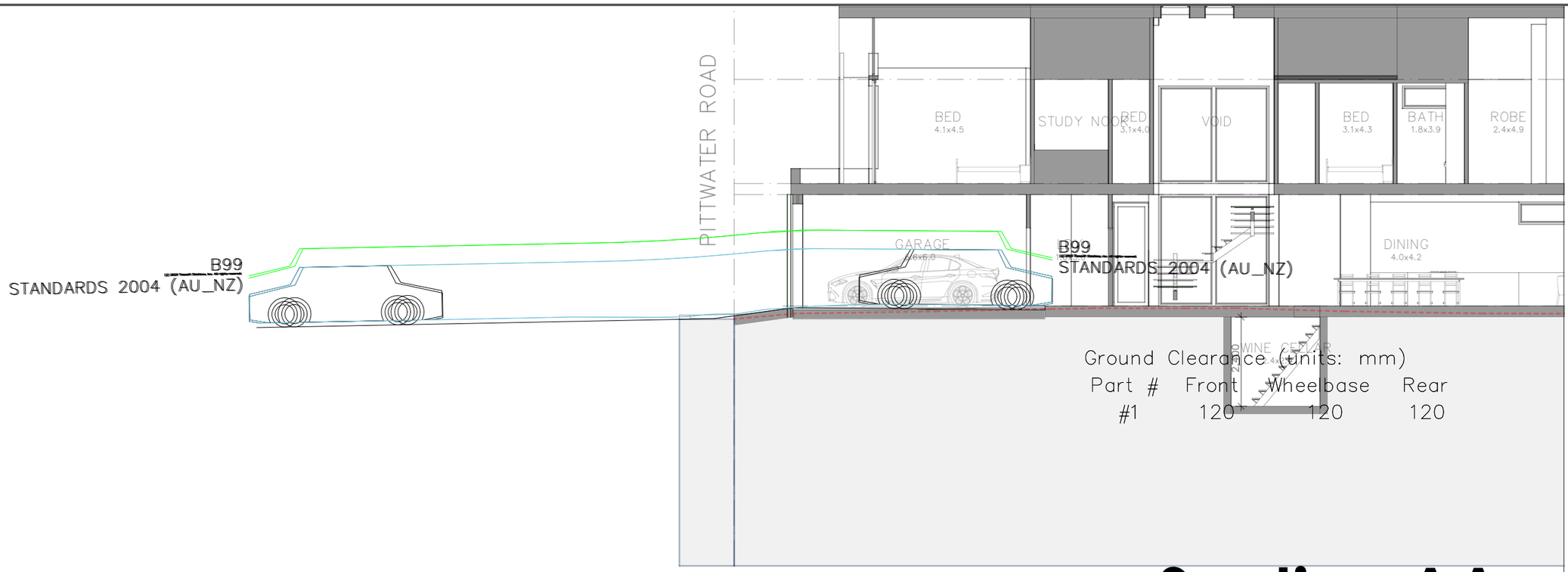
CLIENT:
Azzwic

SITE:
1130 Pittwater Road, Collaroy NSW

TITLE:
Swept Path Analysis: B85

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	12.8.2023	CS	SP
PROJECT NO:	DRAWING NO:		REVISION:
024-019	TR-001		A

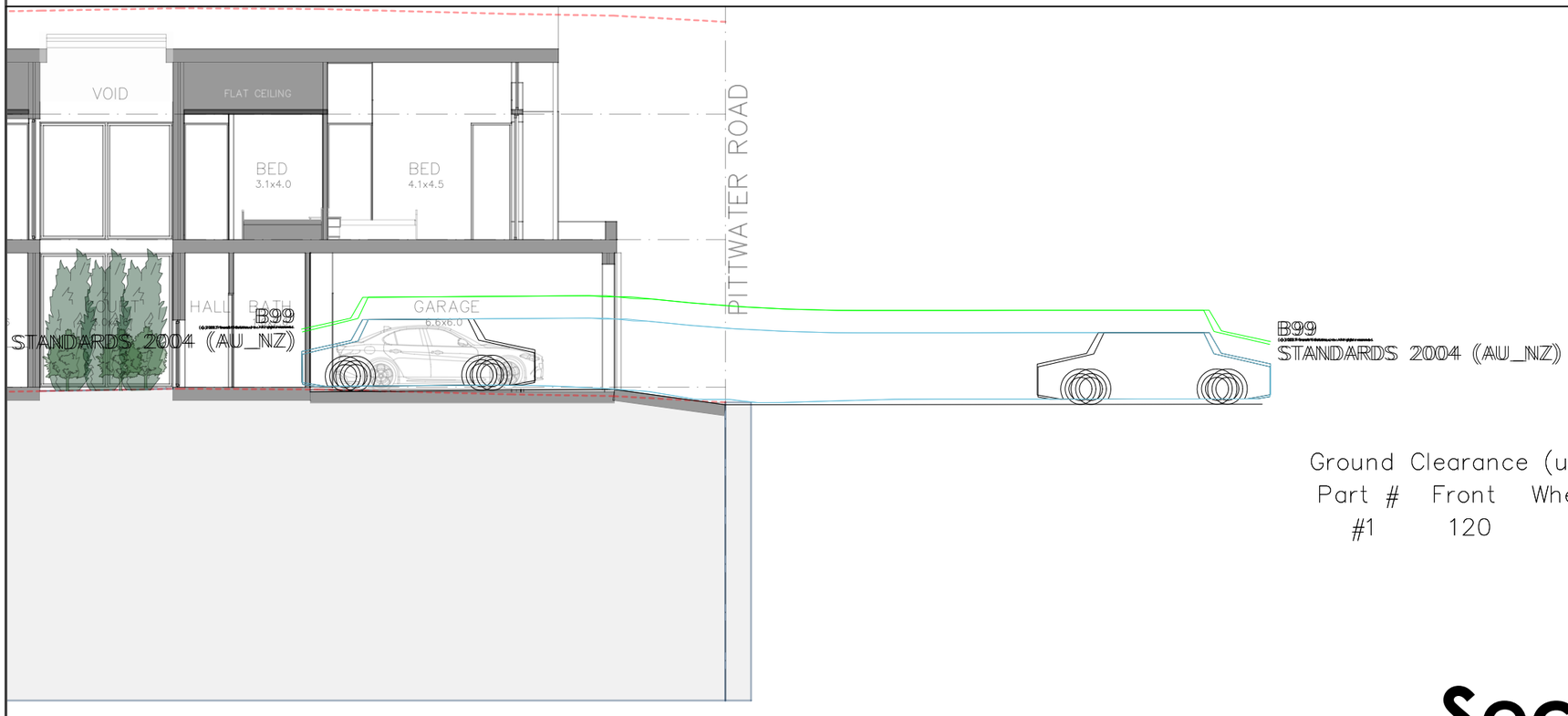
Appendix B – Ground Clearance Analysis



Ground Clearance (units: mm)

Part #	Front	Wheelbase	Rear
#1	120	120	120

Section AA



Ground Clearance (units: mm)

Part #	Front	Wheelbase	Rear
#1	120	120	120

Section BB

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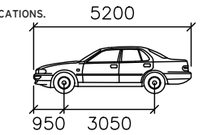
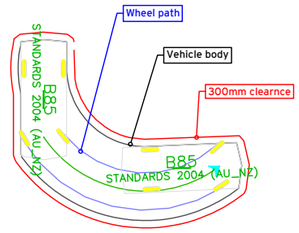


B99

	mm
Width	: 1940
Track	: 1840
Lock to Lock Time	: 6.0
Steering Angle	: 33.9
Speed	: 5kph

FORWARDS



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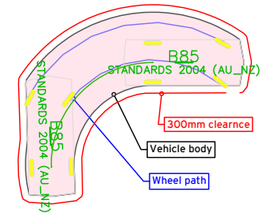

REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

fernway engineering

CLIENT:
Azzwic

SITE:
1130 Pittwater Road, Collaroy NSW

TITLE:
Ground Clearance Analysis: B99

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:125	12.8.2023	CS	SP
PROJECT NO:	DRAWING NO:		REVISION:
024-019	TR-002		A