



## **SPACE COLLECTIVE ARCHITECTS**

**998 ALBANY HIGHWAY  
EAST VICTORIA PARK**

## **SPP 5.4 NOISE MANAGEMENT PLAN**

SEPTEMBER 2022

OUR REFERENCE: 30044-2-22302



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**SPP 5.4 NOISE MANAGEMENT PLAN  
 998 ALBANY HIGHWAY  
 EAST VICTORIA PARK**

Job No: 22302

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FOR

**SPACE COLLECTION ARCHITECTS**

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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned through Space Collective Architects to carry out an acoustic study with regards to traffic related noise for the proposed mixed use development at 998 Albany Highway, East Victoria Park.

The purpose of the study was to:

- Assess the noise that would be received within the development area from vehicles travelling on Albany Highway and Shepperton Road for future traffic volumes.
- Compare the results with accepted criteria and if exceedances exist, develop the framework for the management of noise.

A plan is attached in Appendix A.

It is noted that whilst this study references *State Planning Policy 5.4* as the criteria, some parts of the assessment have not been conducted under strict accordance with the policy, although a conservative approach where possible has been utilised. The intent of this preliminary assessment is to inform of general acoustic requirements as well as garner development approval.

A further report will be required with precise specifications once the detailed design stage of the project is commenced, in response to an anticipated development approval condition requesting a full assessment in accordance with *State Planning Policy 5.4*.

## 2. SUMMARY

The noise modelling indicates that noise received at the proposed development from vehicles travelling along Albany Highway and Shepperton Road in the future (2042) would exceed the Western Australian Planning Commission (WAPC) State Planning Policy (SPP) 5.4 "Road and Rail Transport Noise and Freight Considerations In Land Use Planning" "day time limit" criteria as the highest calculated noise level at a façade is 68 dB  $L_{Aeq(day)}$ .

Herring Storer Acoustic recommends the development be conditioned as such to require a full assessment of the development in accordance with *State Planning Policy 5.4* once detailed designed is finalised to provide a more accurate assessment – this would include finalised window sizes, façade constructions and the like to be accounted for.

## 3. ACOUSTIC CRITERIA

### 3.1 NOISE

The Western Australian Planning Commission (WAPC) released on 6<sup>th</sup> September 2019 State Planning Policy 5.4 "Road and Rail Noise". The requirements of State Planning Policy 5.4 are outlined below.

#### POLICY APPLICATION (Section 4)

##### When and where it applies (Section 4.1)

*SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed:*

- a) noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in **Table 1**.
- b) New or major upgrades of roads as specified in **Table 1** and maps (**Schedule 1, 2 and 3**); or
- c) New railways or major upgrades of railways as specified in maps (**Schedule 1, 2 and 3**); or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise.

Policy trigger distances (Section 4.1.2)

**Table 1** identifies the State's transport corridors and the trigger distances to which the policy applies.

The designation of land within the trigger distances outlined in **Table 1** should not be interpreted to imply that land is affected by noise and/or that areas outside the trigger distances are un-affected by noise.

Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/mitigation required. An initial screening assessment (**guidelines: Table 2: noise exposure forecast**) will determine if the lot is affected and to what extent."

**TABLE 1: TRANSPORT CORRIDOR CLASSIFICATION AND TRIGGER DISTANCES**

<b>Transport corridor classification</b>	<b>Trigger distance</b>	<b>Distance measured from</b>
<b>Roads</b>		
<b>Strategic freight and major traffic routes</b> Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume	300 metres	Road carriageway edge
<b>Other significant freight/traffic routes</b> These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meet the criteria of either >=23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes)	200 metres	Road carriageway edge
<b>Passenger railways</b>		
	100 metres	Centreline of the closest track
<b>Freight railways</b>		
	200 metres	Centreline of the closest track

Proponents are advised to consult with the decision making authority as site specific conditions (significant differences in ground levels, extreme noise levels) may influence the noise mitigation measures required, that may extend beyond the trigger distance.

POLICY MEASURES (Section 6)

The policy applies a performance-based approach to the management and mitigation of transport noise. The policy measures and resultant noise mitigation will be influenced by the function of the transport corridor and the type and intensity of the land-use proposed. Where there is risk of future land-use conflict in close proximity to strategic freight routes, a precautionary approach should be applied. Planning should also consider other broader planning policies. This is to ensure a balanced approach takes into consideration reasonable and practical considerations.

Noise Targets (Section 6.1)

**Table 2** sets out noise targets that are to be achieved by proposals under which the policy applies. Where exceeded, an assessment is required to determine the likely level of transport noise and management/mitigation required.

In the application of the noise targets the objective is to achieve:

- indoor noise levels as specified in **Table 2** in noise sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and
- a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.

It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

**TABLE 2: NOISE TARGETS**

Proposals	New/Upgrade	Noise Targets		
		Outdoor		Indoor
		Day ( $L_{Aeq}(\text{Day})$ dB) (6 am-10 pm)	Night ( $L_{Aeq}(\text{Night})$ dB) (10 pm-6 am)	( $L_{Aeq}$ dB)
Noise-sensitive land-use and/or development	New noise sensitive land use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	$L_{Aeq}$ (Day) 40(Living and work areas) $L_{Aeq}$ (Night) 35 (bedrooms)
Roads	New	55	50	N/A
	Upgrade	60	55	N/A
Railways	New	55	50	N/A
	Upgrade	60	55	N/A

Notes:

- The noise target is to be measured at one metre from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.
- For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.
- The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.
- Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.

Noise Exposure Forecast (Section 6.2)

When it is determined that SPP 5.4 applies to a planning proposal as outlined in Section 4, proponents and/or decision makers are required to undertake a preliminary assessment using **Table 2**: noise exposure forecast in the guidelines. This will provide an estimate of the potential noise impacts on noise-sensitive land-use and/or development within the trigger distance of a specified transport corridor. The outcomes of the initial assessment will determine whether:

- no further measures are required.
- noise-sensitive land-use and/or development is acceptable subject to deemed-to-comply mitigation measures; or
- noise-sensitive land-use and/or development is not recommended. Any noise-sensitive land-use and/or development is subject to mitigation measures outlined in a noise management plan.”

4. ACOUSTIC ENVIRONMENT

The noise measurements were conducted at 12:00 PM, 31 August 2022 for a short term period to determine the L<sub>A10</sub> noise level traffic for approximately 15 minutes. Traffic volume details for this road section are included in Appendix C.

Utilising this measurement, reference to the DEFRA publication has been sought and the difference between the L<sub>A10,18hr</sub> and the L<sub>Aeq,8hr</sub> and the L<sub>Aeq,16hr</sub> has been calculated. The location of the measurements is shown in Appendix A.

Noise measurements were conducted with a Larson Davis 831 Sound Level Meter. The Sound Level Meter was calibrated prior to and after use with a Bruel and Kjaer 4230 Calibrator. All equipment used is currently NATA laboratory calibrated. Calibration certificates are available on request.

**TABLE 3.1: SUMMARY OF MEASURED NOISE LEVELS**

Measurement Location	Measured/Calculated Noise Level, dB(A)		
	L <sub>A10</sub>	L <sub>Aeq, day (6am to 10pm)</sub>	L <sub>Aeq, night (10pm to 6am)</sub>
998 Albany Highway	67.4	64.3	56.9

During the noise measurements it was determined that noise from Albany Highway dominated noise levels at the development, even though it is not an identified road by *State Planning Policy 5.4* and has a current traffic flow of 13,320 vpd , below the trigger volume of 25,000 vpd.

Shepperton Road’s influence on this development was identified as minor and is confirmed by a screening assessment from *State Planning Policy 5.4* detailed below.

Transport Corridor Classification	Number of lanes (both directions), including bus/priority lanes and entrance/exit ramps	Forecast noise exposure category based on lot distance(m) from edge of nearest main road carriageway (not entrance/exit ramps)																											
		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	175	200	225	250	275	300							
Other significant freight/traffic routes • Any actual or planned future State Administered Road • Local Government Roads Carrying 100 or more Class 7 – 12 Austroads vehicles/day • 25,000+ vehicles per days vehicles/day	Urban Region Scheme areas 60-90 km/hr	1 to 2 lanes	67	64	62	61	60	59	58	57	56	56	55	54	54	53	53	52	51	50	49	48	47						
		3 to 6 lanes	69	66	64	63	62	61	60	59	58	58	57	56	56	55	55	54	53	52	51	50	49						
	Urban Region Scheme areas 100+ km/hr	1 to 2 lanes	70	67	65	64	63	62	61	60	59	59	58	57	56	56	55	54	53	52	51	50							
		3 to 6 lanes	74	70	68	66	65	64	63	62	61	61	60	60	59	59	58	57	56	55	54	53	52						
	Rural areas 60-90 km/hr	1 to 2 lanes	62	59	57	56	55	54	53	52	51	51	50	49	49	48	48	46	45	44	43	42	41						
		3 to 4 lanes	66	63	61	60	59	58	56	56	55	54	53	53	52	52	51	50	49	48	47	46	45						
Rural areas 100+ km/hr	1 to 2 lanes	67	64	62	61	60	59	58	57	56	55	54	54	53	53	52	51	50	49	48	47	46							
	3 to 4 lanes	69	66	64	63	62	61	60	59	58	57	56	56	55	55	54	53	52	51	50	49	48							

As Shepperton Road is a “3-6 lane” “urban region scheme area 60-80km/hr” approximately 110m away that closest point, an  $L_{Aeq(day)}$  of 56/57 dB would be appropriate. However, as noise associated with the road is barriered by buildings, the ‘once off reduction in exposure level which equates to 4 dB deduction’ in section 3.3.1 of the *Implementation Guidelines* would apply, reducing the forecasted noise to 52/53 dB  $L_{Aeq(day)}$ , meaning noise associated with Shepperton Road would be below the noise target.

## 5. MODELLING

To determine the noise levels from traffic on Albany Highway, acoustic modelling was carried out using Sound Plan, using the Calculation of Road Traffic Noise (CoRTN)<sup>1</sup> algorithms.

The input data for the model included:

- Topographical and cadastral data supplied by client (Shown in Appendix A).
- Traffic data as per Table 4.1 (Obtained from MRWA Traffic Map, Attached in Appendix C).
- Adjustments as listed in Table 4.2.

**TABLE 4.1 - NOISE MODELLING INPUT DATA**

Parameter	Albany Highway (Current) 2020	Albany Highway (Future) 2042
Traffic Volumes	13,320 vpd	20,590 vpd
Percentage traffic 0600 – 2400 hours (Assumed)	94%	94%
Heavy Vehicles (%) (Assumed)	5.9%	5.9%
Speed (km/hr)	40km/hr	40km/hr
Road Surface	Chip Seal	Dense Graded Asphalt

**TABLE 4.2 – ADJUSTMENTS FOR NOISE MODELLING**

Description	Value
Façade Reflection Adjustment	+2.5 dB
Conversion from $L_{A10(18\text{ hour})}$ to $L_{Aeq(16\text{ hour})}$ (Day)	-3.4 dB*

## 6. TRAFFIC NOISE ASSESSMENT

Using the data contained in Tables 3.1, 4.1 and 4.2, modelling was carried out under existing conditions for calibration. The Sound Plan model for the site has been set up for the 2042 scenario as defined in Table 4.1. The following assumptions have been made:

- 18 hour traffic count will be 94% of daily figures.
- Noise model calibrated to measured noise level as per Table 3.1
- The same diurnal relationship will exist in the future between the  $L_{A10(18\text{ hour})}$  and the  $L_{Aeq}$  parameters; and
- 2.5 dB(A) has been added to the results for façade reflection.

<sup>1</sup> Calculation of Road Traffic Noise UK Department of Transport 1987



The noise requirements based on the above have been listed in Appendix B.

It is noted that these requirements pertain to acoustic requirements only, with regard to *State Planning Policy 5.4*, and may be superseded by other requirements (BAL, Thermal, etc).

## 7. CONCLUSION

In accordance with the WAPC Planning Policy 5.4, an assessment of the noise that would be received within the development of 998 Albany Highway, East Victoria Park from vehicles travelling on Albany Highway has been undertaken.

In accordance with the Policy, the following would be the acoustic criteria applicable to this project:

### **External**

Day	55 dB(A) $L_{Aeq}$
Night	50 dB(A) $L_{Aeq}$

### **Internal**

Sleeping Areas	35 dB(A) $L_{Aeq(night)}$
Living Areas	40 dB(A) $L_{Aeq(day)}$

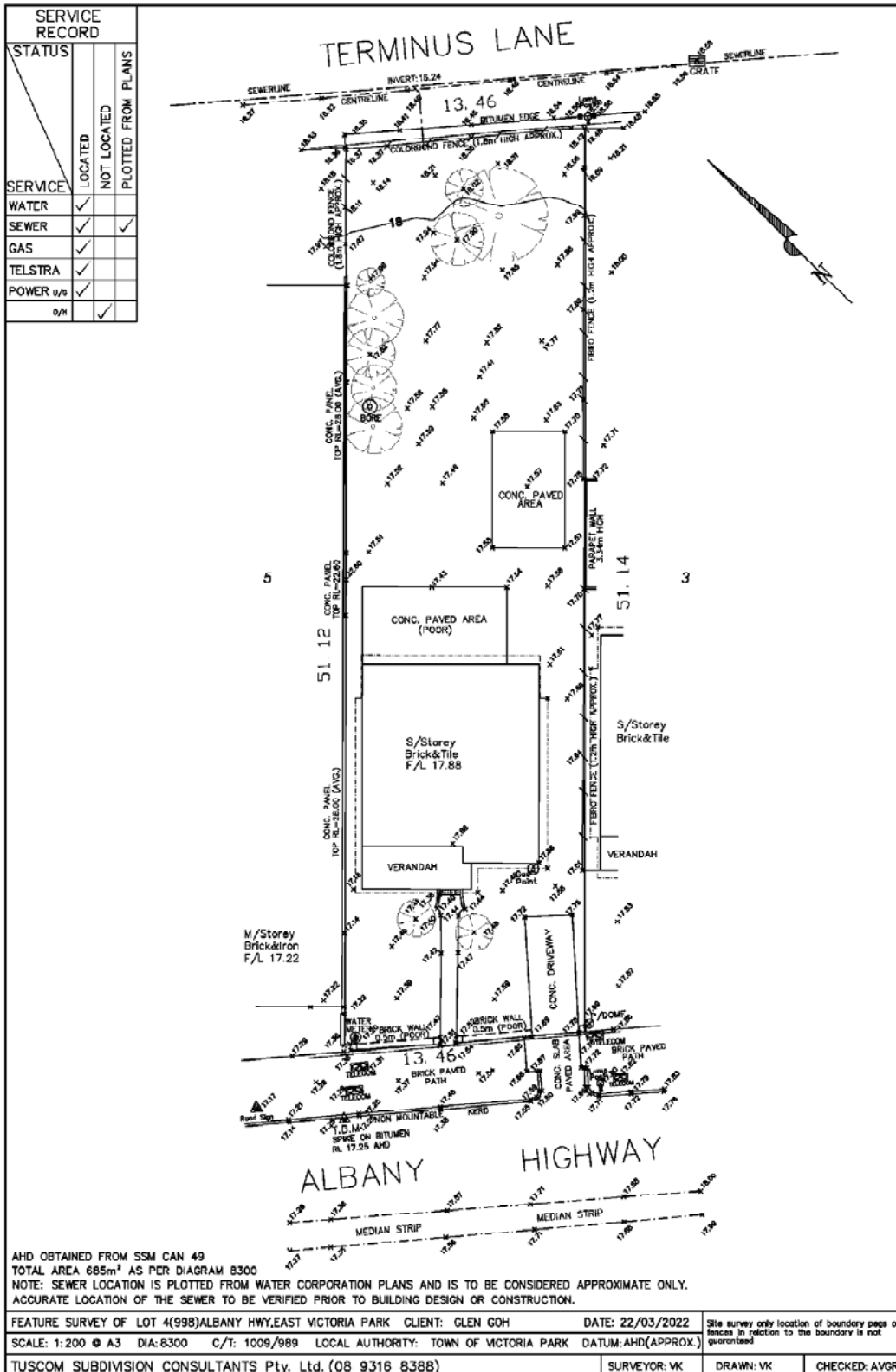
It is noted that walls of the development would be required to be constructed of either masonry or tilt up concrete panel. If a lightweight construction or similar is desirable, investigation into constructions that would meet the requirement of State Planning Policy 5.4 would have to be undertaken.

The results of the acoustic assessment indicate that noise received at the development from future traffic, exceed external noise level criteria. Therefore, noise amelioration in the form of quiet house design listed in Appendix B, as well as notifications on the title is required.

Herring Storer Acoustic recommends the development be conditioned as such to require a full assessment of the development in accordance with *State Planning Policy 5.4* once detailed designed is finalised to provide a more accurate assessment – this would include finalised window sizes, façade constructions and the like to be accounted for.

# APPENDIX A

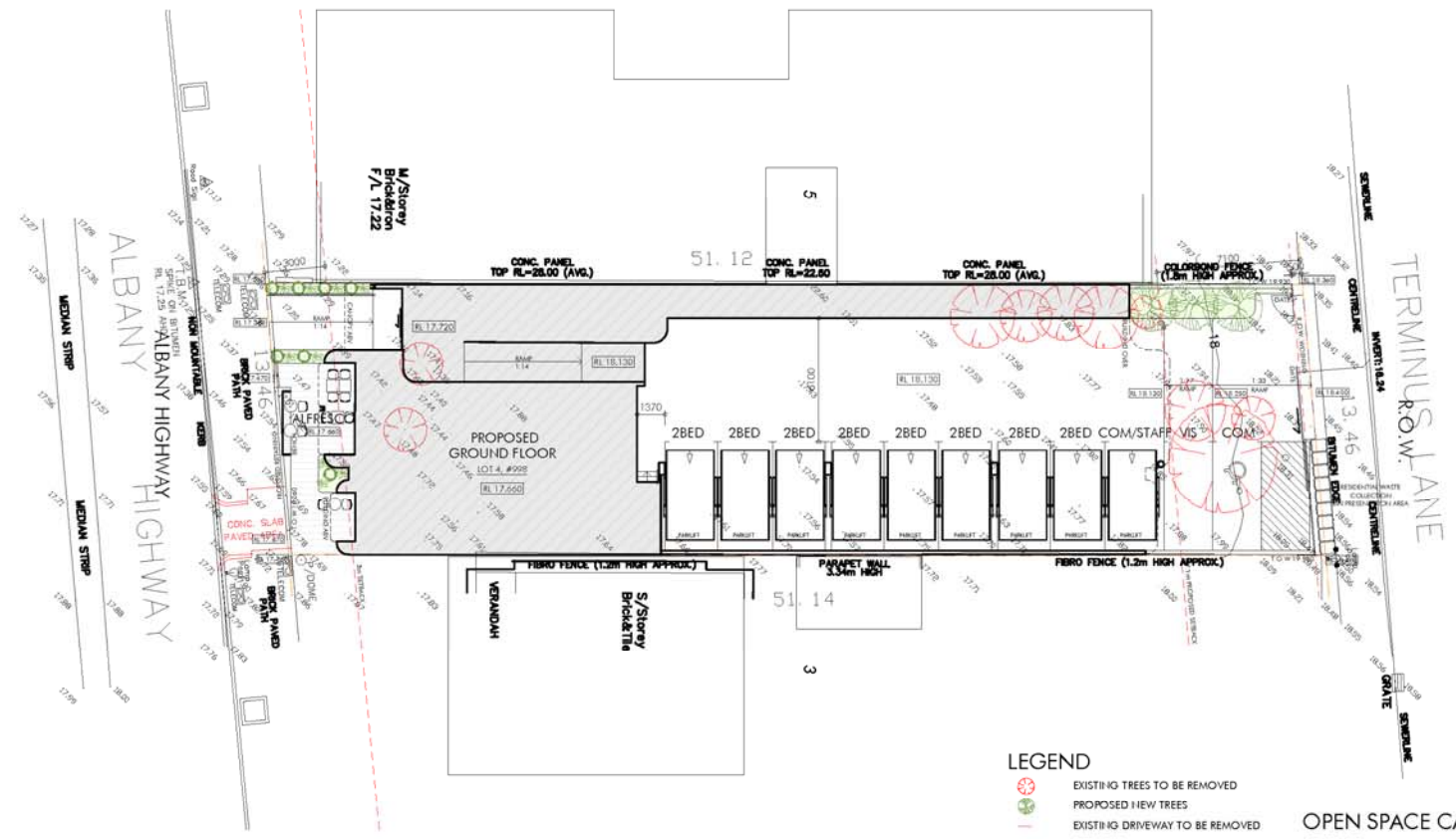
## PLANS



AHD OBTAINED FROM SSM CAN 49  
TOTAL AREA 685m<sup>2</sup> AS PER DIAGRAM 8300  
NOTE: SEWER LOCATION IS PLOTTED FROM WATER CORPORATION PLANS AND IS TO BE CONSIDERED APPROXIMATE ONLY.  
ACCURATE LOCATION OF THE SEWER TO BE VERIFIED PRIOR TO BUILDING DESIGN OR CONSTRUCTION.

FEATURE SURVEY OF LOT 4(998)ALBANY HWY,EAST VICTORIA PARK	CLIENT: GLEN GOH	DATE: 22/03/2022	Site survey only location of boundary pegs or fences in relation to the boundary is not guaranteed
SCALE: 1:200 @ A3	DIA: 8300	C/T: 1009/989	
TUSCOM SUBDIVISION CONSULTANTS Pty. Ltd. (08 9316 8388)		SURVEYOR: VK	CHECKED: AVGR

SERVICE RECORD			
STATUS	LOCATED		PLOTTED FROM PLANS
	LOCATED	NOT LOCATED	
SERVICE			
WATER	✓		
SEWER	✓		✓
GAS	✓		
TELSTRA	✓		
POWER	u/n	✓	
	0/1		✓



- LEGEND**
- EXISTING TREES TO BE REMOVED
  - PROPOSED NEW TREES
  - EXISTING DRIVEWAY TO BE REMOVED
  - SETBACKS
  - PROPOSED LANDSCAPE
  - PROPOSED SLAB
  - PROPOSED LEVELS

**OPEN SPACE CALCULATION**

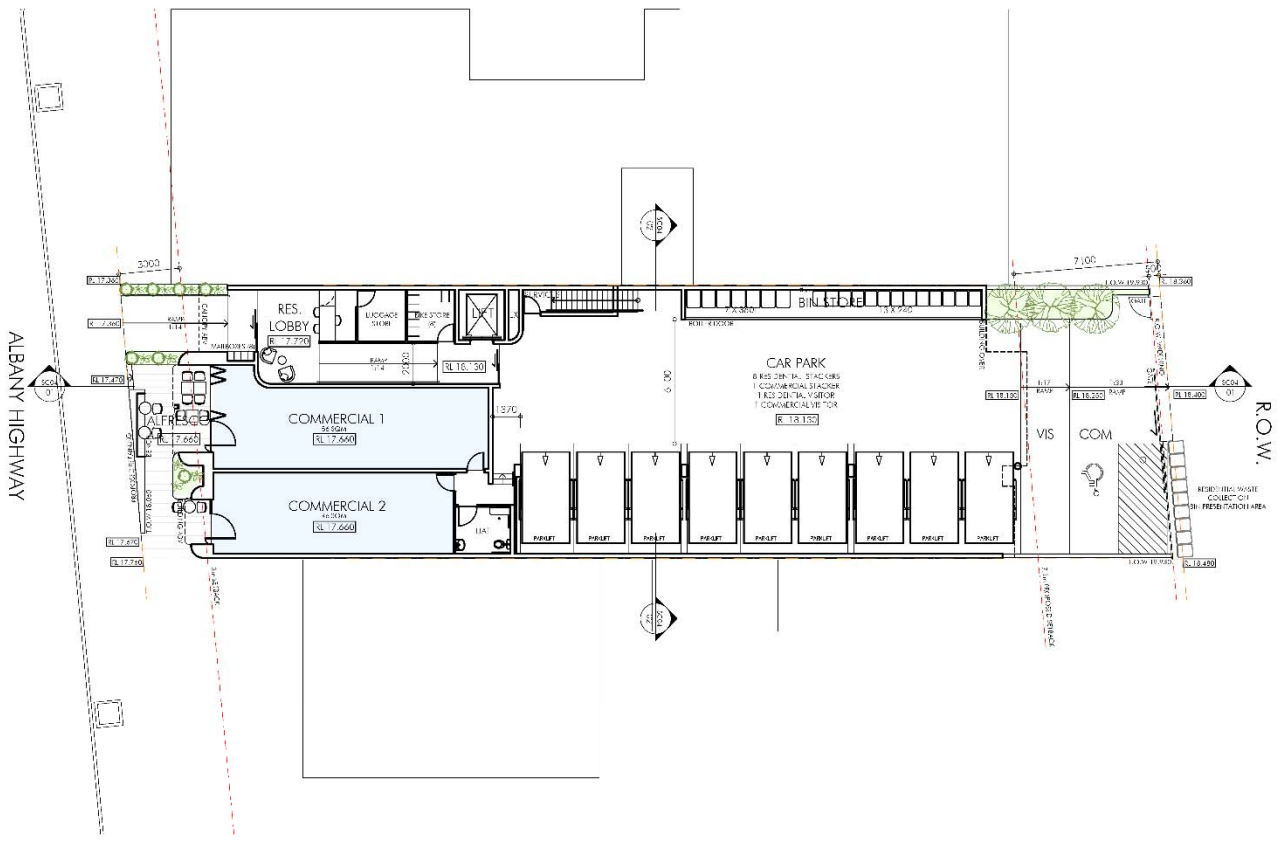
OTHER AREA	143sqm
UNDER-SHADE AREA	300sqm
TOTAL OPEN SPACE AREA	443sqm
% OF SITE AREA	65%



**MULTI-RESIDENTIAL DEVELOPMENT**  
998 ALBANY HIGHWAY EAST VIC PARK



DWG No.	REV
SCO1-1	A



GROUND FLOOR



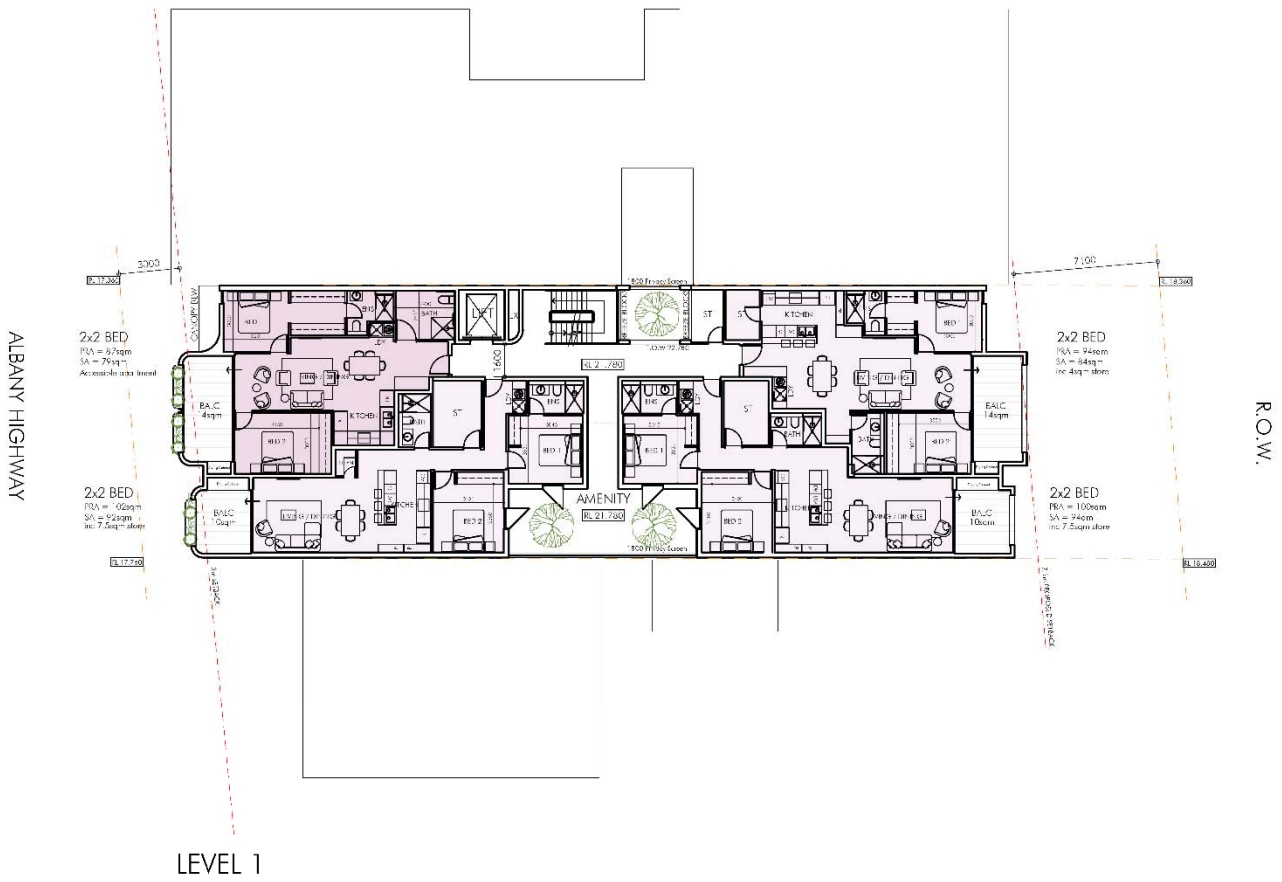
**MULTI-RESIDENTIAL DEVELOPMENT**  
 998 ALBANY HIGHWAY EAST VIC PARK

SCALE  
 1:200 @A3



DATE ISSUED: 11.08.2022  
 DWG. NAME: GROUND FLOOR PLAN

DWG No. SC02-1  
 REV. A

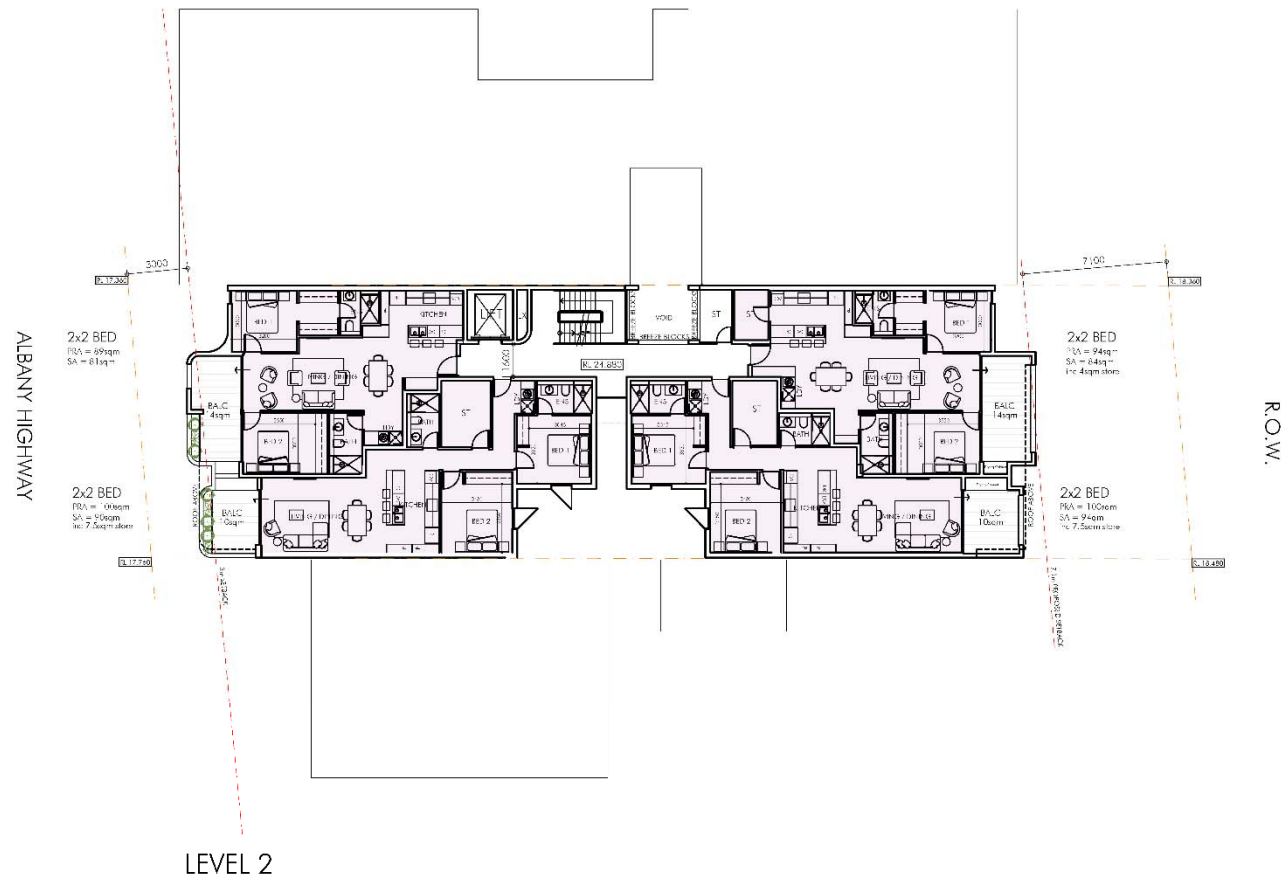


**MULTI-RESIDENTIAL DEVELOPMENT**  
998 ALBANY HIGHWAY EAST VIC PARK



DATE ISSUED: 11.08.2022  
DWG. NAME: LEVEL 1 PLAN

DWG No.	REV
SC02-2	A

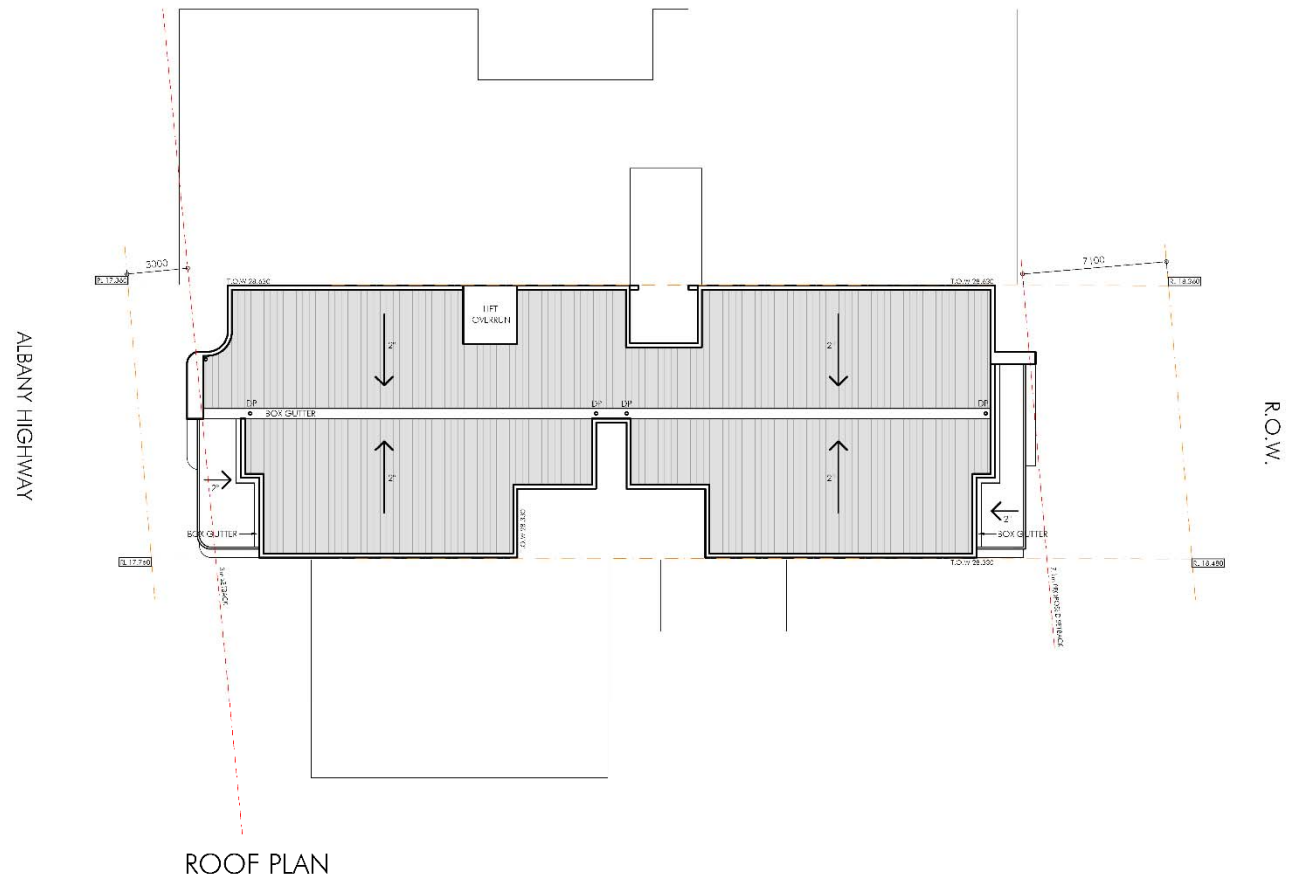


**MULTI-RESIDENTIAL DEVELOPMENT**  
 998 ALBANY HIGHWAY EAST VIC PARK



DATE ISSUED | DWO. NAME  
 11.08.2022 | LEVEL 2 PLAN

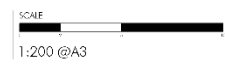
DWO No. | REV  
 SC02-3 | A



ROOF PLAN



**MULTI-RESIDENTIAL DEVELOPMENT**  
 998 ALBANY HIGHWAY EAST VIC PARK



DATE ISSUED	DWG. NAME
11.08.2022	ROOF PLAN

DWG. No.	REV
SC02-4	A



## **APPENDIX B**

### GLAZING REQUIREMENTS

Calculated Noise Levels and Required $R_w$ and $C_{tr}$ Ratings				
Location	Floor	Level dB $L_{Aeq}(\text{Day})$	Bedroom $R_w + C_{tr}$	Living Room $R_w + C_{tr}$
South West Facing Windows (Facing Albany Highway)	All Floors	68	37	34
North East Windows (Facing Terminus Lane)	All Floors	<43	23	23
South East Facing Windows (Centre of Building)	All Floors	<47	23	23
North West Facing Windows (Centre of Building)	All Floors	<44	23	23

Notes: The required  $R_w$  rating can be reduced by reducing the area of glazing.  
 Requirements pertain to only acoustic advice in regard to *State Planning Policy 5.4* and may be superseded by other requirements (BAL, Thermal, etc).

## **APPENDIX C**

### MRWA TRAFFIC FLOW DATA



SITE 3885

# Hourly Volume

Albany Hwy (1290252)

2020/21  
Monday to Friday

North of Hill View Tce (SLK 0.41)

	All Vehicles			Heavy Vehicles				
	NB	SB	Both	NB	SB	Both	%	
00:00	46	45	91	0	0	0	0.0	
01:00	30	31	61	2	2	4	6.6	
02:00	15	22	37	2	2	4	10.8	
03:00	11	16	27	2	2	4	14.8	
04:00	24	29	53	4	2	6	11.3	
05:00	85	65	150	6	3	9	6.0	
06:00	185	147	332	24	18	42	12.7	
07:00	354	253	607	31	25	56	9.2	
08:00	478	330	808	24	35	59	7.3	
09:00	407	312	719	26	23	49	6.8	
10:00	435	343	778	36	33	69	8.9	
11:00	493	388	881	26	35	61	6.9	
12:00	517	408	925	27	41	68	7.4	
13:00	456	447	903	25	36	61	6.8	
14:00	439	445	884	26	33	59	6.7	
15:00	452	432	884	22	28	50	5.7	
16:00	512	458	970	18	35	53	5.5	
17:00	532	439	971	19	24	43	4.4	
18:00	502	344	846	12	17	29	3.4	
19:00	419	335	754	10	11	21	2.8	
20:00	286	350	636	3	9	12	1.9	
21:00	197	303	500	2	6	8	1.6	
22:00	122	198	320	2	8	10	3.1	
23:00	82	99	181	2	3	5	2.8	
TOTAL	7079	6239	13318	351	431	782	5.9	



## Peak Statistics

AM	TIME	11:30	11:30	11:30	10:00	11:30	11:30
	VOL	506	411	917	36	43	73
PM	TIME	17:30	16:30	16:30	13:30	12:00	12:00
	VOL	540	470	982	28	41	68

