Structural
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Traffic
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Traffic Impact Assessment

Shell Cove C2 Apartments

Prepared for Frasers Property Australia

19 May 2022

211168

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Contents

Revision Register

Rev	Date	Remarks	Prepared By	Reviewed By	Approved By
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1 Introduction

1.1 Scope

Taylor Thomson Whitting (TTW) has been engaged by Frasers Property Australia to provide traffic advice and reporting on the proposed Precinct C2 apartments at Shell Cove.

This document assesses and address the traffic and transport impacts of the proposed development and covers the following areas:

- Traffic generation
- Car parking
- Site access
- Service vehicles and loading.

1.2 Project Information

Precinct C2 is located within Shell Cove Boat Harbour Precinct, south east of The Waterfront Tavern and Aqua developments and north of Nautilus (Precinct B2 Apartments).

The overall Master Plan provides a variety of residential offerings with a yield of approximately 3,000 dwellings, a 270 berth boat harbour, Town Centre, hotel, retirement village, commercial development and an 18 hole championship golf course. Additionally, construction of the boat harbour is complete with the first stage of the Marina nearing completion.

This development application seeks approval for construction of 52 residential dwellings across two five-storey residential flat buildings with two level basement parking. Vehicle and pedestrian access would be provided from Quayside Avenue with additional pedestrian-only access from the foreshore.

2 Existing Transport Network

2.1 The Site

2.1.1 Site Location

Precinct C2 is located at The Waterfront, south east of The Waterfront Tavern and Aqua developments and north of Nautilus (Precinct B2 Apartments), at The Promontory Drive, Shell Cove NSW, 2529, as shown in Figure 2.1.

Figure 2.1: Precinct C2 location in surrounding road network

2.1.2 Land Use

The subject site is legally described as Lot 9009 DP 124656 in Shellharbour Local Environmental Plan 2013.

Figure 2.2 illustrates the various land uses in the surrounding area, as specified in the Shell Cove Local Environmental Plan 2013.

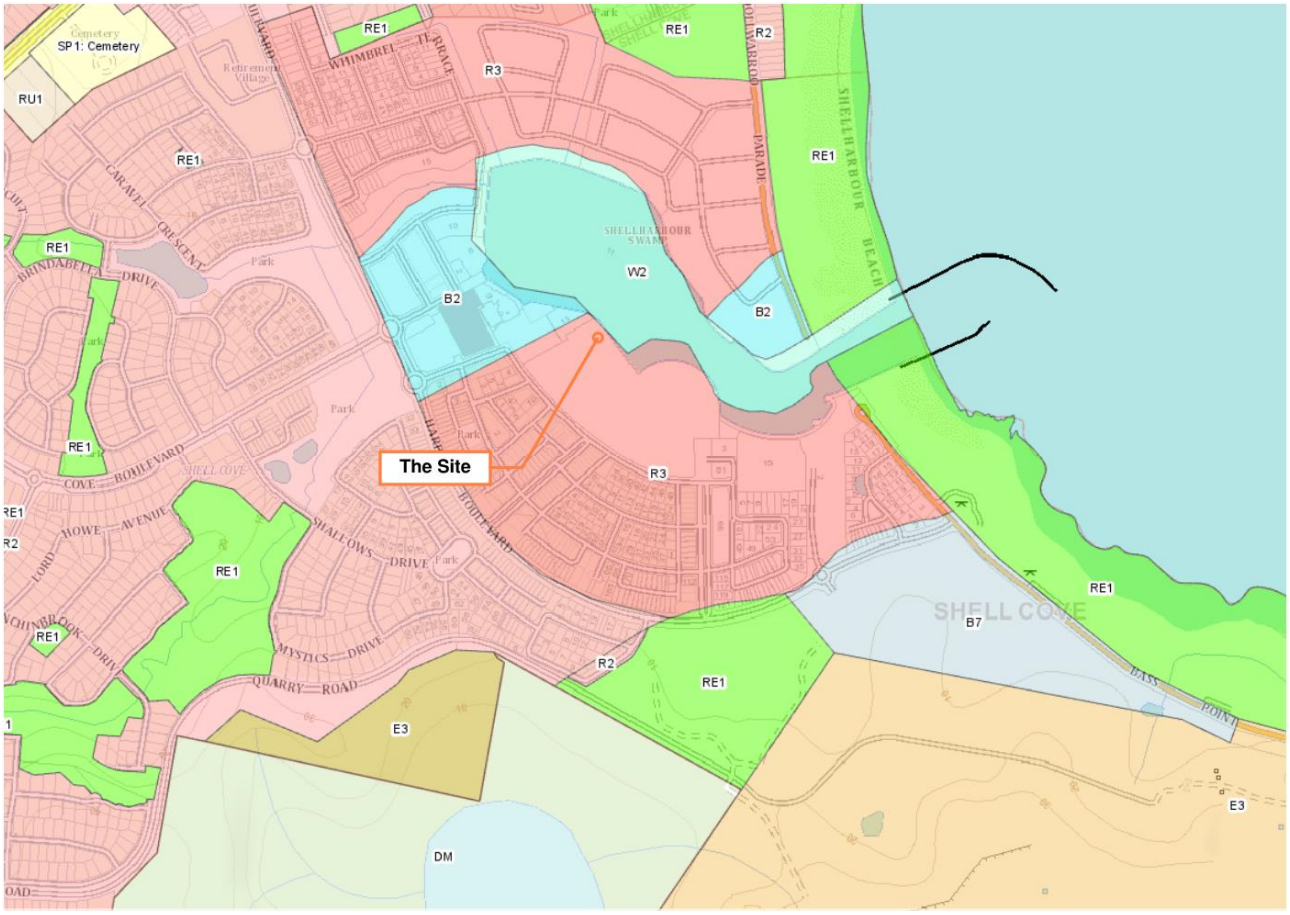


Figure 2.2: Site zoning
Image source: NSW Planning Portal

The site is zoned R3 Medium Density Residential under the Shellharbour LEP.

2.2 Road Network

2.2.1 Local Road Network

Figure 2.3 illustrates local roads in the vicinity of the Site. As shown in the figure, currently, several roads surrounding the site are not operational and are under construction.

Wharf Parade is a two-way local street with a parking lane and a traffic lane in each direction.

The Promontory Drive is a two-way boulevard with a parking lane and a traffic lane in each direction.

Harbour Boulevard is a two-way local street with a parking lane and a traffic lane in each direction.

The site vehicle access will be provided at Quayside Avenue which will connect to The Promontory Drive. The Promontory Drive is connected to the road network through Harbour Boulevard.

Figure 2.3: Local Roads in Vicinity of the Site
Image source: Nearmap for NSW (dated July 2021)

2.2.2 State Road Network

Figure 2.4 illustrates the state roads in vicinity of the site. As shown in the figure, there are no state roads in the immediate vicinity of the site. The nearest state road to the site is Shellharbour Road located approximately 1.2 kilometres from the site.

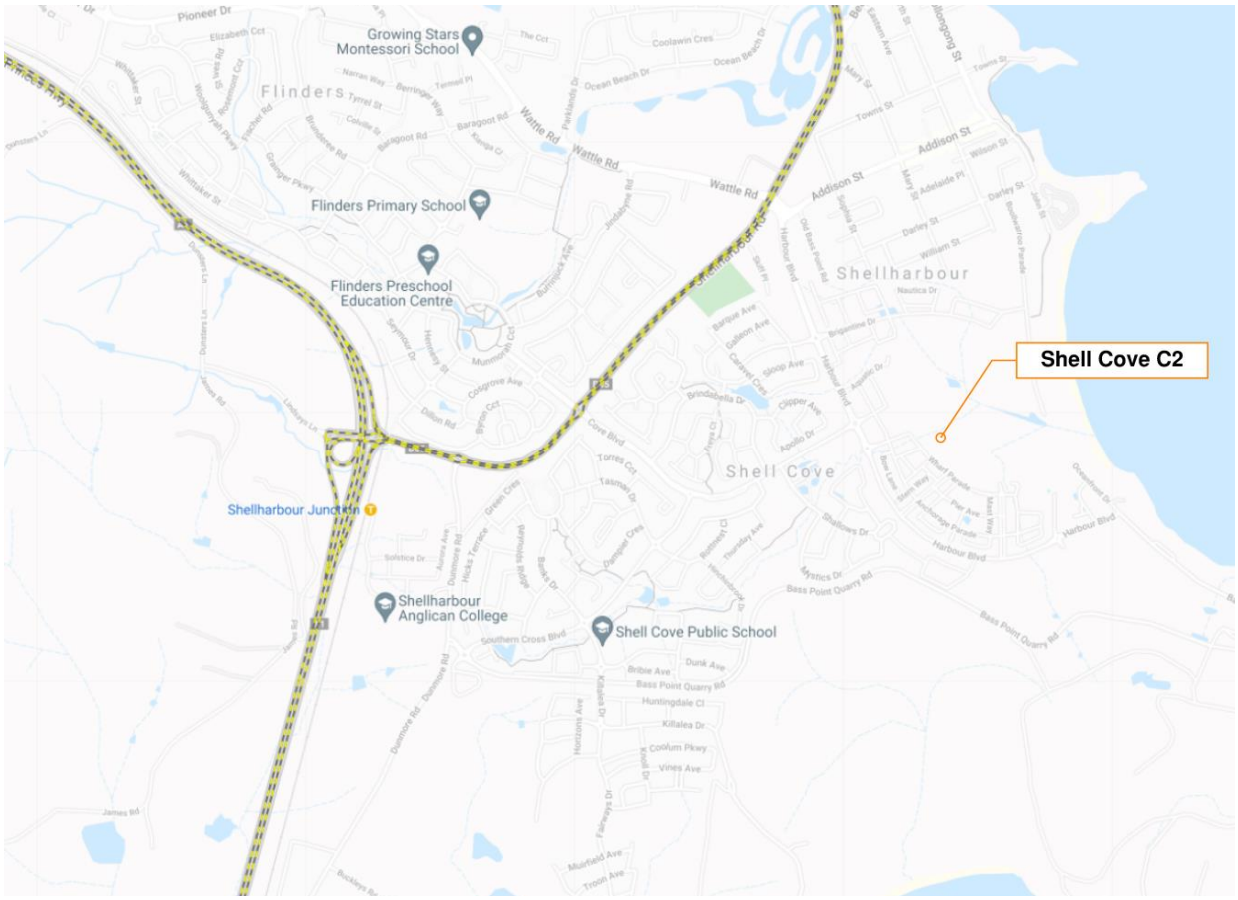


Figure 2.4: State Roads in Vicinity of the Site
Image source: Transport for NSW (dated July 2021)

2.3 Public Transport

Figure 2.5 illustrates transport routes surrounding the site.

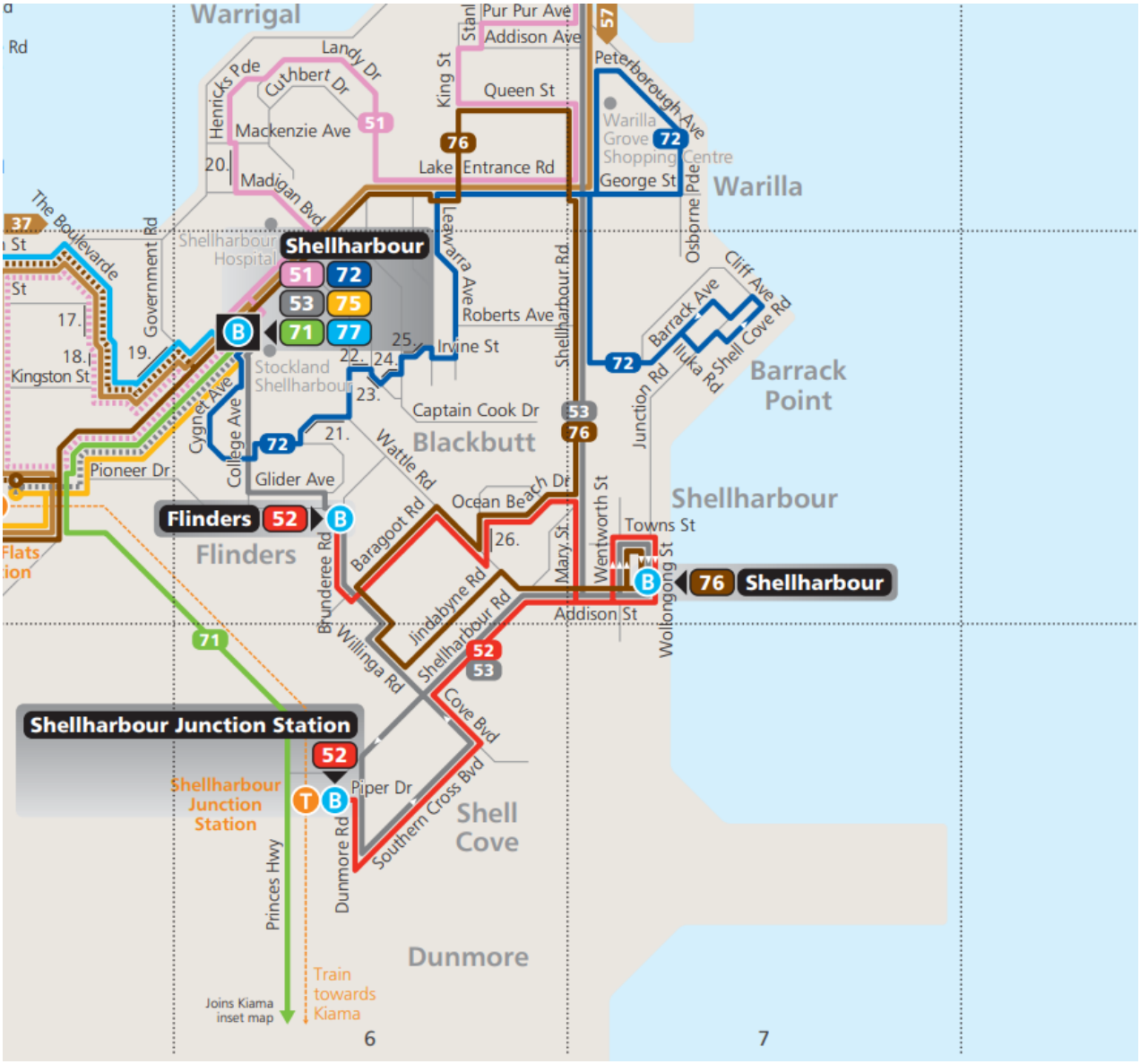


Figure 2.5: Bus and Train network Map
Note: transportnsw.info, July 2021

2.3.1 Train

The nearest train station to the site is Shellharbour Junction Station which is located approximately 3 kilometres from the site. South Coast Line is servicing the station with frequency of approx. 20 minutes in AM and PM peak hours. South Coast Line connects Bomaderry or Port Kembla to Bondi Junction.

2.3.2 Public Buses

The nearest bus stop to the site is located at Civic Avenue by 5 minutes-walk from the site. The bus stop is servicing 2 local lines which are run by Premier Illawarra. Table 2.1 demonstrates destinations and frequency of these lines.

Table 2.1: Public bus trip frequency during peak periods
Data source: transportnsw.info

Route	Destinations	Approx. Frequency
52	Flinders to Shellharbour Junction	Every 60 minutes
53	Shellharbour to Wollongong	Every 60 minutes

2.3.3 Cyclist Infrastructure

Cycleway Finder Website illustrates the existing local cycling routes near the site as Figure 2.6. A more extensive cycleway network is being provided as part of the Shell Cove master plan, as shown in Figure 2.12.

Figure 2.6: Cycling Map in the Local Road Network
Image source: Cycleway Finder (dated July 2021)

2.4 Shell Cove Future Plans

The Shell Cove precinct is undergoing major development with rapidly changing infrastructure. The Shell Cove Boat Harbour Precinct Section 75W modification is detailed as follows.

2.4.1 Section 75W Modification

The Shell Cove Boat Harbour Precinct Section 75W modification (dated July 2018) was lodged to provide a more diverse range of housing choices, as well as further refinements to the road pattern and block layout as housing typologies are developed in more detail.

Figure 2.7 to Figure 2.11 illustrate the Amended Concept Plan, Approved Land Use, Approved Building Heights, Site Access, Street and Public Domain Framework and Street Network and Types in the Section 75W modifications.

Figure 2.7: Amended Concept Plan

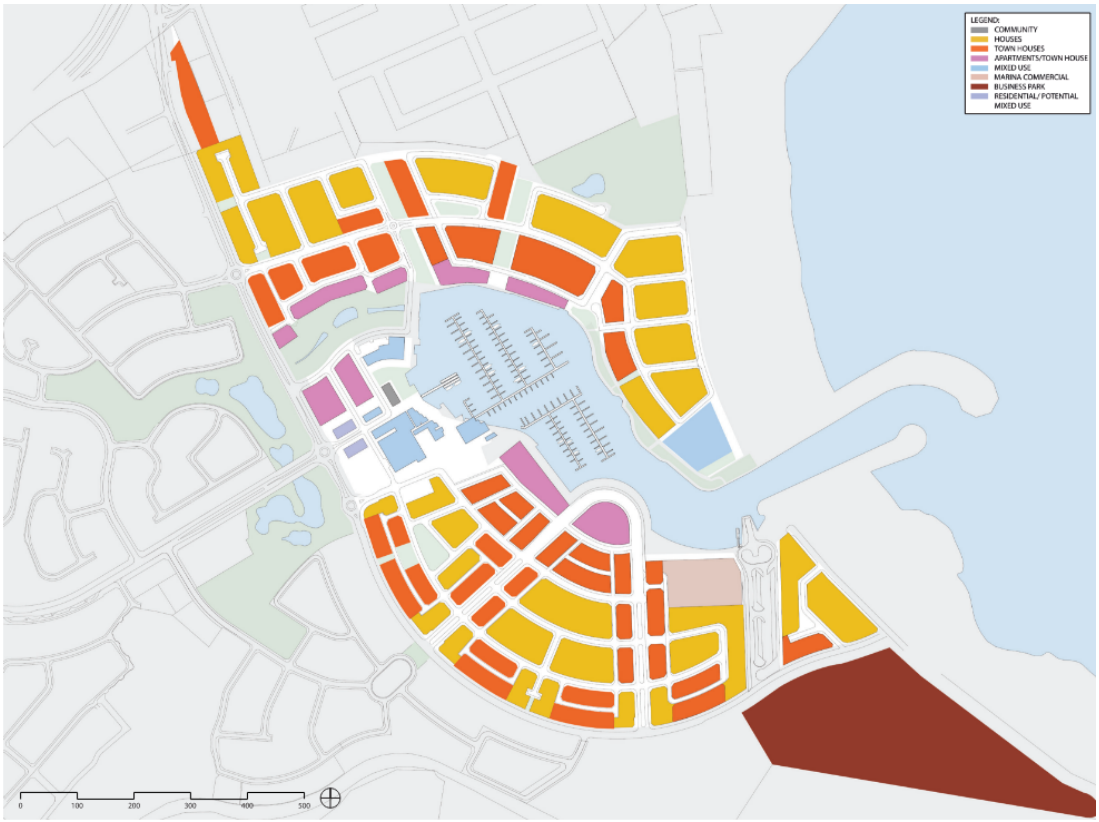


Figure 2.8: Approved Land Use

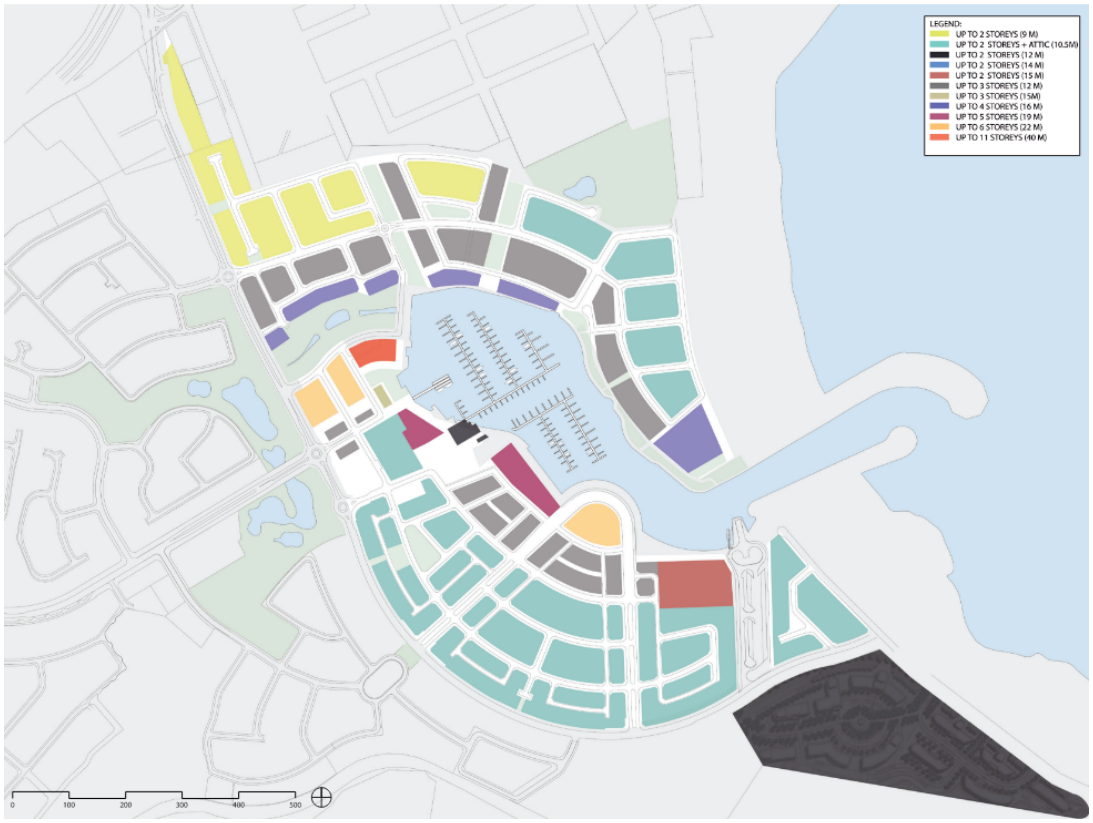


Figure 2.9: Approved Building Heights

Figure 2.10: Site Access, Street and Public Domain Framework

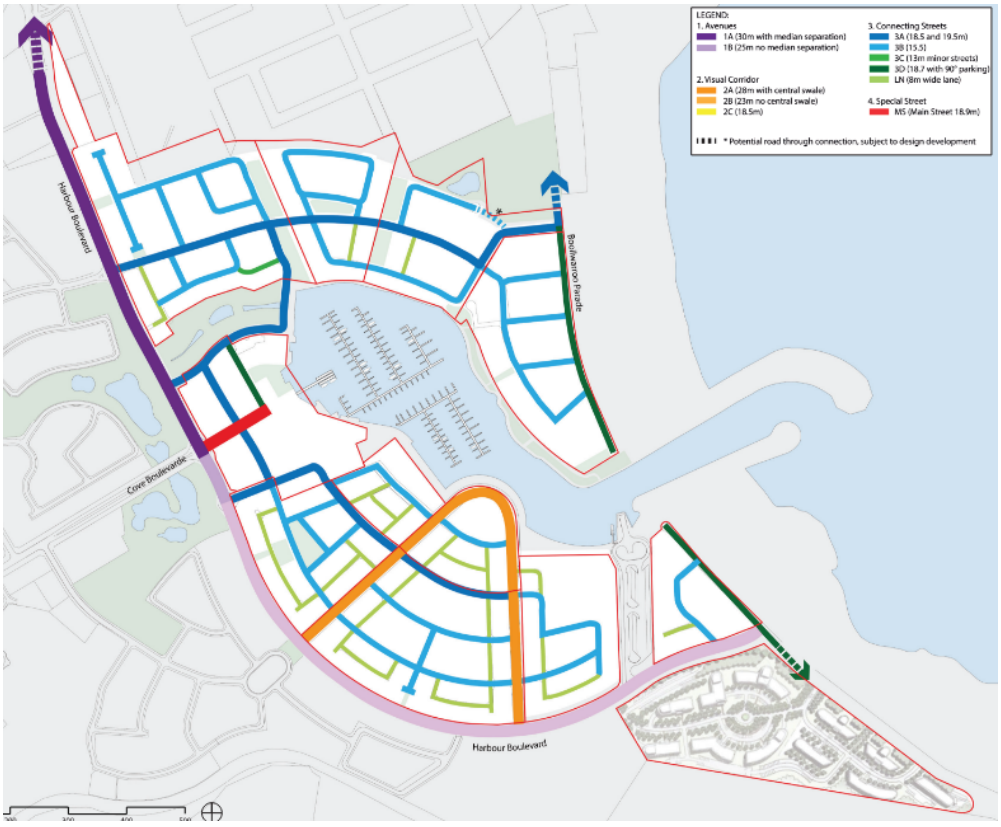


Figure 2.11: Street Network and Types

Figure 2.12 shows the planned Open Space, Pedestrian and Bicycle network for the precinct as part of the original Master Plan. The street layout and building arrangement of the Shell Cove proposal has changed significantly in the Section 75W modification, however the principal active transport network shown in Figure 2.12 remains reasonably consistent.

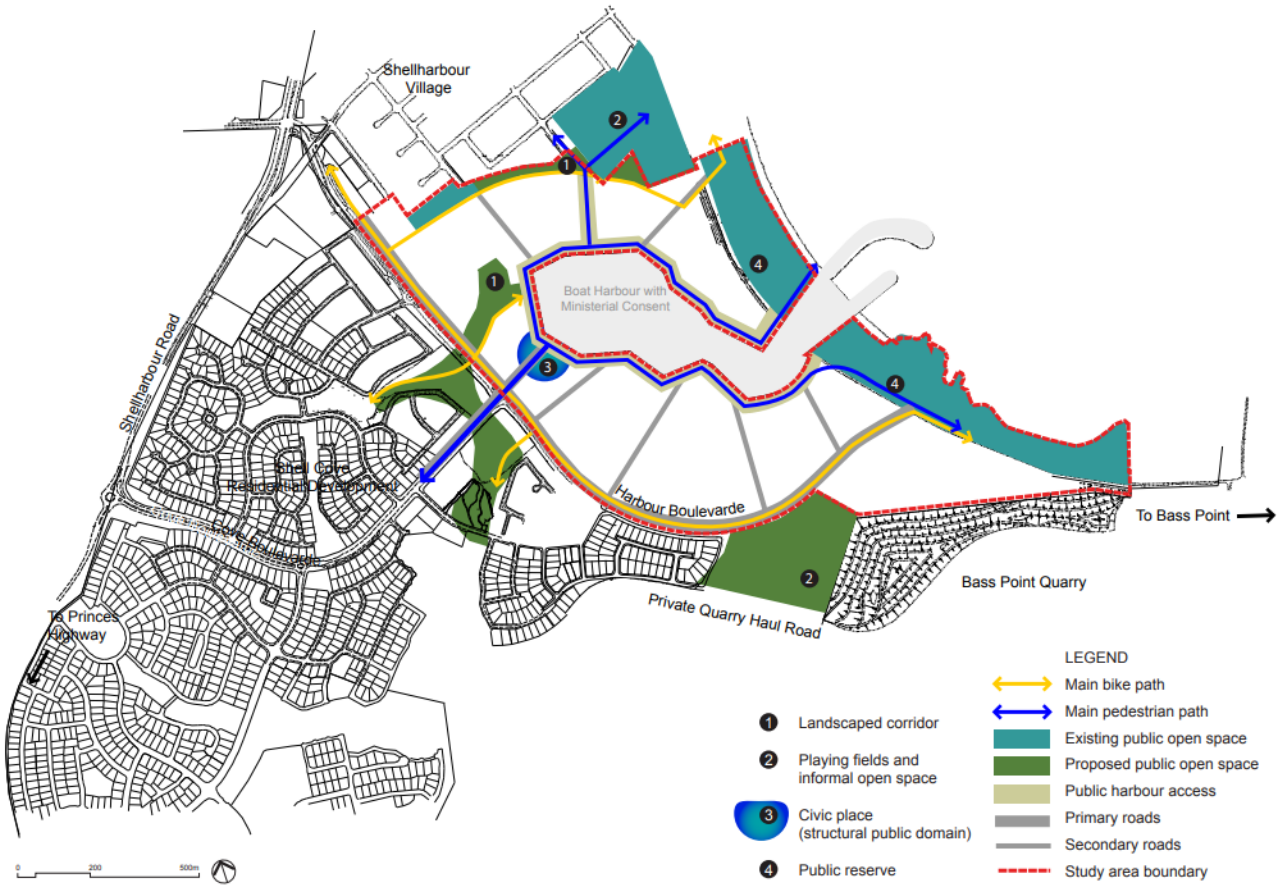


Figure 2.12: Open Space, Pedestrian and Bicycle Network

Shell Cove Boat Harbour Precinct- Concept Application and Environment Assessment, February 2010 prepared by LFA (Pacific) PTY Ltd.

3 Proposed Development

The proposed development comprises:

- Site preparation works including bulk excavation;
- Construction of two five (5) storey residential flat buildings over a two-level basement comprising approximately 52 residential apartments with a max of:
    - 14 two-bedroom apartments inclusive 6 adaptable units (27%)
    - 38 three-bedroom apartments (73%)
- A two-level basement encompassing:
    - A single point of entry from Quayside Avenue:
    - 117 parking spaces comprising;
        - 91 residential car parking spaces includes 6 accessible spaces
        - 26 visitor car parking spaces includes 1 accessible space
- 149m^2 of internal communal space including shared dining room, gymnasium and lounge room;
- Landscaping works including 687m^2 of communal open space comprising:
    - Ground level lawn and pool;
    - Ground level private lawn courtyard; and
    - Completion of foreshore landscaping works as per approved works related to Stage 2 Foreshore DA

3.1 Site Access

The site vehicle access will be provided by a two-way driveway in the southwest part of the site from Quayside Avenue. Quayside Avenue will connect to the road network at The Promontory Drive as shown in Figure 3.1.

Figure 3.1: Proposed Site access
Image source: Ground Floor Plan, Candalepas Associates (dated 13 May 2022)

4 Operational Impacts

4.1 Consistency with Approved Master Plan

In The Shell Cove Boat Harbour Precinct Section 75W modification as shown in Figure 2.8 (approved land use), apartments are considered for this site, and according Figure 2.9 (approved Building Heights) , the site will be located in the residential land use zone for up to 5-storey development. Therefore, the proposed development is consistent with these concept master plans.

On this basis, the traffic generation and traffic impacts have been accounted for in the precinct road network design, and there shall be no requirement for additional road or intersection treatments. Nevertheless, Section 4.2 provides an estimate of the traffic generation of the individual site for comparison and reference.

4.2 Traffic Generation

According to the RMS Guide to Traffic Generating Developments, October 2002, Section 3, trip generation rates for medium density residential flat buildings are as shown in Table 4.1.

Considering 14 2-bed units and 38 3-bed units, the overall site traffic generation is calculated in Table 4.2.

Table 4.1: Traffic Generation Rates

Note: Guide to Traffic Generating Developments, October 2002

	Daily vehicle trips (per dwelling)	Weekday peak hour vehicle trips (per dwelling)
Up to two bedrooms	4 - 5	0.4 - 0.5
Three or more bedrooms	5.0 – 6.5	0.5 - 0.65

Table 4.2: Traffic Generation Volumes

	Units number	Daily vehicle trips	Weekday peak hour vehicle trips
Up to two bedrooms	14	56 – 70	6 - 7
Three or more bedrooms	38	190 - 247	19 - 25
Total	52	246 – 317	25 - 32

According to the updated traffic surveys of RMS Guide to Traffic Generating Developments, August 2013, trip generation rates for low density residential dwellings in regional areas are as shown in Table 4.3.

Considering 52 units, the overall site traffic generation is calculated in Table 4.4.

Table 4.3: Traffic Generation Rates in regional area [1]

Note: Guide to Traffic Generating Developments, Updated traffic surveys, August 2013

	Daily vehicle trips	Weekday average evening peak hour vehicle trips	Weekday maximum evening peak hour vehicle trips	Weekday average morning peak hour vehicle trips	Weekday maximum morning peak hour vehicle trips
Rates (per dwelling)	7.4	0.78	0.90	0.71	0.85

Table 4.4: Traffic Generation Volumes

	Daily vehicle trips	Weekday average evening peak hour vehicle trips	Weekday maximum evening peak hour vehicle trips	Weekday average morning peak hour vehicle trips	Weekday maximum morning peak hour vehicle trips
Rates (per dwelling)	385	41	47	37	44

In accordance with the Guide to Traffic Generating Developments (Table 4.2) and the updated traffic surveys of this document (Table 4.4), the maximum weekday volumes will be as follow:

- 44 vehicles in a weekday morning peak hour
    - assume 90% outbound traffic and 10% inbound traffic in AM peak
    - 40 outbound and 4 inbound vehicle per hour in AM peak
- 47 vehicles in a weekday evening peak hour
    - assume 70% outbound traffic and 30% inbound traffic in PM peak
    - 33 outbound and 14 inbound vehicle per hour in PM peak

These amounts are negligible and will not have a significant effect on the surrounding networks, and as noted in Section 4.1 is considered to be consistent with the approved Shell Cove master plan. The proposed road network would therefore be suitable for this development.

[1] These rates do not include trips made internal to the subdivision, which may add up to an additional 25%

4.3 Car Parking

4.3.1 Rates and Requirements

The current relevant DCP for this site is the Shellharbour Development Control Plan (DCP) 2021. Table 4.5 demonstrates parking requirements for Residential Flat Buildings.

Table 4.5: DCP Parking Requirements
Note: Shellharbour DCP, April 2021

	Residential	Visitors
1 bedroom	1 space/ dwelling	0.25 space/ dwelling
2 bedrooms and more	1.5 space/ dwelling + minimum 1 enclosed space located behind the building line per dwelling*	0.5 space/ dwelling

*A carport is not considered an enclosed space.

*Stack parking will be considered on merit in residential flat building.

According to the proposed 14, 2-bed units and 38, 3-bed units, the total number of parking requirements for the site will be 104 spaces including 26 visitor spaces and 78 specified spaces for residents as shown in Table 4.6.

Table 4.6: Site Parking Requirements according to Shellharbour DCP

	Residential	Visitors	Total
1 bedroom	0	0	0
2 bedrooms and more	78	26	104
Total	**78**	**26**	**104**

The proposed parking layout of the Shell Cove C2 Apartments provides 117 parking spaces, comprising 91 residential spaces and 26 visitor spaces. Therefore, the total site parking capacity is approximately 11% more than the DCP requirement. This is due to additional residential parking spaces above the minimum requirements.

The total provision of 117 spaces includes 93 spaces directly adjacent to aisles, plus 24 stacked parking spaces. This results in 93 aisle-only spaces, plus 48 spaces across 24 pairs of stacked spaces. All 26 visitor parking spaces will be allocated to individual aisle-only spaces. The 24 pairs of stacked spaces will each be allocated to an individual apartment, along with the remaining (excluding visitor parking) 67 aisle-only spaces. All apartments will have at least one parking space. The average parking rate per apartment (for resident parking) will be approximately 1.75 spaces per apartment, exceeding the rate specified by the Shellharbour DCP.

4.4 Bike Parking

The current relevant DCP for this site (Shellharbour DCP) does not provide specific rates for bike parking, however, the proposed development provides the total of 23 bike parking spaces with the following details.

- 18 bike spaces in basement one
    - 6 floor mounted and 12 wall mounted
- 5 bike spaces in basement two
    - All floor mounted

4.4.1 Design Compliance

The car parking dimensions and grades for residential development outline in the Shellharbour DCP 2021 are as below:

- The minimum dimensions required for a single car space are: Length * width
    - 5.5m * 2.6m – open car space
    - 5.5m * 2.9m – open car space abuts one wall
    - 5.5m * 3.1m – open car enclosed both sides by buildings or walls
    - 6.1m * 2.6m – parallel parking

The above dimensions are based on an access aisle width of 7.0m. For each 0.4m reduction in the aisle width, there must be a 0.1m increase in the car space width. The dimensions for car parking spaces for people with a disability must be in accordance with relevant Australian Standards.

The relevant dimensions in the Australian Standards (AS2890.1) are as follows:

- Parking width is 2.4m
- Parking length is 5.4m
- Aisle width is 5.8 m for Class 1A and is 6.2m for Class 1

The C2 apartments will be designed to **Australian Standards** (AS2890.1) and would not be designed to the Shellharbour DCP design parameters.

The current design for this Development Application complies with the relevant AS2890.1 requirements and would be expected to be certified for compliance prior to construction.

The Australian Standards design specification has been chosen over the DCP guidelines for a number of reasons. Primarily, the function of this site as a residential apartment building suggests that the majority of users (other than visitor parking spaces) will be regular repeat users of the site and will be familiar with its design and function. Secondly, the car park has a reasonably low capacity and is fully independent across each level (i.e. manoeuvring within B1 does not block access to B2) meaning that vehicle manoeuvring is less of a concern. Additionally, the construction of a basement car park within a small footprint site requires a more efficient usage of space compared to an at-grade car park, and the Australian Standards design allows this parking provision to be provided within the site footprint.

4.4.2 Accessible Parking

Shellharbour DCP 2021 does not include accessible parking rates. The current design includes 6 accessible parking spaces, including 2 spaces on Basement 1 and 4 spaces on basement 2.

4.4.3 Operation

The car park would be provided with a security control point with remote or swipe card access from Quayside Avenue. A central median island is provided in the design to accommodate this function. The control point treatment is approximately 6 metres from the boundary line to allow adequate vehicle storage space off the footpath.

Internally, there is some overlap between inbound and outbound flows near the bottom of the ramp from Basement 1 to Basement 2. Additionally, there are some merge and crossover movements required at Basement 1 for where traffic splits between Basement 1 and Basement 2. To provide adequate safety in both areas, line marking and signage to clearly indicate priorities shall be provided for these areas.

Swept path analysis of the developed design has been completed, as documented in Appendix A.

4.4.4 Loading and Servicing

Waste collection and servicing of the building would be undertaken at a dedicated loading dock on ground floor. Waste collection would be undertaken by a Council's waste contractor and would involve wheeling bins from the bin storage adjacent to loading dock into the parked waste truck.

Loading Dock Management Plan has also been prepared by TTW which incorporates more details and information regarding the loading dock.

As described in the Loading Dock Management Plan, the access for the waste truck will be reverse in movement and forward out movement for exiting the loading dock.

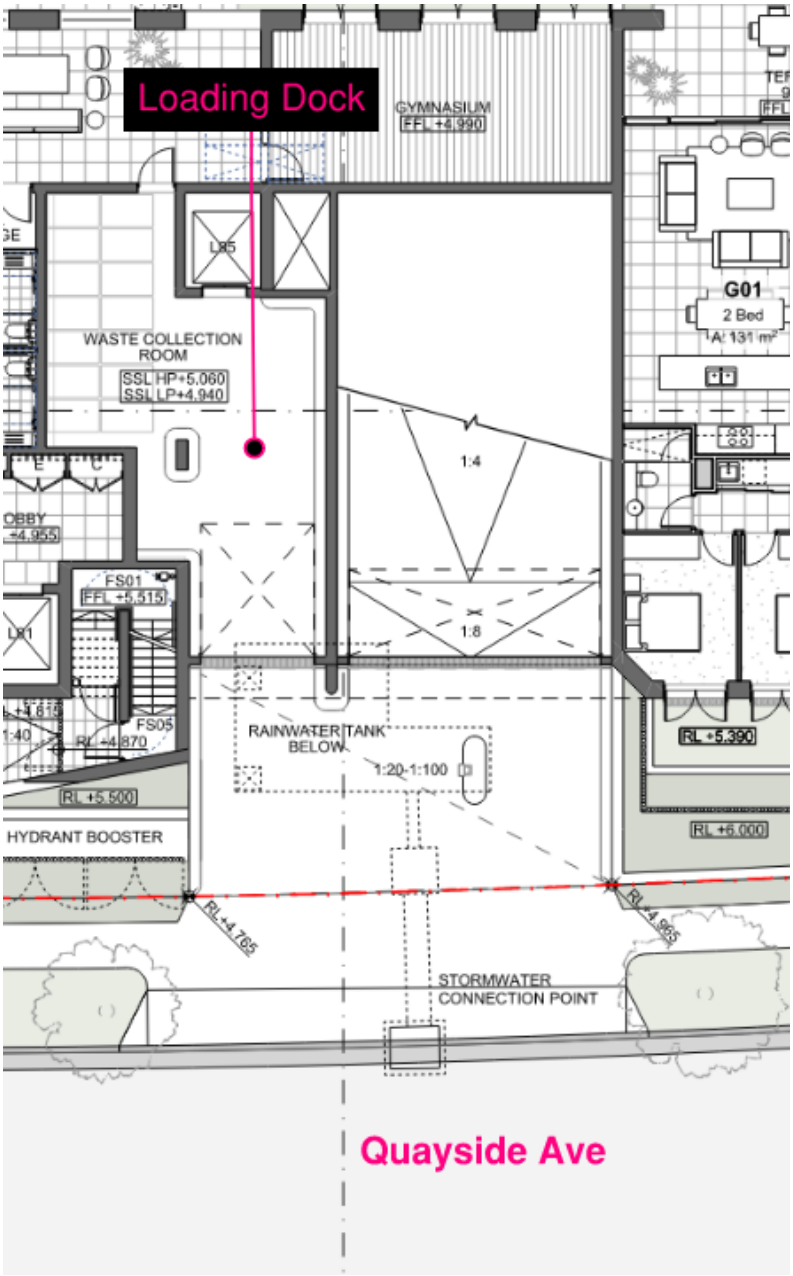


Figure 4.1: Proposed Loading Dock
Image source: Ground Floor Plan, Candalepas Associates (dated 13 May 2022)

5 Conclusion

This report has been prepared to determine the impact of the Shell Cove C2 Apartments on the local transport network.

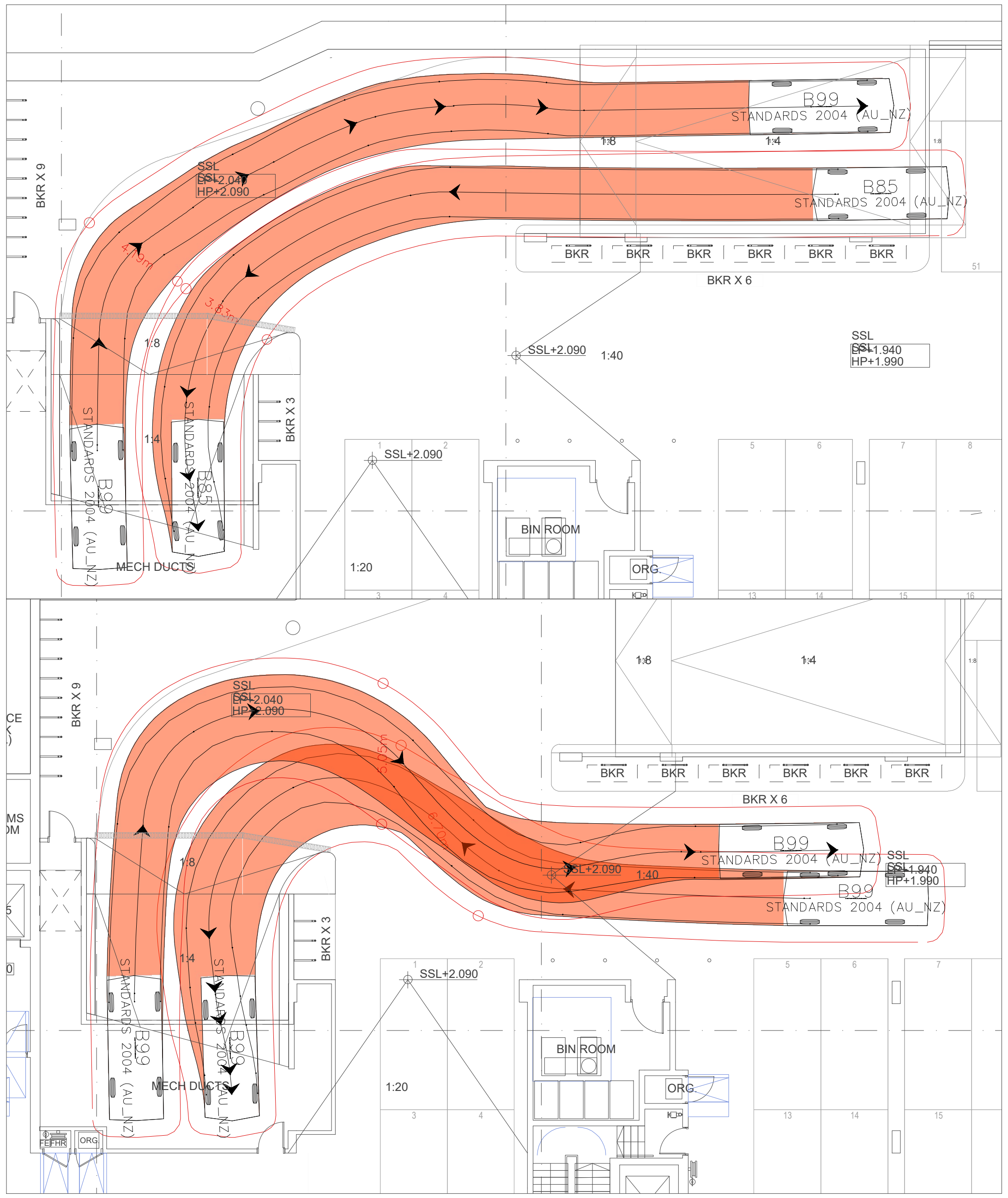
Waste collection is proposed to take place on-site. it is proposed to access the site with a reverse in movement and to egress the site with a forward out movement.

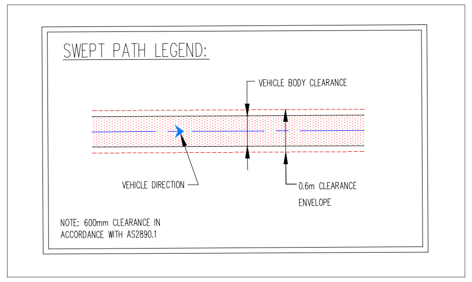
The predicted traffic generation amounts are negligible and will not have a significant effect on the surrounding networks. Therefore, the proposed road network would be suitable for this development.

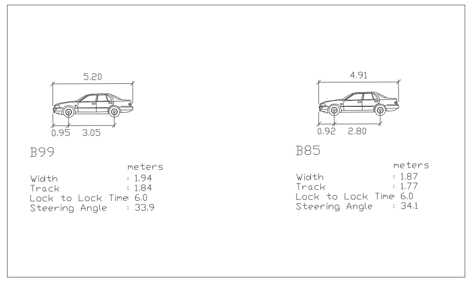
The proposed parking layout of the site includes 117 parking spaces, and the anticipated parking demand is 104 spaces based on Shellharbour DCP. Therefore, the site will provide approximately 11% more than anticipated parking demand by providing additional parking for residents.

The proposed development is considered to be consistent with a up to 5-storey development and the overall apartment numbers are not different from what would have been previously identified in the Master Plan for the Shell Cove Precinct. Accordingly, the traffic generation and traffic impacts have been accounted for in the precinct road network design, and there shall be no requirement for additional road or intersection treatments.

Appendix A Swept Path Analysis







PRELIMINARY
NOT FOR CONSTRUCTION

Rev	Description	Eng	Draft	Date
A1		AL	AL	17/05/22

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Project
PRECINCT C2 SHELL COVE

Sheet Subject
B99 - BASEMENT 1

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Job No	Drawing No	Revision
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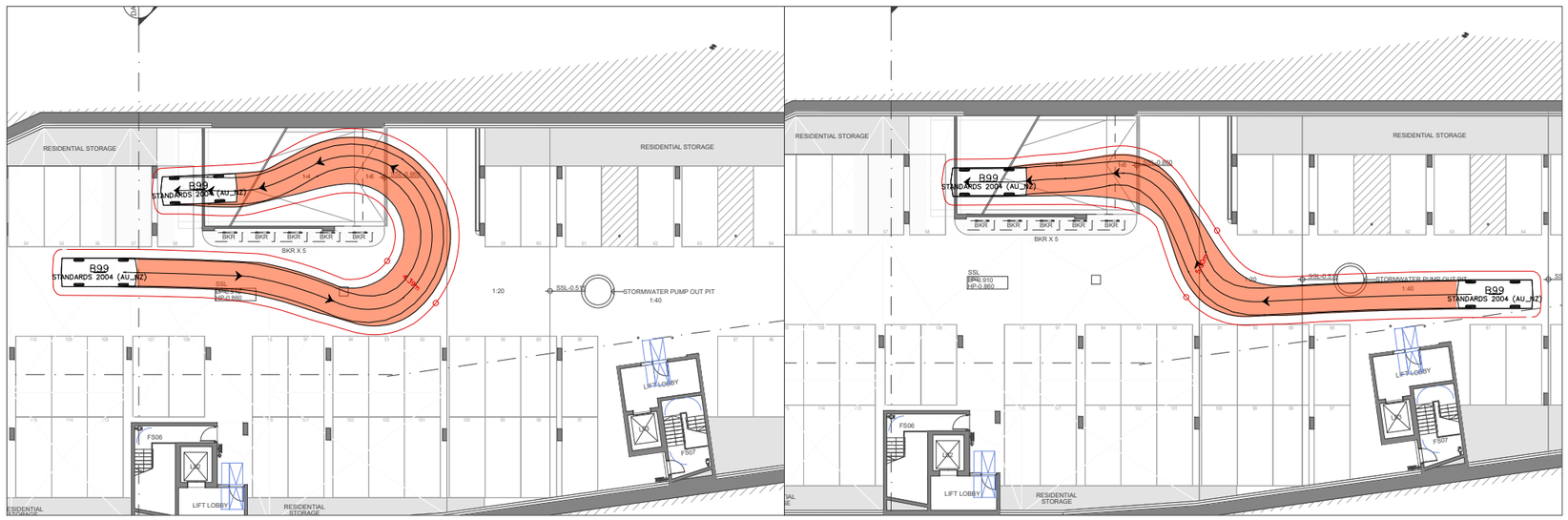

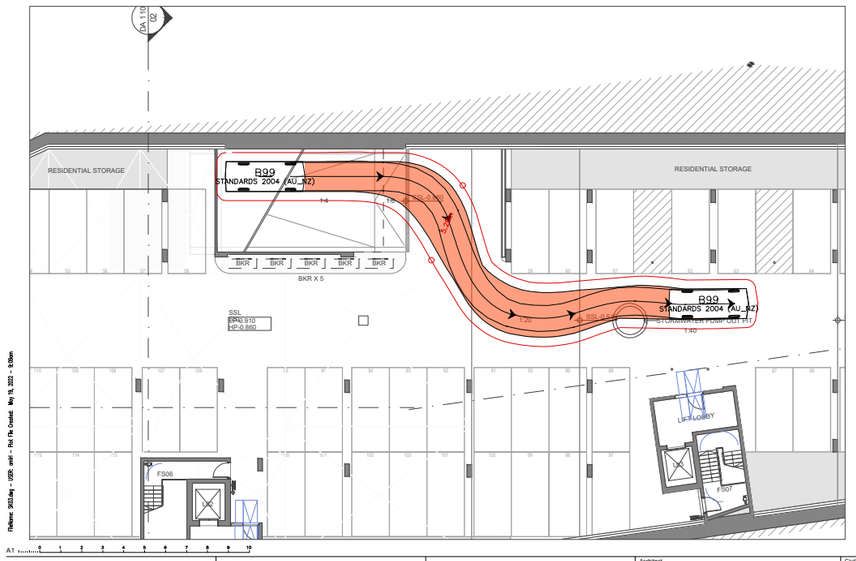

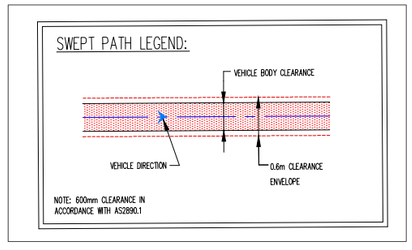

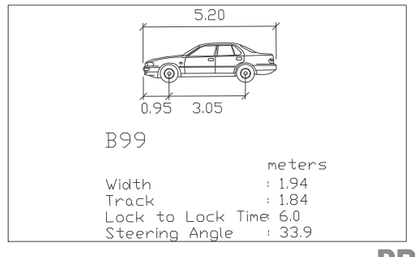

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Project
PRECINCT C2 SHELL COVE

Sheet Subject
B99 - BASEMENT 2

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