Transport Strategies

Reference: 23079
19 June 2024

Patricia Quirk
29 Wandeen Rd
Clareville NSW 2107

Dear Trish

RE: 29 Wandeen Road, Clareville
Vehicle Turning Bay and Driveway Assessment

I have assessed the proposed vehicle turning bay and driveway layouts (See Appendix A) for the above site and my assessment has regard for the design principles of the AS 2890.1:2004 Parking facilities - Off-street car parking.

The proposed vehicle turning bay dimensions, internal circulation, aisle widths and driveway width (within the property boundary) comply with AS2890.1. The proposed on-site vehicle turning bay allows cars to enter and exit the site in a forward direction. See Appendix B.

It is my assessment that a vehicle turning bay is required to mitigate the safety risks that arise due to factors external to the site (i.e., narrow road/double lines/position under crest and horizontal curve) as detailed in the following:

a) Limited visibility due to close proximity of a crest: The driveway is approximately 30m west of a crest on Wandeen Road. See the following photos for views to the crest east of the driveway.

View of the Crest from 1m Inside the Driveway

View of the Crest at the Start of the Driveway

A driver reversing out of the driveway will have limited visibility and will not be able to see approaching westbound vehicles on Wandeen Road until the vehicle has partially entered Wandeen Road. The lack of visibility prior to the vehicle entering the carriageway increases the risk of a collision or accident. See the following photos from a car reversing out of the driveway.

View through Rear Passenger Window with the Vehicle within the Driveway

View through Rear Passenger Window with the Vehicle Partially on Road to Achieve Sightline 1

View through Rear Passenger Window with the Vehicle Partially on Road to Achieve Sightline 2

View through Rear Passenger Window with the Vehicle Partially on Road to Achieve Sightline 3

It is noted that the sightline to the crest is further restricted by the on-street parking directly to the east of the driveway and the off-street parking of neighbouring property at 31 Wandeen Road. See the following photos of the on-street parking and off-street parking activities.

On-Street Parking Activities to the East of the Driveway

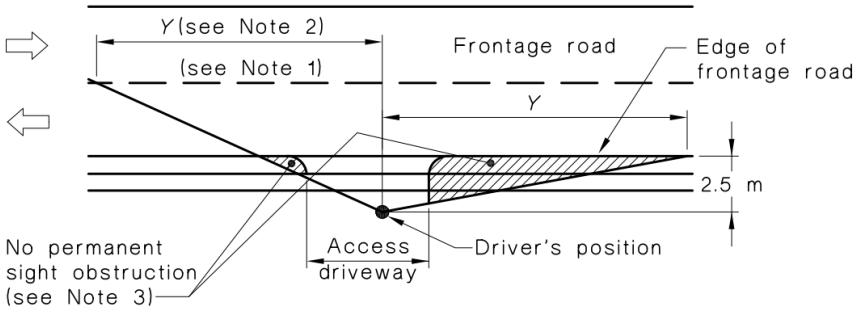
View from Passenger Side of Reversing Vehicle with View Obstructed by Neighbour's Off-Street Parking Activities

b) Limited visibility due to close proximity of a horizontal curve: The driveway is approximately 35m east of a horizontal curve on Wandeen Road. See the following photos for the views to the curve west of the driveway.

View of the Curve from 1m Inside the Driveway

View of the Curve at the Start of the Driveway

c) Non AS2890.1 compliant sightline: The sight distance analysis has been provided in accordance with Figure 3.2 of AS2890.1:2004, reproduced below.



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Based on Figure 3.2 of AS2890.1, the minimum SSD for an access driveway for domestic property access for a 50 km/h frontage road is 40m. Based on the sight distance, the existing driveway on Wandeen Road does not comply with the minimum SSD from Figure 3.2 of AS2890.1.

While the existing driveway does not comply with the minimum distance requirements, the risk can be mitigated by allowing the drivers to safely drive out in a forward direction instead of reversing out of the driveway.

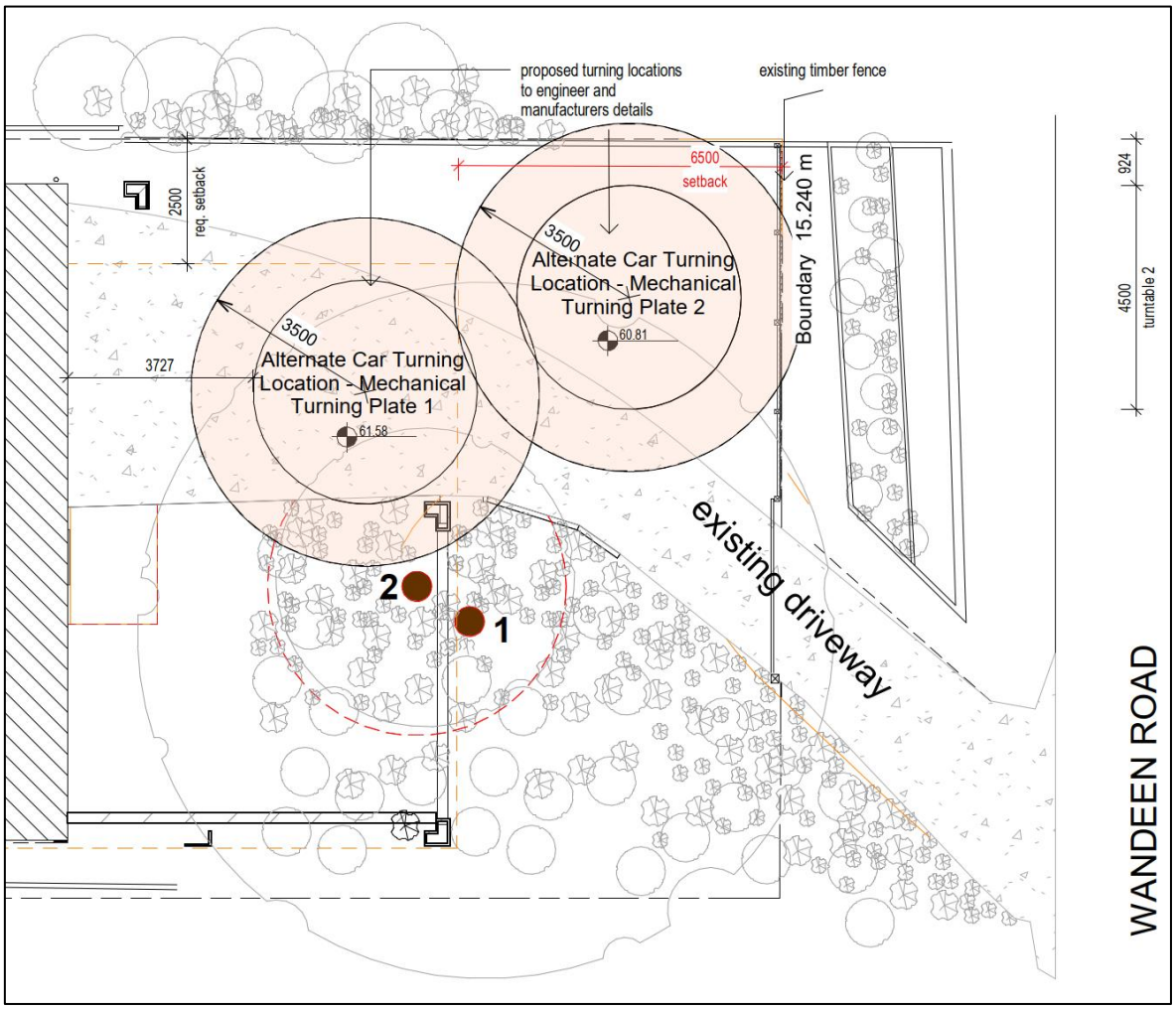
d) Narrow Frontage Road: The narrow Wandeen Road (with a 3.2m-wide lane) and double lines along Wandeen Road mean that the westbound vehicle approaching from the crest will not be allowed to overtake the exiting vehicle from the driveway and must stop instantaneously to avoid the vehicle.

e) Loss of control: When reversing down a steep driveway, it can be easy for the driver to lose control of the vehicle.

f) Safety concerns: Reversing down a steep driveway presents an increased safety risk for some drivers, especially those with limited mobility, vision, or experience. Moreover, the pedestrians walking on the verges (which act as an unformed footpath) along the southern side of Wandeen Road may be injured as the driver may not see them while reversing out from the driveway. See the following photo.

Non-Practicality of Turntable Provision

I have also reviewed the proposed alternate turntable locations, shown in the following figure which responds to Council's suggestion to relocate the proposed turning location to the existing driveway or to the western side of the existing driveway and provide the following response:



General Concerns

Vehicle turntable will not be suitable for the proposed development due to the following reasons:

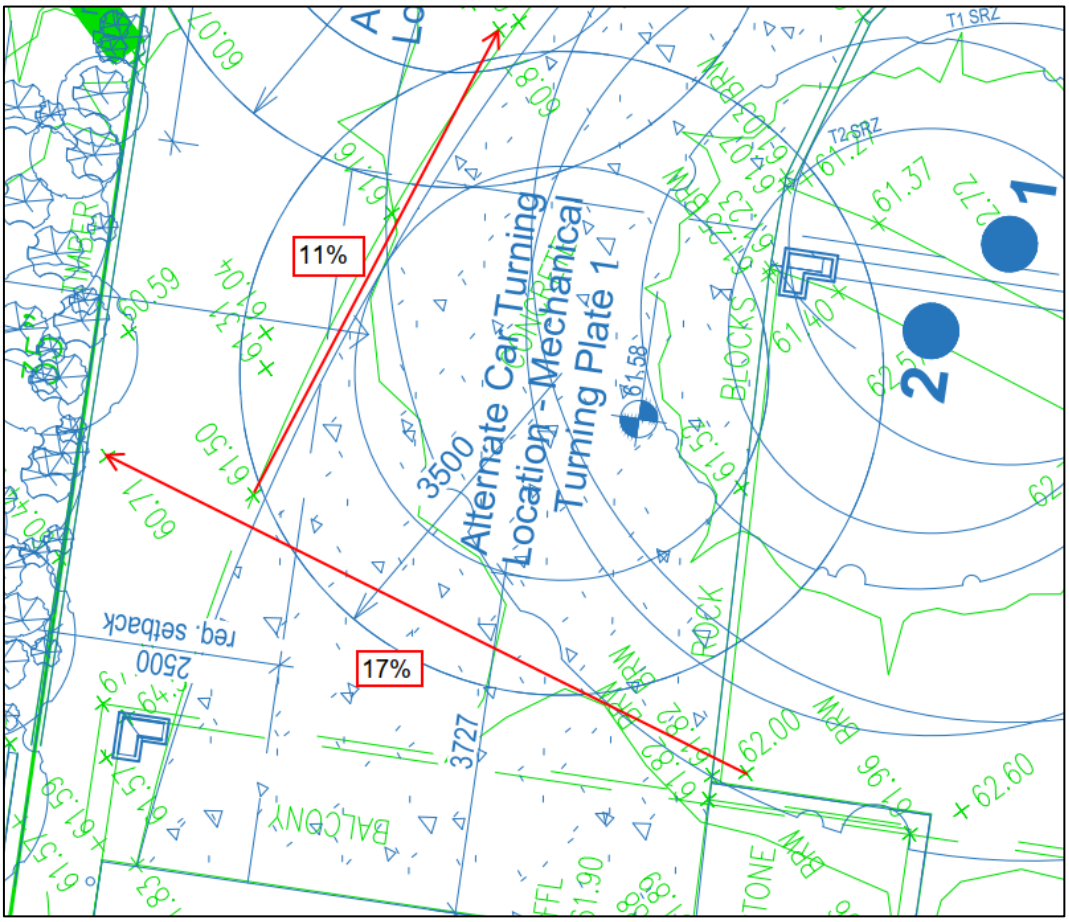
- Maintenance Challenges: Clareville is prone to saltwater corrosion, which can affect the mechanical components of the turntable system. Similarly, the driveway and carpark area are surrounded by several mature and leafy trees and currently experience issues with falling leaves and debris getting into the machinery, potentially causing malfunctions or breakdowns. See the following photos.

- Environmental Factors: Coastal areas are subject to harsh weather conditions, such as strong winds and storms, which could pose a risk to the stability and operation of turntable carpark systems. Additionally, the presence of sand and salt in the air can accelerate wear and tear on the equipment.

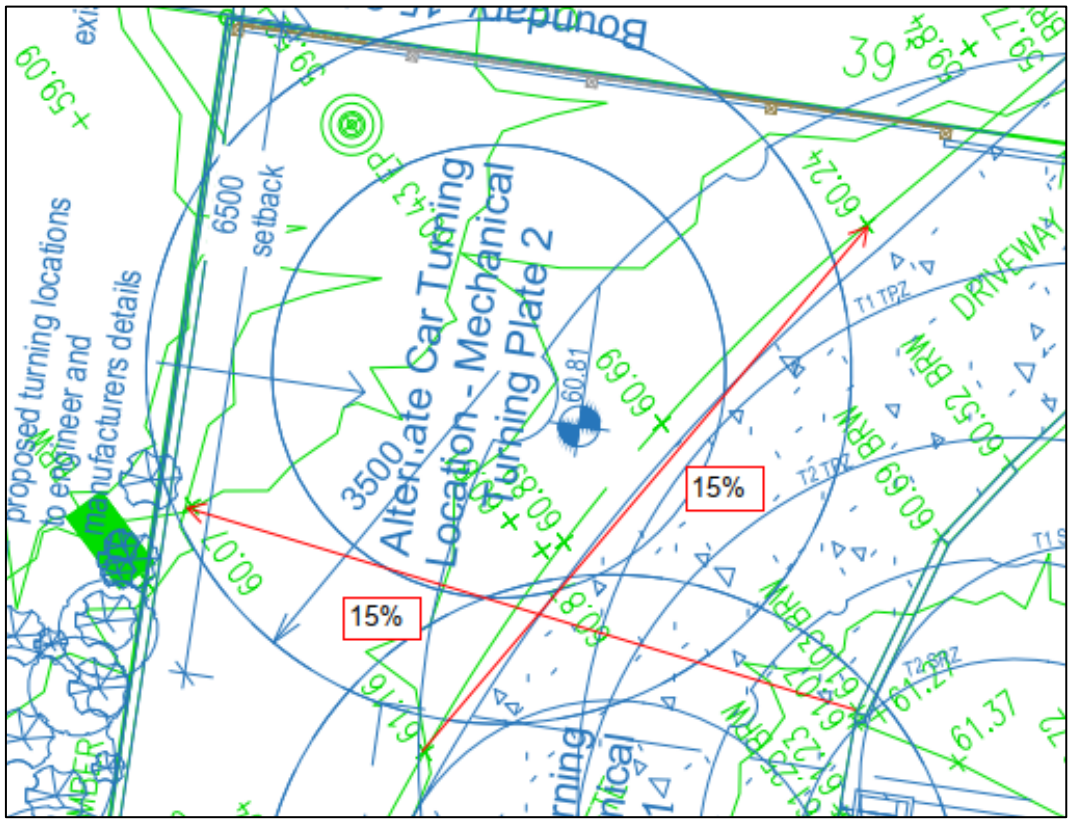
- Gradient Limitations: Turntable carpark systems typically require a level surface to operate effectively. While they may function on a maximum gradient of 5%, it's generally recommended to install them on a flat surface to ensure smooth and reliable operation. It should be noted that the site has significantly steeper (>5%) gradients at the proposed turntable locations. See the following photo.

- A significant gradient could cause issues with the rotation mechanism, potentially leading to uneven weight distribution, increased wear and tear on components, and difficulty in parking or retrieving vehicles. Additionally, safety concerns may arise if the gradient is too steep, affecting the stability of the turntable system. In addition to the steep gradients, the site presents an additional challenge with two cross gradients (north-south and east-west). In order to accommodate a turntable, it's necessary to entirely eliminate one of these gradients and then reduce the other to within the 5% threshold. This is because the turntable can only function within a single gradient of 5%. Based on the survey plan, the following cross-gradients are present:

    - Location 1: north-south gradient of 11%, east-west gradient of 17%



- Location 2: north-south gradient of 15%, east-west gradient of 15%



The driveway currently has a gradient of up to 20% over a length of 9m. See the following photo.

To achieve the AS2890.1 compliant maximum change of grades of 12.5% (crest) and sag (15%), as well as the maximum 5% gradient of the turntable, the driveway will need to be redesigned to be steeper than 20%. This will result in:

- The 20% gradient exceeding 25%, therefore, deviating from the AS2890.1 and Council Standard Drawings – Driveway Profile – Extra High

https://files-preprod-d9.northernbeaches.nsw.gov.au/nbc-prod-files/documents/general-information/driveway-and-vehicle-crossings/standard-vehicle-crossing-profile-extra-high-jul22.pdf?1716176441

- Vehicle bottoming out at the bottom of the driveway.

- As shown in the architectural plans, the relocation of the turning areas to either alternate location one or alternate location two will not result in any significant change to the built form / landscaping ratio on site as both alternate locations will require additional hard landscaping to be implemented. In addition, the associated impacts to residual landscaped areas in relation to changes in site levels and excavation to accommodate these locations as identified in the Arborist report are relied upon and acknowledged.

- Even without the provision of the turntable, should either alternate location 1 and 2 be designed as hardstand turnaround areas, the crossfall gradients (measured across their width) would significantly exceed the AS2890.1 requirements of 5% (maximum), with location 1 at 11% and location 2 at 15%.

Location-Specific Concerns

- Location 1: Turntable requires a minimum of 355mm slab depth in addition to the 100mm to 150mm thickness of the driveway. This results in a total driveway thickness of 505mm to accommodate the turntable. This required excavation will impact the root zone of Tree Number 2 to a significant extent and Tree Number 1 to a lesser extent. We rely upon the arborist report to detail more fully the impacts to the liveability of both trees.

- Location 2:
  - Due to the constrained site, turntable at Location 2 will not work as the clearance zone will be outside of property's boundary

- Due to the vertical drop of approximately 3m from the property boundary, structural retaining walls will be required at both the northern and western property boundary to comply with AS2890.1.
- A thorough review of the swept path assessments was completed to consider the possibility of Location 2 being designed as a hard stand turnaround area. Upon examining the swept paths outlined in Appendix C, it became evident that to accommodate this design, excavation on the eastern side of the existing driveway would be necessary.

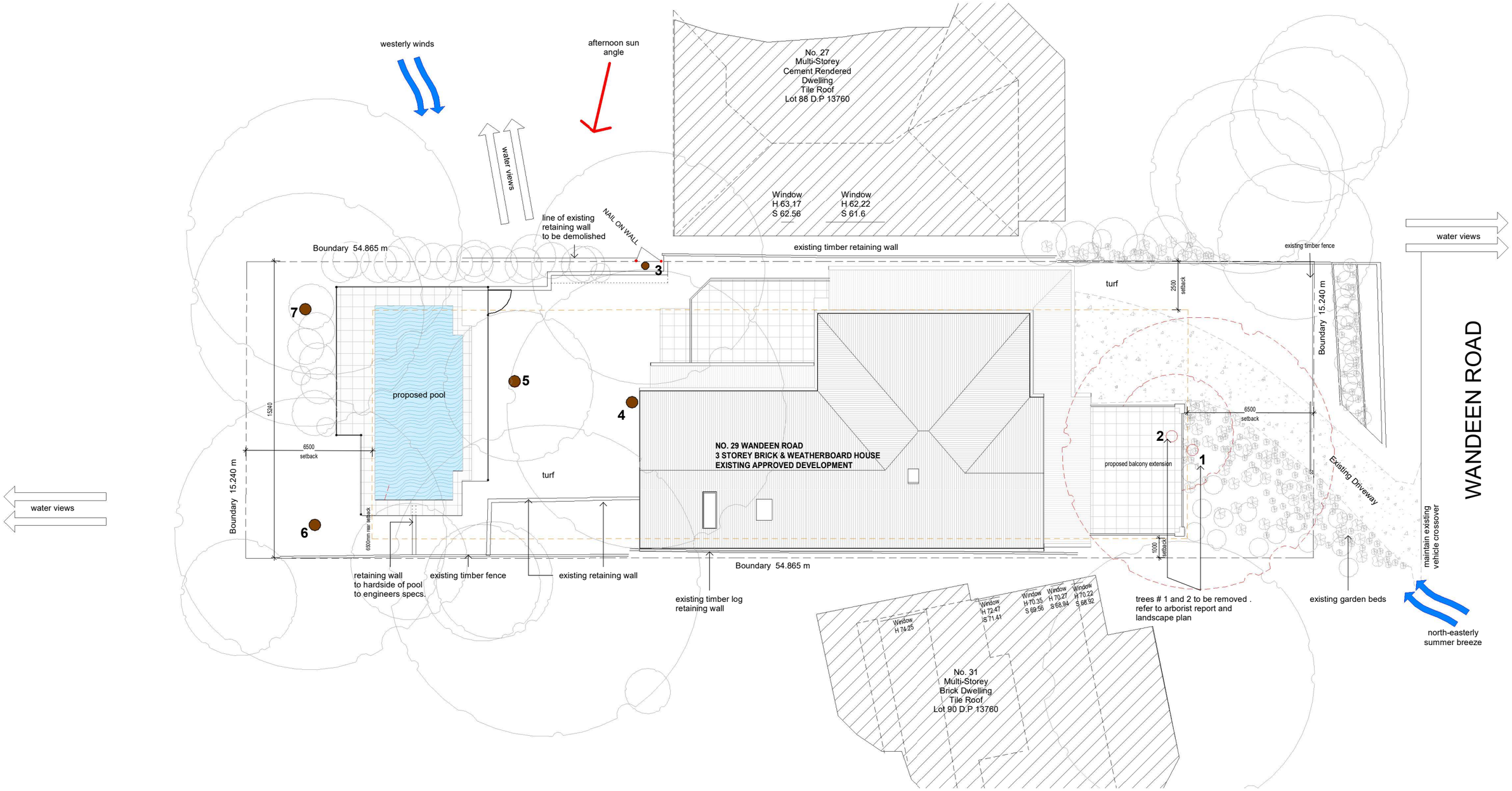
I trust the above provides adequate assessment and information for Council to consider the provision of a conventional turnaround area (without turntable) to accommodate forward-in and forward-out movements for the site and to ensure safety for all users.

Should you have any questions or require further information, please do not hesitate to contact me on 042 4007 141.

Yours sincerely,

Siew Hwee Kong (Meg)
Director/Transport Strategist
Transport Strategies Alliance
Design Practitioner Registration Number: DEP0000127
Professional Engineer Registration Number: PRE0000121

APPENDIX A
Architectural Plans



vanessa miles
design + draft

VANESSA MILES
DESIGN & DRAFT
41 York Terrace
Bilgola Plateau
NSW 2107
P 0421 161 020
E vanessajmiles@yahoo.co.uk

Rev	Description	By	Date
1	Client Revision		7 Nov 23

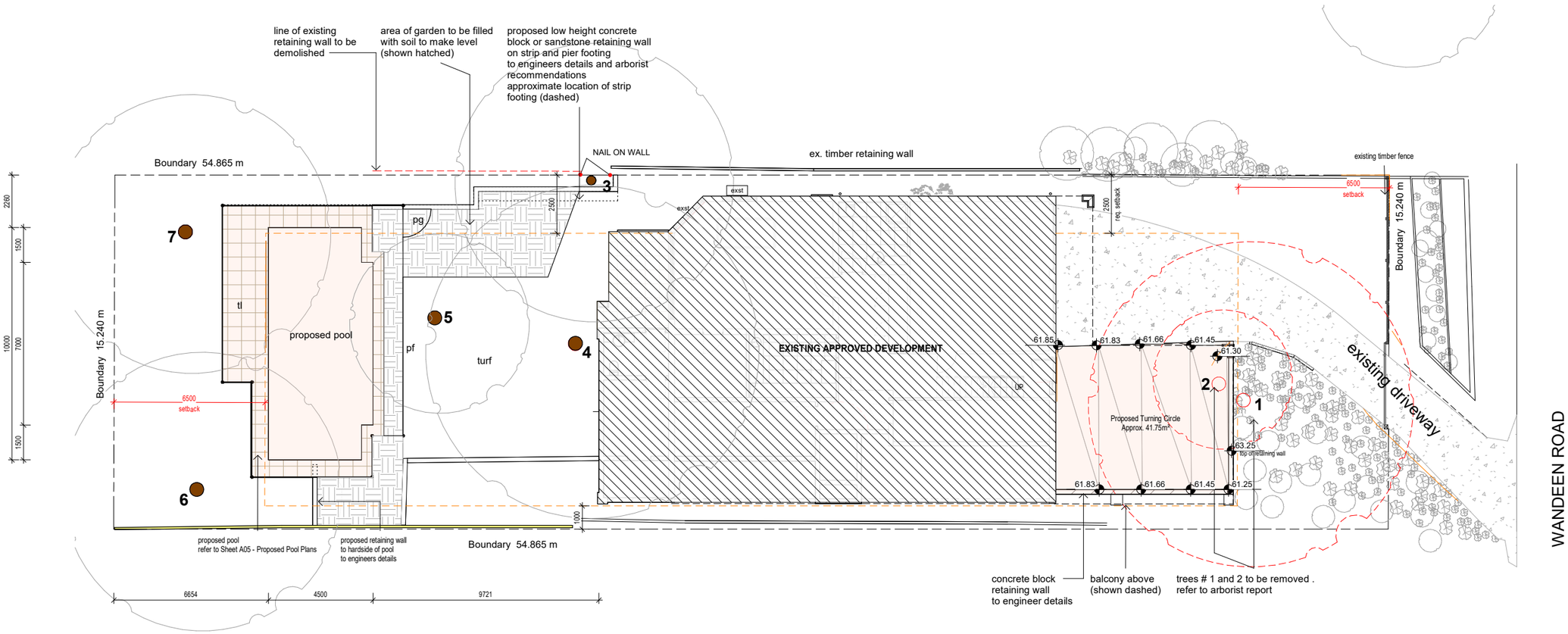
Clareville House
DEVELOPMENT APPLICATION
29 Wandeen Road, Clareville

Lot 89 // DP 13760

for
Trish Quirk

Site Plan

Date	7 Nov 23		A02
Project no.	2013		
Drawn by:	VM	Scale	1 : 100



1 01 Ground Level _ Proposed

1 : 100

proposed alterations & additions

vanessa miles
design + draft

VANESSA MILES
DESIGN & DRAFT
41 York Terrace
Bilgola Plateau
NSW 2107
P 0421 161 020
E vanessajmiles@yahoo.co.uk

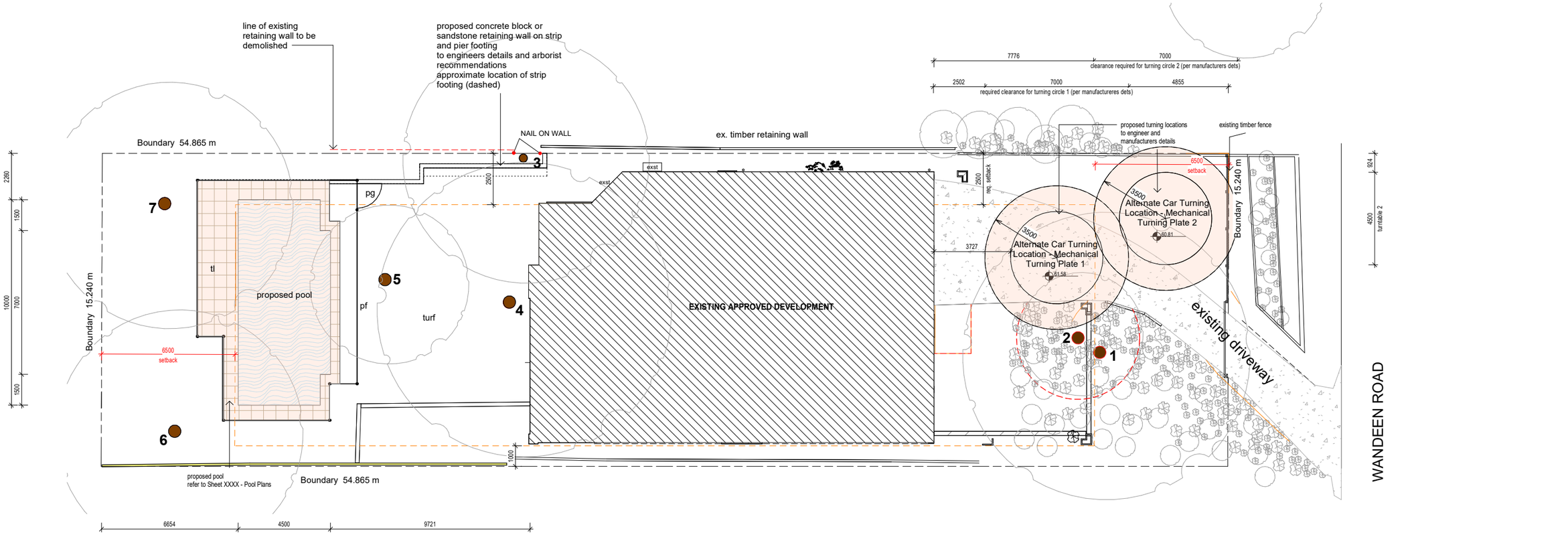
Rev	Description	By	Date
1	Client Revision		7 Nov 23

Clareville House
DEVELOPMENT APPLICATION
29 Wandeen Road, Clareville
Lot 89 // DP 13760

for
Trish Quirk

Ground Floor - Proposed

Date	7 Nov 23		A04
Project no.	2013		
Drawn by:	VM	Scale	1 : 100



1 01 Ground Level _ Alternate Turning Locations

1 : 100

proposed alterations & additions

vanessa miles design + draft

VANESSA MILES
DESIGN & DRAFT
41 York Terrace
Bilgola Plateau
NSW 2107
P 0421 161 020
E vanessajmiles@yahoo.co.uk

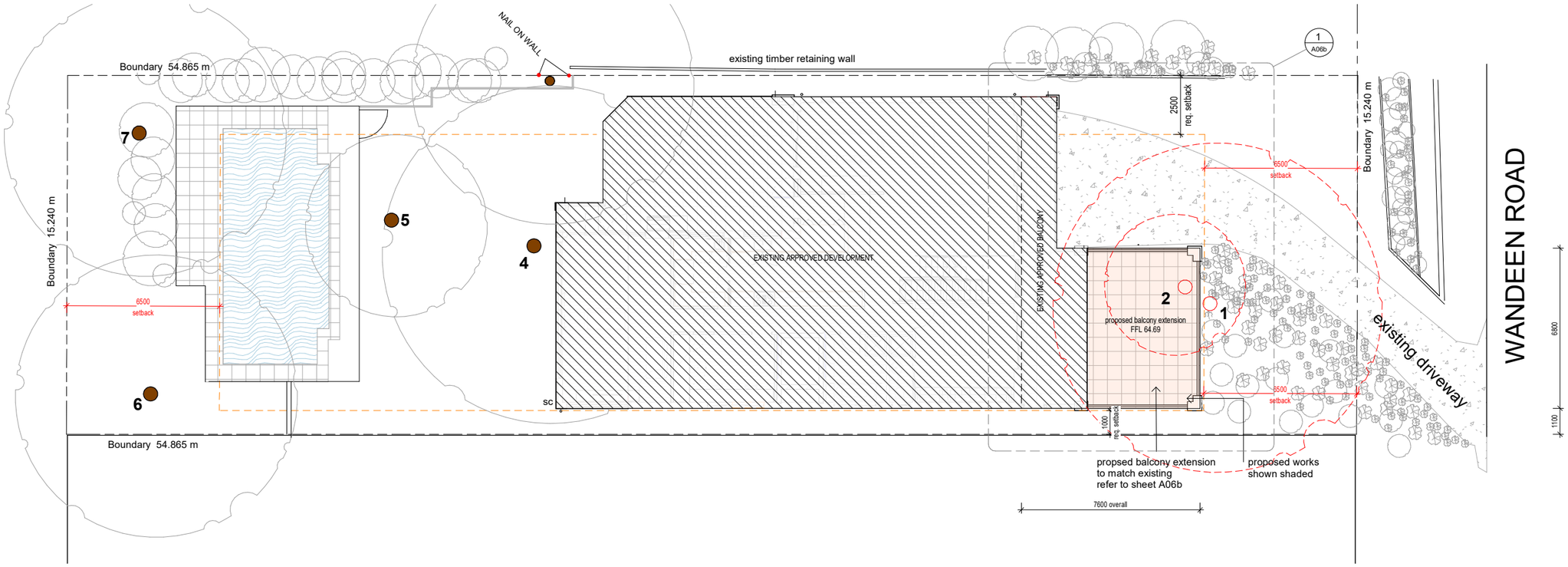
Rev	Description	By	Date
1	Client Revision		7 Nov 23

Clareville House
DEVELOPMENT APPLICATION
29 Wandeen Road, Clareville
Lot 89 // DP 13760

for
Trish Quirk

Ground Floor - Alternate Turning Locations

Date	7 Nov 23	A04b	
Project no.	2013		
Drawn by:	Author	Scale	1 : 100



1 02 First Floor _ Proposed

1 : 100

proposed alterations & additions

vanessa miles
design + draft

VANESSA MILES
DESIGN & DRAFT
41 York Terrace
Bilgola Plateau
NSW 2107
P 0421 161 020
E vanessajmiles@yahoo.co.uk

Rev	Description	By	Date
1	Client Revision		7 Nov 23

Clareville House
DEVELOPMENT APPLICATION
29 Wandeen Road, Clareville
Lot 89 // DP 13760
for
Trish Quirk

First Floor - Proposed

Date	7 Nov 23	A06	
Project no.	2013		
Drawn by:	VM	Scale	1 : 100

APPENDIX B
Swept Path Assessments of Proposed Design

existing timber fence

Boundary 15.240 m

existing driveway

B85 STANDARDS 2004 (AU_NZ)

top of retaining wall

6.5

B85 STANDARDS 2004 (AU_NZ)

Proposed Turning Circle Approx 11.75m

7.4

2.40

2.40

B85 STANDARDS 2004 (AU_NZ)

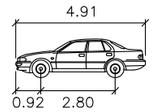
B85 STANDARDS 2004 (AU_NZ)

UP

DEVELOPMENT

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

C:\Users\tech\Transport Strategies Dropbox\view hwee kong\PC\Desktop\TS PROJECT\2023\23079 - 29 Wandeen Road, Clareville\DRAWING\23079-07-SP.dwg

Plotted by Meg Kong

29 WANDEEN ROAD, CLAREVILLE

SWEPT PATH ASSESSMENT

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23079-07-SP
01 OF 01
19 June 2024

DESIGNED BY A.SYAFIQ
APPROVED BY M.KONG

SCALE A3 0 1.0 2.0 1:100

existing timber fence

Boundary 15.240 m

existing driveway

STANDARDS 2004 (AU_NZ)

Top of retaining wall

6.5

Proposed Turning Circle
Approx. 41.75m²

7.4

2.40

2.40

STANDARDS 2004 (AU_NZ)

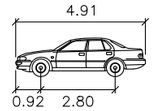
STANDARDS 2004 (AU_NZ)

UP

DEVELOPMENT

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

C:\Users\tech\Transport Strategies Dropbox\view hwee kong\PC\Desktop\TS PROJECT\2023\23079 - 29 Wandeen Road, Clareville\DRAWING\23079-07-SP.dwg

Plotted by: Meg Kong

29 WANDEEN ROAD, CLAREVILLE

SWEPT PATH ASSESSMENT

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148

ABN 13 254 028 433

PHONE 0424 007 141

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23079-07-SP

01 OF 01

19 June 2024

DESIGNED BY A.SYAFIQ

APPROVED BY M.KONG

SCALE A3 1:100

APPENDIX C
Swept Path Assessments of a Hard Stand Turnaround Area on Location 2

existing timber fence

Boundary 15.240 m

proposed turning locations to engineer and manufacturers details

Alternate Car Turning Location - Mechanical Turning Plate 2

B85 STANDARDS 2004 (AU_NZ)

existing driveway

T1 TPZ

T2 TPZ

T1 SRZ

T2 SRZ

61.58

60.31

1

2

2.40

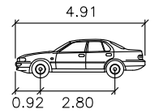
2.40

retaining wall

DEVELOPMENT

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

29 WANDEEN ROAD, CLAREVILLE

SWEPT PATH ASSESSMENT

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148

ABN 13 254 028 433

PHONE 0424 007 141

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23079-06A-SP

01 OF 01

10 June 2024

DESIGNED BY A.SYAFIQ

APPROVED BY M.KONG

SCALE A3 1:100