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Proposed Garden Centre Redevelopment
277 Mona Vale Road
Terrey Hills

ACOUSTIC REPORT




Client:
Flower Power Pty Ltd
c / - Statewide Project Management
Attn: Brent Jones

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1. Introduction

This report is in response to a request by Flower Power Pty Ltd for an environmental noise assessment of a proposed redevelopment of a garden centre located at 277 Mona Vale Road, Terrey Hills. This environmental noise assessment was conducted in accordance with Northern Beaches Council planning policies and the NSW Noise Policy for Industry. To facilitate the assessment, unattended noise monitoring was conducted for the proposal to determine the criteria and assess impacts to sensitive receivers in proximity to the development.

2. Site Description

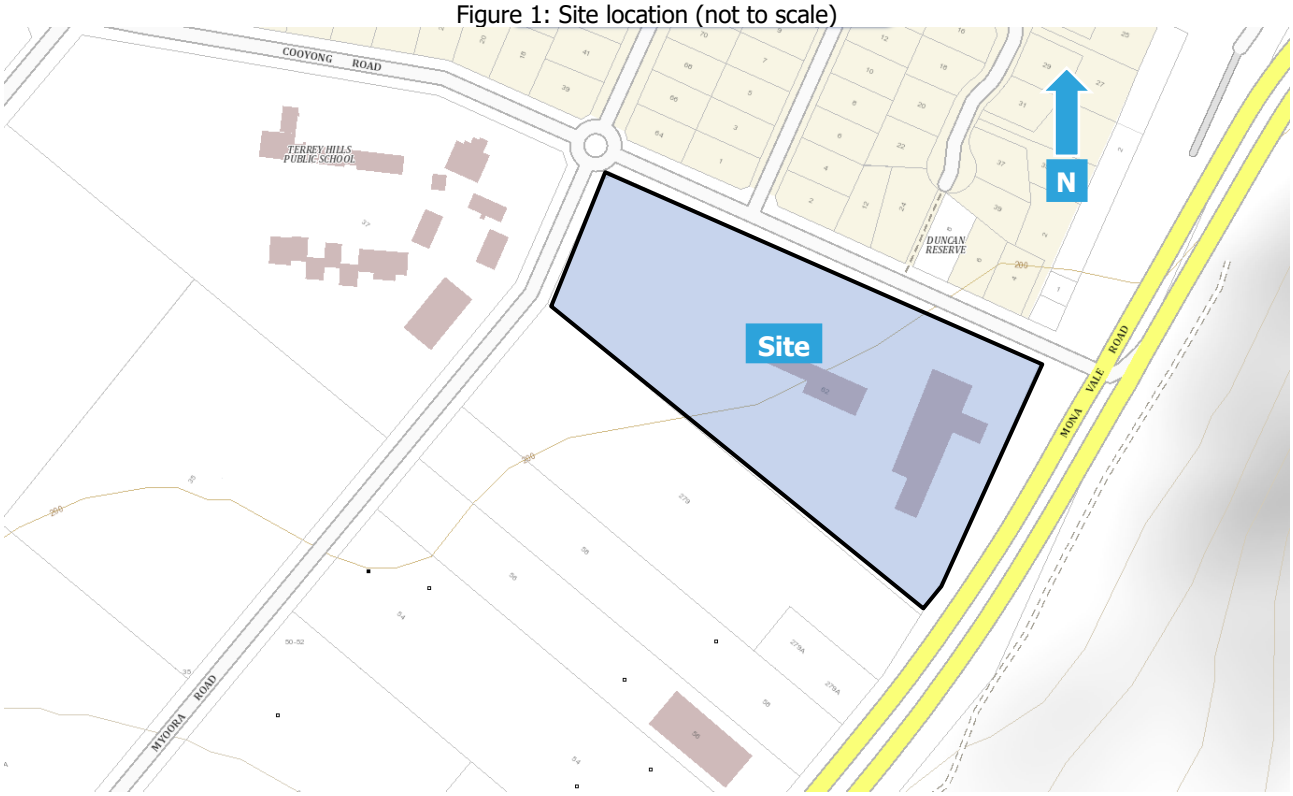
2.1 Site location

The site is described by the following:

277 Mona Vale Road, Terrey Hills
Lot 4 on DP 737411

Refer to Figure 1 for site location.

Figure 1: Site location (not to scale)



A comprehensive site survey was conducted on 8th December 2020 and identified the following:

a) The site is located on land zoned RU4 Primary Production Small Lots.
b) The tenancy is currently occupied by the existing Flower Power garden centre, which will be partially demolished and redeveloped.
c) Residential dwellings are located north of the site.
d) Commercial land uses are located south of the site.
e) Terrey Hills Public School is located north west of the site.
f) Mona Vale Road is located adjacent the eastern site boundary.

2.2 Proposal

The development proposal is to partly demolish and redevelop the existing Flower Power garden centre as follows:

- Partly retain the existing nursery and Flower Power Building as per the architectural drawings.
- Additional retail tenancy, pet shop, fruit shop, garden centre goods store to be located at southern end of site.
- Loading dock, bulky goods display area and landscape shop on the western end of the site.
- New carpark.
- Opening hours of 7am to 7pm for the garden centre, fruit shop and pet shop, with hours for the Garden Centre reduced to 7am to 5:30pm in winter.

This acoustic report assesses noise emissions throughout the hours of operation.

2.3 Acoustic environment

The surrounding area is primarily affected by noise from nearby commercial businesses and the surrounding road network.

3. Equipment

The following equipment was used to record noise levels:

- 2 x Rion NL42 Environmental Noise Monitors (SN# 00171587 & 01259207)
- Pulsar Model 105 Ltd Sound Calibrator (SN # 57417)

The Environmental Noise Monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers and Monitoring

4.1 Receiver locations

The nearest representative sensitive receiver locations were identified as follows;

1. Cooyong Road separates the site from single and two storey residential dwellings to the north from 4-8 Cooyong Road.
2. Cooyong Road separates the site from single and two storey residential dwellings to the north at 12-14 Cooyong Road and 24 Currong Circuit.
3. Cooyong Road separates the site from single and two storey residential dwellings to the north at 1 Currong Circuit and 63 Myoora Road.
4. A single storey residential dwelling is located to the north west at 39 Myoora Road.
5. A single storey residential dwelling is located to the south west at 58 Myoora Road.
6. A two storey residential dwelling is located to the south at 279A Mona Vale Road.

A. Myoora Road separates the site from Terrey Hills Public School to the west.

B. Commercial Premises are located to the south at 279 Mona Vale Road.

Refer to Figure 2 for these locations.

Figure 2: Receivers and noise monitoring locations

4.2 Unattended ambient noise measurement procedure

2 Rion NL42 environmental noise monitors were placed onsite at 277 Mona Vale Road to measure ambient noise levels at locations closer (Monitor A) and further (Monitor B) away from Mona Vale Road. This location was chosen as it was considered representative of the nearest sensitive receiver locations. The monitors were located in free field positions with the microphones approximately 1.4 metres above ground surface level. Noise monitor A was set to record noise levels between 13th and 24th October 2021, with noise monitor B set to record noise levels between 13th and 26th August 2021.

The environmental noise monitors were set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS 1055:2018 *Acoustics – Description and measurement of environmental noise* and the NSW Policy for Industry (2017).

Monitor A is considered representative of noise levels at Receivers 1, 2, 3 & 6, and Monitor B is considered representative of noise levels at Receivers 4 & 5.

For the unattended noise monitoring locations, refer to Figure 2

5. Existing Ambient Noise Levels

The following tables present the meteorological conditions and the measured existing ambient noise levels from the unattended noise survey. Any periods of inclement weather or extraneous noise are omitted from the measured data prior to determining the overall results.

5.1 Meteorological conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological conditions – North Head (wind) and Sydney (rain)

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Noise Monitor A						
Wednesday	13/10/2021	14.2	20	E	11	NE
Thursday	14/10/2021	14.0	7	N	17	NE
Friday	15/10/2021	4.8	15	W	13	NW
Saturday	16/10/2021	0.4	20	WNW	22	WNW
Sunday	17/10/2021	0	15	W	15	ESE
Monday	18/10/2021	0	9	WNW	15	E
Tuesday	19/10/2021	0	6	E	13	SSE
Wednesday	20/10/2021	0	13	WSW	15	SE
Thursday	21/10/2021	0	2	S	13	E
Friday	22/10/2021	0	6	SW	13	E
Saturday	23/10/2021	0	9	NNE	11	E
Sunday	24/10/2021	1.2	11	SSW	15	ESE
Noise Monitor B						
Friday	13/08/2021	0	13	W	9	W
Saturday	14/08/2021	0	9	W	7	NNE
Sunday	15/08/2021	0	9	W	11	W
Monday	16/08/2021	0	7	NW	7	W
Tuesday	17/08/2021	0	9	W	13	ESE
Wednesday	18/08/2021	0	7	W	9	E
Thursday	19/08/2021	0	4	WNW	7	NE
Friday	20/08/2021	0	7	WNW	6	N
Saturday	21/08/2021	0.4	11	NW	11	NNW
Sunday	22/08/2021	0	9	NW	11	NNE
Monday	23/08/2021	0	20	NW	20	NW
Tuesday	24/08/2021	31.0	19	W	26	W
Wednesday	25/08/2021	30	26	WSW	22	WSW
Thursday	26/08/2021	0	11	SW	7	E

5.2 Ambient background noise level – Noise Monitor A (Receivers 1, 2, 3 & 6)

The measured rating background noise levels (RBL), in accordance with the NSW Noise Policy for Industry, are as follows;

Table 2: Measured L90 noise levels – Noise Monitor A

Day	Date	Background L90 dBA (Noise Monitor A)		
		Day	Evening	Night
Wednesday	13/10/2021	x	40.8	36.8*
Thursday	14/10/2021	49.9*	34.8	32.1
Friday	15/10/2021	48.8	39.3	36.8*
Saturday	16/10/2021	51.1*	41.7*	33.7
Sunday	17/10/2021	49.3	33.7	33.6
Monday	18/10/2021	47.6	34.6	33.2
Tuesday	19/10/2021	50.4	38.2	32.6
Wednesday	20/10/2021	48.8	39.2	33.2
Thursday	21/10/2021	49.3	36.2	32.5
Friday	22/10/2021	49.6	39.4	32.1
Saturday	23/10/2021	48.9	40.3	32.7
Sunday	24/10/2021	47.4	34.8	31.7
RBL		49	39	33

Graphical presentation of the measured noise levels is presented in the Appendices.

*Note Heavy rainfall recorded on the 13th, 14th and 15th October and high wind speeds recorded on the 16th October were found to have affected the measured noise levels, therefore the affected time periods were omitted.

5.1 Ambient background noise level – Noise Monitor B (Receivers 4 and 5)

The measured rating background noise levels (RBL), in accordance with the NSW Noise Policy for Industry, are as follows;

Table 3: Measured L90 noise levels – Noise Monitor B

Day	Date	Background L90 dBA (Noise Monitor B)		
		Day	Evening	Night
Friday	13/08/2021	x	36.5	32.2
Saturday	14/08/2021	43.0	31.1	30.5
Sunday	15/08/2021	44.6	33.4	32.2
Monday	16/08/2021	44.4	38.9	35.1
Tuesday	17/08/2021	46.2	36.6	32.5
Wednesday	18/08/2021	45.5	31.2	30.8
Thursday	19/08/2021	43.7	29.5	28.4
Friday	20/08/2021	44.5	34.3	28.4
Saturday	21/08/2021	43.4	31.4	28.9
Sunday	22/08/2021	39.8	31.4	30.9
Monday	23/08/2021	45.1	27.9	34.0*
Tuesday	24/08/2021	49.7*	52.3*	46.1*
Wednesday	25/08/2021	47.8*	33.5	29.3
Thursday	26/08/2021	46.1	35.7	31.2
RBL		45	33	31

Graphical presentation of the measured noise levels is presented in the Appendices.

*Note Heavy rainfall and high wind speeds recorded on the 23rd, 24th and 25th August were found to have affected the measured data, therefore the affected time periods were omitted.

6. Noise Criteria

To determine the appropriate noise criteria to be applied, a review of Northern Beaches Council planning policies and the NSW Noise Policy for Industry was conducted.

6.1 Northern Beaches Council

The site is located within Northern Beaches Council's local government area, the criteria from the Warringah Development Control Plan 2011 (DCP) is applied. Section 3.4.2.3 of the DCP states the following;

> *"Objectives*
> *• To ensure the siting and design of buildings provides a high level of visual and acoustic privacy for occupants and neighbours.*
> *• To encourage innovative design solutions to improve the urban environment.*
> *• To provide personal and property security for occupants and visitors.*
>
> *Requirements*
> *1. Building layout should be designed to optimise privacy for occupants of the development and occupants of adjoining properties.*
> *2. Orientate living areas, habitable rooms and windows to private open space areas or to the street to limit overlooking.*
> *3. The effective location of doors, windows and balconies to avoid overlooking is preferred to the use of screening devices, high sills or obscured glass.*
> *4. The windows of one dwelling are to be located so they do not provide direct or close views (ie from less than 9 metres away) into the windows of other dwellings.*
> *5. Planter boxes, louvre screens, pergolas, balcony design and the like are to be used to screen a minimum of 50% of the principal private open space of a lower apartment from overlooking from an upper apartment."*

Therefore, further reference was made to the NSW Noise Policy for Industry.

6.2 Noise Policy for Industry

Assessment of noise in accordance with NSW EPA Noise Policy for Industry (2017) has two main components: intrusiveness and amenity criteria. These are compared to each other (after conversion of amenity noise level to $L_{Aeq,15min}$ equivalent level) to determine the overall project noise trigger level.

6.2.1 Intrusiveness noise level

The intrusiveness noise level is based on the $L_{Aeq,15\ min}$ associated with commercial activity being less than or equal to the measured L_{A90} Rating Background Level + 5dB as per section 2.3 of the policy. A modifying factor should also be added where appropriate to allow for tonality, impulsiveness, and intermittency or low frequency effects.

6.2.2 Amenity noise level

The amenity noise level is determined in accordance with Section 2.4 of the policy based on the land use and relevant noise criteria specified in Tables 2.2 and 2.3 respectively.

The Noise Policy for Industry sets out acceptable noise levels for various locations. Determination of which residential receiver category applies is described in Table 2.3 of the policy.

Table 4: Receiver category (Table 2.3 of the Noise Policy for Industry)

Receiver category	**Typical planning zoning – standard instrument**	**Typical existing background noise levels**	**Description**
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	**Rural** – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL <35dB(A)	**Suburban** – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL> 45 dB(A) Evening RBL> 40 dB(A) Night RBL >35 dB(A)	**Urban** – an area with an acoustical environment that: • is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

To determine the appropriate receiver category, the following observations were made:

- Receivers 1 to 4 are zoned R2 – Low density residential which corresponds to the typical planning zoning of the suburban category
- Receivers 5 & 6 are zoned RU4 – Primary Production which corresponds to the typical planning zoning of the rural category.
- The measured daytime RBL values presented in Section 5.2 correspond with the typical background noise levels of the urban category during the daytime period, suburban (Noise Monitor A) and rural (Noise Monitor B) during the evening period, and suburban during the night time period.

- The acoustic environment of the surrounding area has characteristically intermittent traffic flows, with limited commerce or industry. Evening ambient noise levels are defined by the natural environment and human activity. This corresponds to the typical description of the suburban category.

Therefore, the nearest receivers would be assessed against the 'suburban' criteria.

6.2.3 Modifying factors

The Noise Policy for Industry includes correction factors such as tonal noise, low-frequency noise, intermittent noise and duration. Where two or more modifying factors are present, the maximum adjustment to a noise source level is 10dBA (excluding duration correction).

6.3 Project noise trigger level

To determine the project trigger noise level, the amenity noise level must first be standardised to an equivalent $L_{Aeq,15min}$ in order to compare to the intrusiveness noise level. This is done in accordance with section 2.2 of the policy as follows;

$$L_{Aeq,15min} = L_{Aeq,\ period} + 3dB$$

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise. Project amenity noise level for industrial developments equals the recommended amenity noise level minus 5dB(A).

Therefore, based on the measured data presented in Section 5, the project specific noise limits are determined.

6.3.1 Sleep disturbance noise level

Sleep disturbance is based on the maximum noise level of events from premises during the night-time period. The Noise Policy for Industry defines sleep disturbance as a noise from a premise at a residential location that exceeds:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

6.3.2 Intrusive noise impacts

The intrusive noise limits are as follows;

Table 5: NSW Noise Policy for Industry – Intrusive Noise Criteria

Time period	Criteria $L_{eq\ (15min)}$ dB(A)			
	Receivers 1, 2, 3 & 6	Receivers 4 & 5	Receiver A	Receiver B
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	54	50	N/A*	N/A*
Evening (6pm-10pm)	44	38	N/A*	N/A*
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	38	36	N/A*	N/A*

*Note intrusiveness criteria only applies to residential receivers.

6.3.3 Amenity criteria

Based on section 2.2 and 2.4 of the policy, the amenity noise levels are as follows;

Table 6: Amenity noise levels

Time period	Criteria $L_{eq\ (15min)}$ dB(A)			
	Receivers 1, 2, 3 & 6	Receivers 4 & 5	Receiver A	Receiver B
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	53	53	45 external / 35 internal*	65
Evening (6pm-10pm)	43	43	-	65
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	38	38	-	65

*Note an outside/inside noise reduction of 10dBA was assumed in accordance with Section 2.6 of the Noise Policy for Industry.

6.3.4 Project specific noise criteria

The project noise trigger level is the lower (that is, the most stringent) value of the intrusiveness and amenity noise levels. Therefore the project noise trigger levels are as follows:

Table 7: Project Criteria

Time period	Criteria $L_{eq\ (15min)}$ dB(A)			
	Receivers 1, 2, 3 & 6	Receivers 4 & 5	Receiver A	Receiver B
Day (7am-6pm Mon-Sat; 8am-6pm Sun)	53	50	45 external / 35 internal*	65
Evening (6pm-10pm)	43	38	-	65
Night (10pm-7am Sun-Fri, 10pm-8am Sat)	38	36	-	65

*Note an outside/inside noise reduction of 10dBA was assumed in accordance with Section 2.6 of the Noise Policy for Industry.

7. Environmental Assessment

7.1 Onsite activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at a representative distance within the development site to each receiver location. Any relevant shielding or building transmission loss is taken into account for these activities.

7.2 Project specific criteria

The noise source levels at the receiver locations are shown in Table 8. L_{Aeq} results are not shown where the calculated total is less than 0dBA.

Table 8: Project specific noise levels (Receivers 1 to 6)

Receivers								
1. 4-8 Cooyong Road (N) 2. 12-14 Cooyong Road & 24 Currong Circuit (N) 3. 1 Currong Citrcuit and 64 Myoora Road (N) 4. 39 Myoora Road (NW) 5. 58 Myoora Road (SW) 6. 279A Mona Vale Road (S)							LAeq 15 min Compliance	
Receiver	Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj,T ext. dB(A) Day	LAeq adj,T ext. dB(A) Eve	Day	Eve
	Criteria						53	43
	Car door closure	75	2	77	30	28	Yes	Yes
1	Car passby	69		69	34	32	Yes	Yes
	Car start	74	2	76	29	27	Yes	Yes
	Loader (wheeled)	89		89	37	0	Yes	n/a
	Forklift unloading	82	2	84	29	26	Yes	Yes
	Truck passby	82		82	18	15	Yes	Yes
	Truck air brakes	102	2	104	26	23	Yes	Yes
	Truck reverse alarm	92	5	97	33	30	Yes	Yes
	Delivery van	78	2	80	27	21	Yes	Yes
	Dog Barking	83		83	2		Yes	Yes
	Voice dining group	75		75	26	26	Yes	Yes
	Voice conversation	70		70	32	32	Yes	Yes
	Total				42	38	**Yes**	**Yes**
	Criteria						53	43
	Car door closure	75	2	77	30	28	Yes	Yes
2	Car passby	69		69	34	32	Yes	Yes
	Car start	74	2	76	29	27	Yes	Yes
	Loader (wheeled)	89		89	48		Yes	n/a
	Forklift unloading	82	2	84	31	28	Yes	Yes
	Truck passby	82		82	23	20	Yes	Yes
	Truck air brakes	102	2	104	26	23	Yes	Yes
	Truck reverse alarm	92	5	97	34	31	Yes	Yes
	Delivery van	78	2	80	23	17	Yes	Yes
	Dog Barking	83		83	1		Yes	Yes
	Voice dining group	75		75	23	23	Yes	Yes
	Voice conversation	70		70	25	25	Yes	Yes
	Total				48	37	**Yes**	**Yes**
	Criteria						53	43
	Car door closure	75	2	77	29	27	Yes	Yes
3	Car passby	69		69	33	30	Yes	Yes
	Car start	74	2	76	28	26	Yes	Yes
	Loader (wheeled)	89		89	41		Yes	n/a
	Forklift unloading	82	2	84	33	30	Yes	Yes
	Truck passby	82		82	25	22	Yes	Yes
	Truck air brakes	102	2	104	28	25	Yes	Yes
	Truck reverse alarm	92	5	97	36	33	Yes	Yes
	Delivery van	78	2	80	25	19	Yes	Yes
	Dog Barking	83		83			Yes	Yes
	Voice dining group	75		75	9	9	Yes	Yes
	Voice conversation	70		70	24	24	Yes	Yes
	Total				44	38	**Yes**	**Yes**
	Criteria						50	38
	Car door closure	75	2	77	10	8	Yes	Yes
4	Car passby	69		69	14	12	Yes	Yes
	Car start	74	2	76	9	7	Yes	Yes
	Loader (wheeled)	89		89	25		Yes	n/a
	Forklift unloading	82	2	84	17	14	Yes	Yes
	Truck passby	82		82	6	3	Yes	Yes
	Truck air brakes	102	2	104	13	10	Yes	Yes
	Truck reverse alarm	92	5	97	21	18	Yes	Yes
	Delivery van	78	2	80	10	4	Yes	Yes
	Dog Barking	83		83			Yes	Yes
	Voice dining group	75		75	7	7	Yes	Yes
	Voice conversation	70		70	9	9	Yes	Yes
	Total				28	22	**Yes**	**Yes**
	Criteria						50	38
	Car door closure	75	2	77	18	15	Yes	Yes
5	Car passby	69		69	21	19	Yes	Yes
	Car start	74	2	76	17	14	Yes	Yes
	Loader (wheeled)	89		89	35		Yes	n/a
	Forklift unloading	82	2	84	28	25	Yes	Yes
	Truck passby	82		82	21	18	Yes	Yes
	Truck air brakes	102	2	104	25	22	Yes	Yes
	Truck reverse alarm	92	5	97	32	29	Yes	Yes
	Delivery van	78	2	80	21	15	Yes	Yes
	Dog Barking	83		83			Yes	Yes
	Voice dining group	75		75	8	8	Yes	Yes
	Voice conversation	70		70	22	22	Yes	Yes
	Total				38	32	**Yes**	**Yes**
	Criteria						53	43
	Car door closure	75	2	77			Yes	Yes
6	Car passby	69		69	3	1	Yes	Yes
	Car start	74	2	76			Yes	Yes
	Loader (wheeled)	89		89	34		Yes	n/a
	Forklift unloading	82	2	84	40	37	Yes	Yes
	Truck passby	82		82	31	28	Yes	Yes
	Truck air brakes	102	2	104	36	33	Yes	Yes
	Truck reverse alarm	92	5	97	40	37	Yes	Yes
	Delivery van	78	2	80	36	30	Yes	Yes
	Dog Barking	83		83	5		Yes	Yes
	Voice dining group	75		75	11	11	Yes	Yes
	Voice conversation	70		70	6	6	Yes	Yes
	Total				45	42	**Yes**	**Yes**

Table 9: Project specific noise levels (Receivers A & B)

Receiver	Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	LAeq adj, T ext. dB(A) Day	LAeq adj, T ext. dB(A) Eve	LAeq 15 min Compliance Day	LAeq 15 min Compliance Eve
	Receivers							
	A. Terrey Hills Public School (W) B. 279 Mona Vale Road (S)							
	Criteria						45	
	Car door closure	75	2	77			Yes	n/a
A	Car passby	69		69			Yes	n/a
	Car start	74	2	76			Yes	n/a
	Loader (wheeled)	89		89	44		Yes	n/a
	Forklift unloading	82	2	84	32	29	Yes	n/a
	Truck passby	82		82	26	23	Yes	n/a
	Truck air brakes	102	2	104	28	25	Yes	n/a
	Truck reverse alarm	92	5	97	36	33	Yes	n/a
	Delivery van	78	2	80	25	19	Yes	n/a
	Dog Barking	83		83			Yes	n/a
	Voice dining group	75		75	8	8	Yes	n/a
	Voice conversation	70		70	26	26	Yes	n/a
	Total				45	36	**Yes**	**n/a**
	Criteria						65	65
	Car door closure	75	2	77	28	26	Yes	Yes
B	Car passby	69		69	32	30	Yes	Yes
	Car start	74	2	76	27	25	Yes	Yes
	Loader (wheeled)	89		89	39		Yes	n/a
	Forklift unloading	82	2	84	27	24	Yes	Yes
	Truck passby	82		82	16	13	Yes	Yes
	Truck air brakes	102	2	104	24	21	Yes	Yes
	Truck reverse alarm	92	5	97	31	28	Yes	Yes
	Delivery van	78	2	80	20	14	Yes	Yes
	Dog Barking	83		83	17	12	Yes	Yes
	Voice dining group	75		75	31	31	Yes	Yes
	Voice conversation	70		70	34	34	Yes	Yes
	Total				42	38	**Yes**	**Yes**

Compliance is predicted for all onsite activities during the proposed operating hours on the condition the recommendations detailed in Section 8 are implemented.

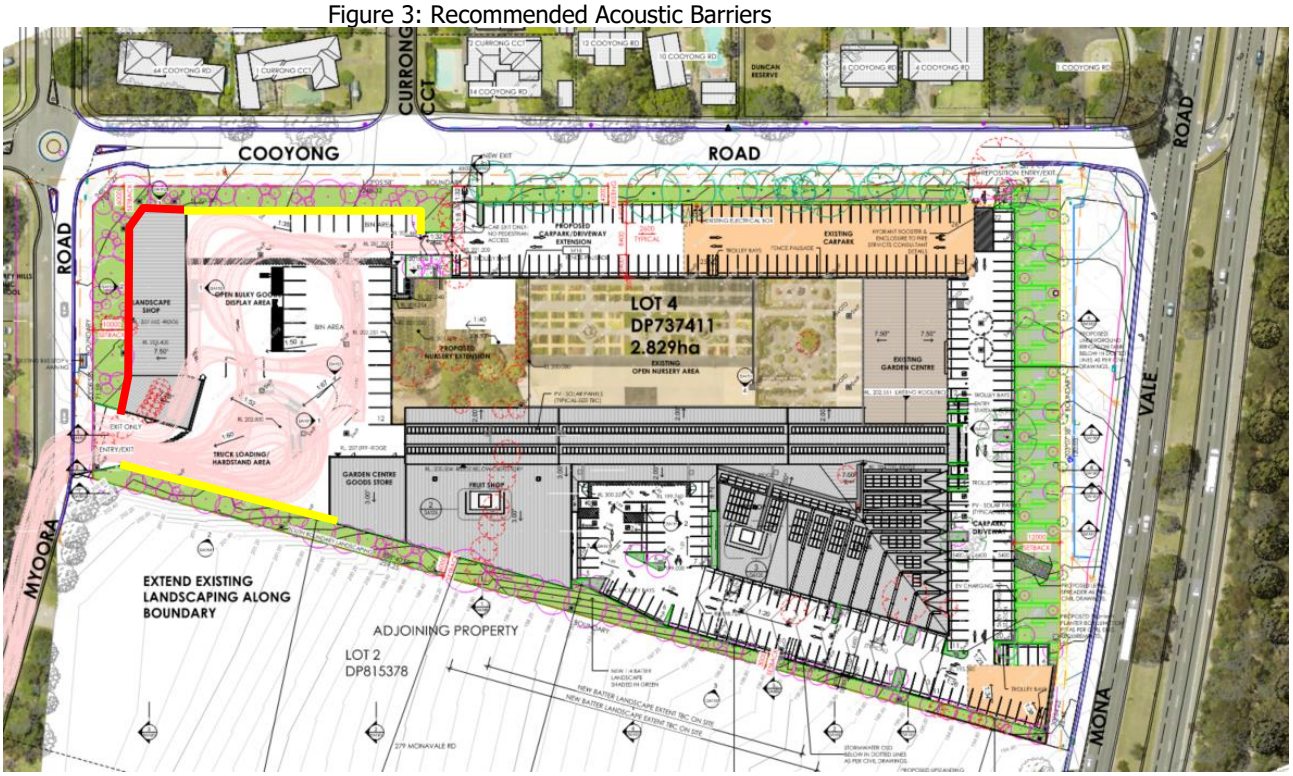
8. Recommendations

8.1 Onsite activities

Based on the predicted noise levels and subjective assessment of the site and surrounds, noise impacts at the residential and commercial receiver locations are predicted to satisfy the assessment criteria on the condition the following recommendations are implemented:

- Acoustic barriers and the solid wall shall be constructed to the height and extent shown in Figure 3. The barriers will vary for each stage of the project. The acoustic barriers should be constructed using either masonry, 9mm fibre cement sheet, Hebel, or other materials with a minimum surface density of 9kg/m^2 and shall be free of gaps and holes.
- Wheeled loader operation shall be limited to the day period only (7am to 6pm).
- Waste collection shall be conducted in accordance with surrounding residential and commercial properties, with recommended hours of 7am to 6pm Monday to Friday.

Figure 3: Recommended Acoustic Barriers



Acoustic Barrier 2.4m high above truck loading area RL

Solid wall to full height of landscape shop

8.2 Mechanical plant

Based on the ambient noise levels measured at the nearest sensitive receiver (refer to Sections 5 & 6) and separation distances, roof-mounted mechanical plant will require a combined sound power level that does not exceed 75 dBA (for plant on the roof of the main building) and 78 dBA (for plant on the roof of the retail building). The number of mechanical plant units is predicted to exceed 1. Table 10 nominates specific noise levels dependent on the number of units.

Table 10: Mechanical plant maximum sound power level

Number of mechanical plant units	Maximum Sound Power Level dBA	
	Main Building Rooftop	Retail Rooftop
1	75	78
2	72	75
3	70	73
4	69	72
8	66	69

Acoustic Works recommends that once mechanical plant selection is finalised, an assessment by a qualified acoustic consultant be conducted prior to installation to determine any requirements for acoustic treatments.

9. Conclusion

An environmental noise assessment was conducted for the proposed garden centre and retail shops to be located at 277 Mona Vale Road, Terrey Hills. On the condition the recommendations detailed in Section 8 are implemented, compliance is predicted with NSW EPA Industrial Noise Policy and Northern Beaches Council's assessment requirements.

Should you have any queries please do not hesitate to contact us.

Yours faithfully,

M Bechara

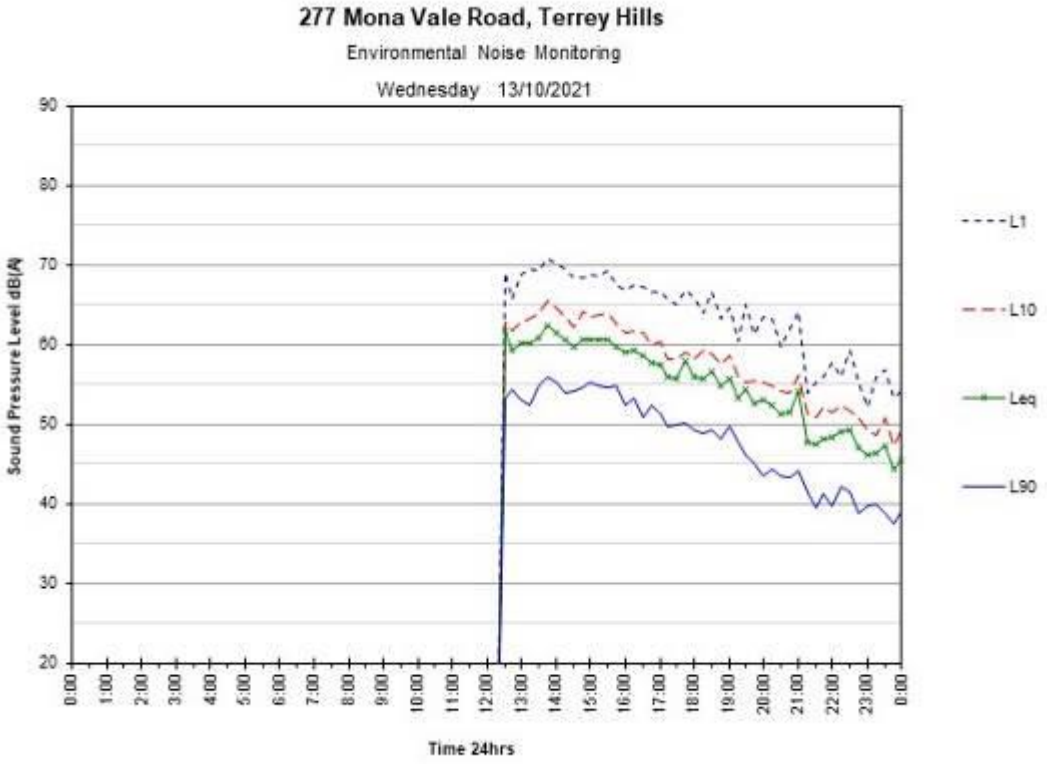
Matthew Bechara M.ArchSci MAAS
Associate Director

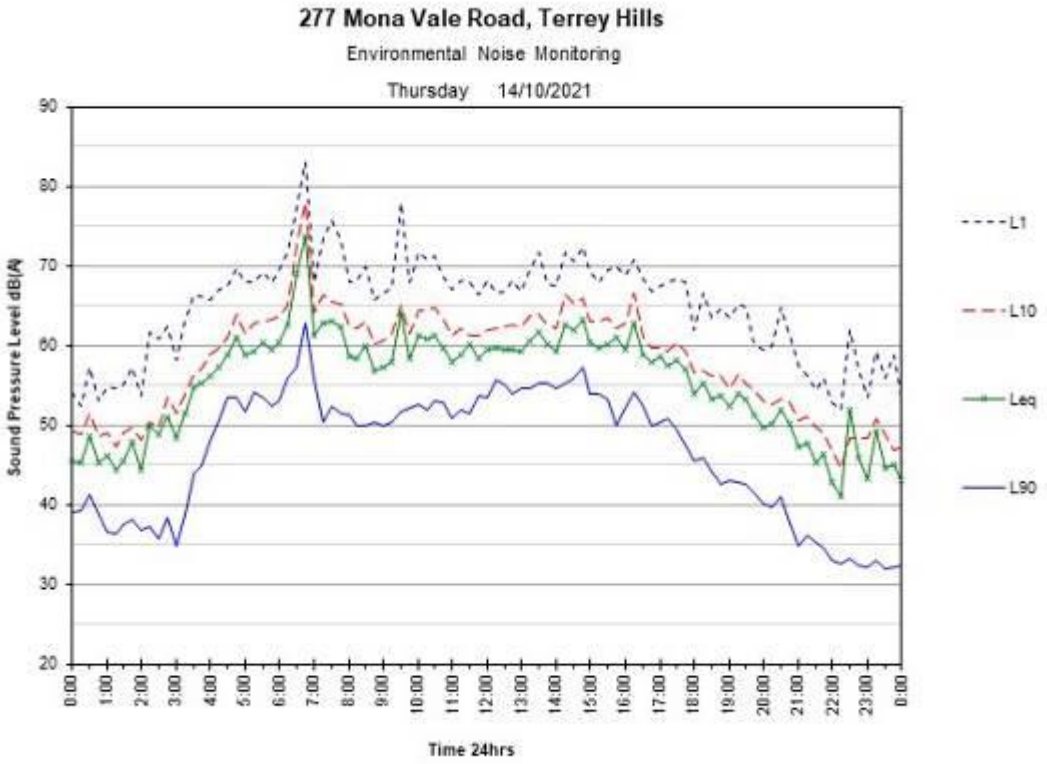
acousticworks)))

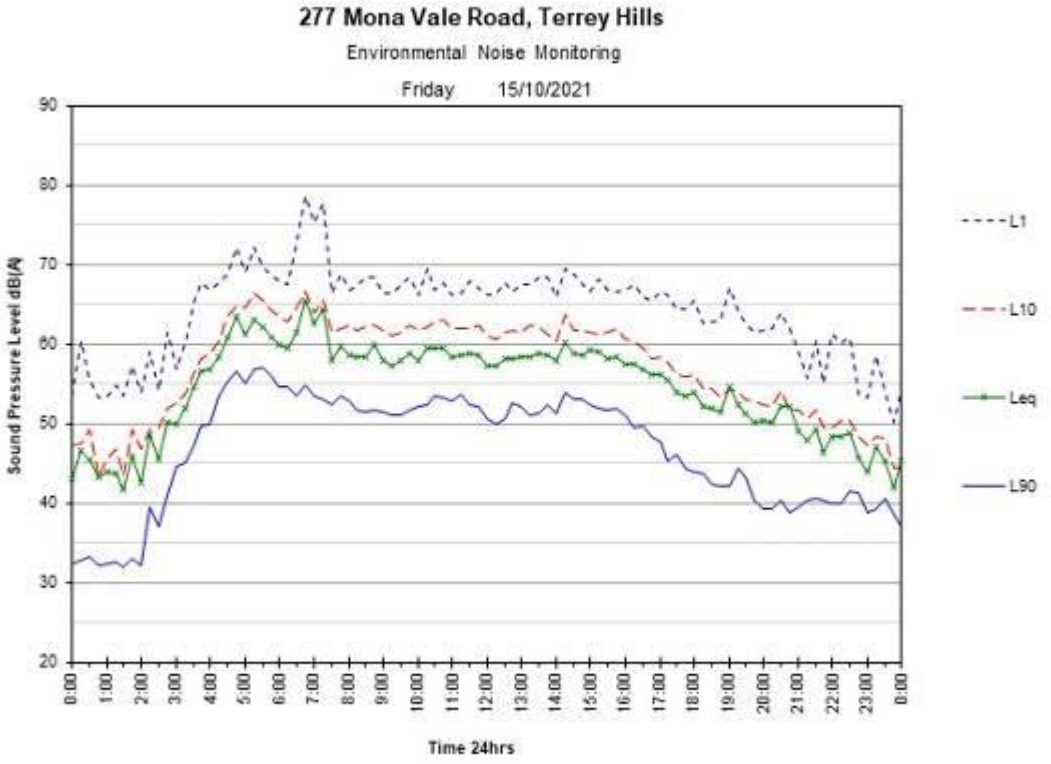
10. Appendices

10.1 Noise monitoring charts

10.1.1 Monitor A



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Environmental Noise Monitoring
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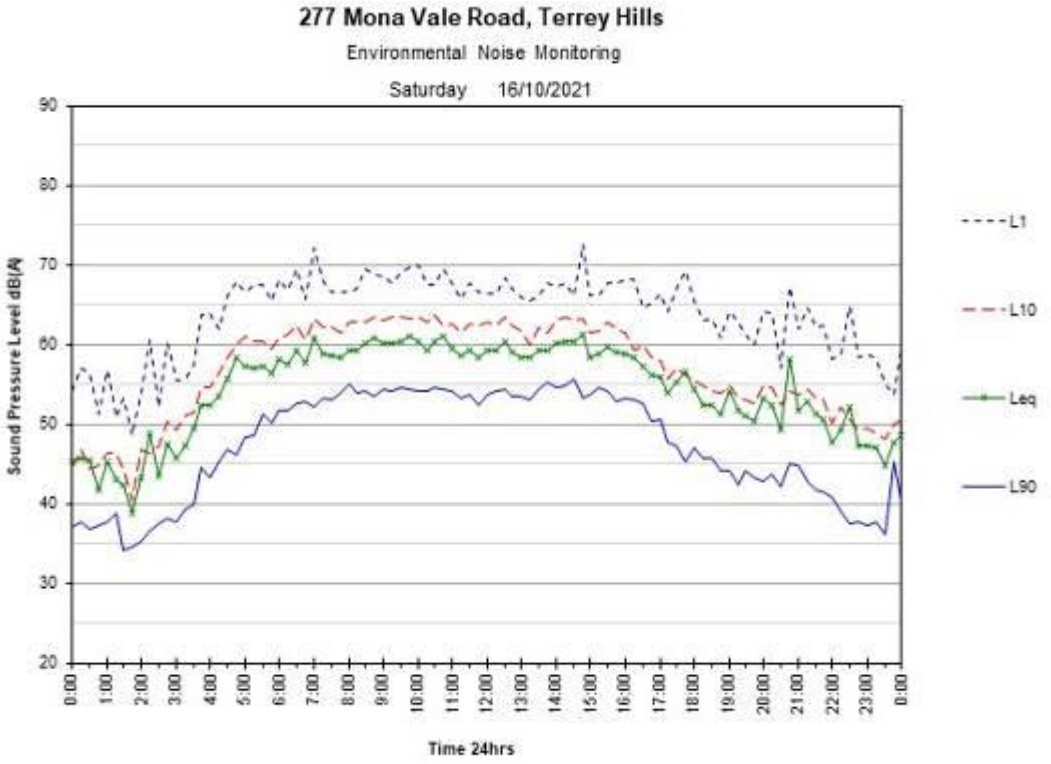
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Environmental Noise Monitoring
Saturday 16/10/2021
Sound Pressure Level dB(A)
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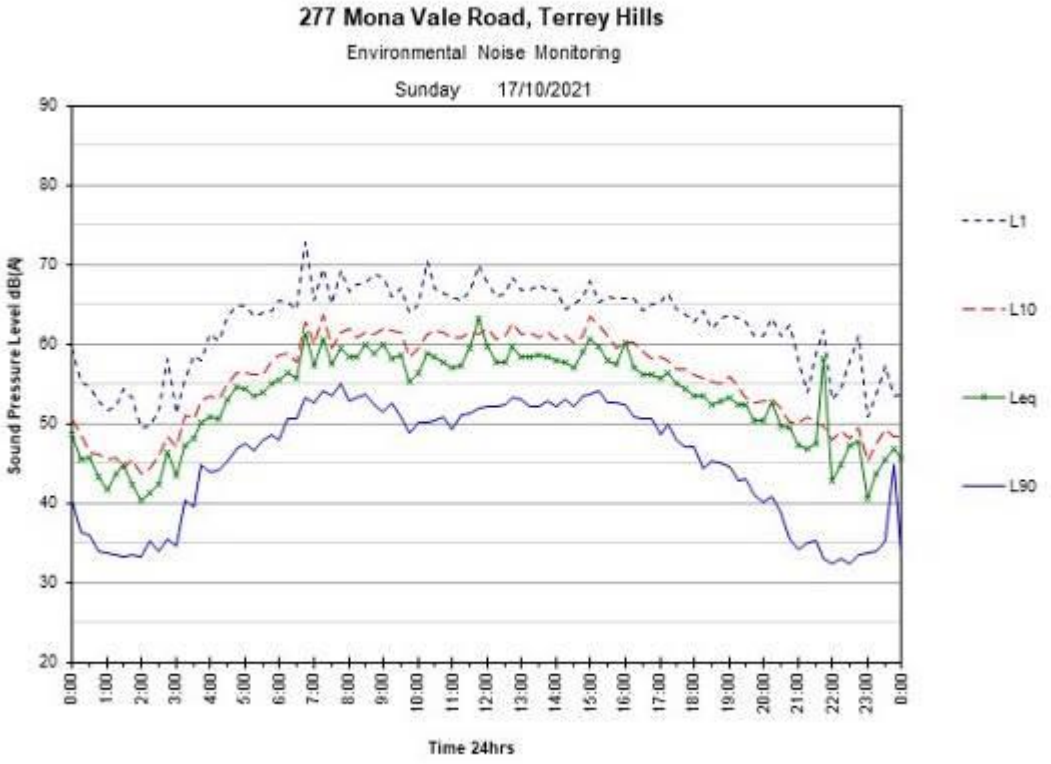
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Environmental Noise Monitoring
Sunday 17/10/2021
Sound Pressure Level dB(A)
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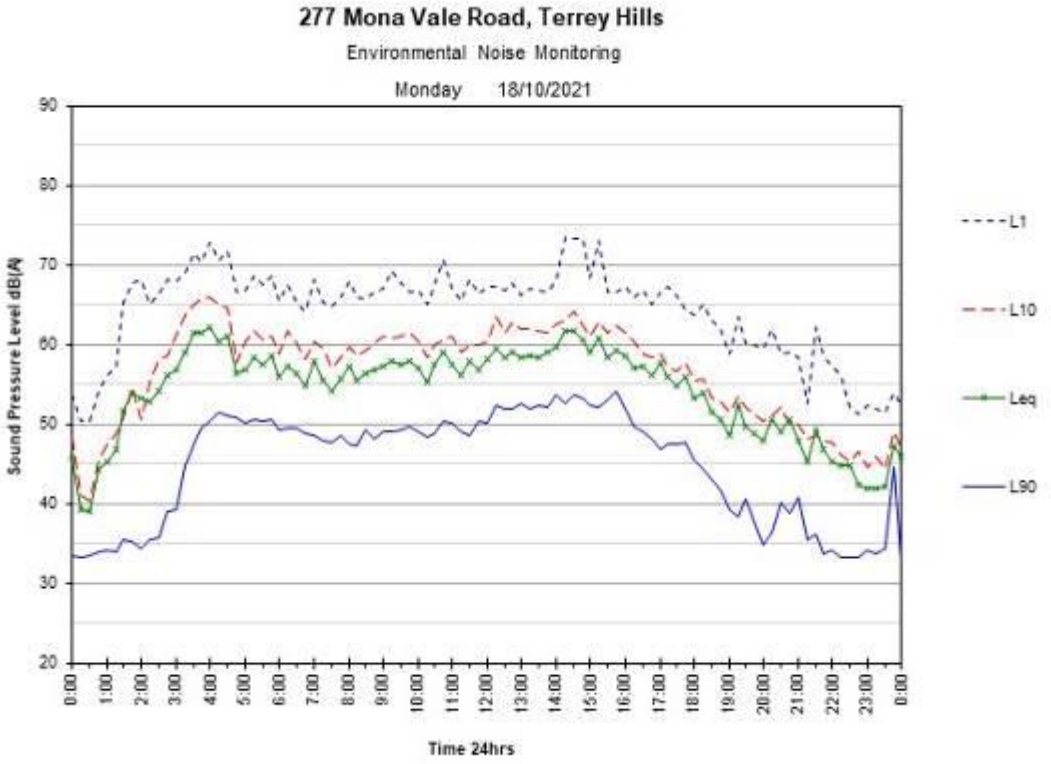
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
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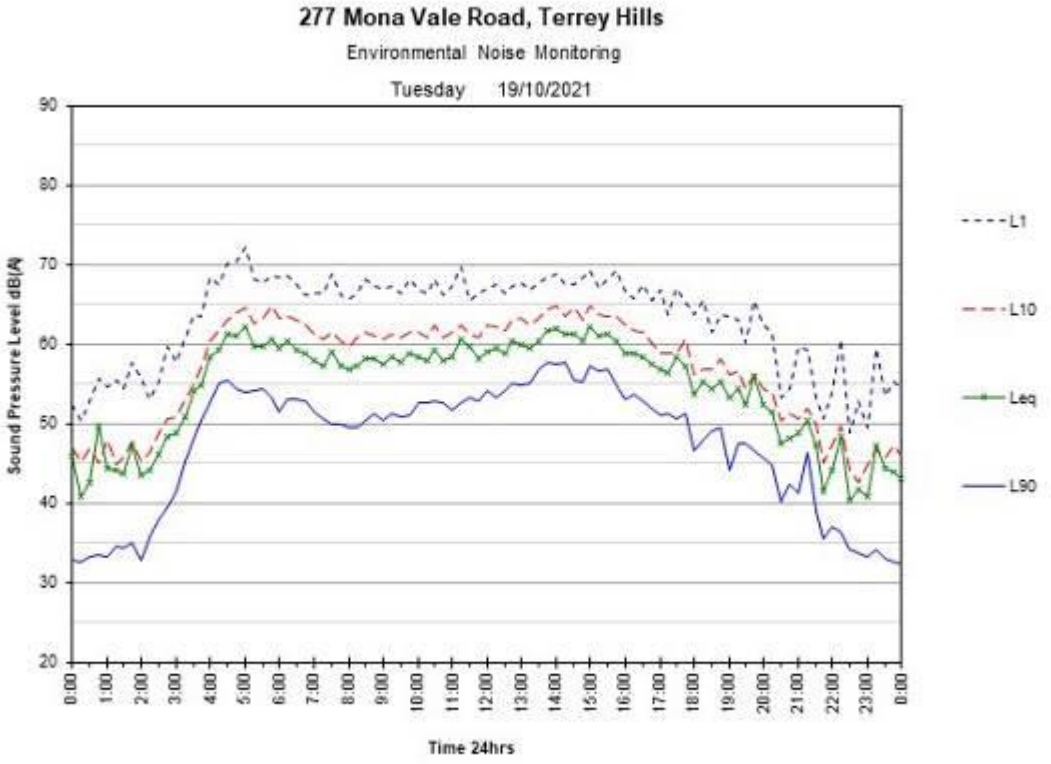
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Tuesday 19/10/2021
Sound Pressure Level dB(A)
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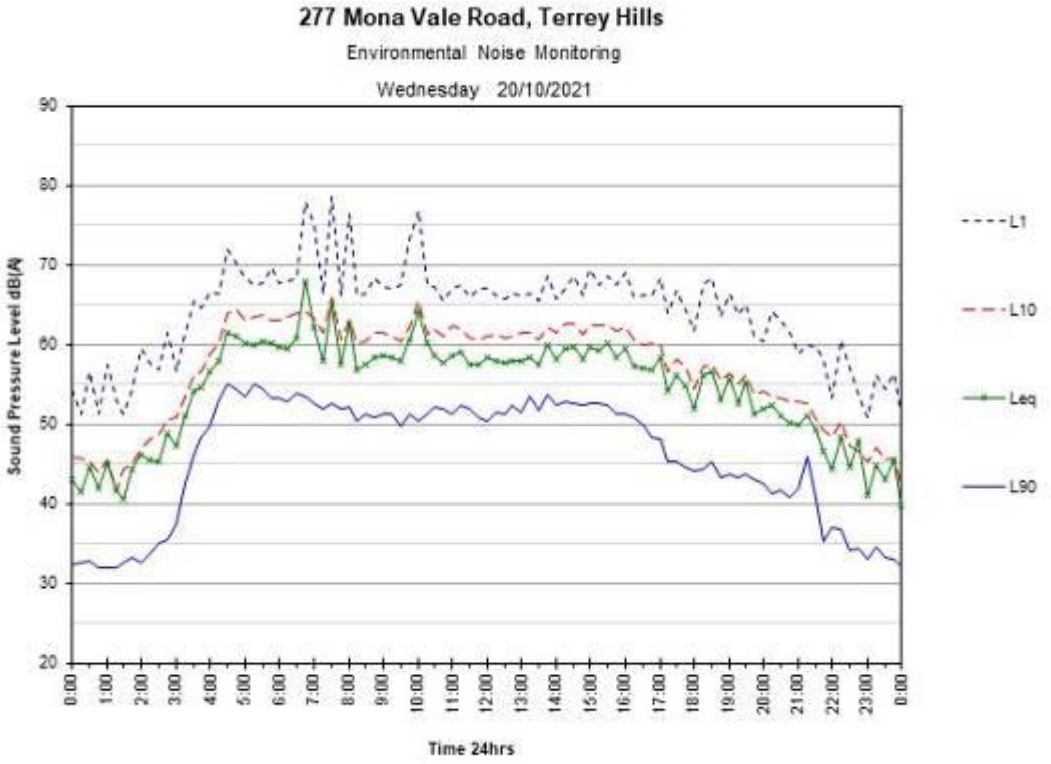
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Environmental Noise Monitoring
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Sound Pressure Level dB(A)
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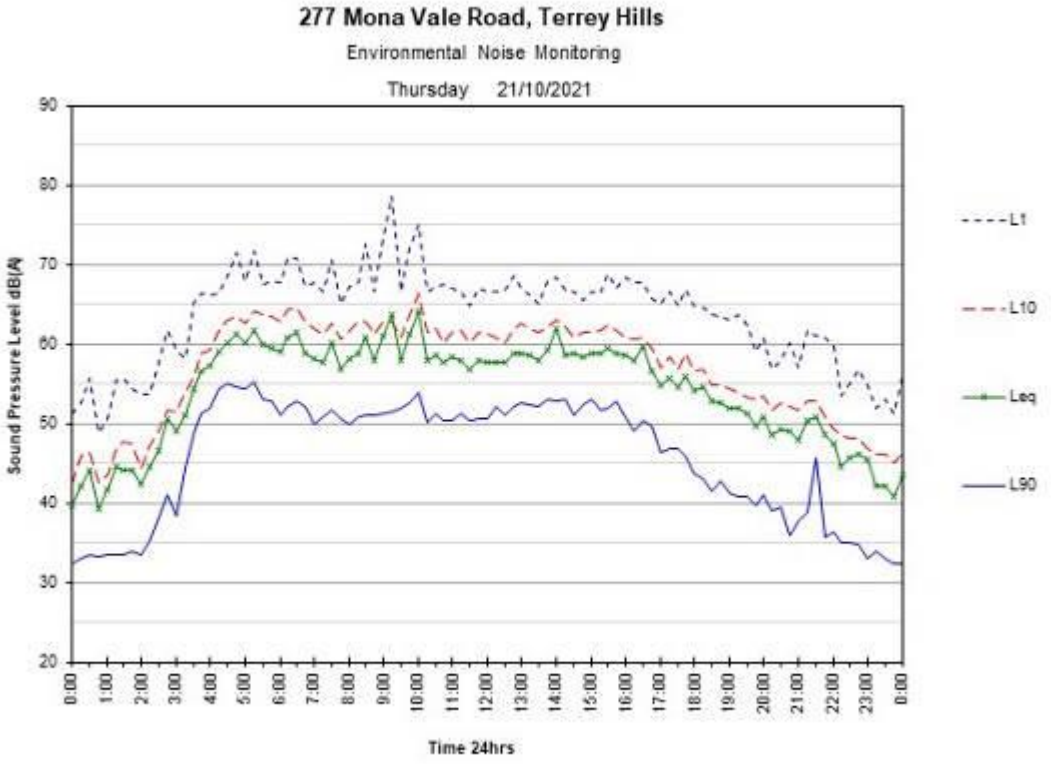
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
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Sound Pressure Level dB(A)
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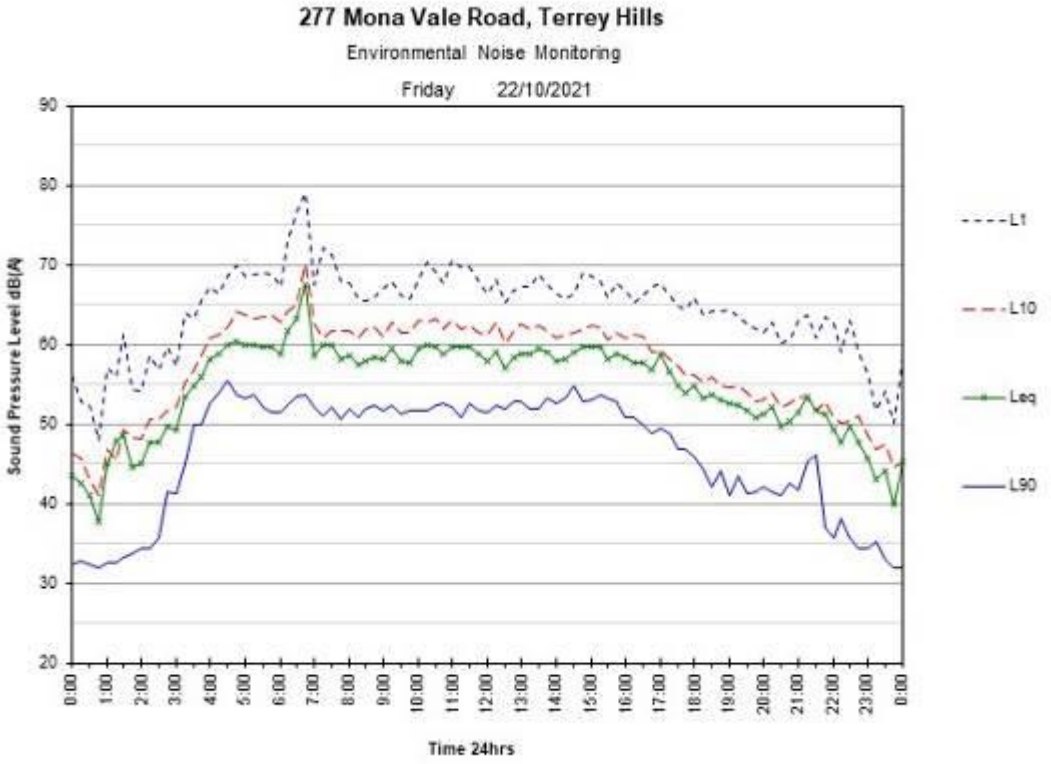
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Friday 22/10/2021
Sound Pressure Level dB(A)
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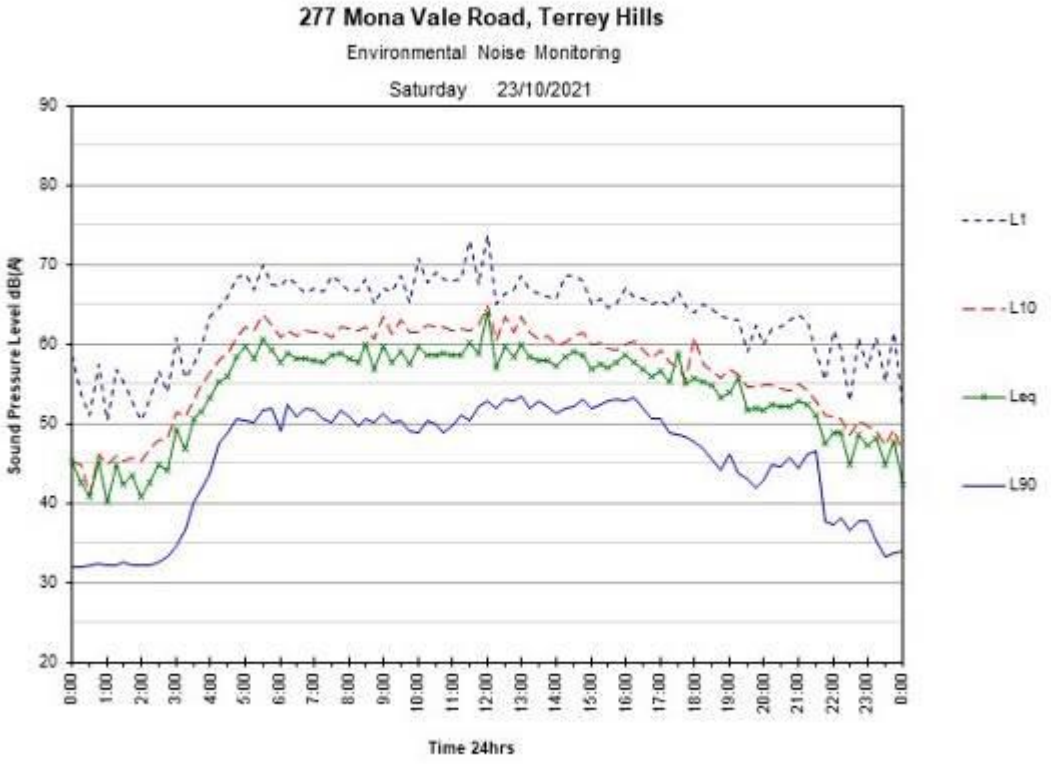
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Environmental Noise Monitoring
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Sound Pressure Level dB(A)
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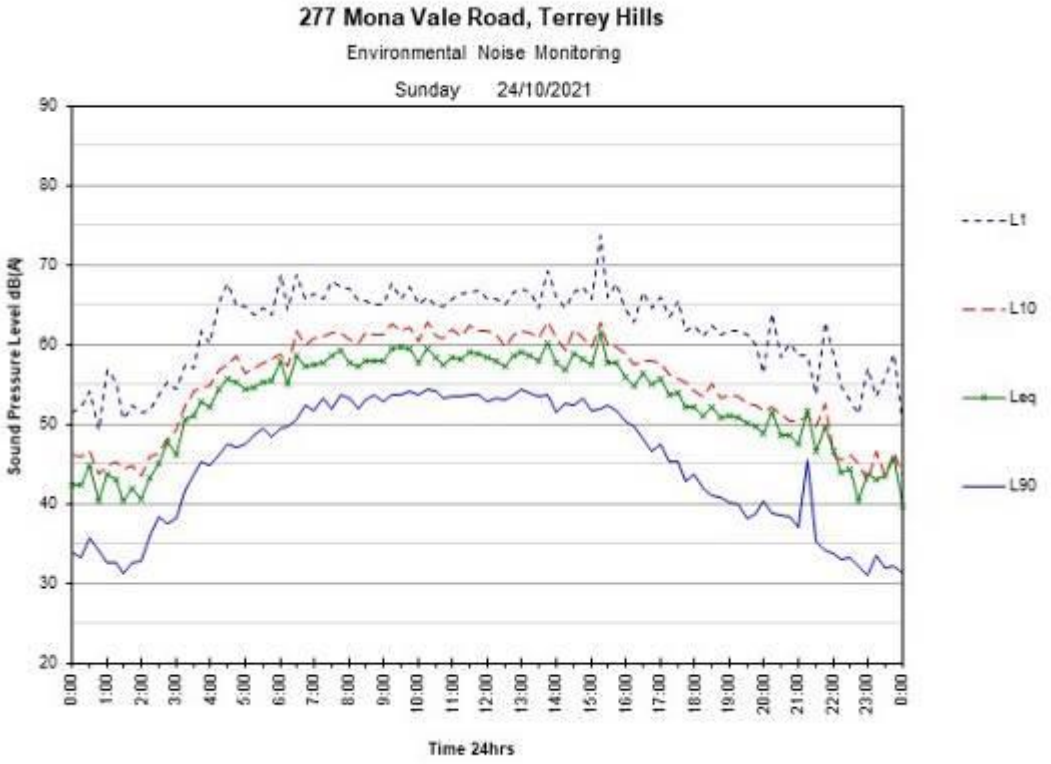
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Environmental Noise Monitoring
Sunday 24/10/2021
Sound Pressure Level dB(A)
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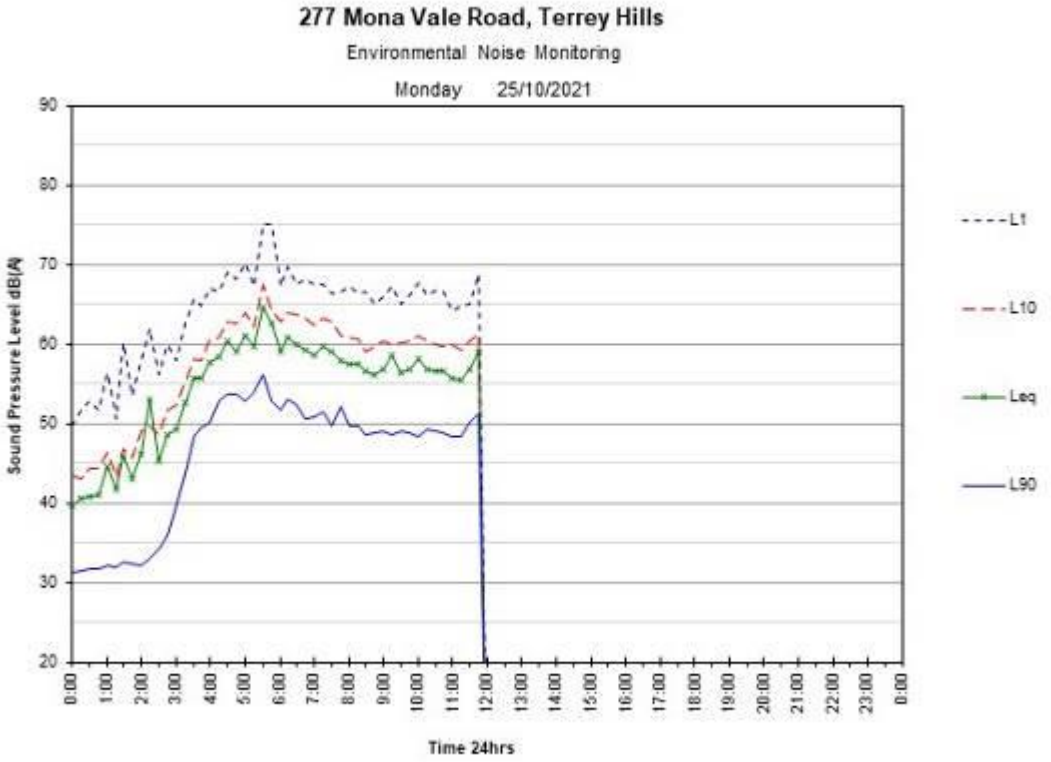
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Environmental Noise Monitoring
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Sound Pressure Level dB(A)
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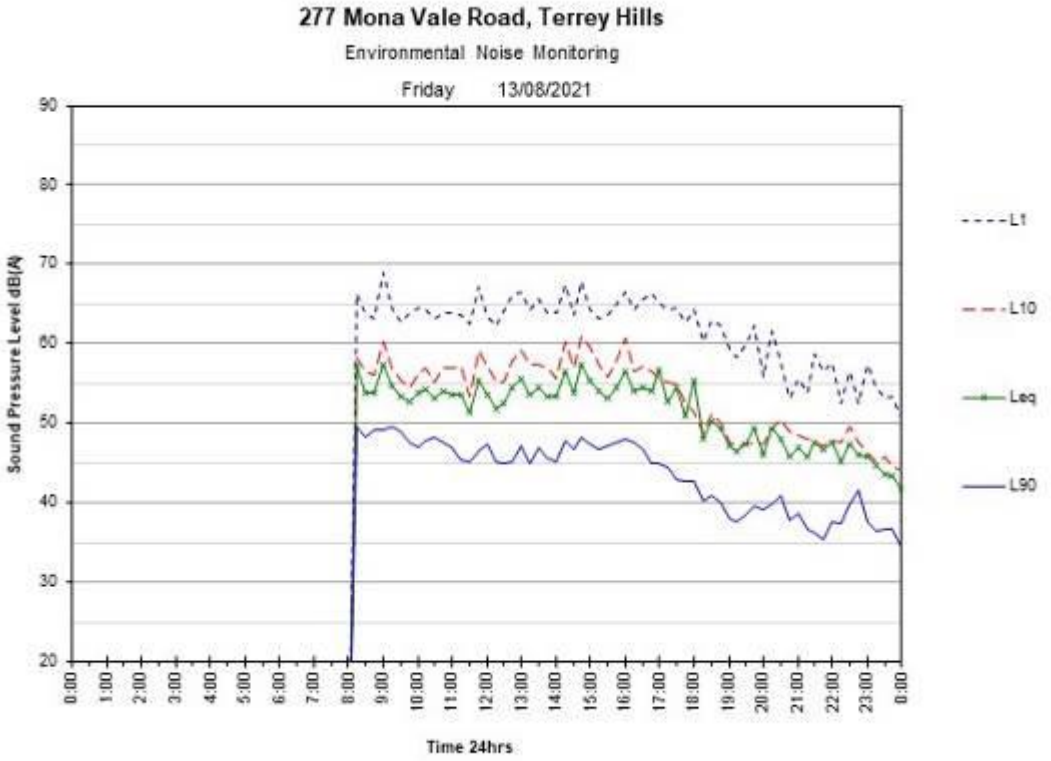
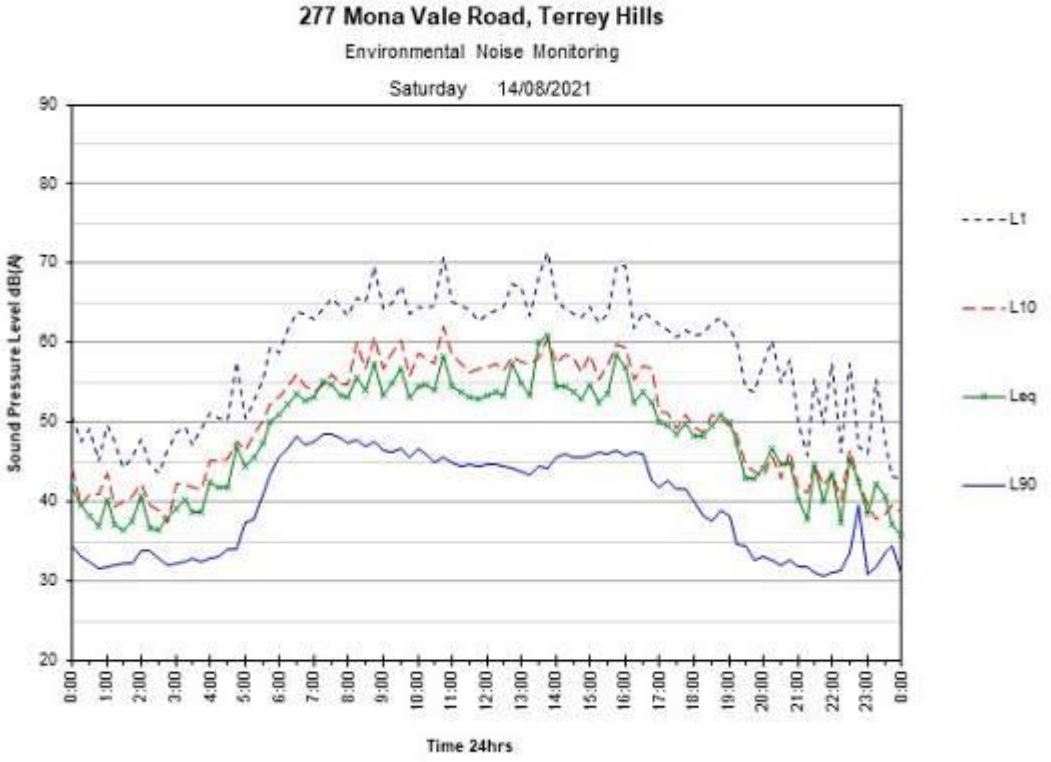
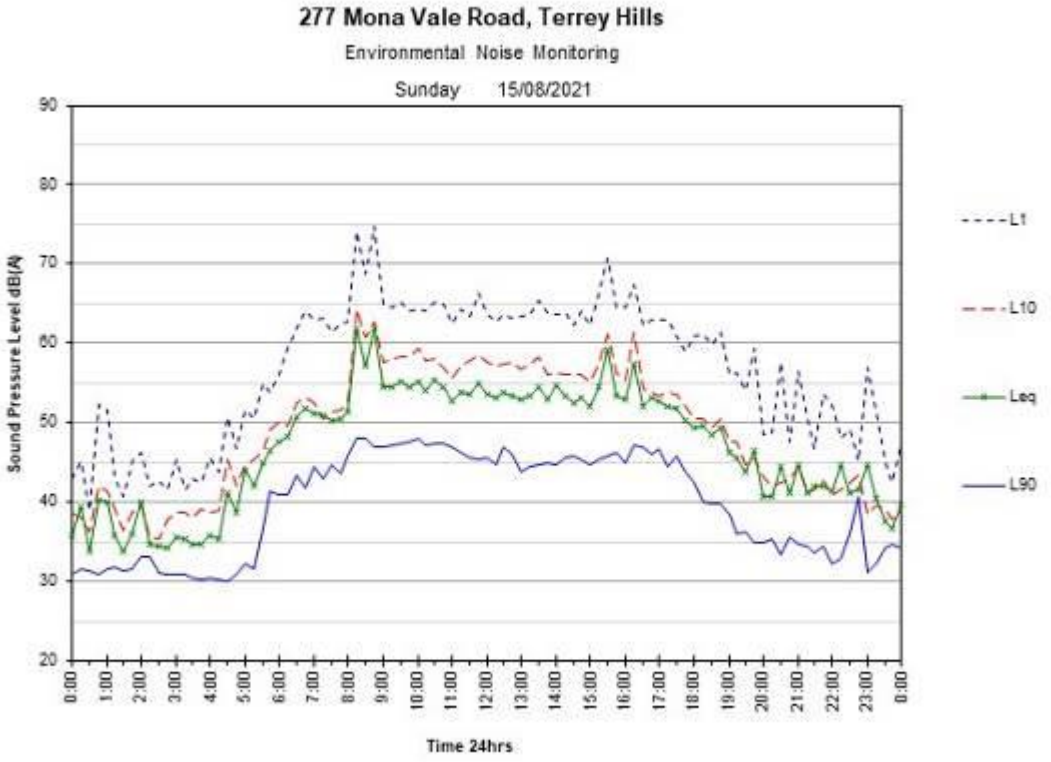
10.1.2 Monitor B



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Environmental Noise Monitoring
Sunday 15/08/2021
Sound Pressure Level dB(A)
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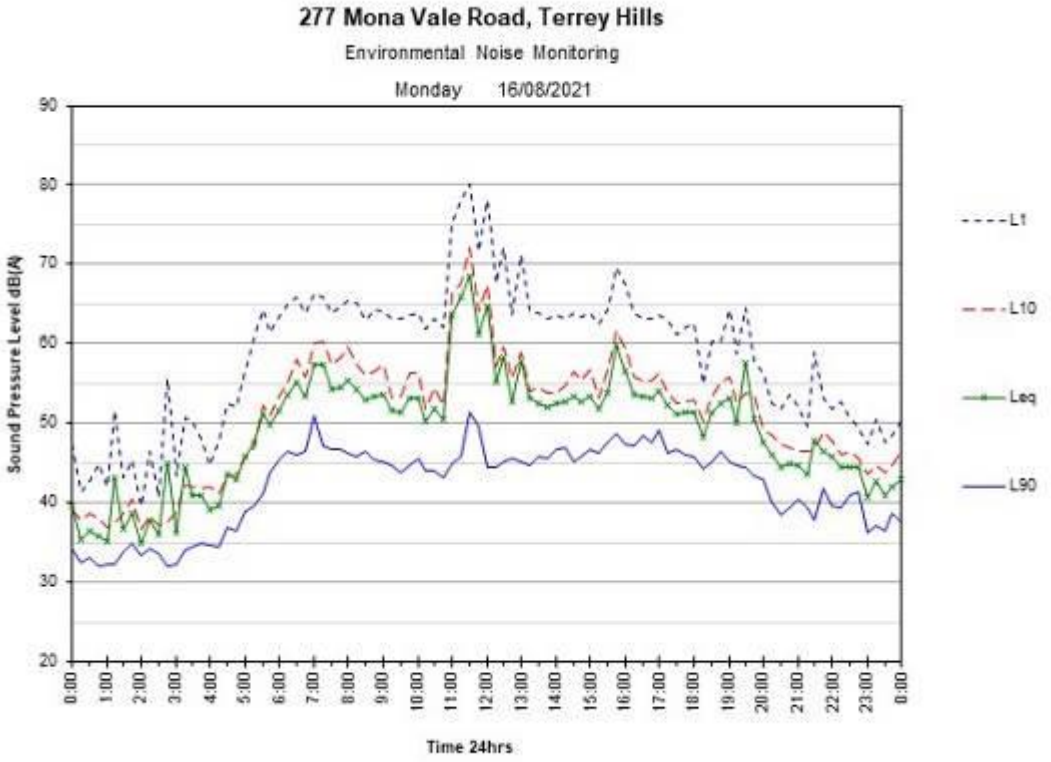
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Environmental Noise Monitoring
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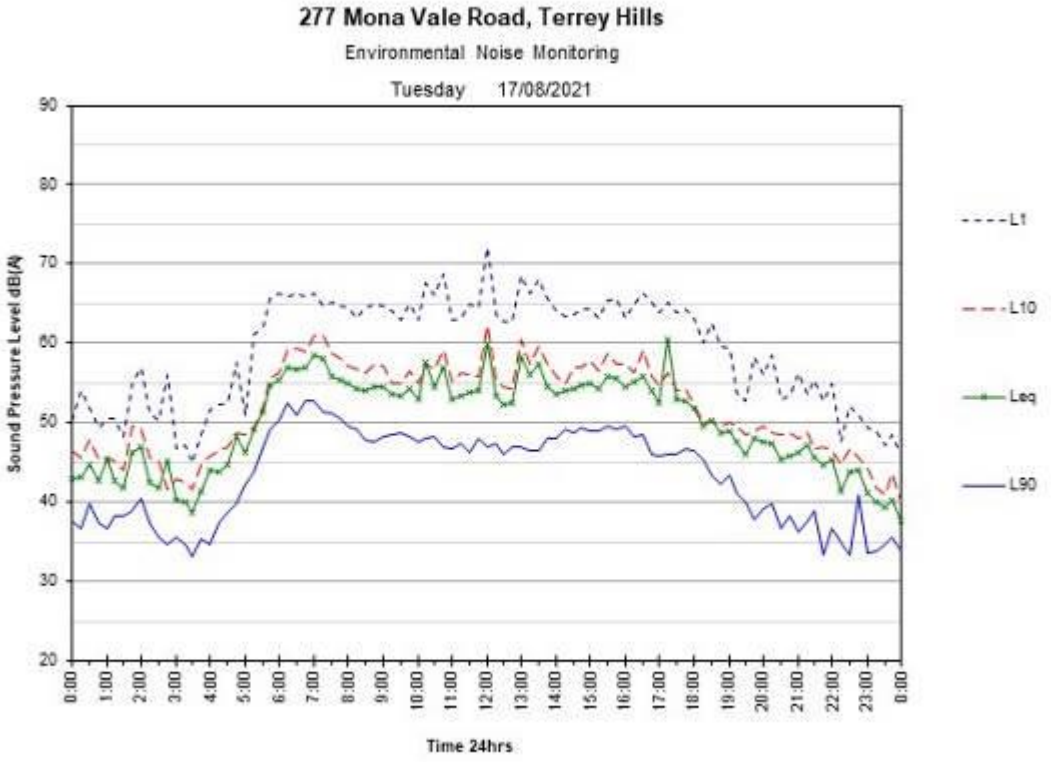
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Environmental Noise Monitoring
Tuesday 17/08/2021
Sound Pressure Level dB(A)
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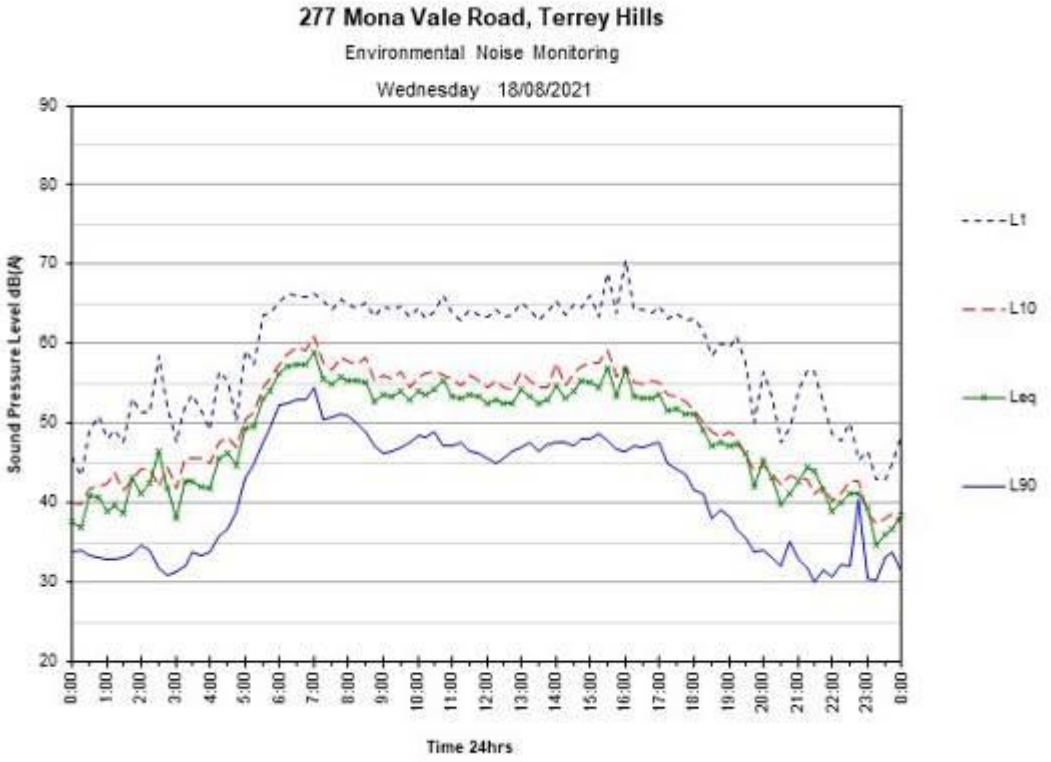
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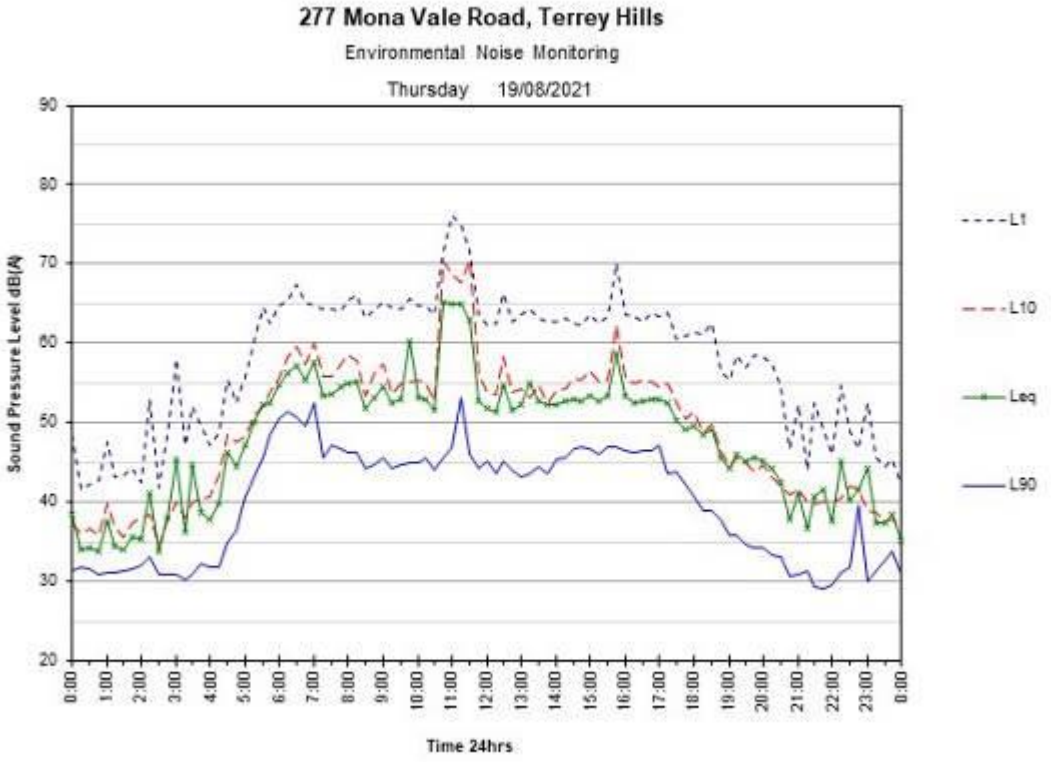
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Environmental Noise Monitoring
Thursday 19/08/2021
Sound Pressure Level dB(A)
Time 24hrs
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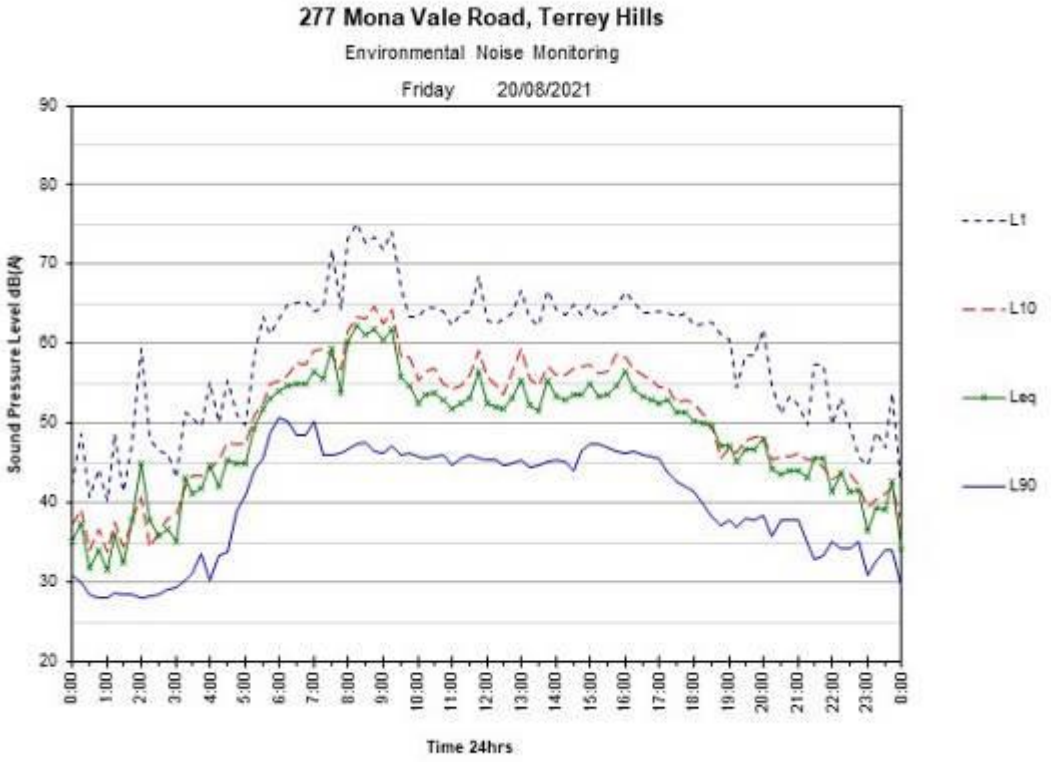
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Environmental Noise Monitoring
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Time 24hrs
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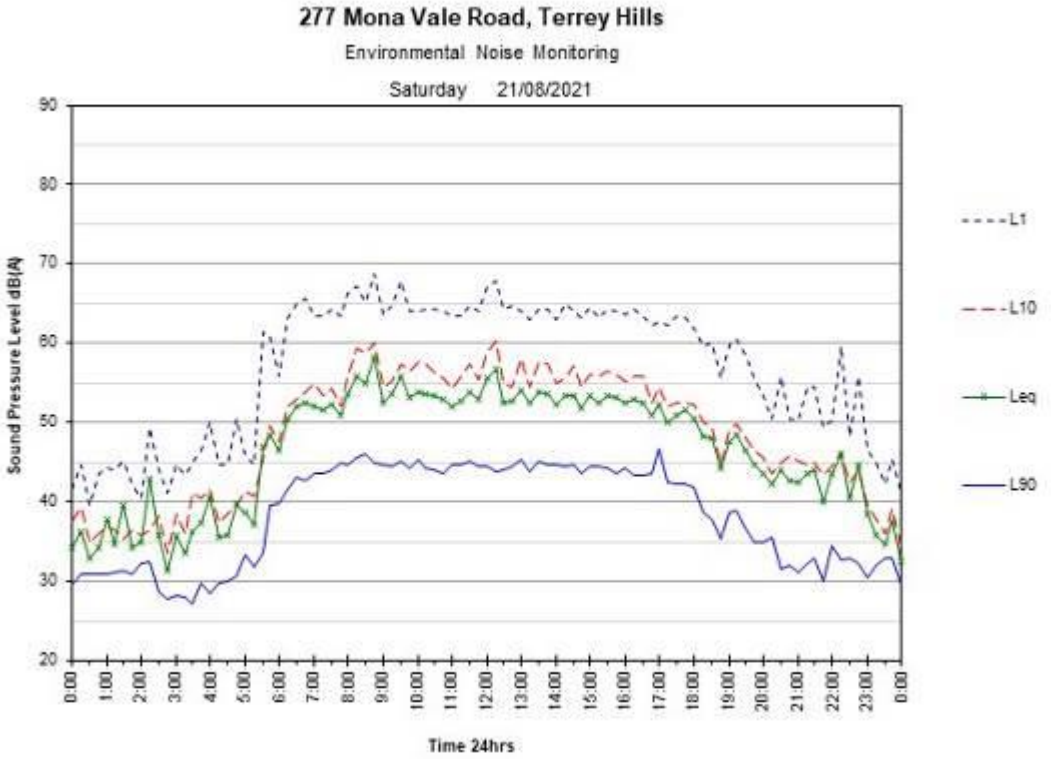
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Environmental Noise Monitoring
Saturday 21/08/2021
Sound Pressure Level dB(A)
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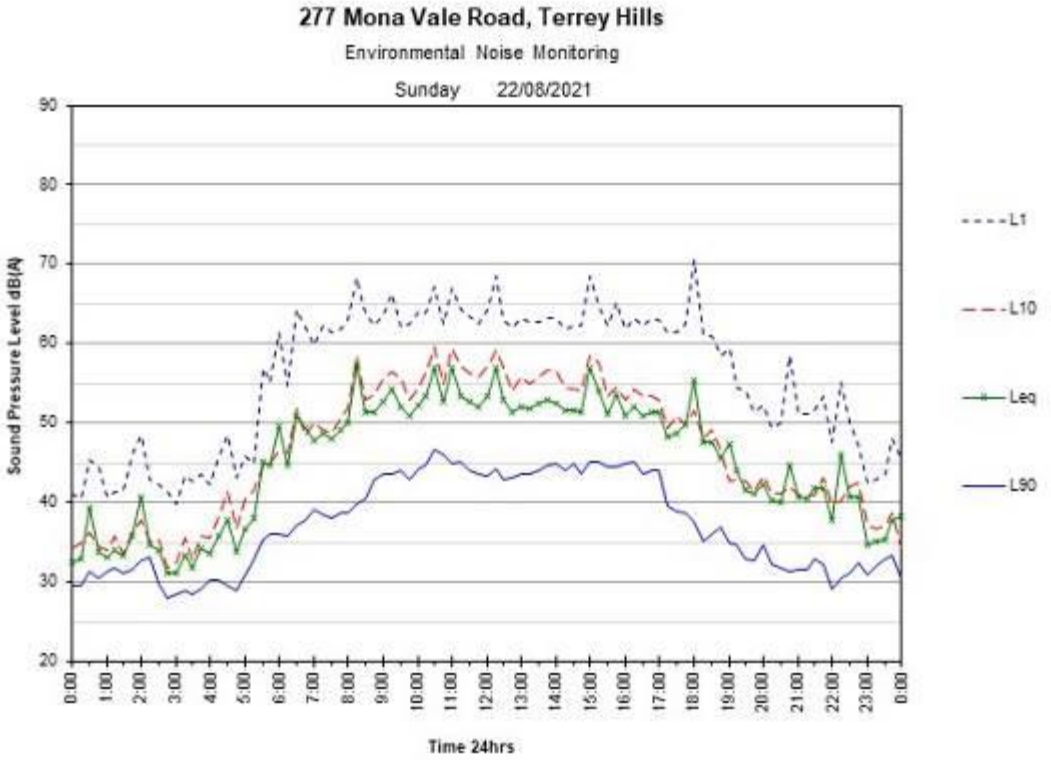
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Environmental Noise Monitoring
Sunday 22/08/2021
Sound Pressure Level dB(A)
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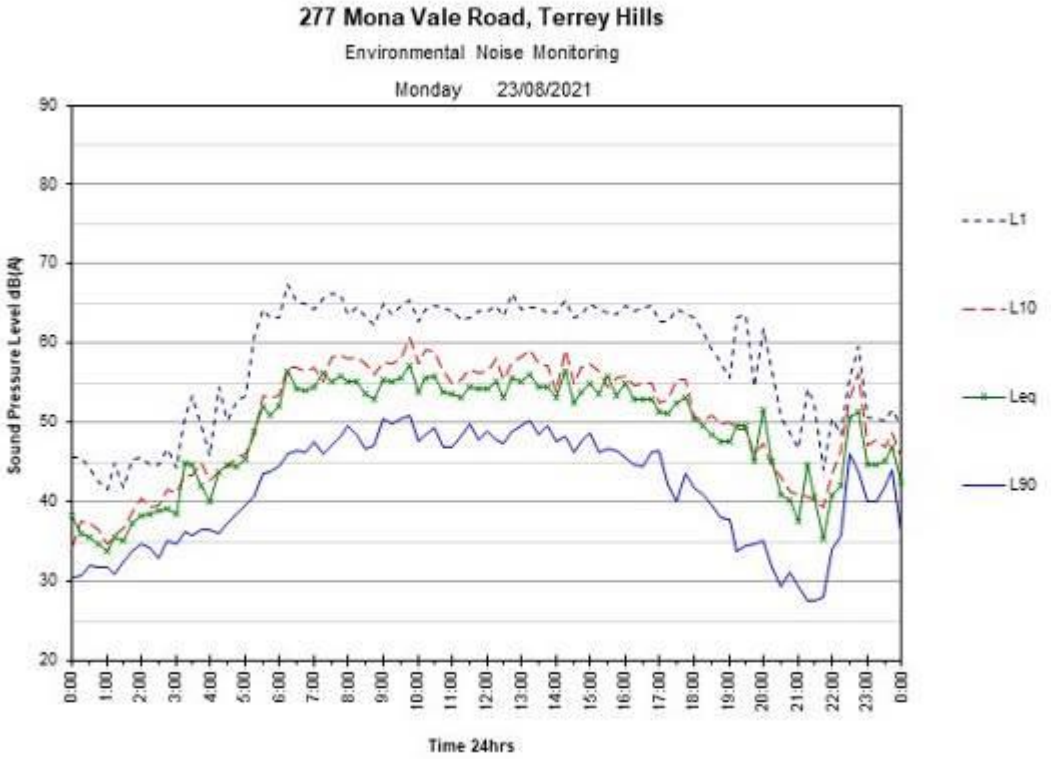
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Monday 23/08/2021
Sound Pressure Level dB(A)
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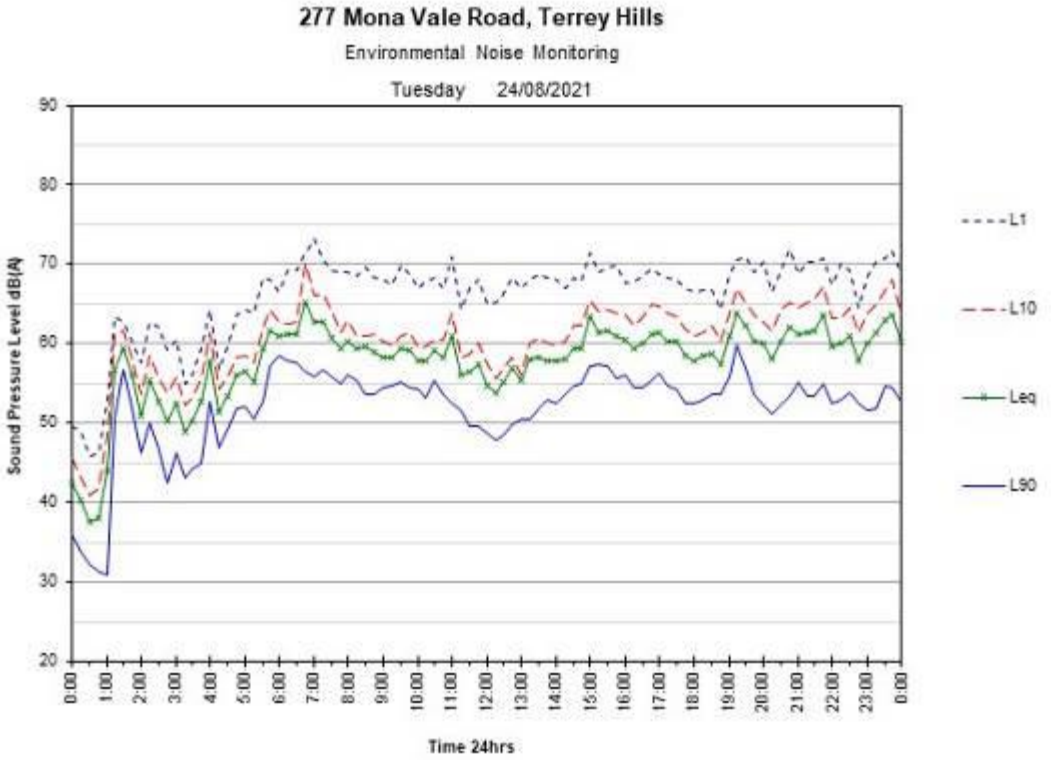
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Tuesday 24/08/2021
Sound Pressure Level dB(A)
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Time 24hrs
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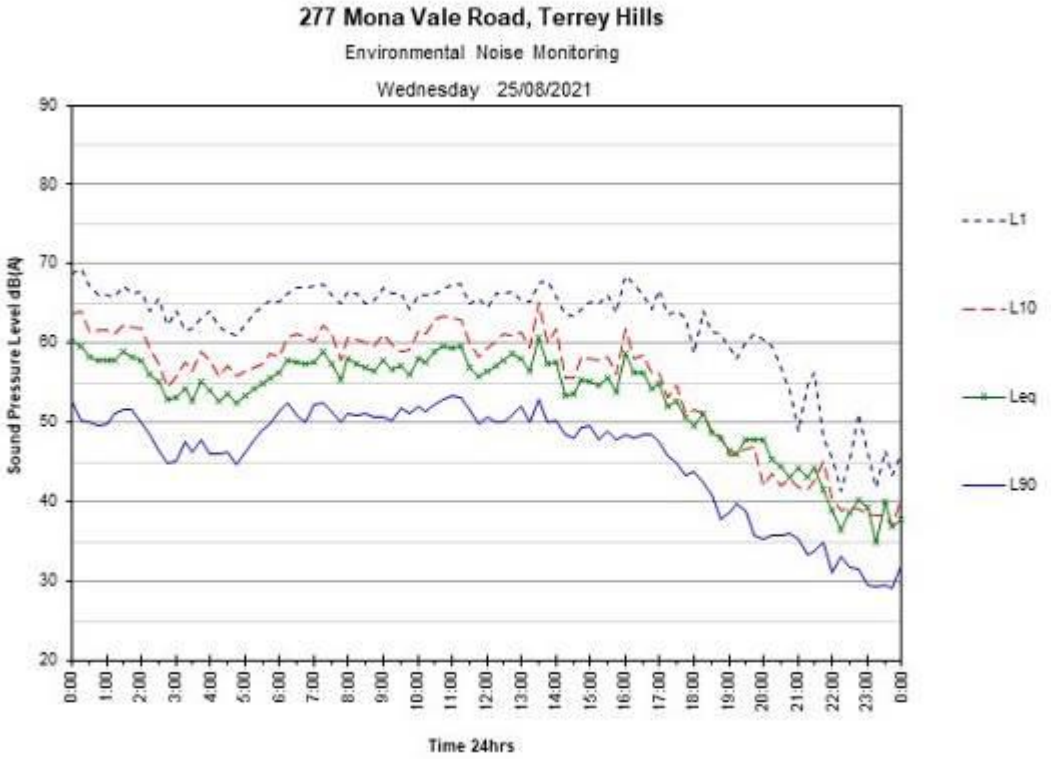
277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Wednesday 25/08/2021
Sound Pressure Level dB(A)
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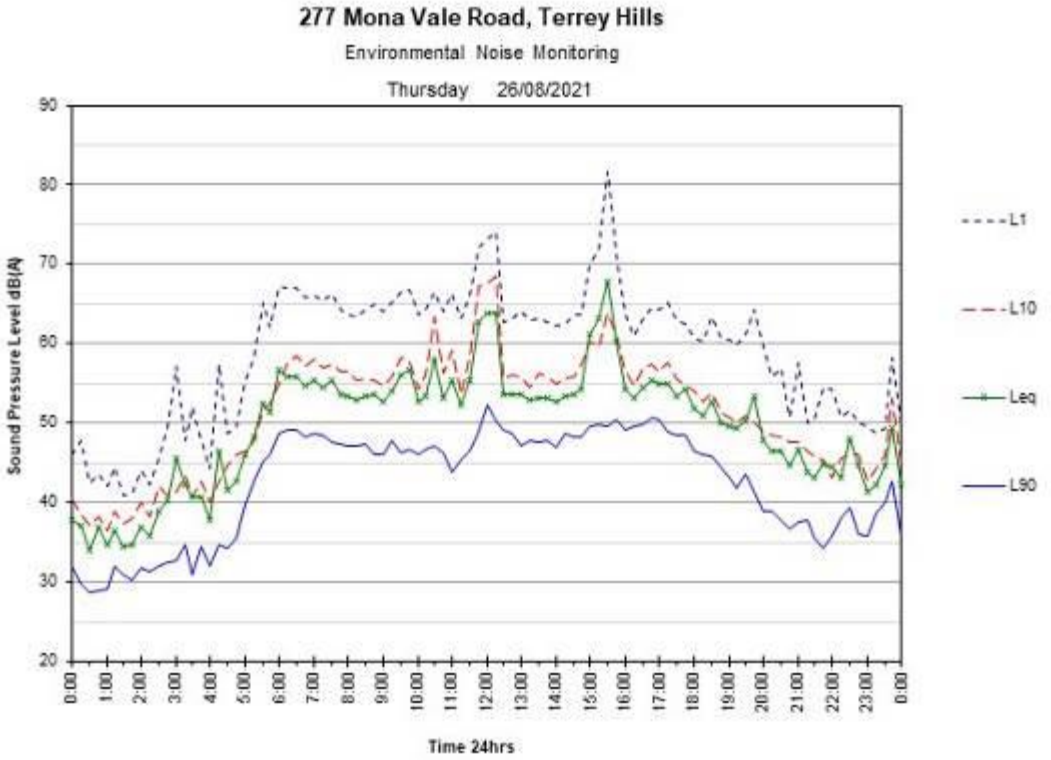
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90


277 Mona Vale Road, Terrey Hills
Environmental Noise Monitoring
Thursday 26/08/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90

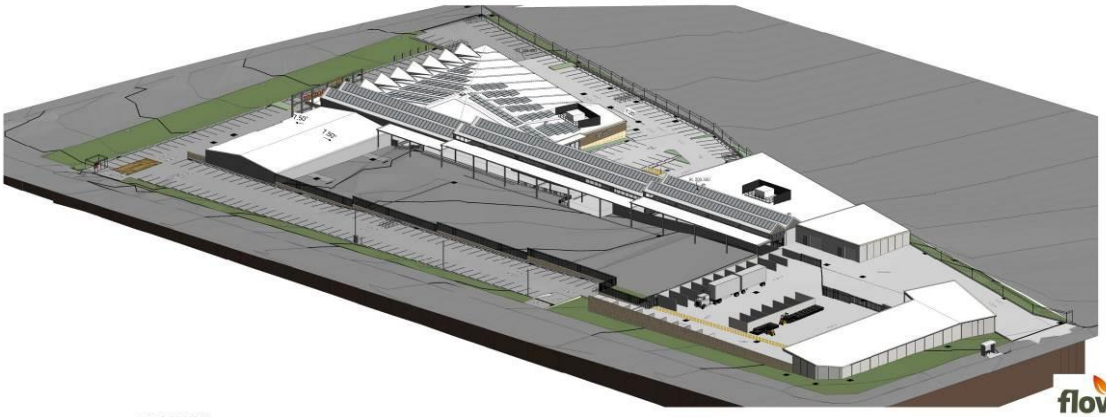
10.2 Development Plans

FLOWER POWER GARDEN
CENTRE TERREY HILLS
277 MONA VALE ROAD
TERREY HILLS NSW

DA - DRAWING LIST		
Sheet Number	Current Revision	Sheet Name
DA000	E	COVER SHEET
DA01	E	RENDERED VIEWS
DA10	E	EXISTING CONDITIONS PLAN
DA11	E	DEMOLITION PLAN
DA12	D	SITE ANALYSIS PLAN
DA14	D	SITE COVERAGE AREA PLAN
DA15	E	PROPOSED SITE PLAN
DA17	E	SHADOW DIAGRAMS
DA19	E	HEIGHT NON-COMPLIANCE
DA100	E	OVERALL FLOOR PLAN
DA111	E	FLOOR PLAN - 1 OF 3
DA112	E	FLOOR PLAN - 2 OF 3
DA113	E	FLOOR PLAN - 3 OF 3
DA120	E	OVERALL ROOF PLAN
DA150	E	ELEVATION - SHEET 1
DA151	E	ELEVATION - SHEET 2
DA152	E	ELEVATION - SHEET 3
DA160	E	SECTIONS - SHEET 1
DA161	E	SECTIONS - SHEET 2
DA162	E	SECTIONS - SHEET 3
DA163	E	SECTIONS - SHEET 4
Total: 21		

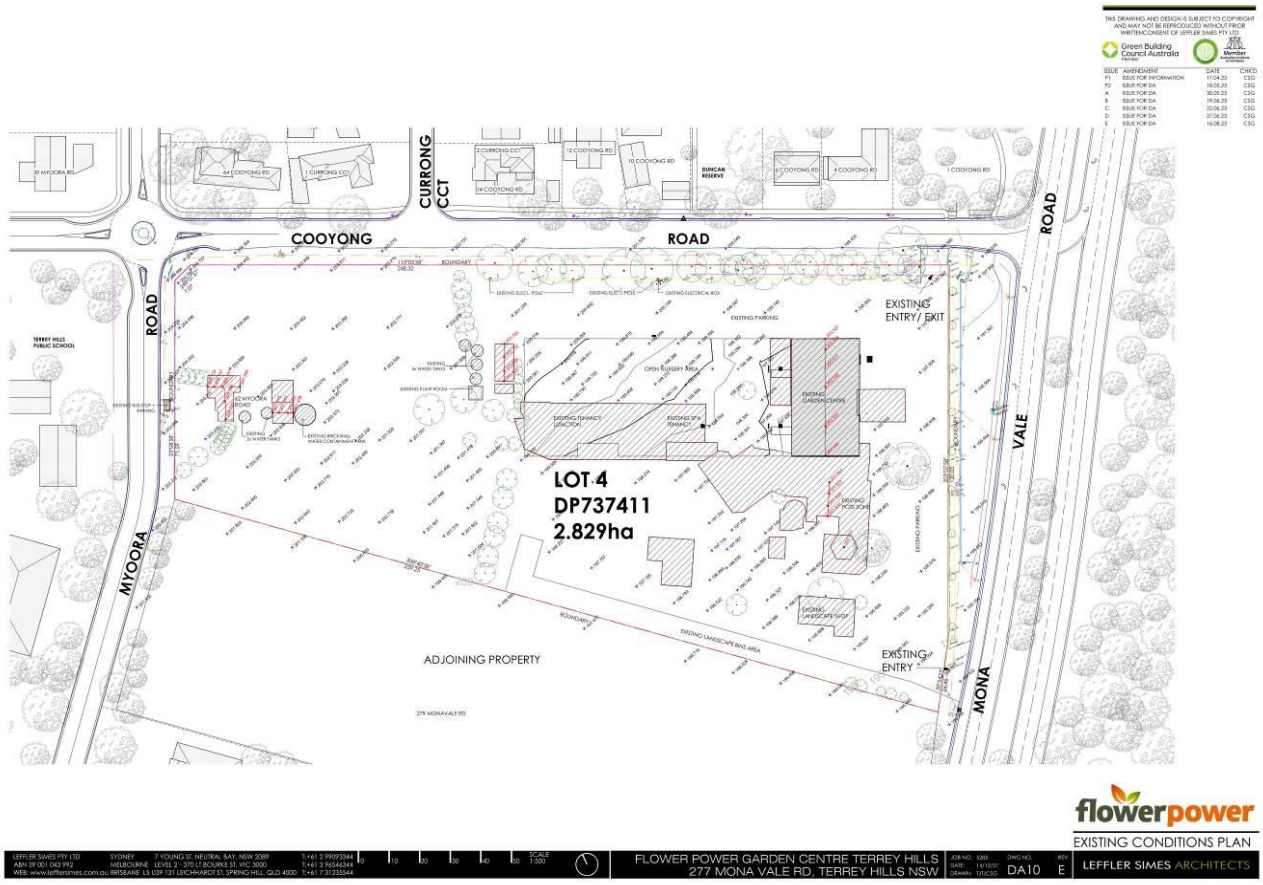
flowerpower
COVER SHEET
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA000 E
LEFFLER SIMES ARCHITECTS

3D VIEW 1

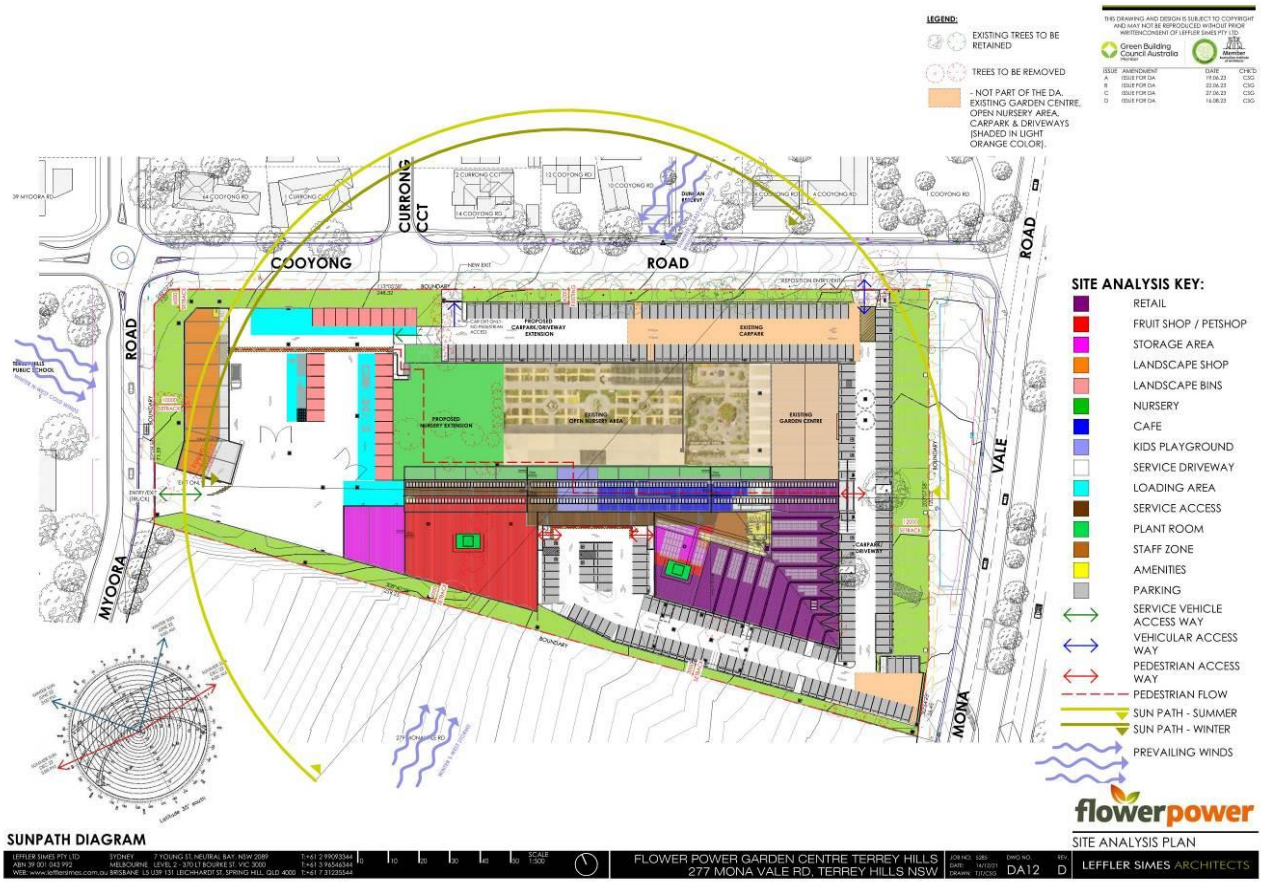


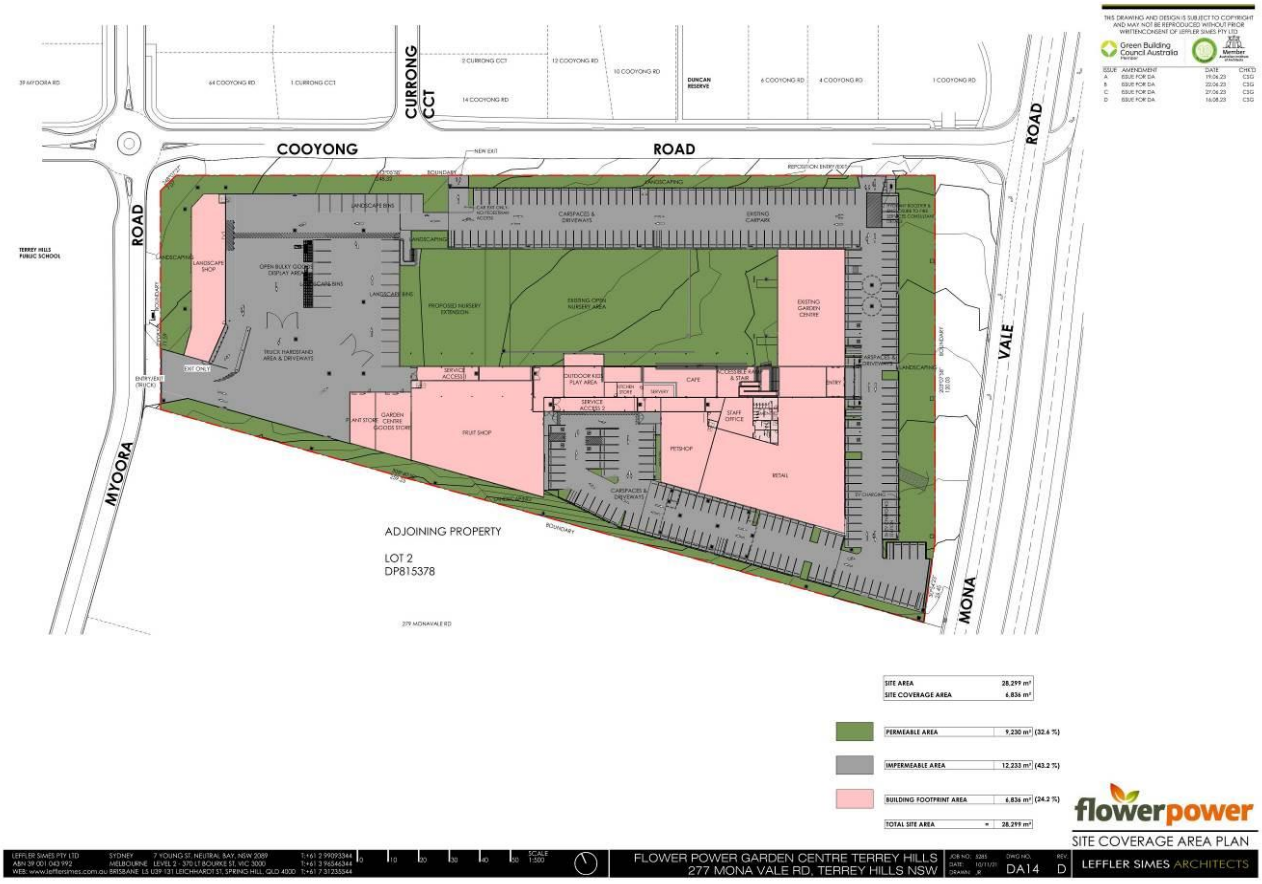
3D VIEW 2

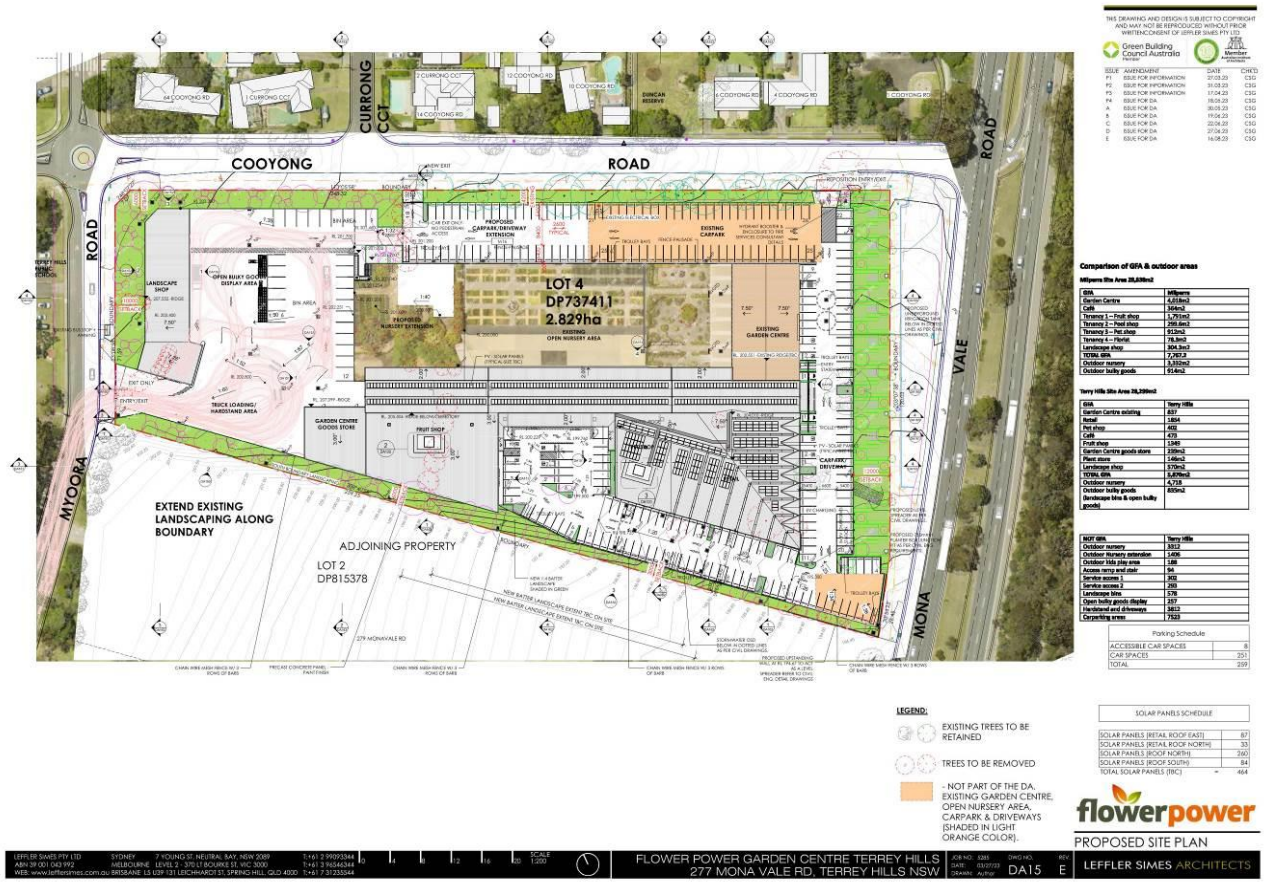
flowerpower
RENDERED VIEWS
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA01 E
LEFFLER SIMES ARCHITECTS

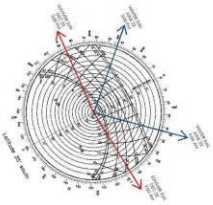

CURRONG CCT
COOYONG ROAD
MYOORA ROAD
VALE ROAD
MONA
DUNCAN RESERVE
TERREY HILLS PUBLIC SCHOOL
EXISTING ENTRY/ EXIT
LOT 4
DP737411
2.829ha
ADJOINING PROPERTY
EXISTING ENTRY
flowerpower
EXISTING CONDITIONS PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA10
E
LEFFLER SIMES ARCHITECTS


DEMOLITION KEY:
TO BE DEMOLISHED
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
CURRONG CCT
COOYONG ROAD
MYOORA ROAD
VALE ROAD
MONA
DUNCAN RESERVE
TERREY HILLS PUBLIC SCHOOL
ADJOINING PROPERTY
flowerpower
DEMOLITION PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA11
E
LEFFLER SIMES ARCHITECTS

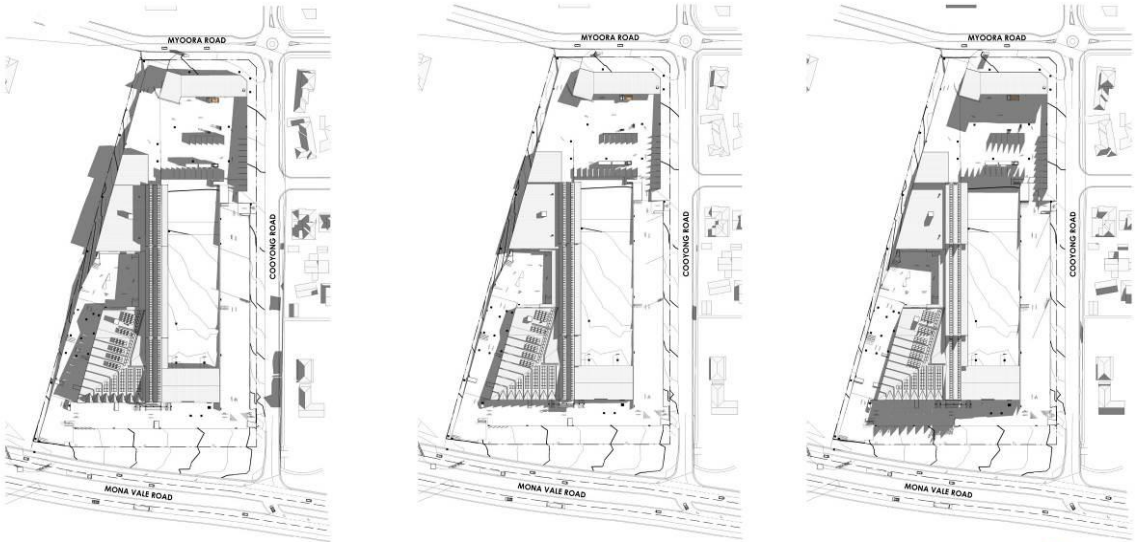

LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
SITE ANALYSIS KEY:
RETAIL
FRUIT SHOP / PETSHOP
STORAGE AREA
LANDSCAPE SHOP
LANDSCAPE BINS
NURSERY
CAFE
KIDS PLAYGROUND
SERVICE DRIVEWAY
LOADING AREA
SERVICE ACCESS
PLANT ROOM
STAFF ZONE
AMENITIES
PARKING
SERVICE VEHICLE ACCESS WAY
VEHICULAR ACCESS WAY
PEDESTRIAN ACCESS WAY
PEDESTRIAN FLOW
SUN PATH - SUMMER
SUN PATH - WINTER
PREVAILING WINDS
COOYONG ROAD
CURRONG CCT
MYOORA ROAD
VALE ROAD
MONA VALE ROAD
SUNPATH DIAGRAM
flowerpower
SITE ANALYSIS PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA12
D
LEFFLER SIMES ARCHITECTS

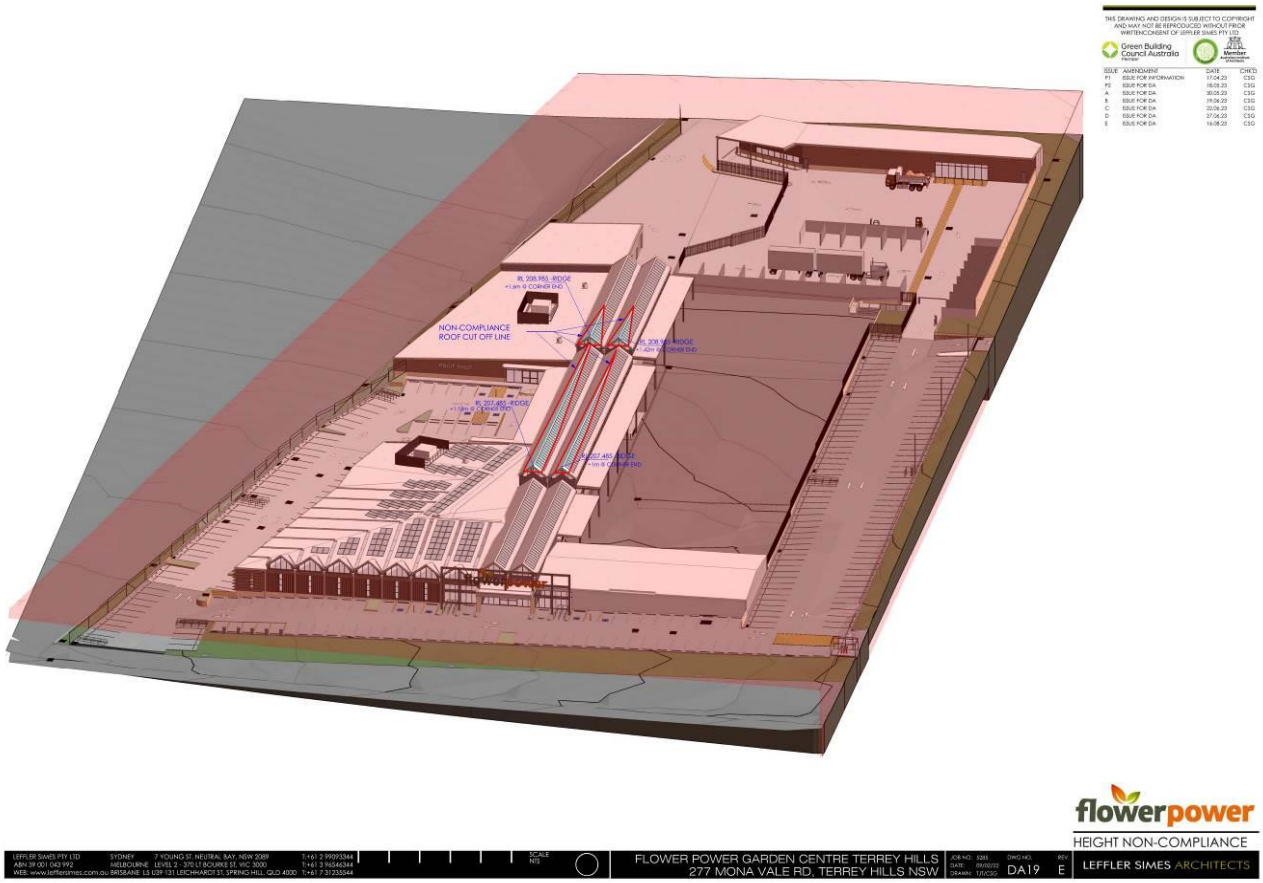

COOYONG ROAD
CURRONG CCT
MYOORA ROAD
VALE ROAD
MONA VALE ROAD
ADJOINING PROPERTY
LOT 2
DP815378
SITE AREA 28,299 m²
SITE COVERAGE AREA 6,836 m²
PERMEABLE AREA 9,230 m² (32.6 %)
IMPERMEABLE AREA 12,233 m² (43.2 %)
BUILDING FOOTPRINT AREA 6,836 m² (24.2 %)
TOTAL SITE AREA 28,299 m²
flowerpower
SITE COVERAGE AREA PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA14
D
LEFFLER SIMES ARCHITECTS

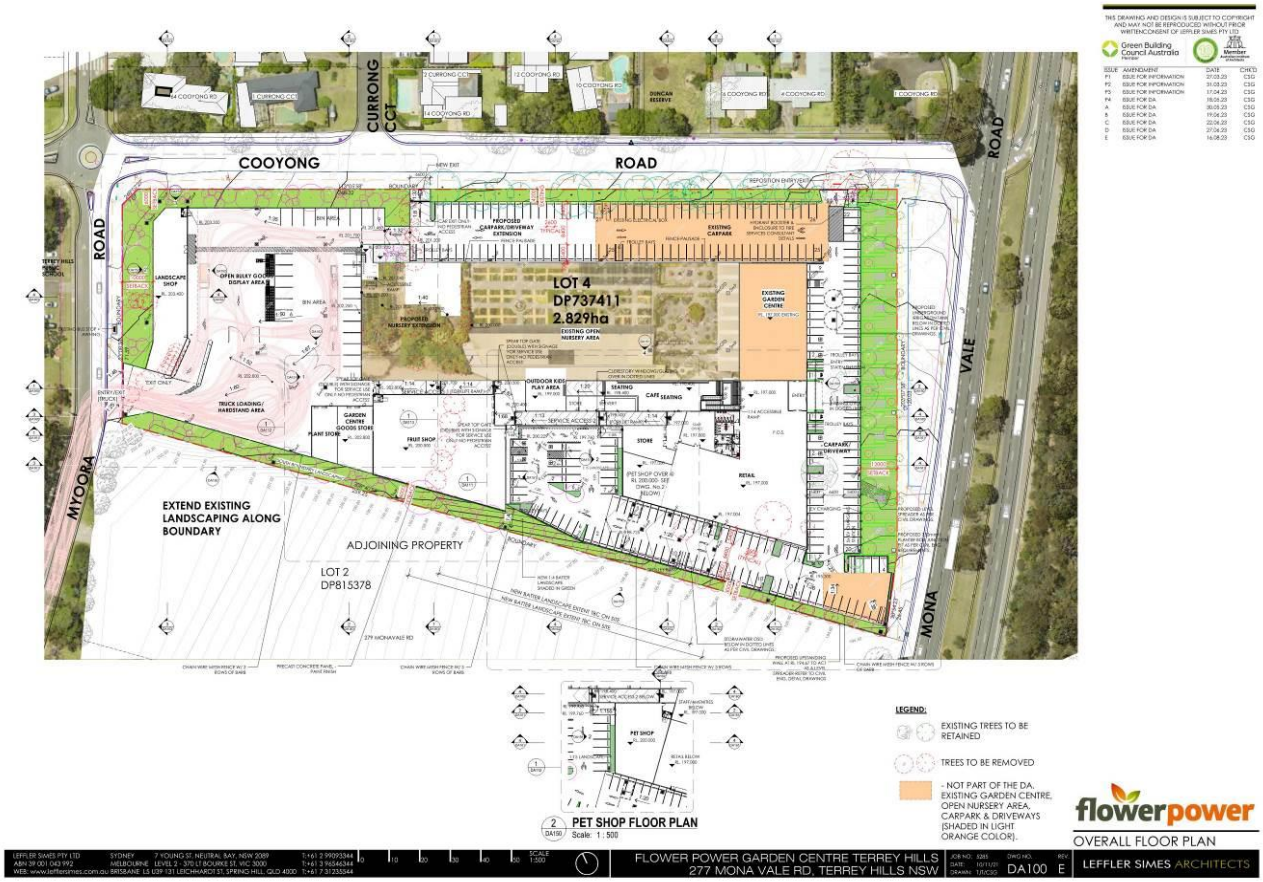




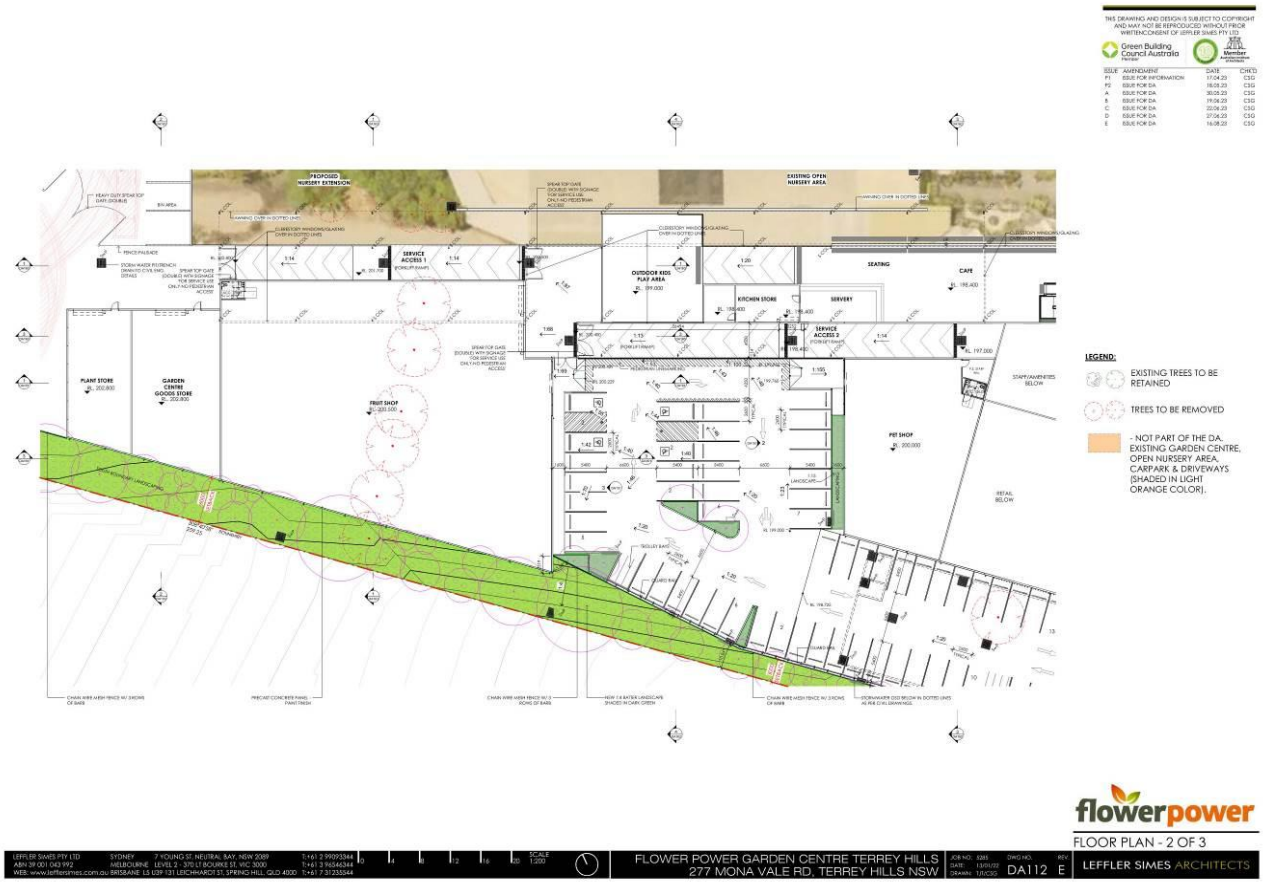
SUNPATH DIAGRAM



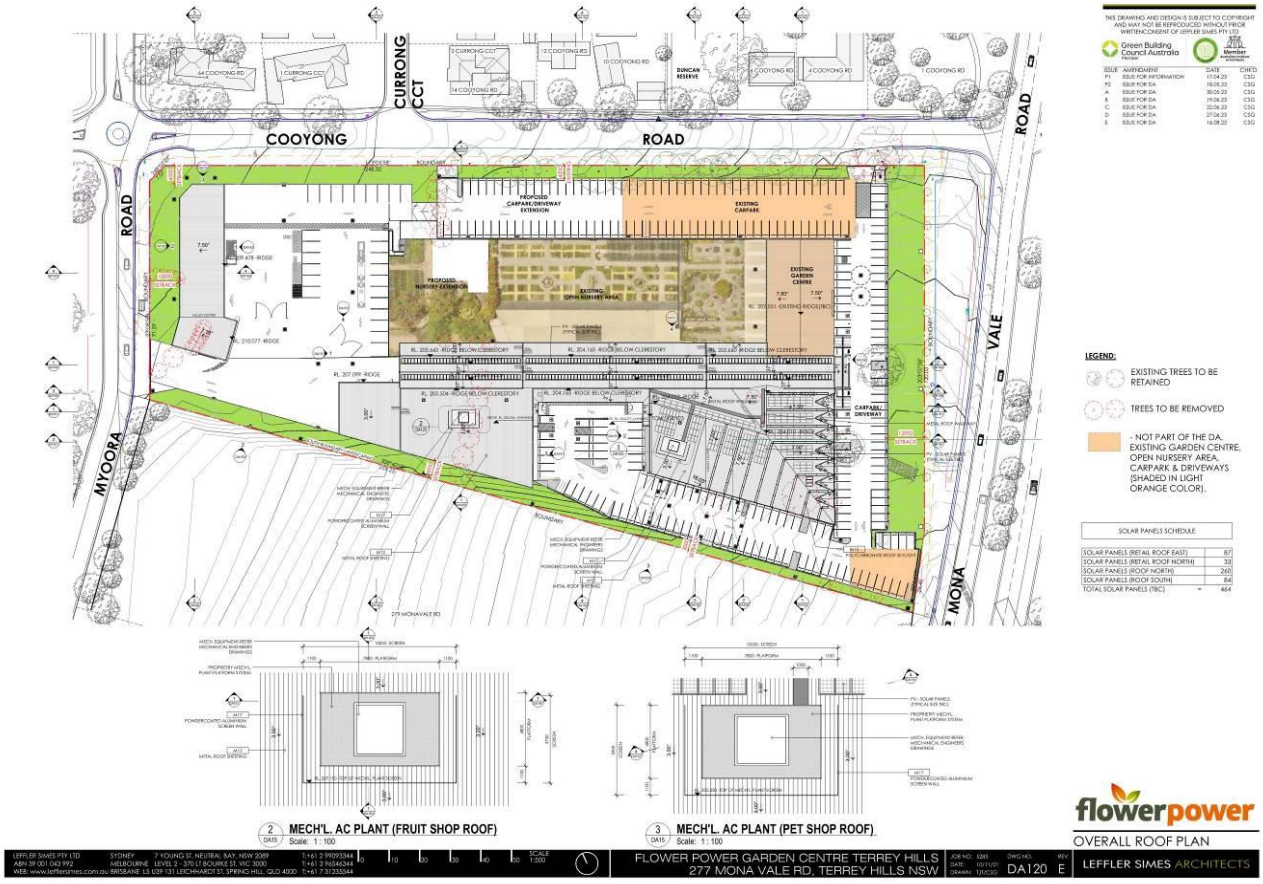

NON-COMPLIANCE
ROOF CUT OFF LINE
flowerpower
HEIGHT NON-COMPLIANCE
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA19
E
LEFFLER SIMES ARCHITECTS

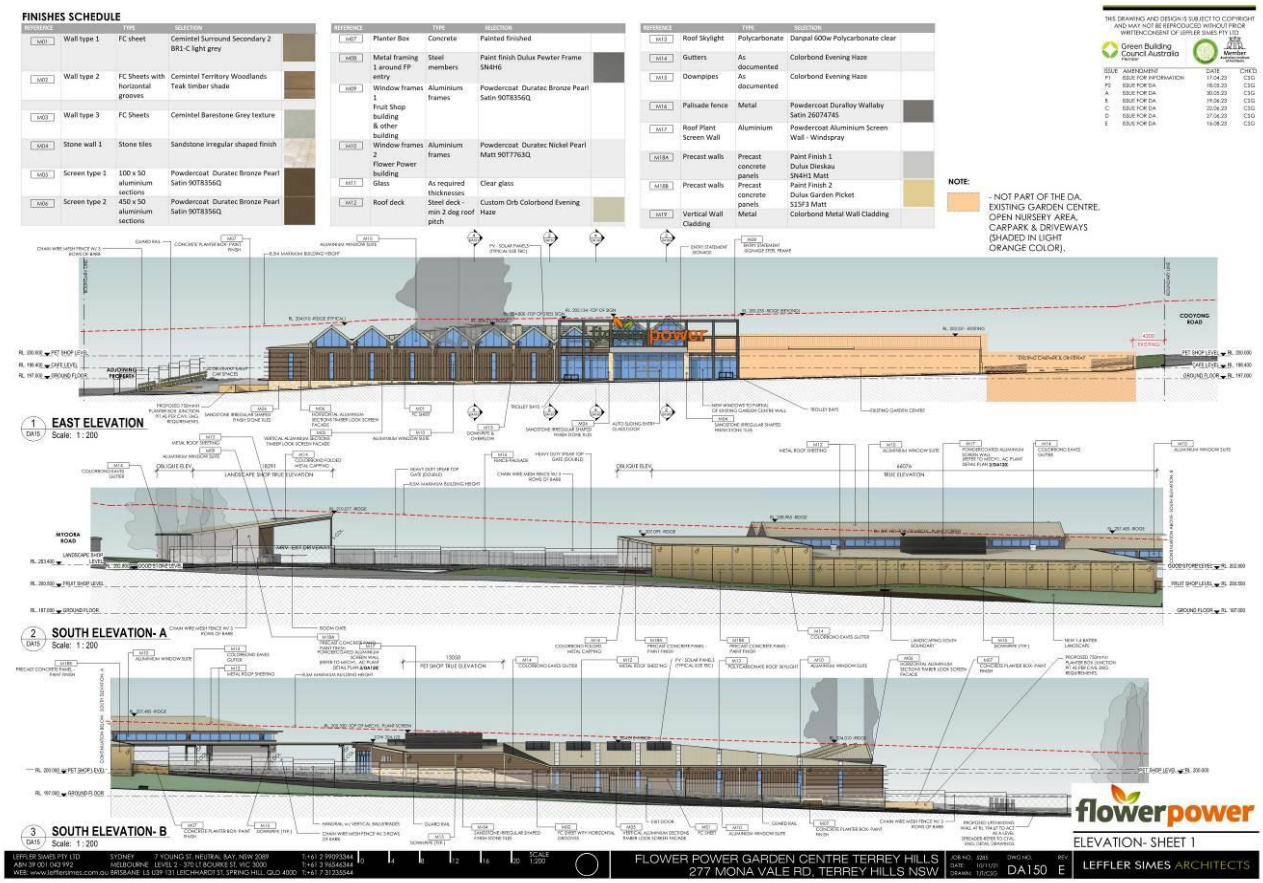

COOYONG ROAD
CURRONG CCT
MYOORA ROAD
VALE ROAD
MONA
LOT 4
DP73741
2.829ha
EXTEND EXISTING
LANDSCAPING ALONG
BOUNDARY
ADJOINING PROPERTY
LOT 2
DP815378
279 MONAVALE RD
PET SHOP FLOOR PLAN
Scale: 1 : 500
LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
OVERALL FLOOR PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA100
E
LEFFLER SIMES ARCHITECTS

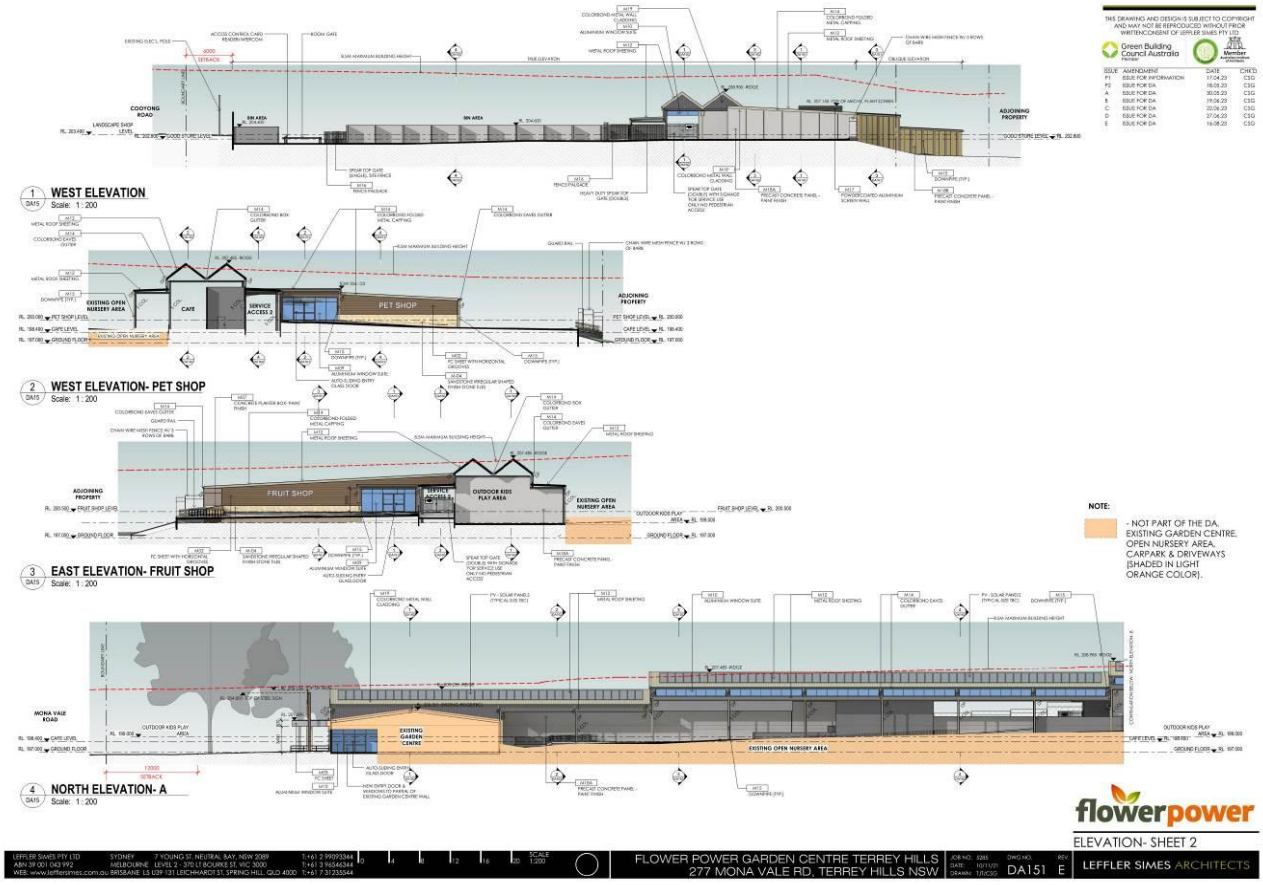

EXISTING OPEN NURSERY AREA
EXISTING GARDEN CENTRE
OUTDOOR KIDS PLAY AREA
SEATING
CAFE
KITCHEN STORE
SERVERY
ENTRY
SERVICE ACCESS 2
STAFF OFFICE
STORE
CARPARK/ DRIVEWAY
FRUIT SHOP
PET SHOP OVER
RETAIL
LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
FLOOR PLAN - 1 OF 3
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA111
E
LEFFLER SIMES ARCHITECTS

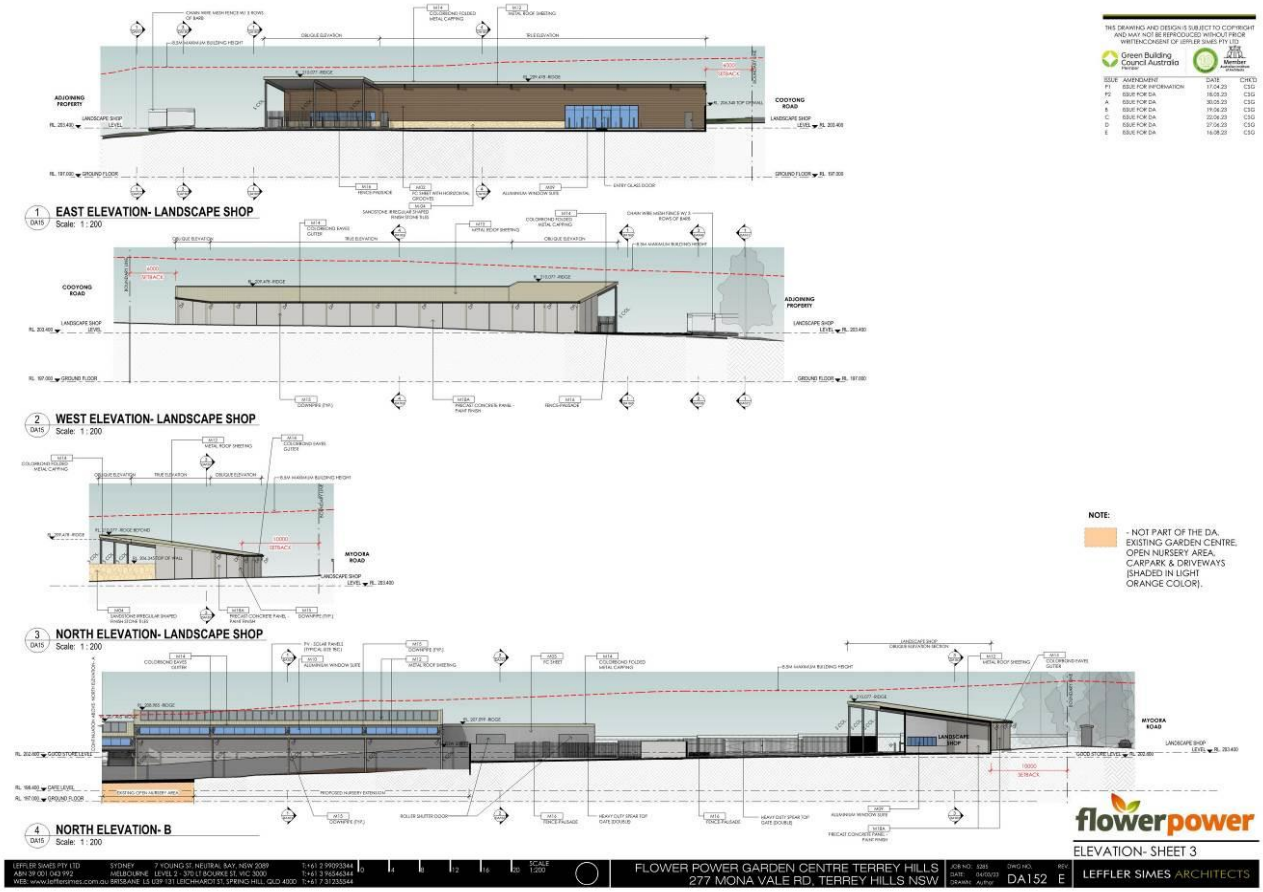

PROPOSED NURSERY EXTENSION
EXISTING OPEN NURSERY AREA
SERVICE ACCESS 1
OUTDOOR KIDS PLAY AREA
SEATING
CAFE
KITCHEN STORE
SERVERY
SERVICE ACCESS 2
PLANT STORE
GARDEN CENTRE GOODS STORE
FRUIT SHOP
PET SHOP
STAFF AMENITIES BELOW
RETAIL BELOW
LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
FLOOR PLAN - 2 OF 3
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA112
E
LEFFLER SIMES ARCHITECTS


MYOORA ROAD
LANDSCAPE SHOP
OPEN BULKY GOODS DISPLAY AREA
PROPOSED NURSERY EXTENSION
SERVICE ACCESS
PLANT STORE
GARDEN CENTRE GOODS STORE
FRUIT SHOP
LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
FLOOR PLAN - 3 OF 3
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA113 E
LEFFLER SIMES ARCHITECTS


COOYONG ROAD
CURRONG CCT
MYOORA ROAD
MONA VALE ROAD
DUNCAN RESERVE
PROPOSED CARPARK/DRIVEWAY EXTENSION
EXISTING CARPARK
PROPOSED NURSERY EXTENSION
EXISTING OPEN NURSERY AREA
EXISTING GARDEN CENTRE
CARPARK/ DRIVEWAY
LEGEND:
EXISTING TREES TO BE RETAINED
TREES TO BE REMOVED
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
SOLAR PANELS SCHEDULE
SOLAR PANELS (RETAIL ROOF EAST) 67
SOLAR PANELS (RETAIL ROOF NORTH) 33
SOLAR PANELS (ROOF NORTH) 260
SOLAR PANELS (ROOF SOUTH) 84
TOTAL SOLAR PANELS (TBC) = 464
2 MECH'L. AC PLANT (FRUIT SHOP ROOF) Scale: 1 : 100
3 MECH'L. AC PLANT (PET SHOP ROOF) Scale: 1 : 100
flowerpower
OVERALL ROOF PLAN
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA120 E
LEFFLER SIMES ARCHITECTS

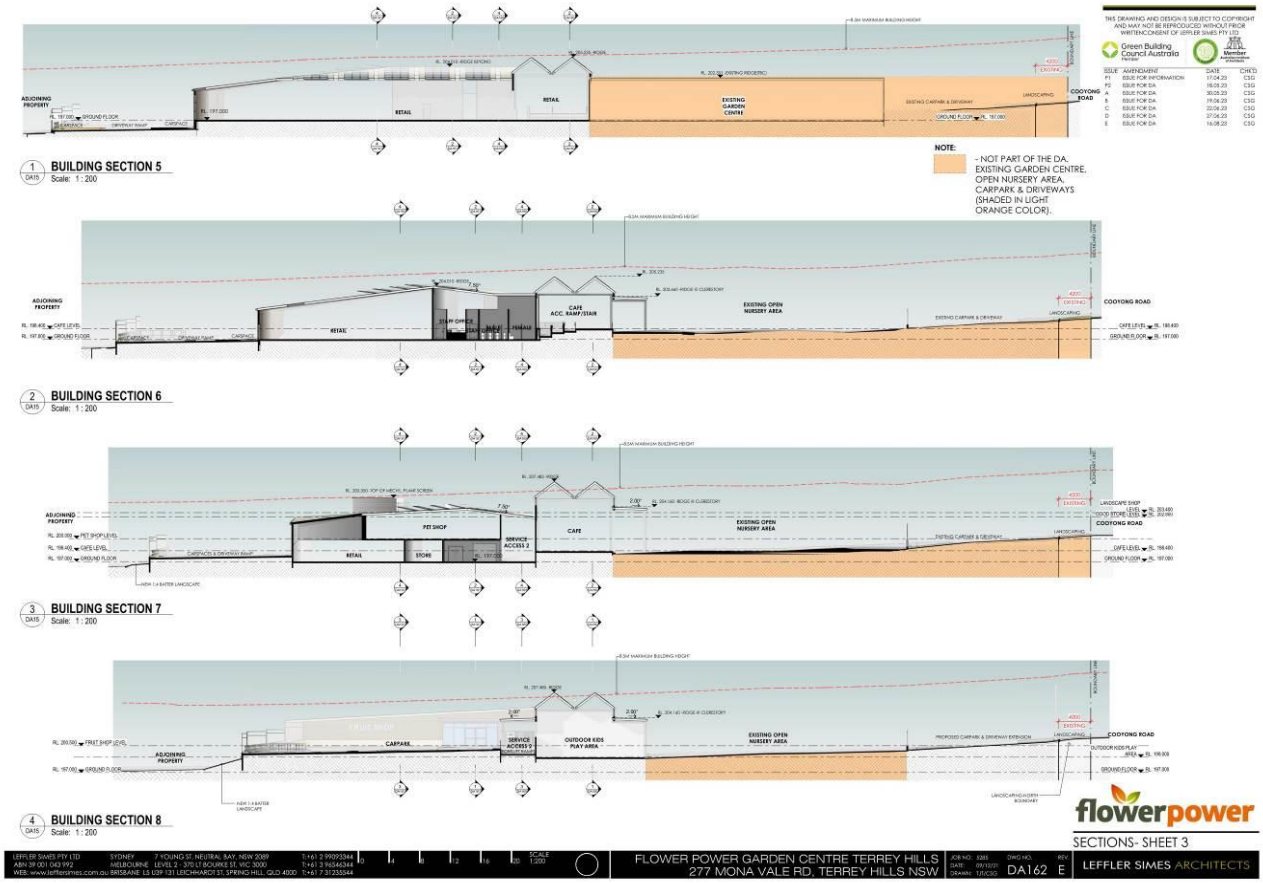

FINISHES SCHEDULE
NOTE:
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
1 EAST ELEVATION
Scale: 1 : 200
2 SOUTH ELEVATION- A
Scale: 1 : 200
3 SOUTH ELEVATION- B
Scale: 1 : 200
flowerpower
ELEVATION- SHEET 1
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA150 E
LEFFLER SIMES ARCHITECTS

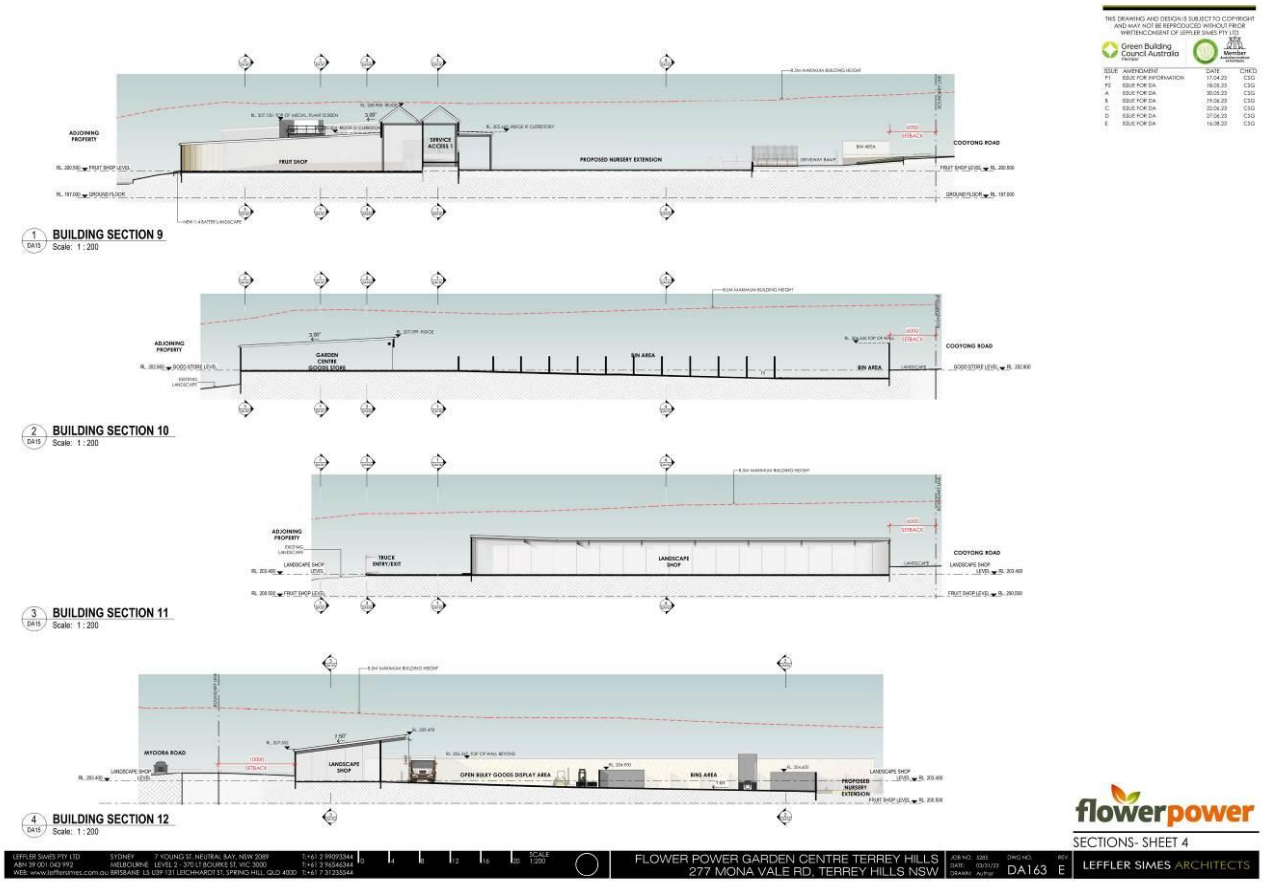

1 WEST ELEVATION
Scale: 1 : 200
2 WEST ELEVATION- PET SHOP
Scale: 1 : 200
3 EAST ELEVATION- FRUIT SHOP
Scale: 1 : 200
4 NORTH ELEVATION- A
Scale: 1 : 200
NOTE:
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
ELEVATION- SHEET 2
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA151 E
LEFFLER SIMES ARCHITECTS


1 EAST ELEVATION- LANDSCAPE SHOP
Scale: 1 : 200
2 WEST ELEVATION- LANDSCAPE SHOP
Scale: 1 : 200
3 NORTH ELEVATION- LANDSCAPE SHOP
Scale: 1 : 200
4 NORTH ELEVATION- B
Scale: 1 : 200
NOTE:
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
flowerpower
ELEVATION- SHEET 3
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA152 E
LEFFLER SIMES ARCHITECTS


1 BUILDING SECTION 1-A
Scale: 1 : 200
2 BUILDING SECTION 1-B
Scale: 1 : 200
3 BUILDING SECTION 2-A
Scale: 1 : 200
4 BUILDING SECTION 2-B
Scale: 1 : 200
flowerpower
SECTIONS- SHEET 1
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA160 E
LEFFLER SIMES ARCHITECTS


1 DA15 BUILDING SECTION 3-A
Scale: 1 : 200
2 DA15 BUILDING SECTION 3-B
Scale: 1 : 200
3 DA15 BUILDING SECTION 4-A
Scale: 1 : 200
4 DA15 BUILDING SECTION 4-B
Scale: 1 : 200
flowerpower
SECTIONS- SHEET 2
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA161 E
LEFFLER SIMES ARCHITECTS


1 DA15 BUILDING SECTION 5
Scale: 1 : 200
NOTE:
- NOT PART OF THE DA. EXISTING GARDEN CENTRE, OPEN NURSERY AREA, CARPARK & DRIVEWAYS (SHADED IN LIGHT ORANGE COLOR).
2 DA15 BUILDING SECTION 6
Scale: 1 : 200
3 DA15 BUILDING SECTION 7
Scale: 1 : 200
4 DA15 BUILDING SECTION 8
Scale: 1 : 200
flowerpower
SECTIONS- SHEET 3
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA162 E
LEFFLER SIMES ARCHITECTS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Green Building Council Australia
ISSUE AMENDMENT DATE CHKD
P1 ISSUE FOR INFORMATION 17.04.23 CSG
P2 ISSUE FOR DA 18.05.23 CSG
A ISSUE FOR DA 30.05.23 CSG
B ISSUE FOR DA 19.06.23 CSG
C ISSUE FOR DA 22.06.23 CSG
D ISSUE FOR DA 27.06.23 CSG
E ISSUE FOR DA 16.08.23 CSG
ADJOINING PROPERTY
FRUIT SHOP
SERVICE ACCESS 1
PROPOSED NURSERY EXTENSION
COOYONG ROAD
1 DA15 BUILDING SECTION 9
Scale: 1:200
GARDEN CENTRE GOODS DOOR
BIN AREA
2 DA15 BUILDING SECTION 10
Scale: 1:200
TRUCK ENTRY/EXIT
LANDSCAPE SHOP
3 DA15 BUILDING SECTION 11
Scale: 1:200
MYOORA ROAD
OPEN BULKY GOODS DISPLAY AREA
4 DA15 BUILDING SECTION 12
Scale: 1:200
flowerpower
SECTIONS- SHEET 4
FLOWER POWER GARDEN CENTRE TERREY HILLS
277 MONA VALE RD, TERREY HILLS NSW
DA163 E
LEFFLER SIMES ARCHITECTS