

REPORT

Operational & Construction Noise and Vibration Assessment of Effects

100 Halsey Street - Substantive Application

NZ CRE 100 Halsey Limited

NDY
A TETRA TECH COMPANY

CONFIDENTIAL

Revision: 1.1 – Resource Consent | **Issued**: 20 October 2026

Document name: rp260924a0001

VERIFICATION

REVISION	DATE ISSUED	PREPARED BY	VERIFIED BY	AUTHORISED BY	COMMENT
1.0	16 October 2026	Thomas Warren	Cameron Walbran	Will McCulloch	Resource Consent
1.1	20 October 2026	Thomas Warren 	Cameron Walbran 	Will McCulloch	Resource Consent

STAKEHOLDERS

ROLE	ORGANISATION
Client	RP Financial
Project Manager	Neoscape
Architect	Peddlethorp
Planning	Barker and Associates
Services Engineering (Office)	NDY
Services Engineering (Data Centre)	Black & White Engineering
Structural Engineering	Holmes

Table of contents

1 INTRODUCTION **1**
- 1.1 Purpose 1
- 1.2 Executive Summary 1
- 1.3 Authority 1
- 1.4 Information Sources 1
- 1.5 Terminology 2
- 1.6 Compliance summary 2

2 SITE LOCATION AND PROPOSAL **3**

3 AUCKLAND UNITARY PLAN **6**
- 3.1 Site Zoning 6
- 3.2 AUP Rules 6

4 OPERATIONAL NOISE ASSESSMENT **10**
- 4.1 Data Centre 10
- 4.2 Office Buildings 12

5 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT **13**
- 5.1 Hours of Operation 13
- 5.2 Expected Construction Activities 13
- 5.3 Construction Noise 14
- 5.4 Vibration 16

6 PROPOSED CONDITIONS OF CONSENT **18**

1 INTRODUCTION

NZ CRE 100 Halsey Limited is proposing a five-building development at 100 Halsey Street in Wynyard Quarter, Auckland.

The site includes Lot 1 Section 2 Survey Office Plan 526051 and Lot 2 Deposited Plan 80054. The whole site is described as "100 Halsey Street" for the remainder of this report.

The proposed development seeks to deliver a high-quality mixed-use commercial precinct of five buildings comprising premium office accommodation, retail and food and beverage uses, integrated amenities and end-of-trip facilities, together with the supporting infrastructure, building services and car parking required to service the development.

Building 2 is proposed as a purpose-built data centre. The building will accommodate the specialist plant, infrastructure and servicing requirements associated with the data centre use, while also incorporating centralised infrastructure to support the wider development.

1.1 PURPOSE

The purpose of this report is to provide an assessment of effects for operational and construction noise and vibration to support the application under the Fast Track Approvals Act 2024, specially to assess compliance with the Auckland Unitary Plan (AUP) noise and vibration standards.

The report addresses the following sources of noise and vibration to nearby receptors:

- Operational noise from the data centre operation in building 2
- Operational noise from the office building uses in buildings 1, 3, 4 and 5
- Noise and vibration associated with the construction of the development

1.2 EXECUTIVE SUMMARY

The nearby receivers include car parking, hotel, residential, office, and bus depot uses. The adjacent car park uses of the Travelodge building have been proposed to not be considered a sensitive receiver for noise effects, with compliance instead assessed to the nearest hotel guest rooms.

The office building uses are predicted to comply with the AUP noise limits at all times.

Operation of the data centre is predicted to comply with the AUP noise limits under:

- Typical chiller operation,
- Generator testing,
- Emergency operation of generators.

Construction noise effects will be minimised as far as practical. The piling activity will not be practical to mitigate to the AUP construction noise limits to all receivers at all times due to the proximity and height of the neighbouring buildings, which makes screening ineffective. This is relatively common for developments in central areas, and an appropriate condition has been proposed to address this.

1.3 AUTHORITY

Authority to undertake this report was provided by RP Financial.

1.4 INFORMATION SOURCES

- Resource consent drawings by Peddlethorp
- Data centre chiller and generator selections and layouts provided by Black & White Engineering
- Discussion and briefing on expected construction activities
- Auckland Unitary Plan (AUP)
- NZS 6803:1999 Acoustics – Construction Noise
- Association of Australasian Acoustical Consultants: Guideline for interpreting and applying NZS 6803:1999
- BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

- BS 5228-2:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

1.5 TERMINOLOGY

Decibel, dB: Noise levels are quantified in decibels, zero decibels being the threshold of audibility for a normally hearing young person and 140 decibels being a very loud sound that will cause discomfort or pain. The decibel scale is logarithmic. A doubling in loudness would subjectively be represented by an increase in noise levels of 10 decibels (dB). A small change of 3dB would be just noticeable to most listeners.

A-weighted decibel, dB(A): It is common practice to apply an "A" weighting to the sound pressure level in decibels. The A-weighting is applied to match measured sound to the response of the typical human ear. A-weighted decibels can be measured with a sound level meter which has been electronically adjusted in accordance with an international standard for A-weighting.

Time descriptors: The spread of noise over a time period can be expressed in a number of ways. Some of the most commonly used for environmental applications are:

- LAeq: The logarithmic average sound pressure level over the measurement period.
- LAmax: The loudest single event over the measurement period.

Peak particle velocity (PPV): The maximum absolute value of velocity, typically expressed in mm/s. This is typically measured in three directions (x, y, z) where one of the directions normally runs parallel to a side wall of a building of interest and another is oriented vertically.

1.6 COMPLIANCE SUMMARY

- All operational noise limits under E25.6.8 of the AUP are proposed to be complied with at all times during normal and emergency operation of the development.
- Construction noise limits under E25.6.28 of the AUP are proposed to be complied with for receivers on other sites for all activities except piling noise as discussed in Section 5.3.3
- Construction vibration limits under E25.6.30 of the AUP are proposed to be complied with at all times.

2 SITE LOCATION AND PROPOSAL

The site is located at 100 Halsey Street, Auckland and is bound to the north by Packenham Street West, the south by Gaunt Street, and the east by Halsey Street.

The existing Travelodge building, located on the corner of Pakenham and Halsey Streets, is to be retained as part of the development and remain operational throughout the duration of construction. The building is on the same site as the development. The building comprises a 154-room hotel, ground-floor retail and F&B uses, and the Wynyard Carpark, which currently provides a supply of 385 car parking spaces to the precinct. The hotel rooms are located along the northern and eastern facades of the building. The Wynyard Carpark is along the western and southern facades of the Travelodge facing towards the rest of the 100 Halsey Street site.

The existing NZ Bus depot currently operates across the rest of the site, with vehicle access from Halsey Street. NZ Bus will progressively reduce its operational footprint across the site as construction progresses, coordinated with the proposed development staging.

Nearby receptors around the site include:

- 139 Packenham Street West, 124 Halsey Street, and 101 Packenham Street West to the north across Packenham Street West – commercial office buildings.
- 75-81 Halsey Street to the west across Halsey Street – the Lighter Quay apartment building.
- 21 Viaduct Harbour Avenue to the west across Halsey Street – the Sofitel Hotel.
- 22 Viaduct Harbour Avenue, 30 Gaunt Street, and 58 Gaunt Street to the southeast and south across Gaunt Street – commercial office buildings.
- 55 Gaunt Street to the immediate west – a future development site.
- 30 Daldy Street to the west across Daldy Street – commercial office building.

The site context is shown below in Figure 1.

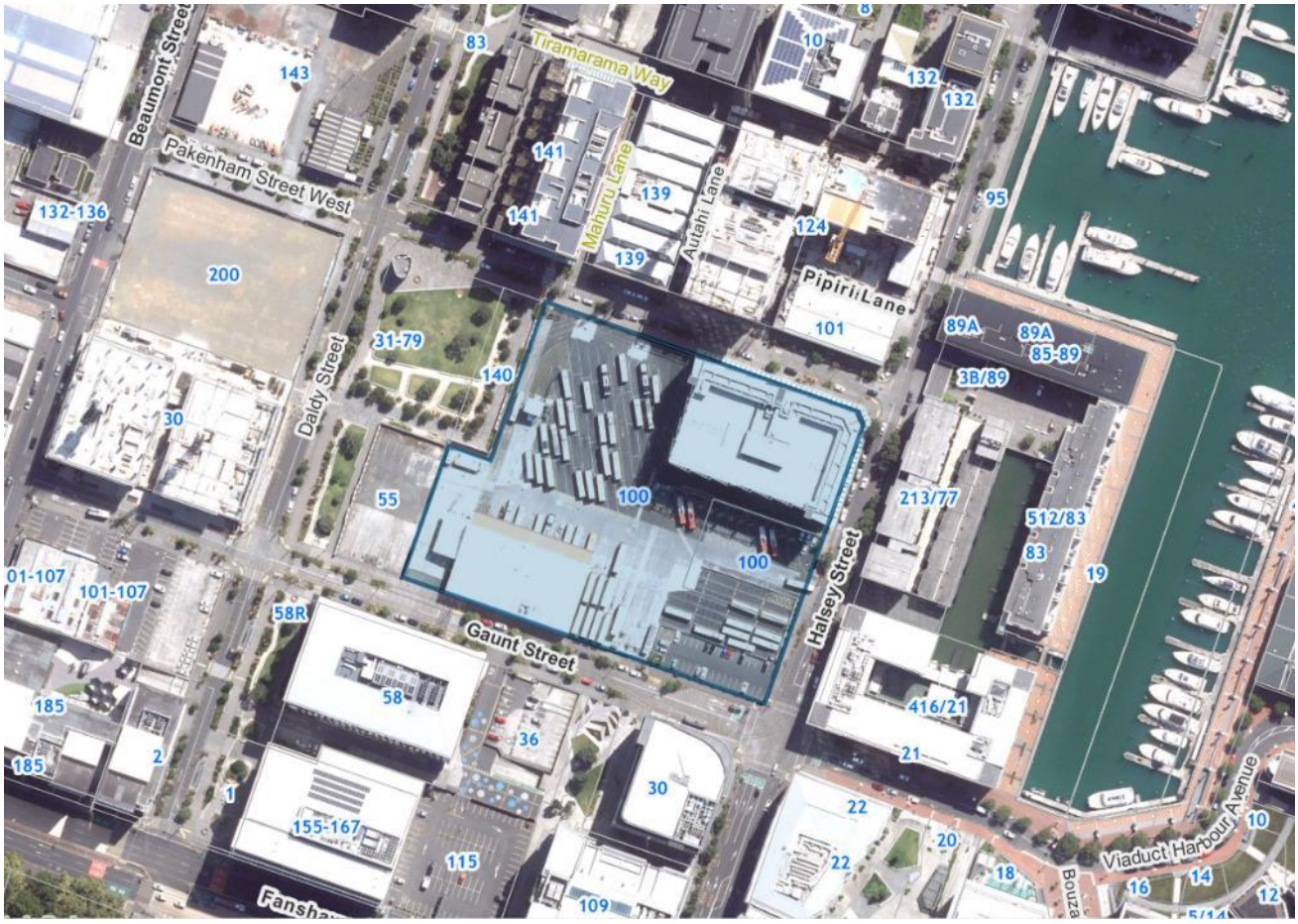


FIGURE 1 SITE CONTEXT

The proposed development includes four new office buildings and one data centre, to be built in a staged development of the site.

The buildings are:

- Building 1: Ground, level 1-7 office building with ground floor retail and rooftop plant.
- Building 2: 5 level data centre building with rooftop plant and one level of basement.
- Building 3: Ground, mezz, level 1-10 (3A) and ground, mezz, level 1-7 (3B) connected office buildings with shared ground floor retail and one level of basement car park.
- Building 4: Ground, level 1-11 office building with ground floor retail and rooftop plant. 2 level basement car park shared with building 5.
- Building 5: Ground, level 1-9 office building with ground floor retail and rooftop plant.

The building locations in relation to the site and the surrounding area are shown in Figure 2 and below:



FIGURE 2 PROPOSED SITE LAYOUT (PLAN)

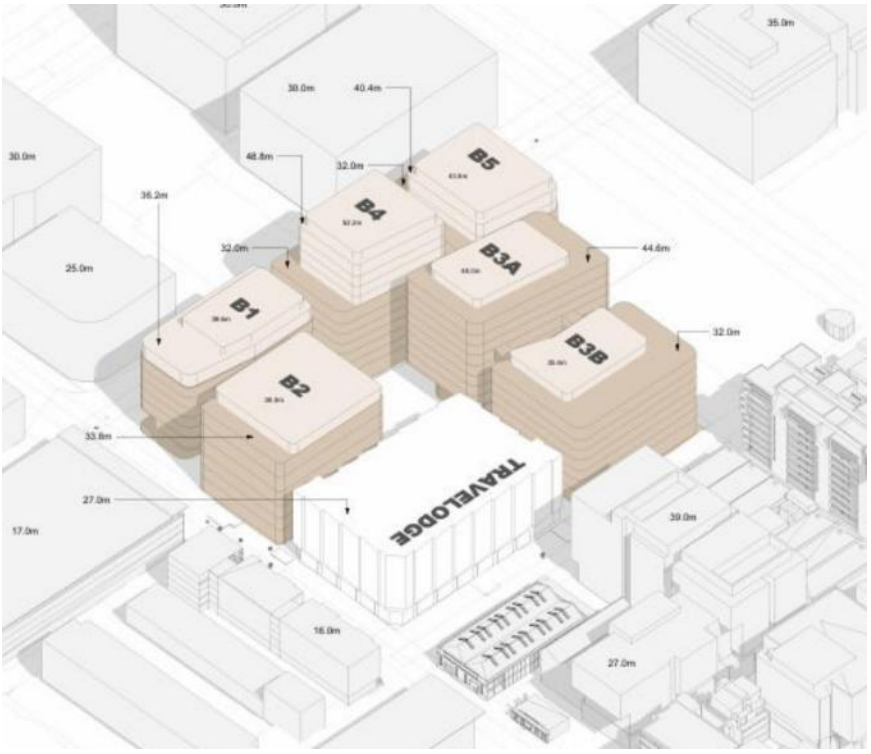


FIGURE 3 PROPOSED SITE LAYOUT (ISO)

3 AUCKLAND UNITARY PLAN

3.1 SITE ZONING

The site and the nearest adjacent sites are located within the Business – City Centre Zone as defined in the AUP. Figure 4 below shows the AUP zoning map for the site and surrounding area, with the site boundary shown in blue.



FIGURE 4 AUP ZONING MAP

3.2 AUP RULES

3.2.1 OPERATIONAL NOISE LIMITS

Standard E25.6.8 of the AUP sets out noise limits in the Business – City Centre Zone, reproduced below. The limits applicable to the City Centre Zone are outlined in red.

E25.6.8. Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone

The noise (rating) level and maximum noise level arising from any activity in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone measured or assessed as the incident level on the façade of any building on any other site in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone must not exceed the limits in Table E25.6.8.1 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone below:

Table E25.6.8.1 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone

Time	Business – City Centre Zone	Business – Metropolitan Centre Zone	Business – Town Centre Zone	Business – Mixed Use Zone
7am - 11pm	65 dB L_{Aeq}	65 dB L_{Aeq}	65dB L_{Aeq}	65dB L_{Aeq}
11pm – 7am	60dB L_{Aeq} 65dB at 63 Hz L_{Aeq} 60dB at 125 Hz L_{Aeq} 75dB L_{AFmax}	60dB L_{Aeq} 65dB at 63 Hz L_{Aeq} 60dB at 125 Hz L_{Aeq} 75dB L_{AFmax}	55dB L_{Aeq} 65dB at 63 Hz L_{eq} 60dB at 125 Hz L_{eq} 75dB L_{AFmax}	55dB L_{Aeq} 65dB at 63 Hz L_{eq} 60dB at 125 Hz L_{eq} 75dB L_{AFmax}

(2) The 63Hz and 125Hz octave band limits do not apply to fixed mechanical plant.

3.2.2 CONSTRUCTION NOISE AND VIBRATION LIMITS

CONSTRUCTION NOISE LIMITS

Standard E25.6.28 of the AUP sets out construction noise limits in the Business – City Centre Zone, reproduced below. (Note Table E25.6.28.1 has not been reproduced as it applies only to works of less than 15 days).

E25.6.28. Construction noise levels in the Business – City Centre Zone and the Business – Metropolitan Centre Zone

(1) Construction activities in the Business – City Centre Zone and the Business – Metropolitan Centre Zone must comply with Standard E25.6.27(1) above for any receiver not in a Business – City Centre Zone or a Business – Metropolitan Centre Zone and must not exceed the levels in Table E25.6.28.1 Construction noise levels for construction less than 15 consecutive calendar days duration in the Business – City Centre Zone and the Business – Metropolitan Centre Zone and Table E25.6.28.2 Construction noise levels for construction of 15 consecutive calendar days or more duration in the Business – City Centre Zone and the Business – Metropolitan Centre Zone when measured for any 30 minute period 1m from the façade of any building in the Business – City Centre Zone or the Business – Metropolitan Centre Zone that is occupied during the work.

Table E25.6.28.2 Construction noise levels for construction of 15 consecutive calendar days or more duration in the Business – City Centre Zone and the Business – Metropolitan Centre Zone

Construction of 15 consecutive calendar days or more (total duration of works)		
Time	**$L_{Aeq(30\ min)}$**	**L_{AFmax}**
Monday to Friday 6.30am-10.30pm	75 dB	90 dB
Saturday 7am-11pm	80 dB	90 dB
Sunday 9am-7pm	65 dB	85 dB
All other times (night time)	60 dB	75 dB
All other times in the City Centre Residential Precinct and the Learning Precinct	55 dB	75dB

Where external measurement of construction noise is impractical or inappropriate, the upper limits for the noise measured inside the building will be 20dB less than the relevant levels in Table E25.6.28.1 Construction noise levels for construction less than 15 consecutive calendar days duration in the Business – City Centre Zone and the Business – Metropolitan Centre Zone and Table E25.6.28.2 Construction noise levels for construction of 15 consecutive calendar days or more duration in the Business – City Centre Zone and the Business – Metropolitan Centre Zone above.

CONSTRUCTION VIBRATION LIMITS

Standard E25.6.28 of the AUP sets out construction vibration limits, reproduced below.

E25.6.30. Vibration

(1) Construction and demolition activities must be controlled to ensure any resulting vibration does not exceed:

(a) the limits set out in German Industrial Standard DIN 4150-3 (1999): Structural vibration – Part 3 Effects of vibration on structures when measured in accordance with that Standard on any structure not on the same site; and

(b) the limits in Table E25.6.30.1 Vibration limits in buildings in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500mm of ground level at the foundation of a single storey building.

Table E25.6.30.1 Vibration limits in buildings

Receiver	Period	Peak Particle Velocity Limit millimetres/second
Occupied activity sensitive to noise	Night-time 10pm to 7am	0.3 mm/s
	Daytime 7am to 10pm	2 mm/s
Other occupied buildings	At all times	2 mm/s

Works generating vibration for three days or less between the hours of 7am to 6pm may exceed the limits in Table E25.6.30.1 Vibration limits in buildings above, but must comply with a limit of 5mm/s peak particle velocity in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500mm of ground level at the foundation of a single storey building, where:

(i) all occupied buildings within 50m of the extent of the works generating vibration are advised in writing no less than three days prior to the vibration-generating works commencing; and

(ii) the written advice must include details of the location of the works, the duration of the works, a phone number for complaints and the name of the site manager.

4 OPERATIONAL NOISE ASSESSMENT

4.1 DATA CENTRE

Building 2 is proposed as a purpose-built data centre, incorporating centralised plant and infrastructure to support the wider precinct, with a site IT capacity of approximately 16MW. The facility comprises two data halls, each designed to accommodate approximately 8MW of IT load. The electrical infrastructure incorporates standby generation to support continuity of critical operations.

The data centre will be the dominant operational noise source from the site.

4.1.1 DATA CENTRE NOISE SOURCES

CHILLERS

NDY have been provided with the following information on the chillers:

- 12 air cooled chillers, located on the gantry level (above level 5)
- Indicative selection for these generators is Carrier 30CF air cooled chillers. Carrier data sheets provided by Black & White Engineering advise a sound power level of 98.9 dBA per chiller. The data sheets note the "Noise Treatment Option" as "none" for the given sound data. Spectral data has not been received at this time.
- We have assumed a 1dB reduction in chiller noise can be achieved either through addition of a noise treatment package or use of a "night" mode operation, to be established and implemented during detailed design.
- Worst case operation is of 10 chillers operating at one time, based on advice provided by Black & White Engineering on redundancy provisions.

GENERATORS

NDY have been provided with the following information on the generators:

- 13 generators, located on level 5
- Indicative selection for these generators is Cat 3516E engineers mounted in an enclosure. Black & White Engineering advise a sound pressure level of 80 dBA at 1m. Spectral data for the containerised units has not been received at this time.
- For testing purposes, 1 generator at a time will be tested with all testing to occur during daytime hours.
- In an emergency: 10 generators may operate simultaneously

4.1.2 DATA CENTRE NOISE EMISSION

CHILLERS

Chiller noise emission has been calculated on the following basis:

- Chillers are installed on the rooftop gantry.
- The chiller plant area is surrounded on all four sides by acoustic louvres or solid screening (600mm deep acoustic louvres have been used for calculation). Screening extends approximately 2.2m above the top of the chillers.
- The provided sound power level for the chillers has been applied to an octave band spectrum taken from another chiller to allow more detailed calculations.
- The key receivers for the chiller noise emission are the Lighter Quay apartments and Sofitel hotel:
  - The Lighter Quay apartments at 75-81 Halsey Street is directly across Halsey Street, approximately 28m horizontally from the edge of the chiller plant room, and with the top level approximately 25m vertically below the top of the chiller plant barriers.
  - The Sofitel at 21 Viaduct Harbour Avenue is directly across Hasey Street with approximately the same distances/heights as the Lighter Quay apartments.
- The Travelodge hotel is within the same site as the development and is therefore not a "building on any other site" as defined in E25.6.8 of the AUP. This building is therefore not covered by the noise rules of

E25.6.8. To consider effects, the nearest guestrooms have been checked against the E25.6.8 limits as a reference.

  - The Travelodge hotel is within the 100 Halsey Street site, approximately 9m horizontally from the edge of the chiller plant room, and with the top level approximately 15m vertically below the top of the chiller plant barriers.

From this, we predict:

- Noise levels to the nearest facade of the Lighter Quay apartments and Sofitel Hotel facades of **55 dBA**. This complies with the day-time and night-time operational noise limit.
- Noise levels to the car park facade of the Travelodge of approximately **62 dBA**. This is not a sensitive receiver.
- Noise levels to the nearest Travelodge guestrooms near the southeastern corner of the hotel facing Halsey Street is predicted to be well **below 60 dBA** due to the angle of sound transmission and shielding from the corner of the building. This complies with the day-time and night-time operational noise limits which would be applied at any building on another site, indicating an appropriate control of effects.

We have also considered the chiller noise cumulatively with the generators, included in the generator predictions below.

GENERATORS

Generator noise emission has been calculated on the following basis:

- Generators are installed to the rooftop area below the chiller gantry.
- The generator plant area is enclosed by louvred screens to the east and west (the containerised generators are oriented east-west). We have assumed the same acoustic louvre is installed full height across both the generators and chillers. To the north and south, the generators will have solid screening.
- The key receivers for the generator noise emission are:
  - The Lighter Quay apartments at 75-81 Halsey Street and directly across Halsey Street, and the Sofitel hotel at 21 Viaduct Harbour Avenue, approximately 20m horizontally from the edge of the generator plant room, and with the top level approximately 15m vertically below the generators.
- The Travelodge hotel is within the 100 Halsey Street site, approximately 9m horizontally from the edge of the generator plant room, and with the top level approximately 5m vertically below the generators. As for chiller noise, the generator noise effects to this building on the same site have been considered based on the E25.6.8 noise levels.
- We have assessed generator noise emission in two scenarios:
  - Scenario 1: 1 generator running for testing during day-time hours
  - Scenario 2: 10 generators running during an emergency during any hours

From this, we predict:

Scenario 1: 1 generator testing, day-time

- Noise levels to the nearest facade of the Lighter Quay apartments and Sofitel Hotel of **56 dBA** for a single generator including cumulative noise of chillers operating at the same time. This is within 1 dB of the level predicted for the chillers alone, indicating a single generator test will not significantly increase the noise level. This complies with the day-time operational noise limit (when generators will be tested).

Scenario 2: 10 generators running, all times

- Noise levels to the nearest facade of the Lighter Quay apartments and Sofitel Hotel of **60 dBA**. This complies with the day-time and night-time operational noise limits.

4.1.3 DATA CENTRE ASSESSMENT OF EFFECTS

LIGHTER QUAY APARTMENTS AND SOFITEL HOTEL

Noise effects to the Lighter Quay apartments and Sofitel hotel are mitigated by achieving compliance with the AUP noise emission limits for both typical and emergency operations:

- Chiller operation

- Chiller operation and testing of generators (1 generator tested at a time)
- Chiller operation and emergency operation of generators

TRAVELODGE GUEST ROOMS

The limits of E25.6.8 do not apply to buildings on the same site as the development, but we have applied a good practice approach to assessing effects against equivalent levels.

We consider that the effects of plant noise to the Travelodge car park facade will be appropriately mitigated by the same treatments applied to chillers and generators to comply with the noise limits to the nearest occupied accommodation areas. The car park use is less sensitive to noise than typical buildings, as people only occupy the space transiently. The predicted noise level of 62 dBA to the car park facade is not expected to interfere with the car park use of these areas.

Noise levels to the nearest Travelodge guest rooms are predicted to be the same or lower than the noise levels at the Lighter Quay apartments, due to the shielding from the corner of the Travelodge building and the angle of transmission (this includes any contribution from reflections off the Lighter Quay apartments). The effects will therefore be similar or less than effects at Lighter Quay, which are controlled by compliance with E25.6.8.

4.2 OFFICE BUILDINGS

The office buildings will be serviced by conventional HVAC, electrical, fire, and hydraulic plant systems, such as:

- Roof-mounted air-cooled chillers,
- Ducted air handling units,
- Extract and supplementary outdoor air fans,
- Hot water heat pumps.

These equipment types are common on office buildings throughout the Auckland CBD and Wynyard Quarter areas. Conventional acoustic mitigation measures (to be established through the design development of these buildings) will be suitable to control noise to meet the AUP operational noise limits. These treatments may include:

- Acoustic louvres around plant equipment,
- Specification of attenuators and/or lined ductwork to AHUs and fans,
- Appropriate bounding constructions to enclosed plant rooms,
- Incorporation of sound-absorptive linings to plant areas where required.

For building 1 in particular, the equipment selections and mitigations will be required to control cumulative effects when combined with the building 2 noise emission, especially to receivers to the east. This will be achievable as the size, capacity, and number of pieces of equipment for building 1 will be significantly less than required for building 2, and building 1 will have more flexibility in operating modes and times (such as reduced load during night periods for office uses).

5 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

5.1 HOURS OF OPERATION

The hours of operation for construction will be in general accordance with the working hours of 7:00 am to 6:00 pm Monday to Friday. Non noisy works (such as fitout works) may occur outside of these hours.

5.2 EXPECTED CONSTRUCTION ACTIVITIES

The construction methodology is expected to generally include

- Piling, using a bored piling rig
- Excavation of basements
- Erection of structures
- Interior fitout works

Based on our understanding of the project, the following construction activities are expected to produce the highest noise and vibration levels:

- Excavation
- Piling (bored)
- Concrete pumping/pouring
- Crane (electric) – this will not be a significant noise source, especially compared to a diesel crane
- Truck movements

The closest distance from the edge of each proposed building to the nearest receptors is shown in Figure 5 below:



FIGURE 5 RECEPTOR DISTANCES

5.3 CONSTRUCTION NOISE

5.3.1 CONSTRUCTION ACTIVITY NOISE LEVELS

Table 1 shows the expected loudest construction activity sources.

The minimum set-back distances to meet the 75 dBA L_{eq} noise limits during the proposed daytime construction hours, assuming no mitigation measures are in place, are shown below in Table 1. Setback distances apply from the construction noise sources to the receptor location, 1m from the receiver facade.

We have included several different sizes of excavator to provide an indication of the effects of using smaller excavators on setback distances.

TABLE 1 EXPECTED NOISY CONSTRUCTION ACTIVITIES

EQUIPMENT	SOUND PRESSURE LEVEL AT 10 M (SPL) (DB L_{AEQ})	INFORMATION SOURCE	MINIMUM SETBACK DISTANCE (M)
110t rotary bored piling rig	83	BS[1] C.3 Ref, 14	37
40t dumper (Caterpillar 740B)	78	Goodman[2]	21
40t excavator, 226kW	79	BS[1] C2, Ref 14	22
30t excavator, 170kW	75	BS[1] C2, Ref 16	14
14t excavator, 66kW	69	BS[1] C2, Ref 25	8
Vibratory roller 8.9t / 98kW	75	BS[1] C.5, Ref 20	14
Vibratory roller, 3t / 20kW, max pass-by	73	BS[1] C.5, Ref 27	11

[1]*BS 5528-1:2009 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*

[2]*Goodman Contractors Certification of Sound Power Levels report no. RP 002 2013641W, 11/12/2013*

Note: Whilst the above list represents the loudest equipment expected, other equipment may be used without necessarily breaching the overall noise limits.

5.3.2 ASSESSMENT LOCATIONS

The assessment point for construction noise under E25.6.28 is "1m from the facade of any building … that is occupied during the work". For all receptors on other sites (i.e. outside the 100 Halsey Street site), 1m from the facade is the most appropriate assessment location and we propose to follow the AUP as written.

For the Travelodge on 100 Halsey Street, we propose a modified assessment point at 1m from the facade of the occupied areas of the building, i.e. 1m from the northern and eastern facades. The southern and western facades of the Travelodge which face directly towards the construction works are car parking, and these car park areas are clearly less sensitive to construction noise effects.

5.3.3 PILING NOISE EFFECTS

Use of a bored piling rig is expected to be the best practical option to minimise noise effects while constructing the pile sizes required to support the buildings in the proposed development.

Based on the minimum setback distances, minimum receptor distances, and overlooking neighbouring buildings we expect that it will not be practical for piling activities to comply to all receptors at all times.

Estimated piling noise levels to the relevant receptors are given in Table 2:

TABLE 2 PILING NOISE

RECEPTOR	MINIMUM DISTANCE TO PILING ACTIVITY	PREDICTED PILING NOISE LEVEL	EXCEEDANCE	DURATION (PER RECEIVER)
139 Packenham Street West and 124 Halsey Street – offices	20 m	80 dBA L_{eq}	5 dB	10 days
21 Viaduct Harbour Avenue and 75-81 Halsey Street – residential and hotel	21 m	80 dBA L_{eq}	5 dB	10 days
30 and 58 Gaunt Street – offices	18 m	81 dBA L_{eq}	6 dB	10 days

The estimated period applies per construction stage. If site staging results in two adjacent buildings being constructed at different times, there may be two periods of piling noise (one for each stage) with a significant gap of several months to years between these periods.

We propose that these piling noise levels are incorporated into an appropriate resource consent condition seeking a relaxation in noise limits. We recommend the following additional mitigation to control the effects of this piling noise to the most sensitive residential and hotel receptors.

- Piling activities which can not comply with the noise limits set out in E25.6.28 of the AUP to the receptors at 21 Viaduct Harbour Avenue and 75-81 Halsey Street shall occur only between 9am to 5pm, Monday to Friday.

5.3.4 EXCAVATION NOISE EFFECTS

Based on the setback distances given in Table 1, we expect that construction noise from excavation activities will be able to comply with the AUP noise limits based on use of appropriate excavator sizes, i.e. avoid using a large excavator within its minimum setback.

5.3.5 OTHER NOISE EFFECTS

Noise effects from construction activities such as truck arrivals and departures, use of concrete pumps, and erection of structure are expected to be able to comply with the AUP noise limits based on:

- Appropriate location of truck loading/loading areas and concrete pumps within the site to stay beyond the minimum setback distances.
- Typical good site noise management practices (discussed in Section 5.3.8)

5.3.6 NZ BUS DEPOT NOISE EFFECTS

The existing NZ Bus occupancy on the site will remain initially, progressively shrinking as the proposed buildings are constructed.

The majority of the NZ Bus site is outdoor bus parking spaces. The AUP construction noise limits apply at 1m from building facades, so will not apply to the outdoor areas. Nonetheless, we have recommended some mitigation (in the form of hoarding) to reduce construction noise impacts to the outdoor areas while allowing the construction to proceed.

We expect the following mitigations will be appropriate:

- Provide hoarding between construction areas and occupied NZ Bus areas, as described in 5.3.7.
- As far as reasonably practical, follow the setback areas from Table 1 for activities near the NZ Bus Depot building.
- Where setback distances cannot be met, consider using smaller equipment or implementing localised controls (such as localised barriers) if practical.

5.3.7 SITE HOARDING

Given the heights of the surrounding receivers, site hoardings will have limited effectiveness at controlling noise. We recommend that a standard site hoarding constructed from plywood or similar is erected around the site boundary to minimise noise impacts to the lower levels of neighbouring sites and to the surrounding streets.

For the staged developments of buildings near outdoor NZ Bus Depot spaces within the 100 Halsey Street site (while still occupied by NZ Bus), a taller barrier should be implemented to minimise noise effects. This should be a minimum 2.4 m high non-perforated site hoarding of at least 10 kg/m^2 (e.g. plywood, cement sheet, or similarly approved).

5.3.8 CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

Given the size of the site and number of receivers in the vicinity of the works, we recommend that a Construction Noise and Vibration Management Plan (CNVMP) should be produced prior to commencement of works. This has been included in the proposed conditions. A draft CNVMP has been produced as part of the resource consent submission.

5.3.9 GENERAL NOISE MITIGATION MEASURES

This section outlines general noise mitigation measures to be used when carrying out construction activities on site. The following list is not exhaustive, contractors are to use good-practice to minimise noise where reasonably practicable. General noise mitigation measures include:

- Localised noise barriers around particularly noise construction activities (when necessary)
- Selection of quiet / muffled equipment
- Time management of noisy construction equipment (where necessary)
- Permanently installed equipment should be located away from the neighbouring buildings to minimise noise emissions to nearby receivers.
- Equipment that is used intermittently will be shut down in the intervening periods between works;
- Trucks and other vehicles shall use non-tonal reversing alarm ("white noise" alarms);
- Vehicle warning devices such as horns not to be used as signalling devices;
- Dropping equipment/materials from height or into trucks is to be avoided
- Turn off vehicles when not in use, particularly when they are parked on the street/loading bays.

In addition to the above measures, affected neighbours should also be advised when particularly noisy activities are to be carried out that may approach the permitted limits. Affected neighbours should also be given the contact details of the nominated person who will be responsible for the implementation for the CNVMP.

A complaints record shall be kept on site and in the event of a complaint relating to noise being received, the identified responsible person shall note that nature of the complaint and advise the complainant that the matter will be investigated as soon as possible. If activities are identified that are considered to be generating excessive noise, the identified responsible person shall take appropriate practicable action to reduce noise to a reasonable level and contact the complainant to advise of the outcomes of the investigation and to make a written note of the even and outcome.

5.4 VIBRATION

Due to the construction types proposed, we anticipate the only significant vibration-producing activity will be the use of vibratory rollers (if required on site).

The setbacks from the following other activities are expected to be sufficient to achieve construction vibration compliance to all receivers:

- Excavation
- Piling. The closest piles to the receptors are predicted to comply based on the bored piling methodology

The table below lists equipment types and minimum setback distances from the equipment to the foundation of the affected building. We have provided two options for vibratory rollers, a larger and a smaller, to provide flexibility when working close to the site boundary.

TABLE 3 HIGH VIBRATION ACTIVITIES

EQUIPMENT	MINIMUM SETBACK DISTANCE (M) FOR COMPLIANCE WITH 2 MM/S PPV[1]	MINIMUM SETBACK DISTANCE (M) FOR COMPLIANCE WITH 5 MM/S PPV[1]
Vibratory roller 13t / 106kW (Cat C13)	45	22
Vibratory roller, 3.7t / 36kW (Cat CB34B)	21	10

[1]*Predictions based on BS 5528-1:2009 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*

Note: Whilst the above list represents equipment that produces the highest expected vibration levels, other equipment may be used without necessarily breaching the overall vibration limits.

As far as practical, equipment sizes and operating areas should be selected to comply with the minimum setbacks for 2mm/s PPV as per the second column of the table. If any vibratory compaction works are required within shorter distances, the following steps should be taken:

- Adhere to the setback distances given for compliance with 5 mm/s PPV
- Follow the required consultation as per E25.6.30(1)(b) for works which can not comply with 2 mm/s PPV
- Confine these works to no more than 3 days

Given that most receiving locations are across the surrounding roads, we expect that managing vibration from compaction to these setbacks will be readily achievable.

5.4.1 TIMING OF HIGH VIBRATION ACTIVITIES

No high vibration activities should be carried out before 7:00 am.

6 PROPOSED CONDITIONS OF CONSENT

A number of acoustic consent conditions have been proposed to align with the outcomes of this assessment. These have been coordinated into the consolidated proposed conditions submitted by the applicant.

CONTACT US

AUSTRALIA

ADELAIDE

T: +61 8 8290 6800
E: adelaide@ndy.com

BRISBANE

T: +61 7 3120 6800
E: brisbane@ndy.com

CANBERRA

T: +61 2 6295 1788
E: canberra@ndy.com

GOLD COAST

T: +61 7 5512 1235
E: goldcoast@ndy.com

MELBOURNE

T: +61 3 9862 6800
E: melbourne@ndy.com

PERTH

T: +61 8 9281 6800
E: perth@ndy.com

SYDNEY

T: +61 2 9928 6800
E: sydney@ndy.com

CANADA

VANCOUVER

T: +1 604 734 9338
E: vancouver@ndy.com

NEW ZEALAND

AUCKLAND

T: +64 9 307 6596
E: auckland@ndy.com

WELLINGTON

T: +64 4 471 0151
E: wellingtonadmin@ndy.com

UNITED KINGDOM

LONDON

T: +44 20 7553 9494
E: london@ndy.com

IRELAND

DUBLIN

T: +353 1 264 6995
E: dublin@ndy.com

To find out more about NDY go to **ndy.com** or follow us on LinkedIn

CONFIDENTIAL INFORMATION: This document is given with the understanding that the information within is private. Please keep it confidential and don't share with anyone else. Take proper care to make sure that others can't see or access this document. It's meant only for you.

DISCLAIMER OF LIABILITY: The information in this document is provided under direction of the client and follows their instructions. Any third party reviewing the content should make their own assessment on whether the information is appropriate to them. NDY makes no assurance the information meets the needs of a third party and does not accept liability for any loss or damage incurred by third parties as a result of using the information.

COPYRIGHT © NDY Group 2026: No part of this document can be copied or sent without written permission from NDY. All rights are reserved.