



# OCEAN REEF SHOPPING CENTRE

## OCEAN REEF

### ENVIRONMENTAL ACOUSTIC ASSESSMENT

FEBRUARY 2024

OUR REFERENCE: 29801-5-22080



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**ENVIRONMENTAL ACOUSTIC ASSESSMENT**  
**SHOPPING CENTRE**  
**OCEAN REEF**

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FOR

**CAMERON CHISHOLM NICOL**

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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the proposed shopping centre redevelopment, with the site bounded by Cringle Street, Venturi Drive and Marina Boulevard.

This report assesses noise emissions from the premises with regards to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. Noise sources considered as part of this assessment, as requested by council, include:

- Mechanical Services;
- Delivery vehicles;
- Childcare Centre; and
- Tavern Noise Sources;

Comment is also provided with regards to noise associated with waste collection.

For reference, the site plan for the proposed development is attached in Appendix A.

## 2. SUMMARY

From the assessments undertaken, noise received at the neighbouring residences complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, the following are recommended to be imposed as conditions:

- The mechanical services design needs to be confirmed during design development phase. An acoustic study of the mechanical services be undertaken once the design has been finalised, to ensure compliance is achieved.
- Waste collections to be undertaken under in accordance with the requirements of Regulation 14A – “Waste collection and other works”.
- Large truck deliveries are not to occur during the night period.
- The outdoor areas of the child care centre is not to open prior to 7am.
- Alfresco areas of the tavern are to not play music above conversational level.

The uses proposed at the site are able to meet the requirements of the *Environmental Protection (Noise) Regulations 1997*. Any potential noise amelioration, although not anticipated to be needed, can be accommodated in the existing design.

A noise management plan is anticipated to be required by the respective operators of both the child care centre and the tavern. This is primarily to ensure that the restrictions that have been assumed in our assessment are adhered to – namely the restrictions on usage of the outdoor play areas for the child care centre and the restriction of music within the alfresco areas of the tavern to not be played above conversational level.

### 3. CRITERIA

#### 3.1 ENVIRONMENTAL PROTECTION (NOISE) REGULATIONS 1997

The allowable noise level for noise sensitive premises in the vicinity of the proposed Large Format Retail development is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are listed in Table 3.1. The assigned noise levels for commercial premises are also shown in Table 3.1.

**TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVELS**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF
Commercial Premises	All Hours	60	75	80

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> is the maximum noise level.  
 IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

**“impulsiveness”** means a variation in the emission of a noise where the difference between L<sub>Apeak</sub> and L<sub>Amax(Slow)</sub> is more than 15 dB when determined for a single representative event;

**“modulation”** means a variation in the emission of noise that –

- is more than 3 dB L<sub>Afast</sub> or is more than 3 dB L<sub>Afast</sub> in any one-third octave band;
- is present for more at least 10% of the representative assessment period; and
- is regular, cyclic and audible;

**“tonality”** means the presence in the noise emission of tonal characteristics where the difference between –

- the A-weighted sound pressure level in any one-third octave band; and
- the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as L<sub>Aeq,T</sub> levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L<sub>ASlow</sub> levels.

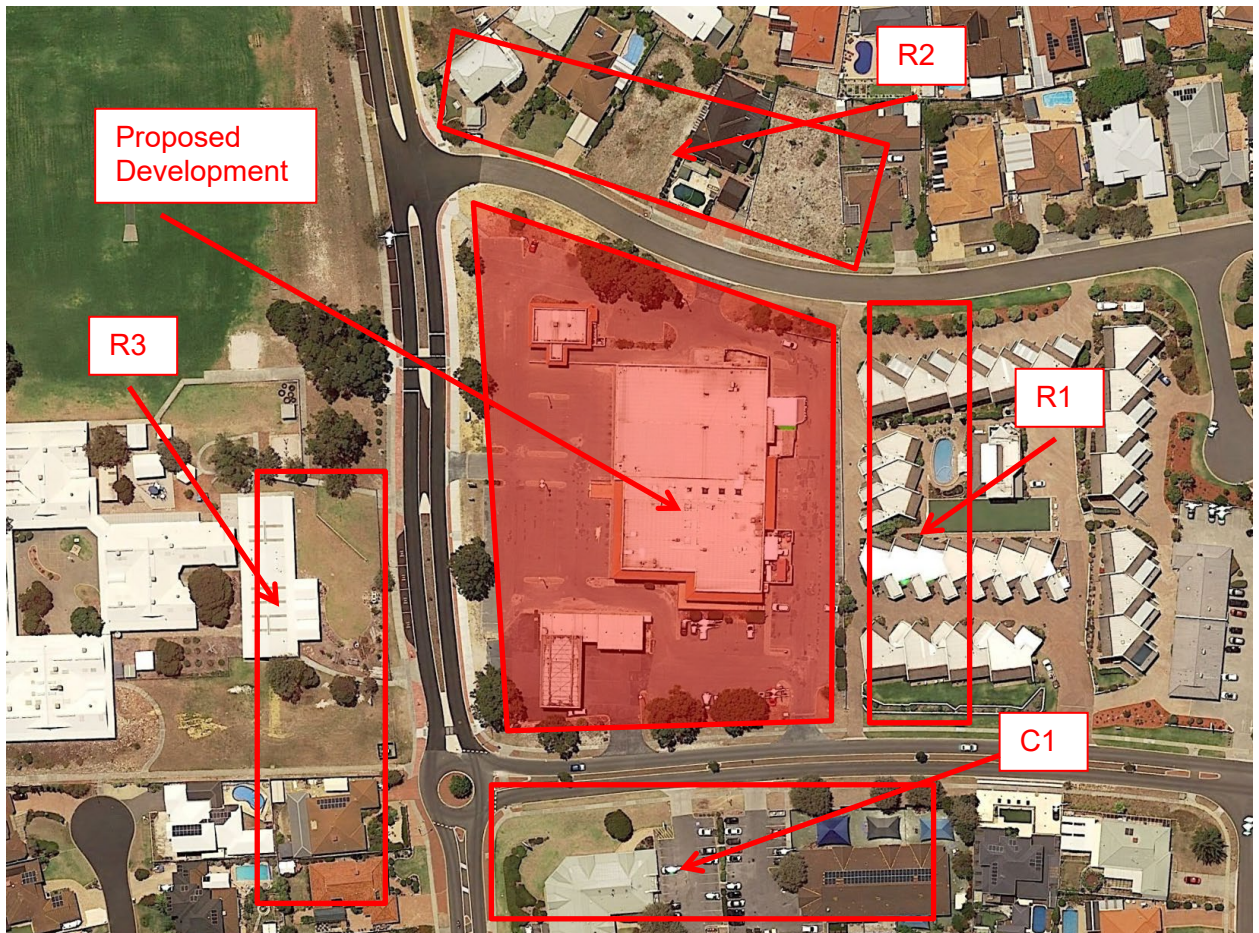
Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

Where <b>tonality</b> is present	Where <b>modulation</b> is present	Where <b>impulsiveness</b> is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

For this development, the closest residential premises of concern are, as shown on Figure 3.1 below. Each individual premises has been considered in our assessment, however, to simplify reporting, only the highest noise level for each area considered has been reported.



**FIGURE 3.1 – AREA AROUND PROPOSED DEVELOPMENT**

The influencing factor at the nearest residential locations have been determined as summarised in Table 3.3.

**TABLE 3.3 – INFLUENCING FACTOR**

Influencing Factor Parameter	Influencing Factor (dB)
Commercial land use with inner circle	+ 2
Commercial land use within outer circle	0
<b>TOTAL IF</b>	<b>+ 2</b>

Based on the above, the assigned noise levels are as listed in Tables 3.4.

**TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL  
 FOR SURROUNDING RESIDENTIAL PREMISES**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L <sub>A 10</sub>	L <sub>A 1</sub>	L <sub>A max</sub>
Noise sensitive premises: Highly sensitive area	0700 - 1900 hours Monday to Saturday	47	57	67
	0900 - 1900 hours Sunday and Public Holidays	42	52	67
	1900 - 2200 hours all days	42	52	57
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	37	47	57

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> is the maximum noise level.

### 3.2 WASTE COLLECTION

It is noted that under the *Environmental Protection (Noise) Regulations 1997*, the noise received at a premise from the collection of waste does not need to comply with the Assigned Noise levels, provided it is carried out in accordance with Regulation 14A of the Regulations. In summary, waste collection carried out during the following times do not need to comply with the Assigned noise levels:

- 0700 hours and 1900 hours on any day that is not a Sunday or a public holiday.  
or
- 0900 hours and 1900 hours on a Sunday or public holiday.

For information waste collection carried out during the above times is classified as **class 1 works**. **Class 2** works means specified works carried out otherwise than between the hours specified in the definition of class 1 works.

Note: Class 2 works, also do not need to comply with the assigned noise levels, provided certain requirements, including operating under an approved Noise Management Plan, are followed.

For information it is also noted that, under the Regulations, the above requirements applies to "specified works". For completeness, the Regulations define "specified works" as below :

- (a) the collection of waste; or
- (b) the cleaning of a road or the drains for a road; or
- (c) the cleaning of public places, including footpaths, cycle paths, car parks and beaches; or
- (d) the maintenance of road verges and public open space (including the collection of rubbish and the planting, trimming, watering or removal of trees); or
- (e) the periodic collection of household items or other things placed on street verges by residents for the purpose of such a collection; or
- (f) activities associated with hazard or emergency management.

Waste *means* waste from domestic or commercial sources and includes:

- (a) putrescible waste; and
- (b) non putrescible waste; and
- (c) recyclable materials.

Thus, based on the above, noise emissions from waste collections do not need to be assessed and does not form part of the acoustical assessment.

In the event other “specified works” are undertaken on site, these would also be treated similarly, however have not been included in this assessment due to the sporadic nature of these events.

#### 4. MODELLING

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, “SoundPlan”. Calculations were carried out using the EPA worst case weather conditions as stated in the Environmental Protection Authority’s “Draft Guideline on Environmental Noise for Prescribed Premises”.

##### 4.1 MECHANICAL SERVICES

It is noted that mechanical services have not been selected at this stage of the development, thus, it is not possible to use actual equipment selections in our calculations. Hence, typical noise levels for air conditioners associated with tenancies of the size proposed has been utilized. The noise modelling is conservative, as it does not include any diversity in load, which would occur (particularly during the night period).

The calculations for the mechanical services were based upon the sound power levels listed in Tables 4.1.

**TABLE 4.1 – SOUND POWER LEVELS  
MECHANICAL SERVICES**

Item of Equipment	Sound Power Level, (dB(A))
Retail Tenancies	AC - 19 @ 72
Gym	AC 2 @ 72
Childcare	AC 2 @ 72
Tavern	AC - 4 @ 72 Exhaust Fan 1 @ 75
Supermarket	AC - 1 @ 84 Exhaust 2 @ 72 Refrigeration 1 @ 88

It is noted equipment selected during the design phase of the development will need to have noise emissions confirmed in relation to the above assumed noise levels.

With regards to noise emissions, the following are noted:

- 1 Noise associated with the mechanical services does not take into account any diversity of operation. Such diversity would occur during the evening and night periods (whilst cooler). Thus, this is a conservative assessment.
- 2 The location of the mechanical plant has been assumed to generally on the roof, with the exception of the ground floor tenancies, where the AC units have been assumed to be in the underground carpark area. The plant rooms indicatively shown have also been utilised in the modelling.



#### 4.2 DELIVERIES

The  $L_{A1}$  assigned noise level would be the pertinent prescribed noise level in this instance (for deliveries) as the duration of time that the noise of the deliveries is present is less than 10% of a representative time period. The noise associated with the delivery is the manoeuvring of the truck into place, upon which the truck is switched off – hence – even if the delivery takes some time (i.e. 30 – 60 minutes) the noise level associated with the truck is not present throughout the duration of the delivery.

The calculations for delivery trucks were based in the sound power levels listed in Tables 4.2. The large delivery truck being for the supermarket and liquor store; and the small delivery being for the other tenancies, such as the convenience store and fast food tenancies.

**TABLE 4.2 – GENERAL SOUND POWER LEVELS**

Item of Equipment	Sound Power Level, (dB(A))
Large Delivery Truck (ie Refrigerated Truck)	94
Small Delivery Truck (ie Bread)	85

#### 4.3 CHILD CARE CHILDREN PLAYING

Based on previous assessments of child care centres, the outdoor area for the centre would be the critical component for assessment.

Typically, child care centre normal hours of operations would be between 0630 and 1830 hours, Monday to Friday (closed on public holidays). It is noted that although the proposed child care centre would open before 7 am (ie during the night period), the outdoor play area would not be used until after 7am – which is considered to be industry standard for child care centres.

Based on our understanding from previous child care centre assessments, the number of children that could be utilising the outdoor areas at one time has been approximated at 60 children.

The noise emissions associated with children playing in the outdoor areas are listed below in Table 4.4.

**TABLE 4.4 – SOUND POWER LEVELS CHILDCARE CENTRE**

Item	Sound Power Level, dB(A)
Children Playing	83 (per 10 children)

#### 4.4 TAVERN ALFRESCO AREAS

Noise levels associated with the external areas of the tavern have been conservatively assumed to be akin to beer garden noise levels, with a sound power level of 66 dB(A)/m<sup>2</sup> utilised in the calculations.

This is considered conservative, as the areas are understood to be more akin with dining areas. As a part of this assessment, it has been assumed that any music within the alfresco areas will be background/conversational levels only.

The internal noise levels of the tavern have been assumed at this stage of the development to be able to be designed to contain any noise levels within the building.

## 5. PREDICTED NOISE EMISSIONS

Calculations were undertaken to all the residences noted on Figure 3.1. The resultant noise levels are listed in Table 5.1.

NOTE: Noise levels were calculated at all adjacent noise sensitive premises, however, for simplicity of reporting, only the highest noise levels have been included below.

**TABLE 5.1 – CALCULATED NOISE LEVELS**

Item	Residences (dB(A))			
	R1	R2	R3	C1
Mechanical services	31 L <sub>A10</sub>	32 L <sub>A10</sub>	27 L <sub>A10</sub>	27 L <sub>A10</sub>
Deliveries				
Large Delivery Truck	52 L <sub>A1</sub>	41 L <sub>A1</sub>	11 L <sub>A1</sub>	32 L <sub>A1</sub>
Small Delivery Truck	40 L <sub>A1</sub>	29 L <sub>A1</sub>	2 L <sub>A1</sub>	20 L <sub>A1</sub>
Tavern Alfresco	22 L <sub>A10</sub>	24 L <sub>A10</sub>	37 L <sub>A10</sub>	38 L <sub>A10</sub>
Children Playing in Child Care	40 L <sub>A10</sub>	37 L <sub>A10</sub>	35 L <sub>A10</sub>	39 L <sub>A10</sub>

Some noise control measures have been included in the noise modelling, with the noise control measures included in the conclusion below. Noise contour plots are included in Appendix B.

## 6. ASSESSMENT

The following provided the acoustic assessment for the noise sources requiring compliance, as listed in Table 5.1.

### 6.1 L<sub>A10</sub> NOISE EMISSIONS

Noise emissions from the mechanical services would be steady state and would operate for the majority of time. Hence noise received from the mechanical services needs to comply with the assigned L<sub>A10</sub> noise level. Additionally, noise emissions from the following noise source would also occur for more than 10% of the time and would be assessed under the assigned L<sub>A10</sub> noise Level:

- Children playing in the outdoor play area of the Child Care Centre.

Given the resultant noise level at the residences and likely background noise level in the area, we believe that noise emissions from the mechanical services are likely to be tonal, hence, a +5 dB(A) penalty has been applied to the calculated noise level associated with these noise sources. Table 6.1 lists the characteristics that should be included in the assessable noise level.

**TABLE 6.1 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L<sub>A10</sub> NOISE LEVELS, dB(A)  
 MECHANICAL SERVICES**

Location	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	31	+5	-	-	36
R2	32	+5	-	-	37
R3	27	+5	-	-	32
C1	27	+5	-	-	32

Table 6.2 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the mechanical services.

**TABLE 6.2 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS  
 MECHANICAL SERVICES**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	22	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
R2	23	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
R3	32	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
C1	32	All Hours	60	Complies

Noise received from children playing within the child care outdoor play area does not contain any annoying characteristics. Thus, the assessable noise levels are as listed in Table 5.1. Table 6.3 assesses the noise levels against the applicable Assigned Noise Levels. It is noted that the outdoor play areas will only be open during the day period, hence, some of the time periods it is not applicable to assess the noise impact.

**TABLE 6.3 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS  
 CHILDREN PLAYING AT CHILD CARE CENTRE**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	40	Day Period	47	Complies
		Sunday Day Period	42	N/A
		Evenings	42	N/A
		Night	37	N/A
R2	37	Day Period	47	Complies
		Sunday Day Period	42	N/A
		Evenings	42	N/A
		Night	37	N/A
R3	35	Day Period	47	Complies
		Sunday Day Period	42	N/A
		Evenings	42	N/A
		Night	37	N/A
C1	39	All Hours	60	Complies

Noise received from the tavern alfresco area does not contain any annoying characteristics on the assumption that music (if any) in these areas would be at background noise levels only. Thus, the assessable noise levels are as listed in Table 5.1. Table 6.4 assesses the noise levels against the applicable Assigned Noise Levels.

**TABLE 6.4 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS  
 TAVERN ALFRESCO AREA**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	22	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
R2	24	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
R3	37	Day Period	47	Complies
		Sunday Day Period	42	Complies
		Evenings	42	Complies
		Night	37	Complies
C1	38	All Hours	60	Complies

## 6.2 L<sub>A1</sub> NOISE EMISSIONS

Noise emissions from the following noise sources would be present for less than 10% of a representative time period, hence noise received from this noise source needs to comply with the assigned L<sub>A1</sub> noise level:

- Small Deliveries (bakery truck and the like).
- Large Refrigerated Truck Deliveries.

Based on the definitions of tonality, noise emissions from these sources, being an L<sub>A1</sub> and being present for less than 10% of the time, would not be considered tonal. Thus, no penalties would be applicable to the noise associated with delivery trucks. Hence, Table 6.6 and Table 6.7 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the above noise sources.

The cumulative affect of multiple deliveries being present may increase the time period of the noise impact, however, large truck deliveries are the only noise source in this area that would exceed even the L<sub>A10</sub> parameter, which are understood (for even the busiest supermarket) to be limited to a morning and afternoon delivery – hence, would remain an L<sub>A1</sub> criteria.

**TABLE 6.6 – ASSESSMENT OF L<sub>A1</sub> NOISE LEVEL EMISSIONS  
 SMALL TRUCK DELIVERIES**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A1</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	40	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	Complies
R2	29	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	Complies
R3	2	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	Complies
C1	20	All Hours	75	Complies

**TABLE 6.7 – ASSESSMENT OF L<sub>A1</sub> NOISE LEVEL EMISSIONS  
 LARGE REFRIGERATED TRUCK DELIVERIES**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A1</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	52	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	+ 5 dB
R2	41	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	Complies
R3	11	Day Period	57	Complies
		Sunday Day Period	52	Complies
		Evenings	52	Complies
		Night	47	Complies
C1	32	All Hours	75	Complies

Noise emissions from the following noise sources would be present for less than 10% of a representative time period, hence noise received from this noise source needs to comply with the assigned L<sub>A1</sub> noise level:

## 7. CONCLUSION

From the above assessments, the noise received at the neighbouring residences complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. However, the following are recommended to be imposed as conditions:

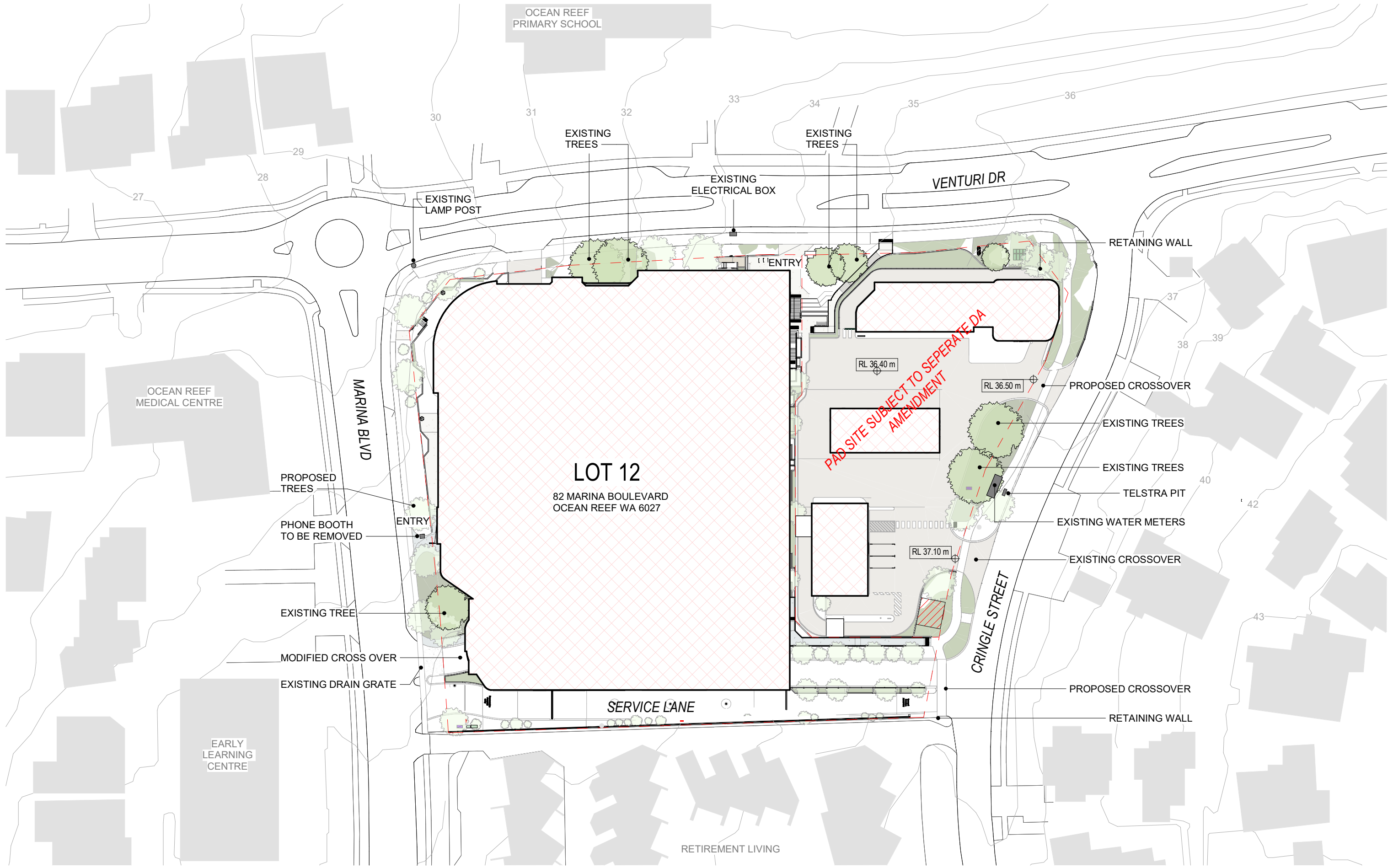
- The mechanical services design needs to be confirmed during design development phase. An acoustic study of the mechanical services be undertaken once the design has been finalised, to ensure compliance is achieved.
- Waste collections to be undertaken under in accordance with the requirements of Regulation 14A – “Waste collection and other works”.
- Large truck deliveries are not to occur during the night period.
- The outdoor areas of the child care centre is not to open prior to 7am.
- Alfresco areas of the tavern are to not play music above conversational level.

## **APPENDIX B**

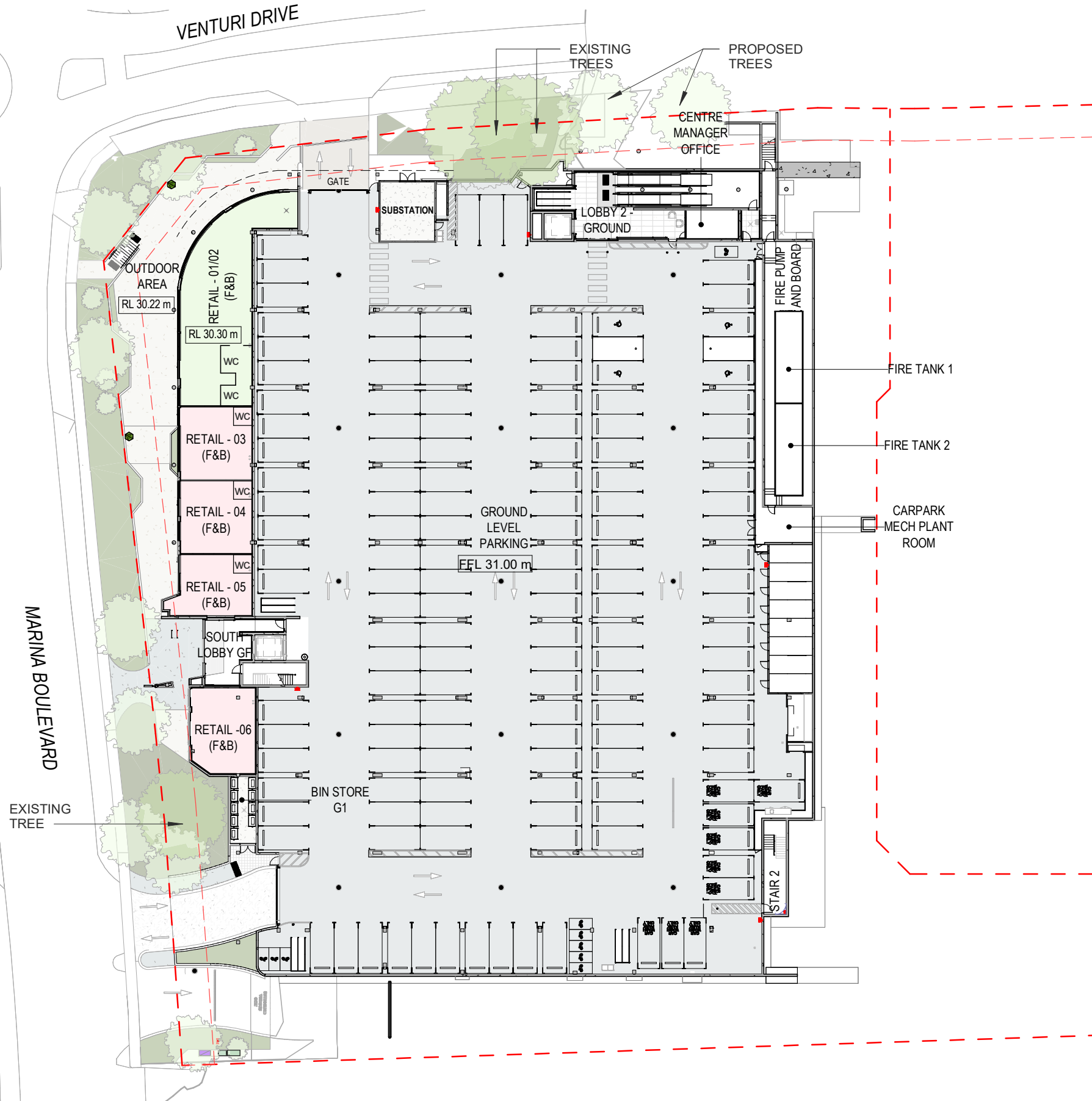
### NOISE CONTOUR PLOTS







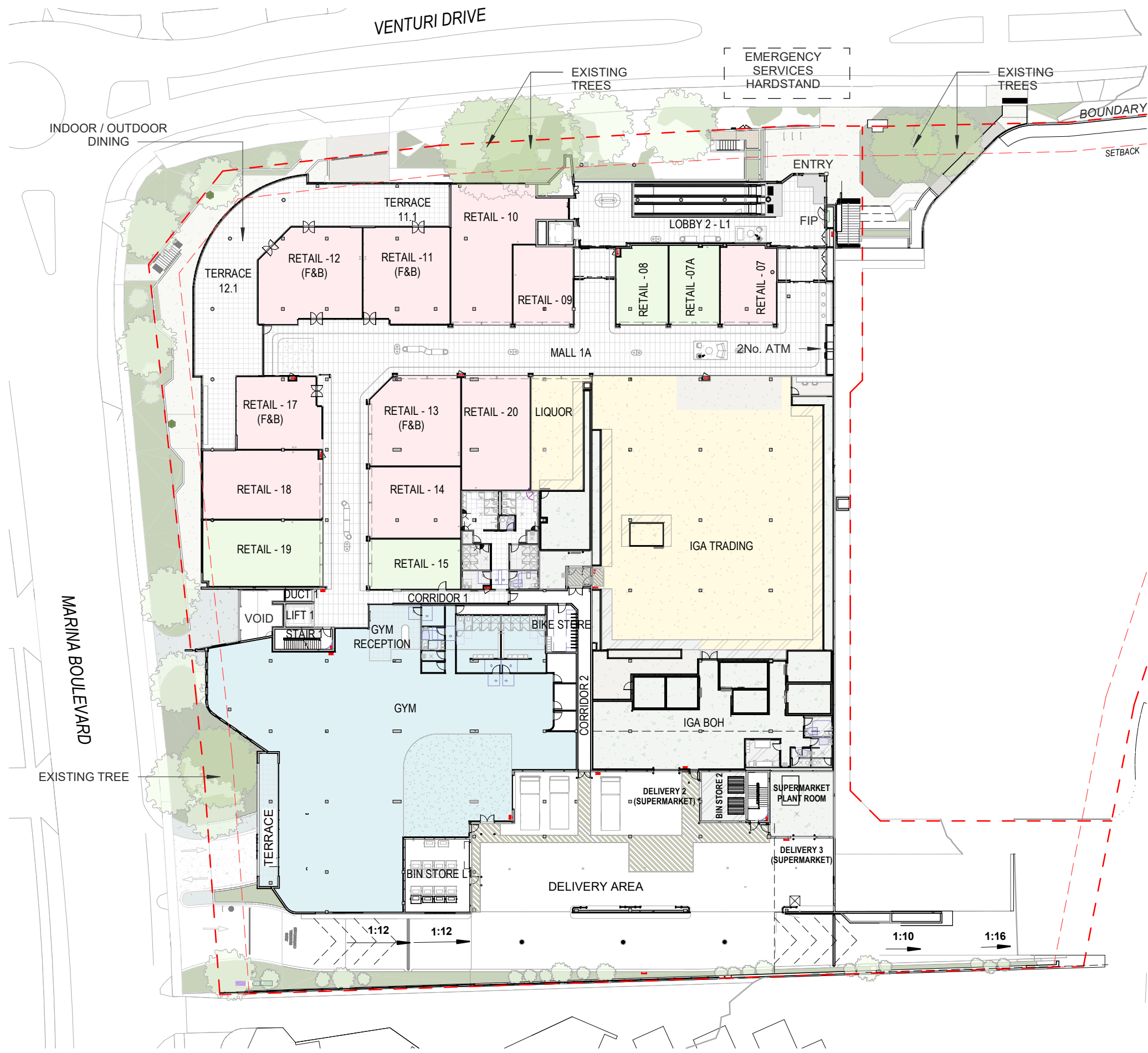
VENTURI DRIVE



CARPARKING TABLE	Count	Level
2600 x 5500 STANDARD BAY - GF	46	00 Ground
2600 x 5500 STANDARD BAY - GF + WHEELSTOP	89	00 Ground
2400 x 5500 CARWAS OPERATOR BAY + WHEEL STOP	8	00 Ground
2400 x 5500 CARWASH OPERATOR BAY	1	00 Ground
<b>00 Ground</b>	<b>144</b>	
2400 x 5500 ACCESSIBLE BAY	1	01 M Level
2600 x 5500 ACCESSIBLE BAY	2	01 M Level
2600 x 5500 STANDARD BAY	13	01 M Level
<b>01 M Level</b>	<b>16</b>	
2600 x 5400 Marking - Electric Vehicles Bay	4	02 Level (LS)
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ	38	02 Level (LS)
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ+ WHEELSTOP	13	02 Level (LS)
2600 x 5400 - ACCESSIBLE BAY - L2_IGA BRIEF REQ	2	02 Level (LS)
2600 x 5500 STANDARD BAY - L2 + WHEELSTOP	40	02 Level (LS)
2400 x 5500 DAY CARE BAY + WHEEL STOP	4	02 Level (LS)
2400 x 5500 5 MIN + WHEEL STOP	2	02 Level (LS)
2400 x 5500 TAXI + WHEEL STOP	2	02 Level (LS)
<b>02 Level (LS)</b>	<b>105</b>	
<b>GRAND TOTAL</b>	<b>265</b>	

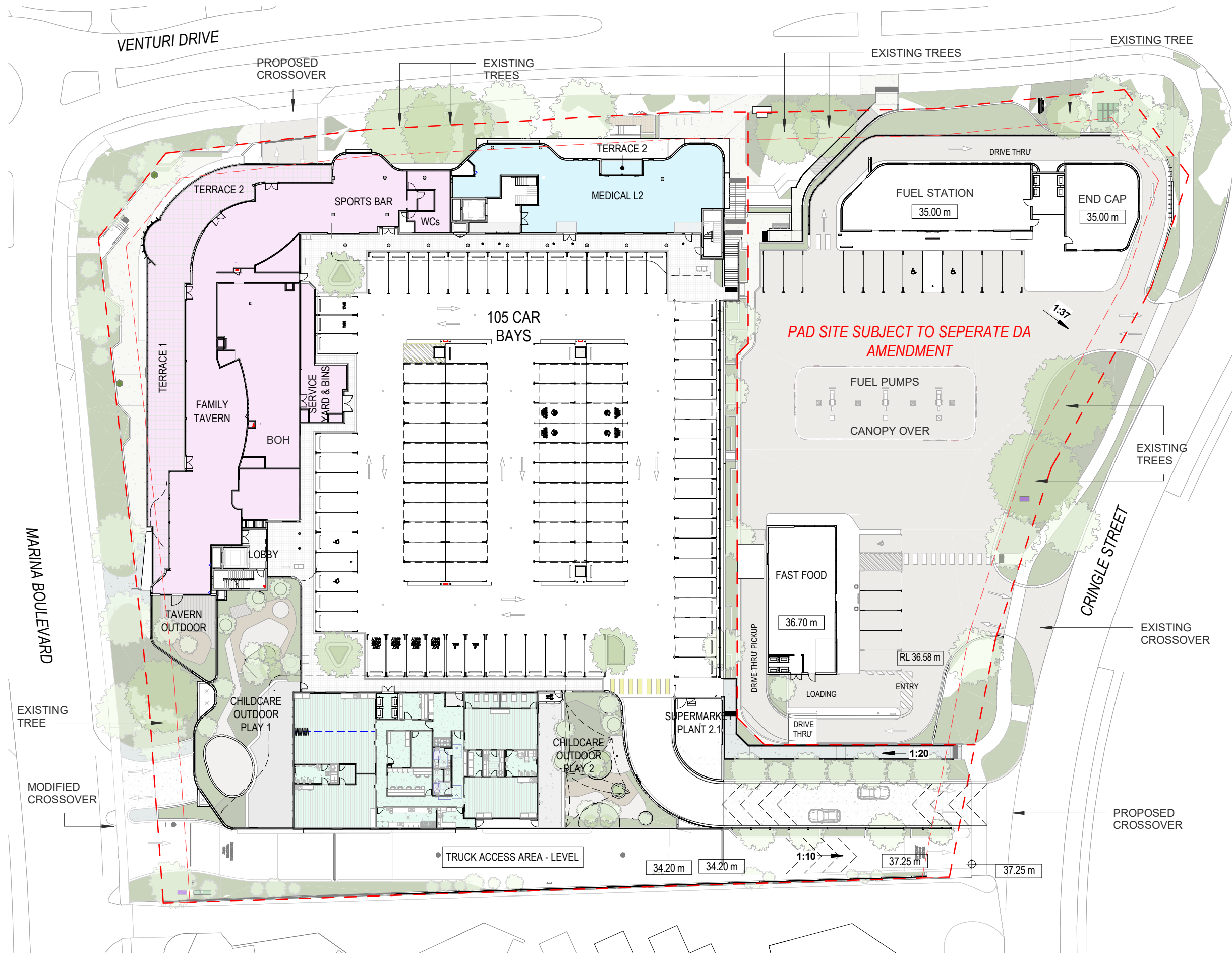
Name	Area	Level
AIRLOCK	6.13 m <sup>2</sup>	01 Level
TERRACE 11.1	51.33 m <sup>2</sup>	01 Level
TERRACE 12.1	235.02 m <sup>2</sup>	01 Level
TERRACE 17.1	34.09 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>326.58 m<sup>2</sup></b>	
DELIVERY 1 (COMMON)	106.17 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>106.17 m<sup>2</sup></b>	
BACK OF HOUSE	106.17 m <sup>2</sup>	
GYM	1060.71 m <sup>2</sup>	01 Level
GYM TERRACE	38.90 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>1099.61 m<sup>2</sup></b>	
GYM	1099.61 m <sup>2</sup>	
RETAIL -03	61.02 m <sup>2</sup>	00 Ground
RETAIL -04	60.87 m <sup>2</sup>	00 Ground
RETAIL -05	53.82 m <sup>2</sup>	00 Ground
RETAIL -06	63.21 m <sup>2</sup>	00 Ground
<b>00 Ground</b>	<b>238.92 m<sup>2</sup></b>	
RETAIL -07	64.23 m <sup>2</sup>	01 Level
RETAIL -07A	58.69 m <sup>2</sup>	01 Level
RETAIL -08	59.02 m <sup>2</sup>	01 Level
RETAIL -09	68.25 m <sup>2</sup>	01 Level
RETAIL -10	156.83 m <sup>2</sup>	01 Level
RETAIL -11	124.38 m <sup>2</sup>	01 Level
RETAIL -12	140.36 m <sup>2</sup>	01 Level
RETAIL -13	115.32 m <sup>2</sup>	01 Level
RETAIL -14	94.93 m <sup>2</sup>	01 Level
RETAIL -15	66.34 m <sup>2</sup>	01 Level
RETAIL -17	85.46 m <sup>2</sup>	01 Level
RETAIL -18	116.79 m <sup>2</sup>	01 Level
RETAIL -19	113.56 m <sup>2</sup>	01 Level
RETAIL -20	113.16 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>1377.32 m<sup>2</sup></b>	
<b>RETAIL</b>	<b>1616.23 m<sup>2</sup></b>	
OUTDOOR DINING RETAIL 01/02	135.22 m <sup>2</sup>	00 Ground
RETAIL -01/02	165.64 m <sup>2</sup>	00 Ground
<b>00 Ground</b>	<b>300.86 m<sup>2</sup></b>	
RETAIL 01/02	300.86 m <sup>2</sup>	
LIQUOR	165.82 m <sup>2</sup>	01 Level
SUPERMARKET	1350.22 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>1516.03 m<sup>2</sup></b>	
SUPERMARKET	1516.03 m <sup>2</sup>	
DELIVERY 2 (SUPERMARKET)	62.53 m <sup>2</sup>	01 Level
DELIVERY 3 (SUPERMARKET)	30.78 m <sup>2</sup>	01 Level
<b>01 Level</b>	<b>93.31 m<sup>2</sup></b>	
SUPERMARKET - NOT NET LETTABLE	93.31 m <sup>2</sup>	
TR 1.0	5.40 m <sup>2</sup>	00 Ground
TR 1.1	5.40 m <sup>2</sup>	00 Ground
TR 1.2	5.40 m <sup>2</sup>	00 Ground
TR 1.3	10.73 m <sup>2</sup>	00 Ground
<b>00 Ground</b>	<b>26.93 m<sup>2</sup></b>	
SUPERMARKET TROLLEYS	26.93 m <sup>2</sup>	
<b>GRAND TOTAL</b>	<b>5085.71 m<sup>2</sup></b>	





Name	Area	Level
AIRLOCK	6.13 m <sup>2</sup>	01 Level
TERRACE 11.1	51.33 m <sup>2</sup>	01 Level
TERRACE 12.1	235.02 m <sup>2</sup>	01 Level
TERRACE 17.1	34.09 m <sup>2</sup>	01 Level
01 Level	326.58 m <sup>2</sup>	326.58 m <sup>2</sup>
DELIVERY 1 (COMMON)	106.17 m <sup>2</sup>	01 Level
01 Level	106.17 m <sup>2</sup>	
BACK OF HOUSE	106.17 m <sup>2</sup>	
GYM	1060.71 m <sup>2</sup>	01 Level
GYM TERRACE	38.90 m <sup>2</sup>	01 Level
01 Level	1099.61 m <sup>2</sup>	
GYM	1099.61 m <sup>2</sup>	
RETAIL - 03	61.02 m <sup>2</sup>	00 Ground
RETAIL - 04	60.87 m <sup>2</sup>	00 Ground
RETAIL - 05	53.82 m <sup>2</sup>	00 Ground
RETAIL - 06	63.21 m <sup>2</sup>	00 Ground
00 Ground	238.92 m <sup>2</sup>	
RETAIL - 07	64.23 m <sup>2</sup>	01 Level
RETAIL - 07A	58.69 m <sup>2</sup>	01 Level
RETAIL - 08	59.02 m <sup>2</sup>	01 Level
RETAIL - 09	68.25 m <sup>2</sup>	01 Level
RETAIL - 10	156.83 m <sup>2</sup>	01 Level
RETAIL - 11	124.38 m <sup>2</sup>	01 Level
RETAIL - 12	140.36 m <sup>2</sup>	01 Level
RETAIL - 13	115.32 m <sup>2</sup>	01 Level
RETAIL - 14	94.93 m <sup>2</sup>	01 Level
RETAIL - 15	66.34 m <sup>2</sup>	01 Level
RETAIL - 17	85.46 m <sup>2</sup>	01 Level
RETAIL - 18	116.79 m <sup>2</sup>	01 Level
RETAIL - 19	113.56 m <sup>2</sup>	01 Level
RETAIL - 20	113.16 m <sup>2</sup>	01 Level
01 Level	1377.32 m <sup>2</sup>	
RETAIL	1616.23 m <sup>2</sup>	
OUTDOOR DINING	135.22 m <sup>2</sup>	00 Ground
RETAIL 01/02	165.64 m <sup>2</sup>	00 Ground
00 Ground	300.86 m <sup>2</sup>	
RETAIL 01/02	300.86 m <sup>2</sup>	
LIQUOR	165.82 m <sup>2</sup>	01 Level
SUPERMARKET	1350.22 m <sup>2</sup>	01 Level
01 Level	1516.03 m <sup>2</sup>	
SUPERMARKET	1516.03 m <sup>2</sup>	
DELIVERY 2 (SUPERMARKET)	62.53 m <sup>2</sup>	01 Level
DELIVERY 3 (SUPERMARKET)	30.78 m <sup>2</sup>	01 Level
01 Level	93.31 m <sup>2</sup>	
SUPERMARKET - NOT NET LETTABLE	93.31 m <sup>2</sup>	
TR 1.0	5.40 m <sup>2</sup>	00 Ground
TR 1.1	5.40 m <sup>2</sup>	00 Ground
TR 1.2	5.40 m <sup>2</sup>	00 Ground
TR 1.3	10.73 m <sup>2</sup>	00 Ground
00 Ground	26.93 m <sup>2</sup>	
SUPERMARKET TROLLEYS	26.93 m <sup>2</sup>	
GRAND TOTAL	5085.71 m <sup>2</sup>	

- AMENITIES
- FAMILY TAVERN
- GYM
- MALL
- MALL 1B
- RETAIL
- RETAIL LEASED
- SUPERMARKET & LIQUOR LEASED



Name	Area	Level
03 Level		
COMMERCIAL T1	242.89 m <sup>2</sup>	03 Level
COMMERCIAL T2	85.32 m <sup>2</sup>	03 Level
COMMERCIAL T3	228.84 m <sup>2</sup>	03 Level
	557.06 m <sup>2</sup>	

02 Level (LS)		
CHILDCARE	557.26 m <sup>2</sup>	02 Level (LS)
CHILDCARE OUTDOOR PLAY 1	356.73 m <sup>2</sup>	02 Level (LS)
CHILDCARE OUTDOOR PLAY 2	225.27 m <sup>2</sup>	02 Level (LS)
CHILDCARE	1139.26 m <sup>2</sup>	

02 Level (LS)		
MEDICAL L2	283.78 m <sup>2</sup>	02 Level (LS)
TERRACE 3	12.29 m <sup>2</sup>	02 Level (LS)

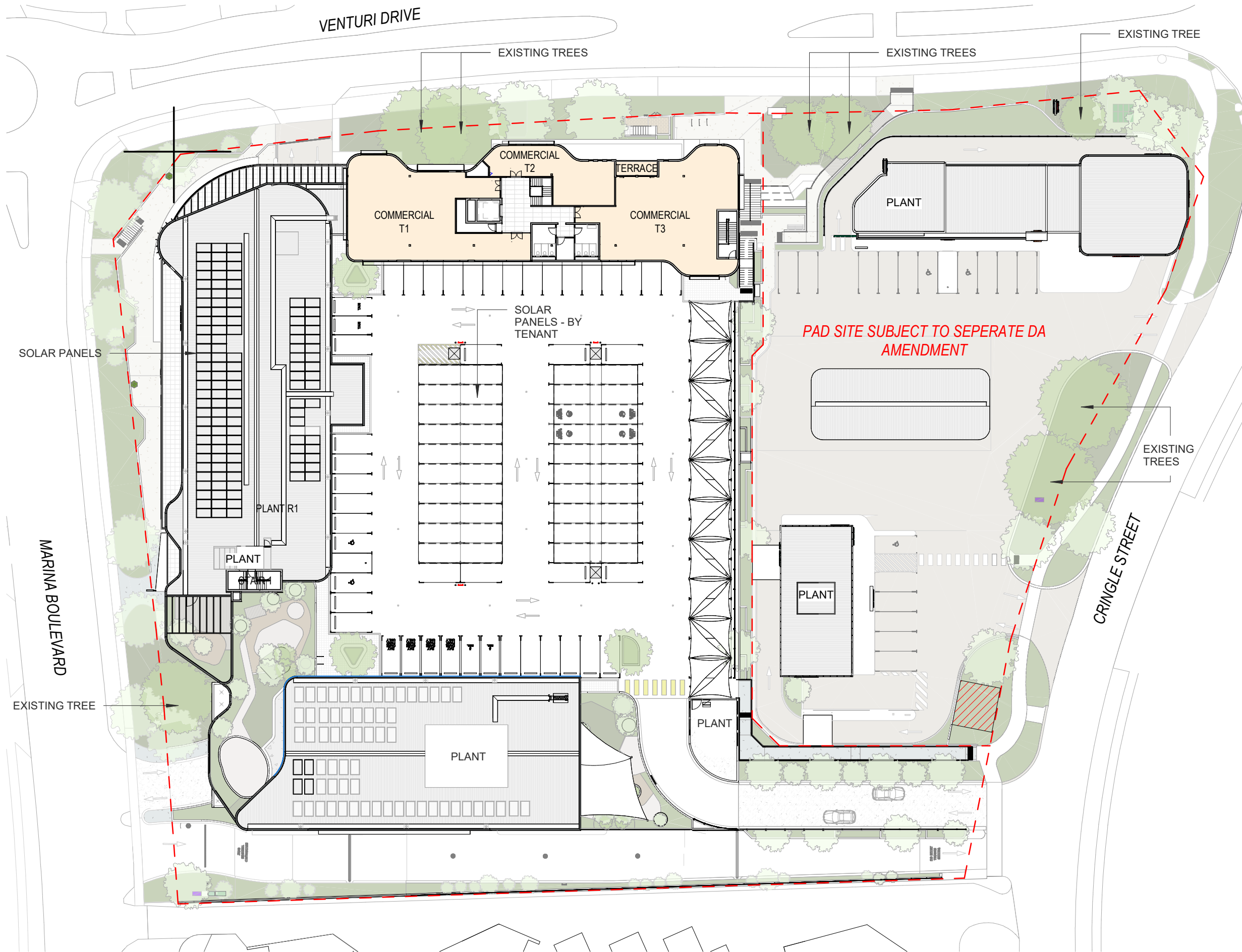
03 Level		
TERRACE 4	10.67 m <sup>2</sup>	03 Level
COMMERCIAL	306.74 m <sup>2</sup>	

02 Level (LS)		
FAMILY TAVERN	730.49 m <sup>2</sup>	02 Level (LS)
SERVICE YARD & BINS	65.62 m <sup>2</sup>	02 Level (LS)
SPORTS BAR	137.50 m <sup>2</sup>	02 Level (LS)
TAVERN OUTDOOR PLAY	75.30 m <sup>2</sup>	02 Level (LS)
TERRACE 2	281.13 m <sup>2</sup>	02 Level (LS)
TAVERN	1290.04 m <sup>2</sup>	
GRAND TOTAL	3293.11 m <sup>2</sup>	

CARPARKING TABLE L2	Count
2600 x 5400 Marking - Electric Vehicles Bay	4
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ	38
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ+ WHEELSTOP	13
2600 x 5400 - ACCESSIBLE BAY - L2_IGA BRIEF REQ	2
2600 x 5500 STANDARD BAY - L2 + WHEELSTOP	40
2400 x 5500 CARWAS OPERATOR BAY + WHEEL STOP	8
2400 x 5500 CARWASH OPERATOR BAY	1
2400 x 5500 DAY CARE BAY + WHEEL STOP	4
2400 x 5500 5 MIN + WHEEL STOP	2
2400 x 5500 TAXI + WHEEL STOP	2
GRAND TOTAL	114

- CHILDCARE
- CHILDCARE PLAY
- FAMILY TAVERN
- MALL 1B
- MEDICAL

NOTE:  
UECA: Un-Enclosed Covered Area

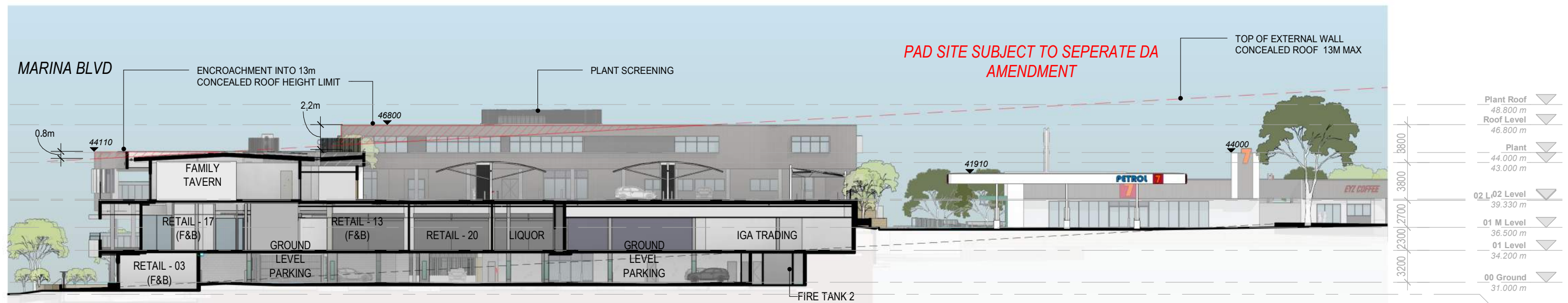


Name	Area	Level
<b>03 Level</b>		
COMMERCIAL T1	242.89 m <sup>2</sup>	03 Level
COMMERCIAL T2	85.32 m <sup>2</sup>	03 Level
COMMERCIAL T3	228.84 m <sup>2</sup>	03 Level
	557.06 m <sup>2</sup>	
<b>02 Level (LS)</b>		
CHILDCARE	557.26 m <sup>2</sup>	02 Level (LS)
CHILDCARE OUTDOOR PLAY 1	356.73 m <sup>2</sup>	02 Level (LS)
CHILDCARE OUTDOOR PLAY 2	225.27 m <sup>2</sup>	02 Level (LS)
CHILDCARE	1139.26 m <sup>2</sup>	
<b>02 Level (LS)</b>		
MEDICAL L2	283.78 m <sup>2</sup>	02 Level (LS)
TERRACE 3	12.29 m <sup>2</sup>	02 Level (LS)
<b>03 Level</b>		
TERRACE 4	10.67 m <sup>2</sup>	03 Level
COMMERCIAL	306.74 m <sup>2</sup>	
<b>02 Level (LS)</b>		
FAMILY TAVERN	730.49 m <sup>2</sup>	02 Level (LS)
SERVICE YARD & BINS	65.62 m <sup>2</sup>	02 Level (LS)
SPORTS BAR	137.50 m <sup>2</sup>	02 Level (LS)
TAVERN OUTDOOR PLAY	75.30 m <sup>2</sup>	02 Level (LS)
TERRACE 2	281.13 m <sup>2</sup>	02 Level (LS)
TAVERN	1290.04 m <sup>2</sup>	
<b>GRAND TOTAL</b>	<b>3293.11 m<sup>2</sup></b>	

- COMERCIAL
- FAMILY TAVERN
- MALL 1B



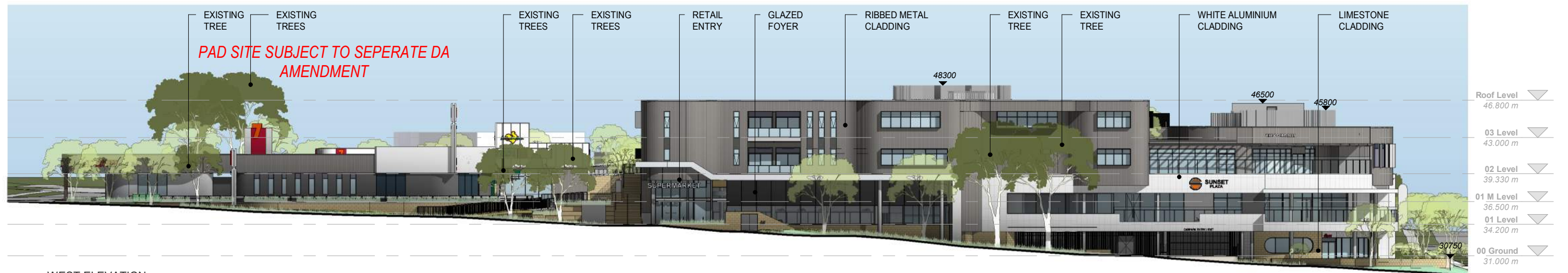
SECTION EAST WEST



SECTION NORTH SOUTH



NORTH ELEVATION



WEST ELEVATION



RIBBED METAL CLADDING



CLADDING COLOUR (BASALT MATT)



LIME STONE CLADDING



WHITE RENDERED MASONARY



NATIVE VEGETATION



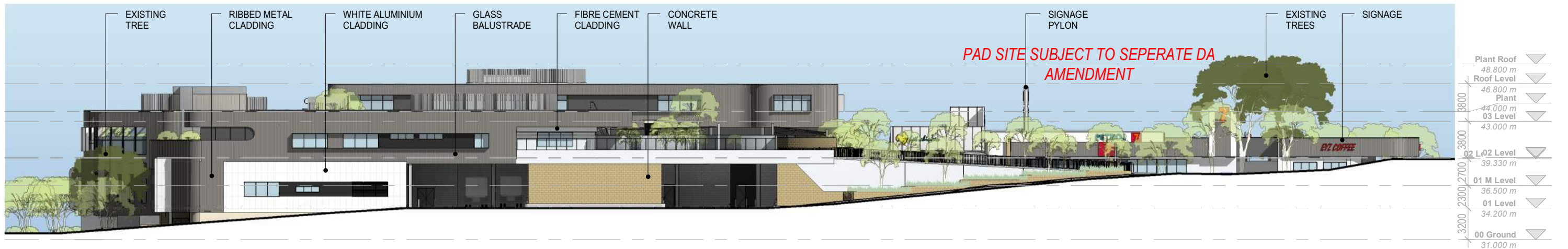
ACTIVATED SHOPFRONTS



COASTAL PALETTE



SOUTH ELEVATION



EAST ELEVATION



RIBBED METAL CLADDING



CLADDING COLOUR (BASALT MATT)



LIME STONE CLADDING



WHITE RENDERED MASONARY



NATIVE VEGETATION

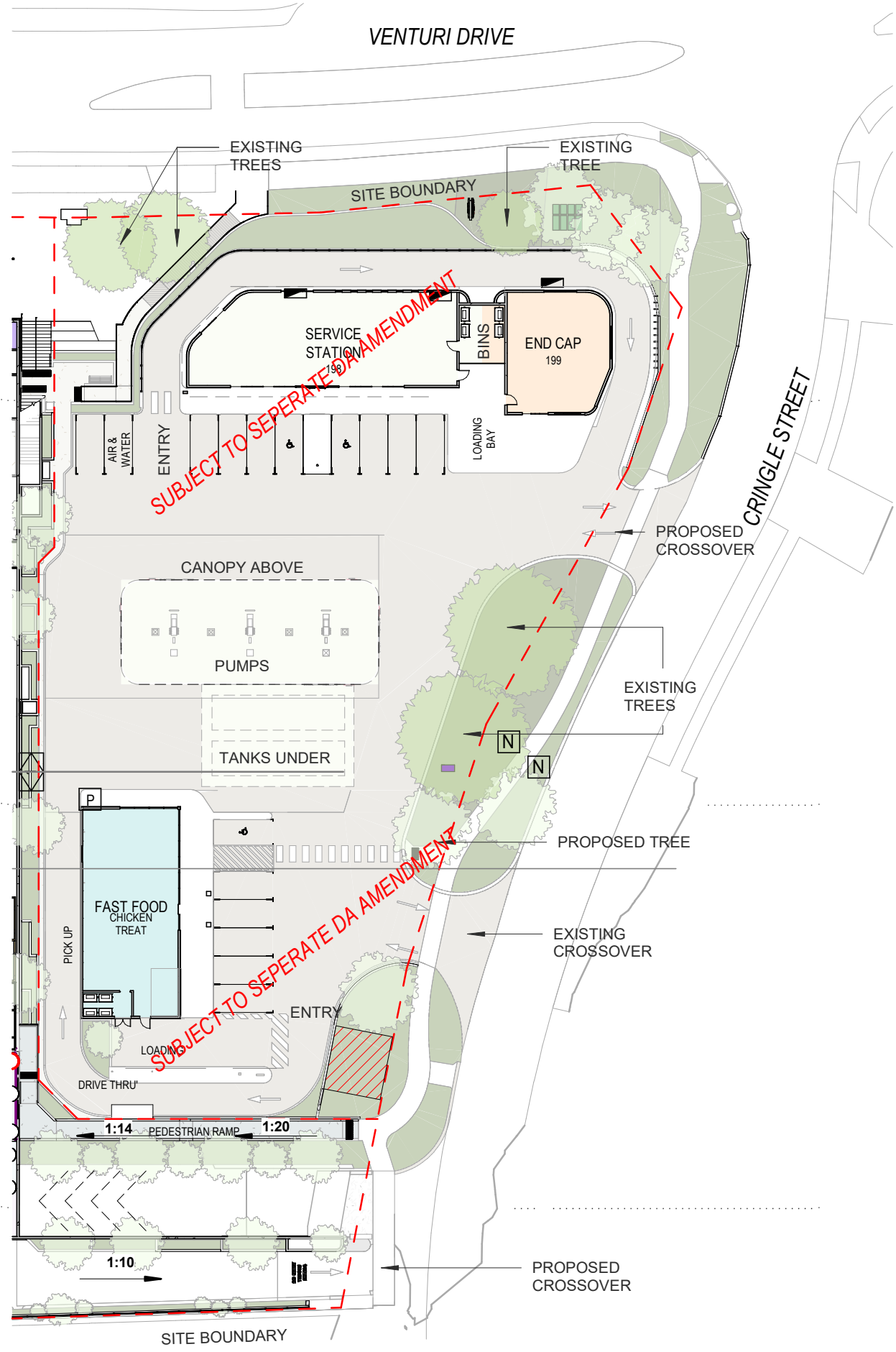


ACTIVATED SHOPFRONTS



COASTAL PALETTE

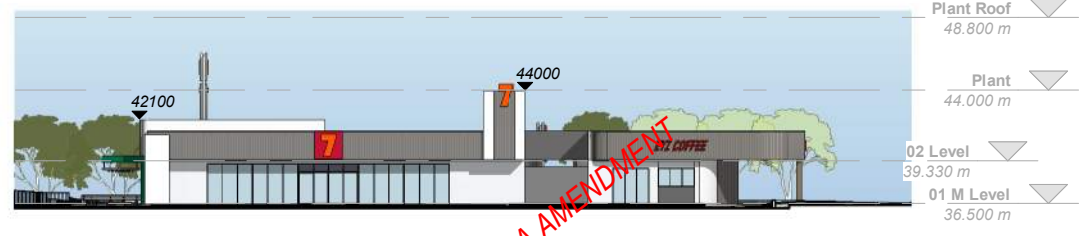




SERVICE STATION EAST



SERVICE STATION SOUTH



SERVICE STATION WEST



FAST FOOD EAST



FAST FOOD NORTH



FAST FOOD WEST

AREA SCHEDULE (Rentable) SERVICE STATION + DRIVE THROUGH

Name	Area
SERVICE STATION	200.25 m <sup>2</sup>
SERVICE STATION + ENDCAP BINS	24.09 m <sup>2</sup>
SERVICE STATION CANOPY + TANKS	351.32 m <sup>2</sup>
SERVICE STATION CAR BAYS	157.30 m <sup>2</sup>
END CAP	101.25 m <sup>2</sup>
FAST FOOD OUTLET	168.06 m <sup>2</sup>
GRAND TOTAL	1002.28 m <sup>2</sup>

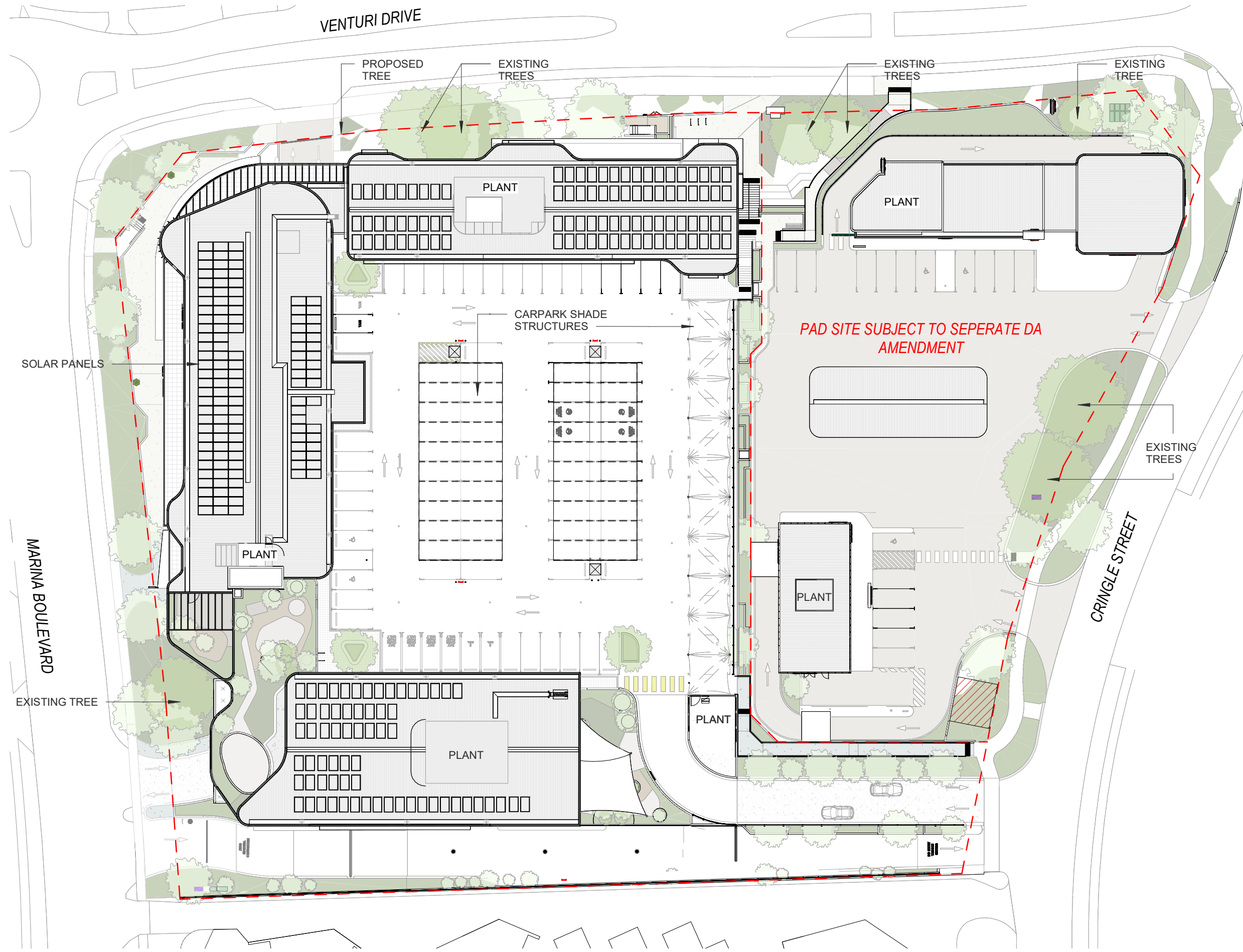
CARPARKING TABLE

Count	
2400 x 5500 ACCESSIBLE BAY	1
2600 x 5500 ACCESSIBLE BAY	2
2600 x 5500 STANDARD BAY	13
GRAND TOTAL	16



CRINGLE ST PERSPECTIVE

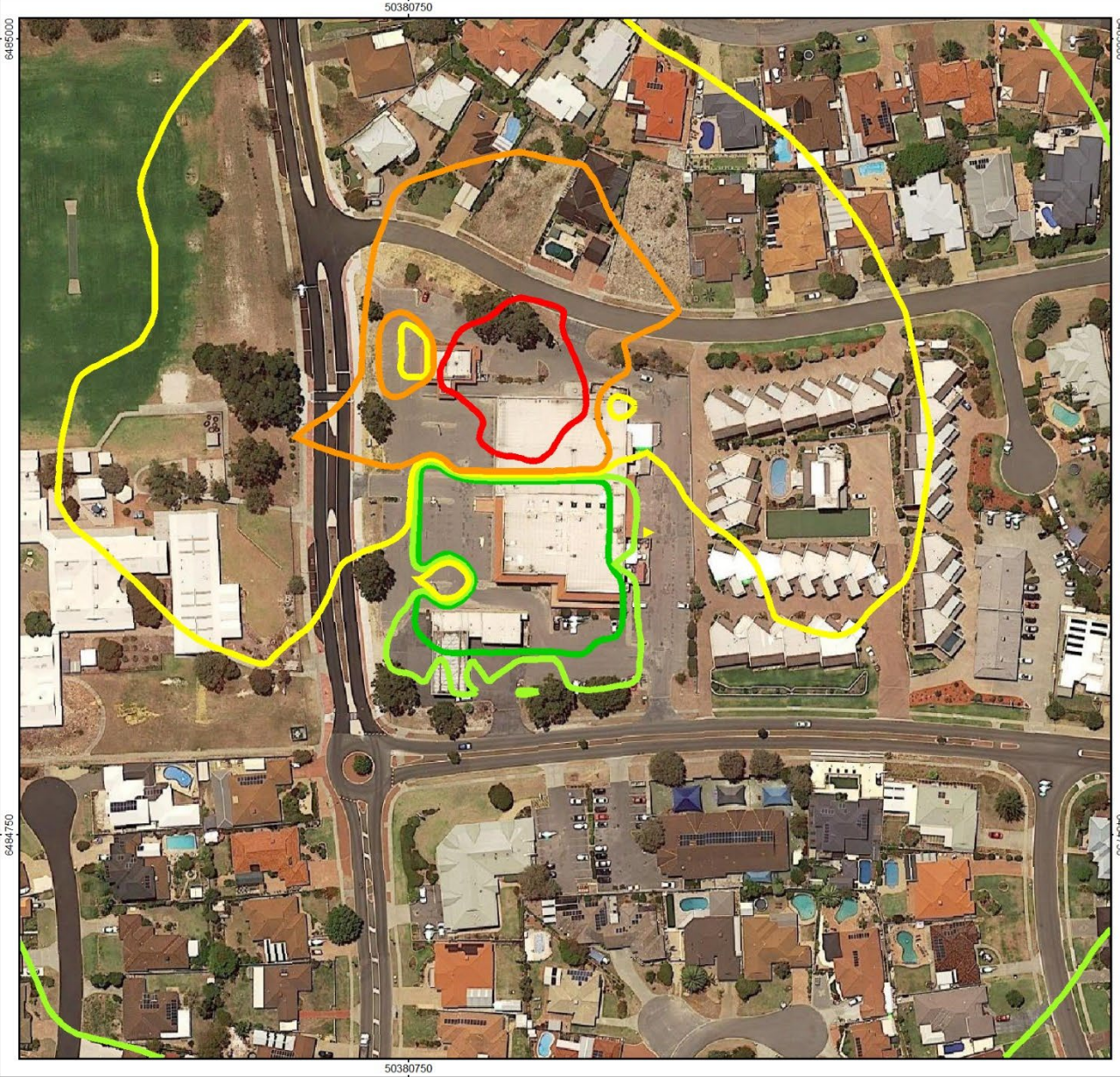
NOTE: SIGNAGE WILL BE VIA A SEPERATE APPLICATION



CARPARKING TABLE	Count	Level
2600 x 5500 STANDARD BAY - GF	46	00 Ground
2600 x 5500 STANDARD BAY - GF + WHEELSTOP	89	00 Ground
2400 x 5500 CARWAS OPERATOR BAY + WHEEL STOP	8	00 Ground
2400 x 5500 CARWASH OPERATOR BAY	1	00 Ground
<b>00 Ground</b>	<b>144</b>	
2400 x 5500 ACCESSIBLE BAY	1	01 M Level
2600 x 5500 ACCESSIBLE BAY	2	01 M Level
2600 x 5500 STANDARD BAY	13	01 M Level
<b>01 M Level</b>	<b>16</b>	
2600 x 5400 Marking - Electric Vehicles Bay	4	02 Level (LS)
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ	38	02 Level (LS)
2600 x 5400 STANDARD BAY - L2_IGA BRIEF REQ+ WHEELSTOP	13	02 Level (LS)
2600 x 5400 - ACCESSIBLE BAY - L2_IGA BRIEF REQ	2	02 Level (LS)
2600 x 5500 STANDARD BAY - L2 + WHEELSTOP	40	02 Level (LS)
2400 x 5500 DAY CARE BAY + WHEEL STOP	4	02 Level (LS)
2400 x 5500 5 MIN + WHEEL STOP	2	02 Level (LS)
2400 x 5500 TAXI + WHEEL STOP	2	02 Level (LS)
<b>02 Level (LS)</b>	<b>105</b>	
<b>GRAND TOTAL</b>	<b>265</b>	

## **APPENDIX B**

### **NOISE CONTOUR PLOTS**



Customer:  
 Cameron Chisholm Nicol  
 Project: Ocean Reef Shopping Centre DA  
 Project-No. 22080

Map  
**1**

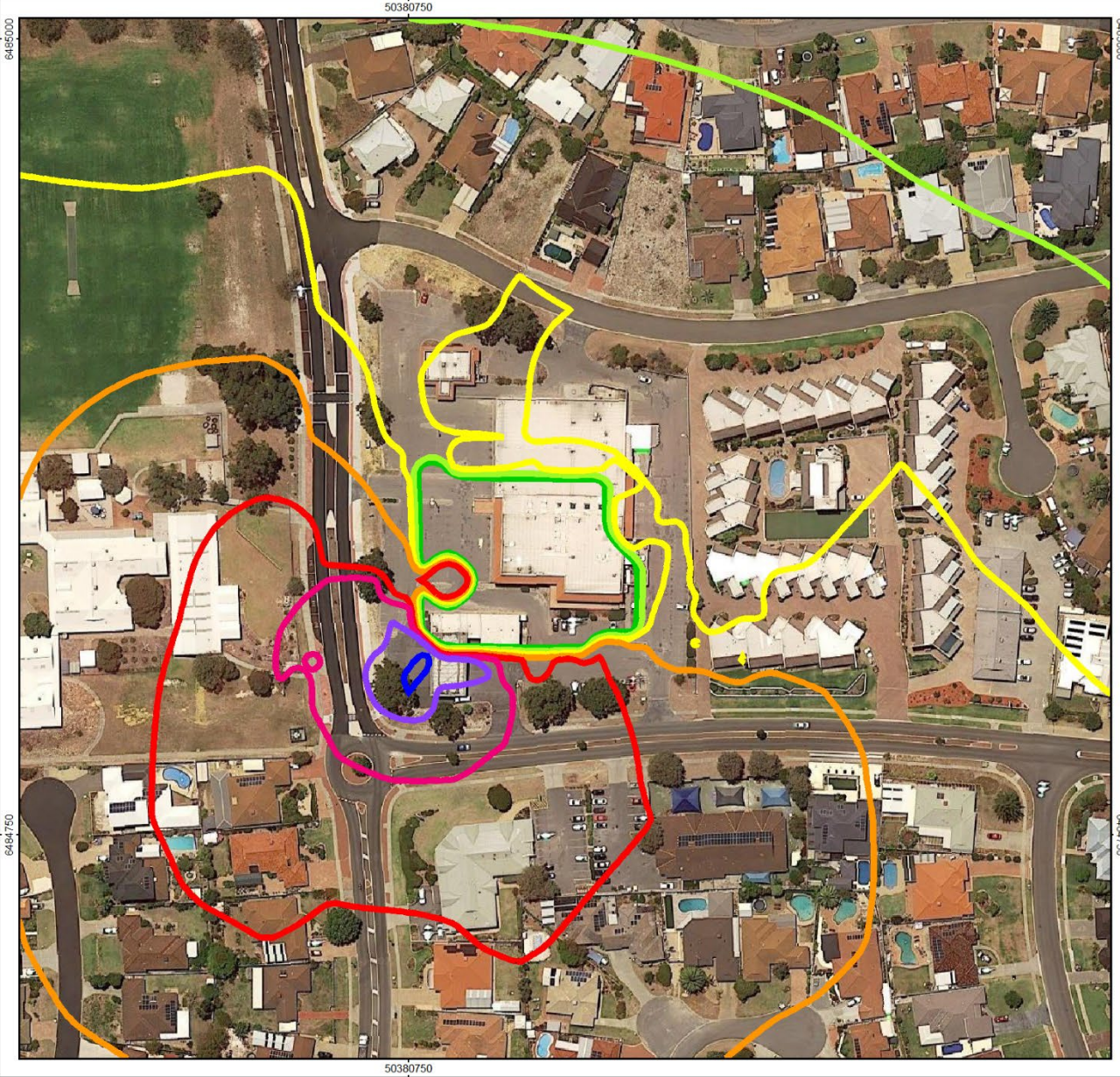
**Mechanical Services**  
**Result number 0**  
 Calculation in 2 m above ground

Project engineer: George Watts  
 Created:  
 Processed with SoundPLAN 8.2, Update 18/11/2022

**Levels L10**  
 in dB(A)

- █ = 15
- █ = 20
- █ = 25
- █ = 30
- █ = 35
- █ = 40
- █ = 45
- █ = 50
- █ = 55



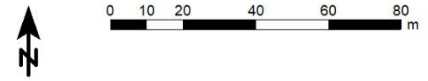
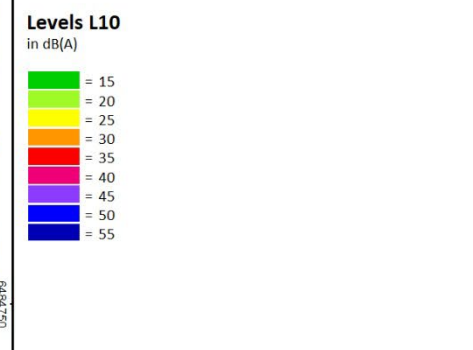


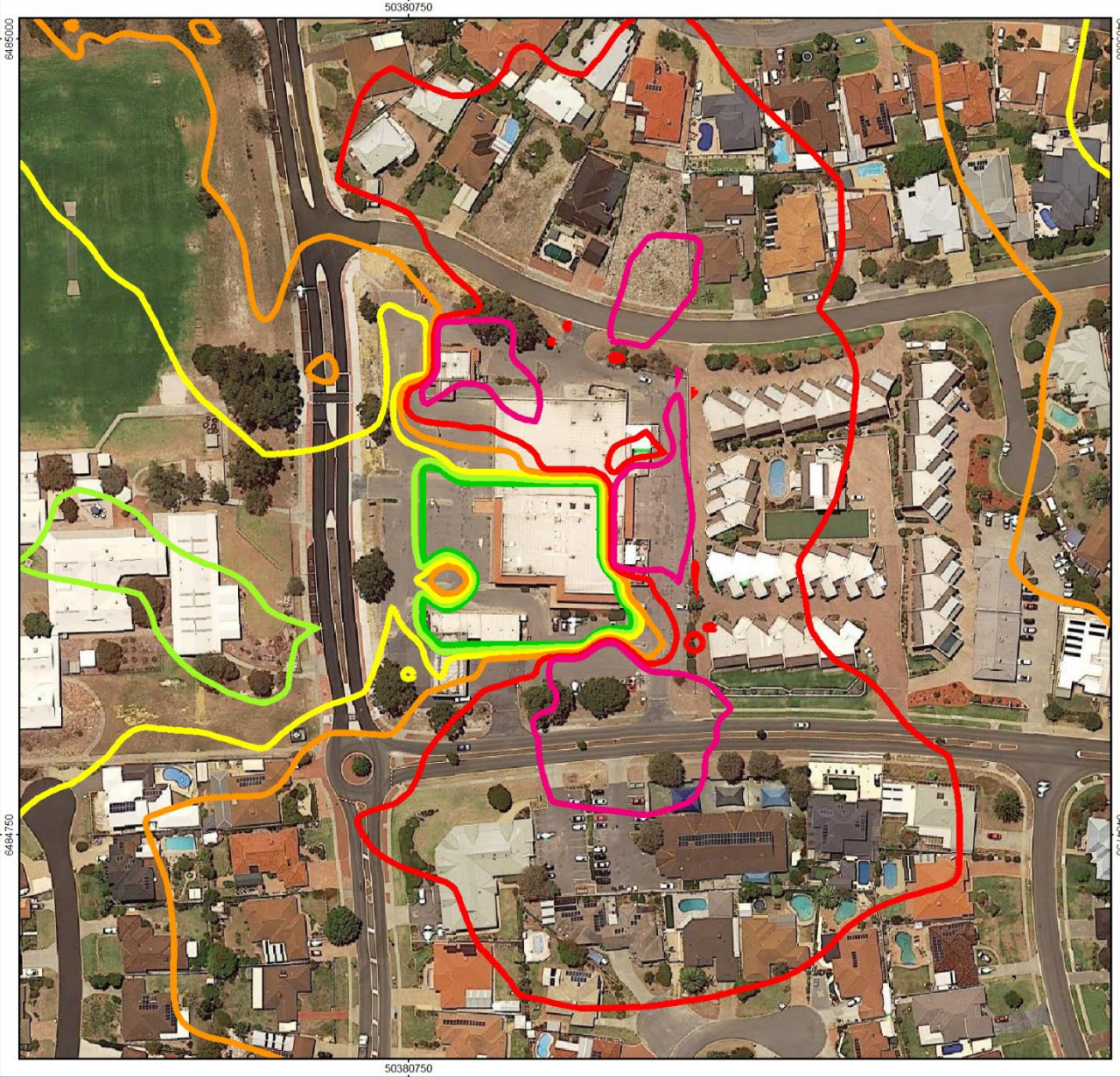
Customer:  
 Cameron Chisholm Nicol  
 Project: Ocean Reef Shopping Centre DA  
 Project-No. 22080

Map  
**2**

**Tavern Alfresco**  
**Result number 0**  
 Calculation in 2 m above ground

Project engineer: George Watts  
 Created: 18/01/2023  
 Processed with SoundPLAN 9.0, Update 28/02/2024





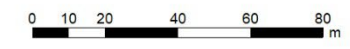
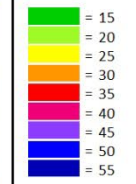
Customer:  
 Cameron Chisholm Nicol  
 Project: Ocean Reef Shopping Centre DA  
 Project-No. 22080

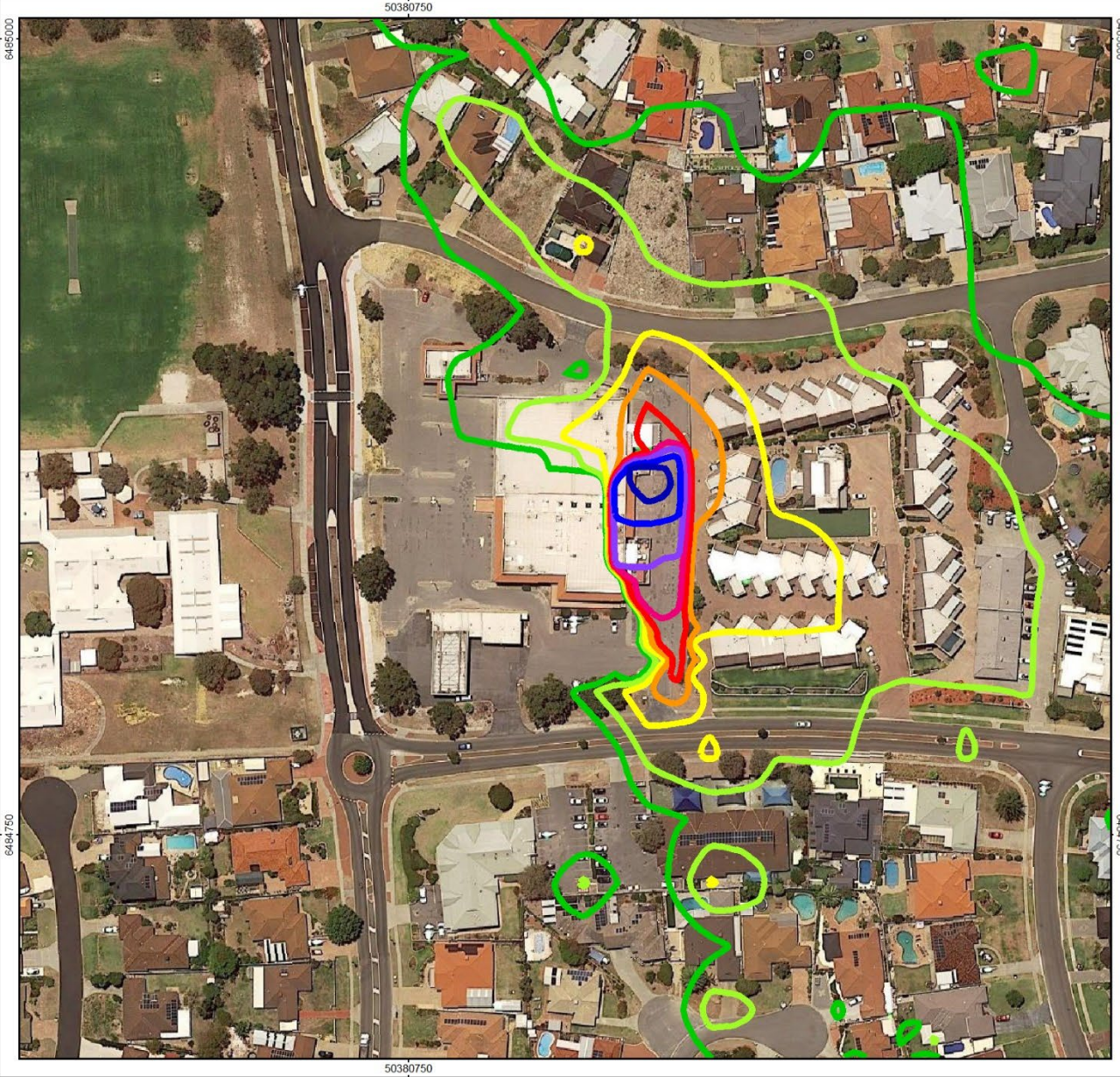
Map  
**3**

**Children Playing Childcare Outdoor Area**  
**Result number 0**  
 Calculation in 2 m above ground

Project engineer: George Watts  
 Created: 18/01/2023  
 Processed with SoundPLAN 9.0, Update 28/02/2024

**Levels L10**  
 in dB(A)





Customer:  
 Cameron Chisholm Nicol  
 Project: Ocean Reef Shopping Centre DA  
 Project-No. 22080

Map  
**4**

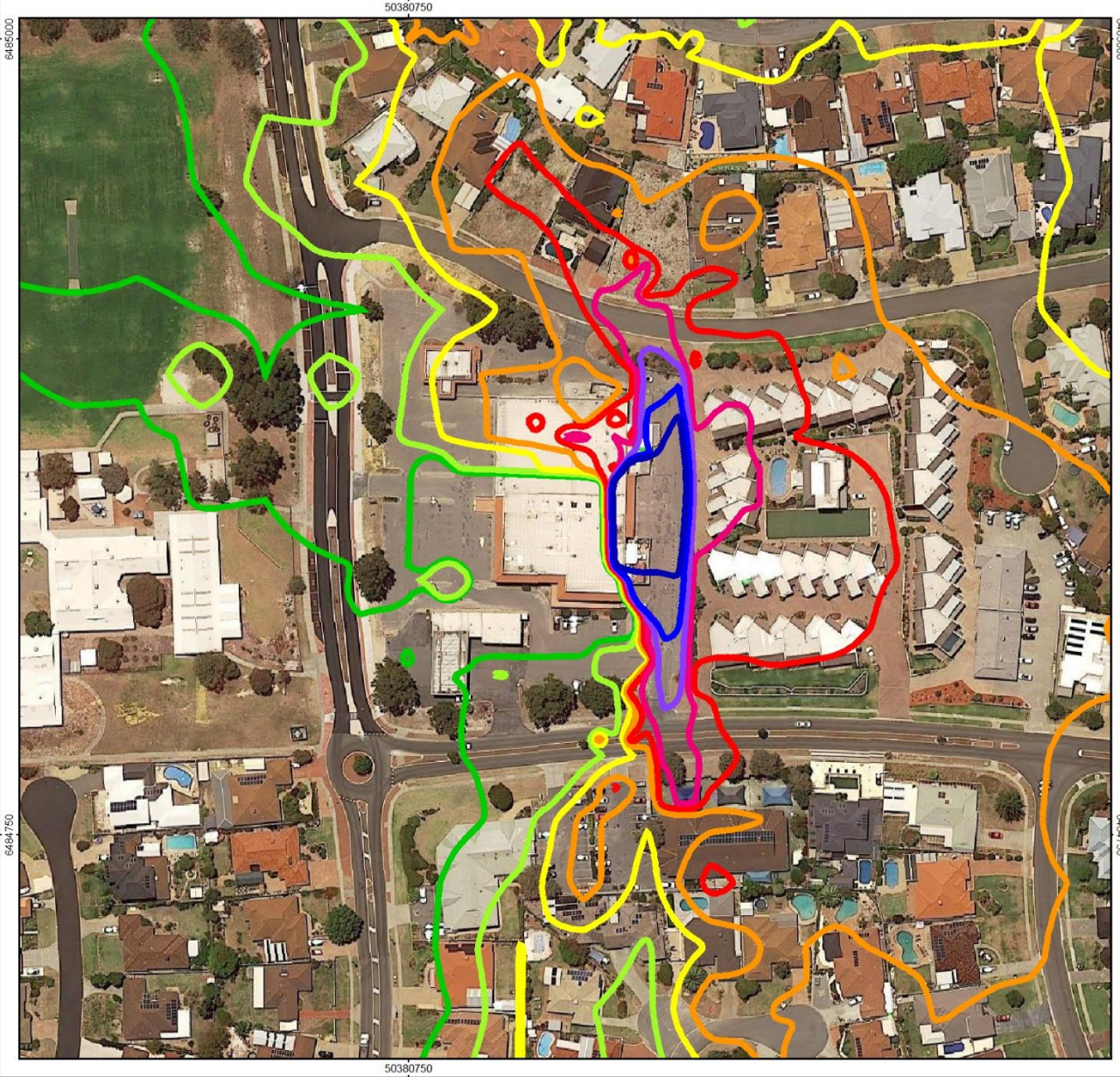
**Small Truck Delivery**  
**Result number 0**  
 Calculation in 2 m above ground

Project engineer: George Watts  
 Created: 18/01/2023  
 Processed with SoundPLAN 8.2, Update 18/11/2022

**Levels L1**  
 in dB(A)

- █ = 15
- █ = 20
- █ = 25
- █ = 30
- █ = 35
- █ = 40
- █ = 45
- █ = 50
- █ = 55





Customer:  
 Cameron Chisholm Nicol  
 Project: Ocean Reef Shopping Centre DA  
 Project-No. 22080

Map  
**5**

**Large Truck Delivery**  
**Result number 0**  
 Calculation in 2 m above ground

Project engineer: George Watts  
 Created: 18/01/2023  
 Processed with SoundPLAN 8.2, Update 18/11/2022

**Levels L1**  
 in dB(A)

- █ = 15
- █ = 20
- █ = 25
- █ = 30
- █ = 35
- █ = 40
- █ = 45
- █ = 50
- █ = 55

