

**BEFORE INDEPENDENT COMMISSIONER WELLINGTON CITY COUNCIL**

*In the matter of* the Resource Management Act 1991

*And*

In the matter of A Resource Consent for the construction and operation of an extend carpark to Foodstuffs New World, Khandallah, Wellington

**STATEMENT OF EVIDENCE  
Edward Xavier Dyer**

*Prepared on behalf of*

**Wellington City Council  
NOISE & ACOUSTICS**

**31 January 2024**

## **Introduction**

1. My full name is Edward Xavier Dyer. I am an environmental noise officer at Wellington City Council, Specialist Advice and Compliance Team.

## **Qualifications and Experience**

2. My qualifications with respect to acoustics include completing the specialist acoustics course taught at Massey University '*Bio-physical effects of noise, vibration and electrometric radiation*'. This is a level 3 specialist noise course on sources, propagation, measurement units and effects of noise and vibration on human health. Measurement and assessment as well as instrumentation, procedures, collection of data and interpretation; legislation, standards and guidelines are all covered in the course.
3. In my role at Council as an environmental noise officer I am responsible for overseeing the excessive noise provisions as well as conducting acoustics compliance measurements and assessment. I have other various roles such as review of Resource Consents which have noise or vibration components as well as providing specialist advice on the District Plan noise rules.

## **Code of Conduct**

4. The evidence I give is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

## **Background and Involvement SR517439**

5. Foodstuffs Limited has applied for Resource Consent to expand their existing New World carpark at **26 Ganges Road, Khandallah**, Wellington. This expansion would add 64 new carparks to the existing spaces and two new access ways to the carpark, replacing three existing dwellings to the west and south of the existing site.
6. The New World Supermarket is an existing operation, which includes a host of noise sources from vehicles, people, plant and thus forms part of the existing environment in this area and existing sound scape.
7. Following review of the original Marshall Day Acoustics (MDA) noise report and application WCC issued a Further Information Request (FiR) which included a request for further information around operational noise and construction noise.

8. Subsequently the Applicant through MDA submitted an updated Noise Report. A formal written response was also provided by MDA with respect to the WCC written response to the Further Information Request. The MDA report has clarified a host of matters that were not clear in the original review presented to WCC, this included the fact that the original MDA report assessed early morning deliveries which did not form part of the consent here. For clarity I note that early morning deliveries have their own consent (SR No. 108073).
9. The Applicant notes all deliveries would be carried out during the day (0700-1900) at the site's dedicated loading bay. This remains unchanged from the *previously* consented operation with no proposed access across the new car park.
10. Fixed plant also remains unchanged from the previously *consented* operation and as such loading and fixed plant noise do **not** form part of this Application.

## **Involvement and Background**

11. I was one of the two authors of the Wellington City Council Technical Noise Review which reviewed the original MDA Acoustic Review dated 23 May 2022 and further information noise response issued by MDA dated 29 August 2022.
12. My evidence in this Application is based around the Wellington City Council Technical Noise Review and submission received.
13. I can confirm I have visited the area and viewed the subject site from the road reserve.

## **Development Site and Proposed Activity**

14. The site, surrounding environs and proposed activity is well described in detail within the Application. I provide the following overview:

## **Overview of Environmental Noise (Operational Noise, Construction Noise and Vibration)**

### **Operational Noise**

- 20 The proposed (new) activity relates to parking only with noise emissions from vehicle movements and vehicle door closing. There would also be people noise from gathering and activity, however this would be expected to be a genuine low level noise

source when, suitably managed by the individuals, and when the car park has its proposed acoustic barrier fencing in place.

21 The MDA review notes there is currently no specific noise mitigation on the site however new noise protection walls (noise barrier fencing) around the perimeter of the site is proposed, the proposed noise barrier is shown in Figure 2 and Figure 3 of the MDA review.

22 The MDA report further notes that the only noise source prior to 7.00am is staff arriving on site. The MDA report notes **“gates and signage will be installed that limit customer access to match the opening hours of the store”**. The WCC review therefore assumed that only staff arriving prior to 7.00am would occur on site and there is no customer access.

23 With staff arriving before 7.00am there will be engine sounds and car door closing, along with vocal effort from people (if present and if any talking occurs). The MDA report notes that car door closing can achieve compliance with  $L_{AFMax}$  noise limits in the District Plan, provided that staff are ‘trained’ not slam car doors.

24 It is therefore critical that the  $L_{AFMax}$  levels are suitably managed to ensure nighttime sleep protection and impacts sounds from vehicle door closing do not wake residents.

25 The MDA report notes all noise walls are proposed to be at least 1.8 metres high and constructed with no air gaps between panels and between the fence and the ground i.e a noise fence. The minimum surface mass should be  $12 \text{ kg/m}^2$ .

26 The MDA response to further information review also notes that a reduction of the noise barrier of up to 14 dB has been applied for ground floor receivers and 3 dB for first floor receivers. We assumed the MDA assessment is based on this minimum 1.8m high barrier as this is the height shown in the MDA report (Figure 3 acoustic barrier design). I note that a typical wooden grade acoustic fence at 1.8m is generally expected to reduce noise between 8-10 dB (for ground floor receivers). A reduction at ground level of 14 dB is achievable however it is not clear how the final fence design and specifications will achieve this level; the Applicant’s noise advisor should provide further comment on this and how 14 dB will be achieved.

27 I further note that if there is line of sight between source and receiver i.e for second level dwellings generally no reductions in sound are assumed. I make this

observation as MDA has relied on a 3dB reduction. The Applicant's noise advisor should provide further comment on this matter also for each specific receiver site.

## Operational Noise Summary

28 In summary the assessment of environmental noise effects provided by MDA advises the activity is **complying** with the permitted Wellington City Council District Plan noise limits. Specifically, the MDA review notes "***activity noise levels from the site are predicted to comply with the District Plan noise limits at all times***" subject to the above-mentioned noise barrier being "***constructed around the carpark perimeter as described in this report***".

## Operational Vibration

20 Vibration effects from day to day activities such as light vehicles, such as cars, being drive and use of the car park are not anticipated to be a cross boundary matter for this activity.

## Construction Noise

21 Construction noise has been assessed by MDA adopting the correct standard NZS 6803:1999 "*Acoustics - Construction Noise*". The MDA report notes the construction noise limits from NZS6803:1999 are 75 dB  $L_{Aeq}$  and 85 dB  $L_{AFmax}$  during the proposed construction hours of 7.30am to 6.00pm Monday to Saturday. This appears to be a minor typo as the MDA report notes the project is typical duration and as such the applicable limits are 75 dB  $L_{Aeq}$  and 90 dB  $L_{AFmax}$  during the proposed construction hours of 7.30am to 6.00pm Monday to Saturday (Construction work at any one location for more than 14 calendar days but less than 20 weeks). The applicable limits are corrected on Table 6 of the MDA report.

22 The applicable limit for receiver sites is 75 dB  $L_{Aeq}$  between 7.30am to 6.00pm.

23 The MDA report also discusses construction noise in some detail and notes that there will be exceedances at times, this is not uncommon for construction projects for limited periods which lie directly adjacent to noise sensitive sites.

24 With respect to construction noise the MDA report however notes that exceedances will be limited, stating construction noise will be '***clearly distinguishable in the ambient noise environment***'. I agree.

25 A key noise control measure is ensuring that construction noise take place during daytime hours only (as proposed by the Applicant). Table 10 of the MDA assessment sets out the predicted construction noise levels, as summarised below:

Location	Predicted Typical construction noise levels (dB L <sub>Aeq</sub> )				
	Piling	Truck Movements	Earthworks	Concrete Pouring	Hand Tools
2, 4 and 6 Dekka Street	81	69	83	78	79
5 Dekka Street	82	70	84	78	80
7 Dekka Street	82	70	84	78	80
29 Nicholson Road	82	70	84	78	80
32 Nicholson Road	72	60	74	72	70
37 Nicholson Road	76	64	78	76	74
35 Nicholson Road	76	64	78	76	74
35A Nicholson Road	74	62	76	74	72
34 Ganges Road	74	62	76	74	72
21, 23, 25, 33 Ganges Road	70	58	72	70	68

20 As shown in Table 10 from the MDA assessment, the applicable limits of 75 dB L<sub>Aeq</sub> will be exceeded for certain activities. The Applicant has noted that a final methodology is not known however the MDA report concludes, provided that best practicable options are adopted to ensure noise levels are no louder than necessary based on the limited duration construction noise can be managed to be reasonable. Thus, MDA recommend the preparation of a Construction Noise and Vibration Management Plan. I support this mitigation measure.

21 In my experience it is typical for construction projects of this nature and scale to at times have minor exceedances even when adopting BPO under s.16. Mitigation measures will however reduce the received cross boundary noise emission levels making it possible for the Applicant to have levels with only minor exceedances of NZS 6803:1999 which would be reasonable for the scope of the works.

22 I support this mitigation measure and recommend where there will be non-compliance the CNVMP specifically provides a schedule to assess this. I also support the mitigation measures for construction noise to occur during daytime only between 7.30am to 6.00pm Monday to Saturday.

### **Construction Vibration**

23 MDA has also assessed vibration from construction activity. There are currently no vibration standards in the Wellington District Plan however the Proposed Plan adopts German Standard DIN 4150-3:2016 "*Structural Vibration – Part 3: Effects of Vibration on Structures*".

- 24 This Standard is used widely in New Zealand to assess potential for vibration causing damage to buildings and is frequently referenced in consent conditions issued by Wellington City Council and other Councils nationwide.
- 25 The MDA assessment further concludes the vibration limits **“are significantly below the levels which would cause cosmetic damage to buildings”** which are the levels set out in German Standard DIN 4150-3:2016. I note that vibration levels may be noticeable during some periods and at some parts of the site. The Applicant’s noise advisor may wish to provide further comment on this specific matter.

## Noise Management and Mitigation Methods

- 26 The Resource Management Act (RMA) Section 16 (s.16) requires occupiers to adopt the best practicable option (BPO) to ensure noise emissions do not exceed a reasonable level, regardless of compliance with a rule in a plan. The definition of best practicable option is set out in Section 2 (s.2) of the Act and is summarized as follow:

*“Best Practicable Option”, in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to –*

- (a) The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and*
  - (b) The financial implications, and the effects on the environment, of that option when compared with other options; and*
  - (c) The current state of technical knowledge and the likelihood that the option can be successfully applied.*
- 27 The MDA report recommends a host of consent conditions including requiring that construction noise and vibration management plan (CNVMP). We have reviewed and considered these and adopted these recommendations in part.
- 28 In my view adopting BPO measures through the adoption of a Construction Noise and Vibration Management Plan and acoustic grade fencing are **critical** management methods and are requirement to ensure noise levels remain reasonable at all times.
- 29 I support the intent of the submitted conditions however below provide a set of amended draft conditions. In my experience adopting the detailed suite of conditions and related noise management method through the CNVMP, can give the community a level of certainty that the final design, specifications and noise management methods can ensure noise effects (when adopted) will be managed in line with the s.16 duties of the Resource Management Act.

## Submissions (Noise and Vibration)

30 I have read the submissions received. Below I address the submissions that oppose the Application and where noise is specifically highlighted as a concern. I have given consideration to noise matters raised in those submissions.

31 The activity is a non-residential activity located in a residential zone thus protection of health and amenity of adjacent residentially zoned sites is an important consideration.

32 I am of the view that the submissions raise valid concerns including potential off site noise emission levels (cross boundary). I provide comment as follows:

### Construction Noise Submissions

33 The following subject matters were raised in the submissions relating to construction noise:

- Construction noise levels
- Hours of construction

34 **Submission 6. Kevin and Marie Pugh.** Submitter 6 highlights the Applicant's acoustic assessment, noting that the levels are only just complied with and there is no detail as to how the stated mitigation measures will be monitored and enforced. The submitters also note that construction noise will exceed NZS6803:1999 noting an assessment of construction effects has not been undertaken at this stage.

35 **Submission 68. Michael Hayward - 40 Ganges Road.** Submitter 68 noted concern over construction noise and operational hours. They request construction works are limited to 7:00am - 6:00pm and operational noise is limited to 7:00am - 8:00pm with no deliveries outside these hours.

36 In summary, Marshall Day Acoustics preliminary construction assessment provided predicted construction levels as  $L_{Aeq}$  ranging from  $L_{Aeq}$  58 dB to  $L_{Aeq}$  84 dB, a 9 dB exceedance of NZS 6803:1999. Construction hours were provided, being 7:30am - 6:00pm.

37 Preliminary mitigation methods were provided, and a Construction Noise Vibration Management Plan was proposed as a condition of consent. In my view, adopting the draft proposed conditions in Appendix A, construction noise effects can be suitably managed to reduce adverse effects.



## Operational Noise Submissions

- 38 In summary, the following subject matters were raised in the above submissions relating to operational noise:
- Delivery truck noise
  - Night time noise
- 39 **Submission 24. Brenda Vale - 42 Ganges Road.** This submitter stated the delivery time proposed is unacceptable, being between 10:00pm - 7:00am. The submitter notes reversing noise of lorries is already audible inside their dwelling. They have concerns over the proposed 10m morning parking mitigation measure to residential dwellings.
- 40 **Submission 27. Robert Vale - 42 Ganges Road.** Submitter 27 has raised concerns over the one delivery per 15-minute mitigation measure proposed, leaving the potential to have one delivery every 15 minutes all through the night. They note the reversing alarms are of concern and have concerns over the proposed 10m morning parking mitigation measure to residential dwellings given their property is within 10m to the roadside.
- 41 **Submission 47. Andrew Black - 35 Clutha Ave.** Submitter 47 has concerns over delivery noise. Mr Black requests locked gates when carpark is not in use and limits on delivery times.
- 42 **Submission 51. Janet Preston - 35 Nicolson Road.** Submitter 51 has raised noise as an issue, despite the proposed acoustic fencing, they have highlighted the one delivery per 15 minutes throughout the night. Concern over sleep impacts of deliveries at nighttime as well as noise from shopping trolleys. They have requested no delivery trucks between 11:00pm and 7:00am on any day.
- 43 **Submission 67. Christina Lokum- 45a Ganges Road.** Submitter 67 raised concern over delivery noise during night-time hours, stating the increased car park area will increase the noise from these trucks.
- 44 **Submission 68. Michael Hayward - 40 Ganges Road.** Concerns over the construction noise and operational hours. Requested construction works are limited to 7:00am - 6:00pm and operational noise are limited to 7:00am - 8:00pm with no deliveries outside these hours.
- 45 Deliver activities do not form part of this application. Delivery activities are already consented, and the related hours are provided for in the Resource Consent SR No. 108073 (26 Ganges Road, Khandallah).

46 Condition (c) reads. *“Delivery times shall be restricted to the current supermarket operating hours of:*

*(i)Monday to Friday 0800 to 2030 hours; and*

*(ii)Saturdays and Sundays & Public Holidays 0800 to 2000 hours.”*

47 Any delivery outside these hours would therefore be a compliance matter under the supermarket’s resource consent condition (c).

48 Marshall Day Acoustics have assessed noise related to vehicles including vehicle doors when using the proposed carpark. At all locations the predicted levels are compliant with the Operative District Plan level for operational noise when received in both Outer Residential and Centres Area both day and night.

### **General Topic Noise Submissions**

49 **Submission 10. Fiona Calderwood - 31 Ranui Crescent.** This submitter had concerns over the increased volume in traffic causing increased noise in the area.

50 **Submission 66. Jolanda Meijer - 37 Ngaoto Street.** Generally, this submitter mentions the negative impacts of noise on the adjacent neighbouring properties however does not give specifics.

51 Marshall Day Acoustics have provided predicted levels for traffic relating to the car park. At all locations the Operative District Plan is complied with.

52 I have read MDA reports in this regard and agree with their findings.

53 I am of the view the issues raised in submissions are valid can in my view be addressed through the final design, specifications and adoption of the suite of mitigation measures.

54 I am of the view that adopting BPO (s.16) measures to mitigate off site noise emissions should be considered. This can be achieved by adopting my draft conditions.

## Summary

- 20 Overall, I consider the effects are largely addressed through the existing consent (operational noise) and agree with MDA conclusion which states in regard to construction *“we consider the noise effects to be reasonable, provided that best practicable options are adopted”*.
- 21 With regard to delivery related noise, I recommend a condition is imposed to ensure the extended car park land is treated the same as the operating supermarket, specifying delivery times in line with SR No. 108073 condition (c).
- 22 I am of the view the issues raised in submissions can, in my view, be addressed through the final design, specifications and adoption of the suite of mitigation measures adopted via the draft recommended conditions below.

## Conclusion

75. If consent is granted, I recommend the draft conditions attached in **Appendix A** be adopted.

# Glossary of Acoustic Terminology

**dB** **Decibel.** A bel is defined as the logarithm to base ten of the ratio of two acoustical powers, or intensities. One tenth of a bel, the decibel, is the generally used unit. The primary unit of sound measurement; used to quantify both sound pressure level and sound power level. Used for measuring the relative magnitude based on a logarithmic scale.

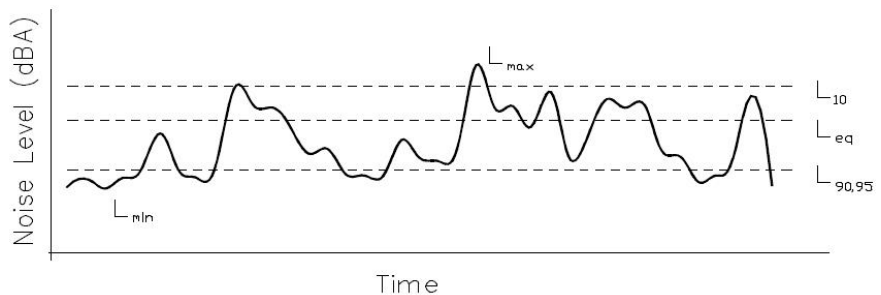
**dB(A)** **A weighted Sound Level.** A measurement of sound which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear. A measure of sound pressure level designed to reflect the acuity of the human ear, which does not respond equally to all frequencies. The ear is less efficient at low and high frequencies than at medium or speech-range frequencies. Therefore, to describe a sound containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA.

**L<sub>Amax</sub> dB** **The single highest sampled level of sound.** Used in night time emission limits as a means of ensuring sleep protection. A-weighted.

**L<sub>Aeq</sub> dB** **Equivalent Continuous Sound Pressure Level.** The A-weighted time-averaged sound level (or equivalent sound level) that has the same mean square sound pressure level as the time-varying sound level under consideration. Commonly referred to as an "energy average" measure of sound exposure.

**LA90 or L<sub>A90</sub> dB** **The A-weighted level of sound exceeded for 90% of the monitoring period.** This level of sound equates to an average background sound level, and is influenced by constant sources. Noise emission limits are not generally specified in terms of an L<sub>90</sub> level, but it is used as a guide to the general background sound level. The L<sub>A90</sub> is widely accepted as reflecting human perception of ambient background noise and generally reflects the noise level in the lulls between individual noise events, for example noise present during car by pass or someone yelling.

**L<sub>N</sub> as function of Time**



**NZS 6801:2008**  
**NZS 6802:2008**

**NZS 6801:2008 Acoustics – Measurement of Environmental Sound**  
**NZS 6802:2008 Acoustics – Environmental Noise**

**Sound Power**

**Sound Power Level.** The 'energy' created by a sound is defined as its sound power. The ear cannot hear sound power nor can it be measured directly. Sound power is not dependent upon its surrounding environment.

**Sound Pressure**

**Sound Pressure Level** is defined as varying pressure fluctuations caused by sound waves. The ear converts these fluctuations into what we call audible sound, which is the sensation (as detected by the ear) of very small rapid changes in the air pressure above and below a static value. This "static" value is atmospheric pressure.

## Appendix A – Recommended Draft Noise Conditions

### **(...) Construction Noise Hours**

The Consent Holder must ensure that construction activities operate between the hours of 7.30am and 6.00pm Monday to Saturday.

### **(...) Construction Noise and Vibration Management Plan**

The consent holder must submit to the Council's Compliance Monitoring Officer for certification a Construction Noise and Vibration Management Plan (CNVMP) for certification at least 20 working days prior to any work commencing on site. The purpose of the CNVMP is to set out the best practicable option for the management of noise and vibration effects associated with the construction activities related to the car park. The CNVMP must be prepared by a suitably qualified and experienced acoustic and vibration expert. The CNVMP shall be drafted in accordance with Appendix E2 of NZS6803:1999 Acoustics – Construction'. No work may commence on site until the CNVMP is certified by the Council's Compliance Monitoring Officer. The construction activities must be carried out in accordance with the certified CNVMP.

### **(...) Construction Noise Limits and Management**

The consent holder must ensure that construction activities, except where identified in the CNVMP as predicted to exceed the levels in the NZS Acoustic standard "NZS6803:1999 Acoustics Construction Noise', shall be managed and controlled so that the noise received at any residential or commercial site does not exceed the limits set out in Table 2 and Table 3 of 'NZS6803:1999 Acoustics – Construction' Noise' when measured and assessed in accordance with that Standard.

### **(...) Schedule to the Construction Noise and Vibration Management Plan**

Unless otherwise provided for in a CNVMP, a Schedule to the CNVMP (Schedule) shall be prepared by a suitably qualified and experienced person, in consultation with the owners and occupiers of sites subject to the Schedule, when construction noise is either predicted or measured to exceed the noise standards in condition. The objective of the Schedule is to set out the Best Practicable Option for the management of noise and/or vibration effects of the construction activity beyond those measures set out in the CNVMP. The Schedule shall include details such as (i) construction activity location, the nearest neighbours to the construction activity; the predicted noise and/or vibration level for all receivers where the levels are predicted or measured to exceed the applicable standards in condition and / the proposed mitigation and; the proposed communication with neighbours. The schedule shall be issued to Council's Compliance Monitoring Officer for certification at least five working days prior to any works occurring. The construction activities must not be carried out until Council has certified the schedule.

### **(...) Construction Vibration and Management**

The consent holder must ensure that construction activities, shall be managed and controlled so that the vibration levels received at any site does not exceed the limits in 'DIN 4150- 3:1999 "Structural Vibration – Part 3: Effects of vibration on structures'.

**(...) Acoustic Design Certificate District Plan Compliance (Acoustic Fence)**

Prior to the completion and construction of the perimeter acoustic design barrier fence the consent holder must submit to the Council's Compliance Monitoring Officer an Acoustic Design Certificate (ADC) for the acoustic barrier fence. This certificate must certify that a site inspection has taken place and that the final constructed acoustic fence is sufficient to ensure noise emitted from the car park area complies with the following noise limits:

Noise Emitted from Site and Received in Centres Zoned Sites

At all times 60 dB  $L_{Aeq}$  (15 min)

At all times 85 dB  $L_{AFmax}$

Noise Emitted from Site and Noise Received in Residentially Zoned Sites

Monday to Sunday 7am to 7pm 50 dB  $L_{Aeq}$  (15 min)

Monday to Sunday 7pm to 10pm 45 dB  $L_{Aeq}$  (15 min)

Monday to Sunday 10pm to 7am 40 dB  $L_{Aeq}$  (15 min)

Monday to Sunday 10pm to 7am 65 dB  $L_{AFmax}$

Note:

1. The intent of this condition is to ensure final design and specifications of the noise barrier is suitably designed, specified, located and operated to ensure noise emissions comply with the operational noise limits of the District Plan.
2. The fence must be maintained in this condition in perpetuity.

Appendix A: Supporting Information



- Activity Areas
- Central Area
  - Business 1
  - Business 2
  - Curtis St Business Area
  - Centre
  - Urban Development Area
  - Airport
  - Institutional Precinct
  - Inner Residential
  - Outer Residential
  - MDRA
  - Rural
  - Open Space A
  - Open Space B
  - Open Space C
  - Conservation
  - Sea
  - Over water





Figure 1: MDA noise assessment



Figure 2: MDA noise assessment – acoustic barrier



Figure 2: Carpark layout

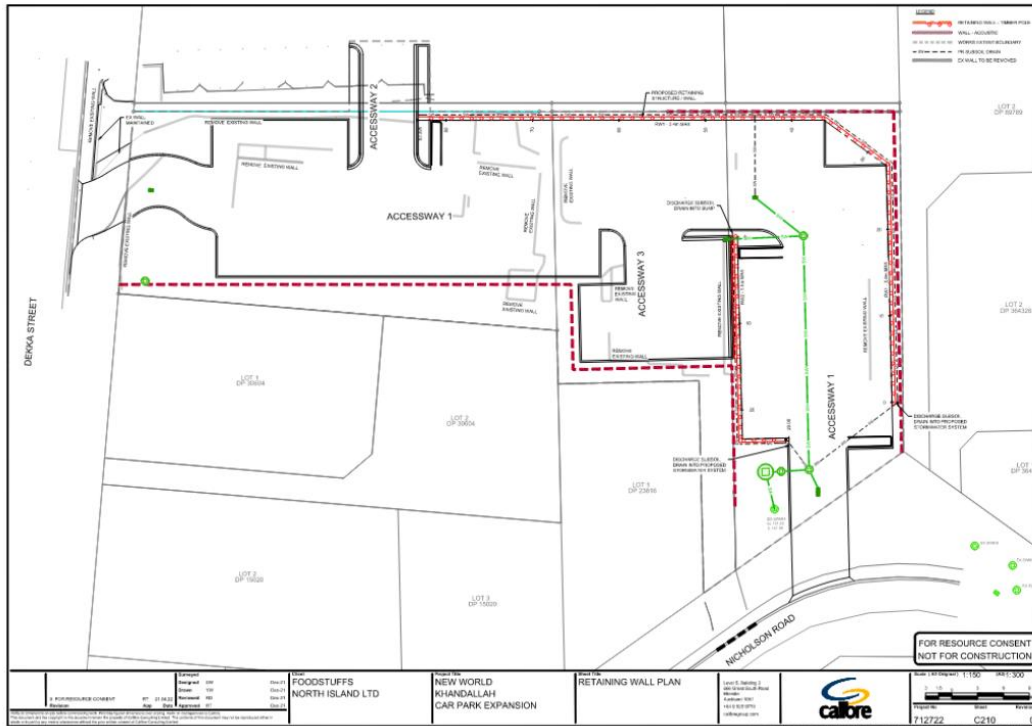


Figure 3: MDA noise assessment – acoustic barrier design

Figure 3: Acoustic barrier design

