

VOLUME 4

# South Frequent Transit Network

## Assessment of Construction Noise and Vibration Effects

October 2023

Version 1.0

## Document Status

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## Revision Status

Version	Date	Reason for Issue
1.0	13/10/2023	Final for lodgement

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## Glossary of Defined Terms and Acronyms

We note that ‘Takaanini’ (with double vowels) is used throughout the Report Acknowledging the ongoing kōrero and guidance from Manawhenua on the cultural landscape. ‘Takanini’ is used where reference is made to a specific and existing named place (e.g., Takanini Road, Takanini Town Centre etc.). Manawhenua is also used throughout the Report as while gifting the programme name as Te Tupu Ngātahi, Manawhenua confirmed this was an appropriate spelling (capital ‘M’ and one word). Notwithstanding this, the term is spelled as two words in other fora and the proposed designation conditions – Mana Whenua.

Acronym/Term	Description
<b>AEE</b>	Assessment of Effects on the Environment
<b>AC</b>	Auckland Council
<b>AT</b>	Auckland Transport
<b>AUP:OP</b>	Auckland Unitary Plan Operative in Part
<b>BS</b>	British Standard
<b>CNVMP</b>	Construction Noise and Vibration Management Plan
<b>FTN</b>	Frequent Transit Network
<b>MDRS</b>	Medium Density Residential Standards
<b>NIMT</b>	North Island Main Trunk
<b>NoR</b>	Notice of Requirement (under the Resource Management Act 1991)
<b>NoR 1</b>	Great South Road FTN Upgrade
<b>NoR 2</b>	Great South Road Upgrade (Drury section)
<b>NoR 3</b>	Takaanini FTN – Weymouth, Alfriston, and Great South Road Upgrades
<b>NoR 4</b>	Takaanini FTN – Porchester Road and Popes Road Upgrades
<b>NPS-UD</b>	National Policy Statement on Urban Development
<b>PC78</b>	Plan Change 78 to the Auckland Unitary Plan: Operative in Part
<b>PPV</b>	Peak Particle Velocity
<b>The Project</b>	The Four NoRs proposed to authorise transport upgrades along key sections of roads which fall within the South FTN network (subject of this report / application).
<b>RMA</b>	Resource Management Act 1991
<b>Schedules</b>	Site Specific or Activity Specific Construction Noise and Vibration Management Schedules
<b>SH1</b>	State Highway 1

Acronym/Term	Description
South FTN	South Frequent Transit Network

## Executive Summary

This report assesses the construction noise and vibration from the four proposed Notices of Requirement (**NoRs / the Project**) for the South Frequent Transit Network (**South FTN**) against relevant standards and guidelines. Where necessary, we have investigated and recommended mitigation.

Construction noise and vibration can be mitigated and managed through the Construction Noise and Vibration Management Plan (**CNVMP**) proposed in the designation conditions to generally comply with the applicable noise and vibration criteria across all NoRs. Exceedances of the criteria could occur intermittently over a short duration if high noise or vibration generating equipment is used adjacent to occupied buildings. Any future buildings will need to be assessed at the time of construction and mitigation and management determined through the CNVMP. Where an exceedance is predicted at any receiver that exists at the time of construction, the effects will be mitigated and managed through the CNVMP and site specific or activity specific construction noise and vibration management schedules (**Schedules**).

The construction boundary is assumed to be at the edge of the proposed alignment.

### NoR 1 – Great South Road FTN Upgrade

The Great South Road Intersections cover eight intersection upgrades and the replacement of the Otūwairoa / Slippery Creek bridge for the Great South Road FTN route between Manukau and Drury.

The closest existing receivers are approximately 2m away from the construction boundary. With mitigation in place, the most affected receivers could still receive intermittent noise levels up to 90 dB  $L_{Aeq}$  when works are immediately adjacent. However, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works, mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

74 existing dwellings and 14 commercial type buildings may experience vibration levels above 5mm/s Peak Particle Velocity (**PPV**), exceeding the daytime Category B criterion, if the roller compactor is used on the construction boundary in the closest position to them. Mitigation, such as the use of non-vibratory compaction equipment within 8m of buildings, is recommended to avoid potential cosmetic damage.

### NoR 2 – Great South Road Upgrade (Drury section)

The Great South Road (Drury section) upgrades between Waihoehoe Road and SH1 Drury Interchange include widening lanes, constructing active mode facilities, and the replacement of the Hingaia Stream bridge. The construction area will be adjacent to both the Business – Light Industry Zone and the Business – Metropolitan Centre Zone. Construction noise received in the Business – Metropolitan Centre Zone is subject to less stringent daytime noise criteria compared to noise received in all other zones.

The closest receivers are located approximately 4m away from the construction boundary. With mitigation in place, the most affected receivers could still receive intermittent noise levels of up to 85 dB  $L_{Aeq}$  when works are immediately adjacent. However, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the

works, mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

One commercial type building may experience vibration levels above the daytime Category B criterion if the roller compactor is used on the construction boundary in the closest position to them. Mitigation, such as the use of non-vibratory compaction equipment within 8m of buildings, is recommended to achieve compliance.

### NoR 3 – Takaanini FTN – Weymouth, Alfriston, and Great South Road Upgrades

The Alfriston Road upgrades along Weymouth Road and Alfriston Road, and between Alfriston Road and Myers Road include road widening, construction of active mode facilities, intersection upgrades, and stormwater treatment wetlands, and replacement of bridges over the North Island Main Trunk (NIMT) and State Highway 1 (SH1).

The closest receivers are located approximately 2m away from the construction boundary. With mitigation in place, the most affected receivers could still receive intermittent noise levels of up to 90 dB  $L_{Aeq}$  when works are immediately adjacent. However, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works, mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

76 existing dwellings and 12 commercial type buildings may experience vibration levels above the daytime Category B criteria if the roller compactor is used on the construction boundary in the closest position to them. Mitigation, such as the use of non-vibratory compaction equipment within 8m of buildings, is recommended to avoid potential cosmetic damage.

### NoR 4 – Takaanini FTN – Porchester and Popes Road Upgrades

The Porchester Road and Popes Road upgrades include widening of roads for active mode facilities, seven intersection upgrades, and stormwater treatment wetlands.

The closest receivers are located approximately 2m away from the construction boundary. With mitigation in place, the most affected receivers could still receive intermittent noise levels of up to 90 dB  $L_{Aeq}$  when works are immediately adjacent. However, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works, mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

98 existing dwellings and one commercial type building may experience vibration levels above the daytime Category B criteria if the roller compactor is used on the construction boundary in the closest position to them. Mitigation, such as the use of non-vibratory compaction equipment within 8m of buildings, is recommended to avoid potential cosmetic damage.

# 1 Introduction

## 1.1 Purpose and scope of this report

This report has been prepared to inform the Assessment of Effects on the Environment (**AEE**) for Notices of Requirement (**NoR**) being sought by Auckland Transport (**AT**) for the South Frequent Transit Network (**FTN**) under the Resource Management Act 1991 (**RMA**). Four NoRs are proposed to authorise transport upgrades along key sections of roads which fall within the South FTN network. The transport upgrades authorised by the NoRs are referred to in this report as the **Project**.

Specifically, this report considers the actual and potential effects associated with the construction and operation of the Project on the existing and likely future environment as it relates to construction noise and vibration effects and recommends measures that may be implemented to avoid, remedy and/or mitigate these effects.

This report should be read alongside the AEE, which contains further details on the history and context of the Project. The AEE also contains a detailed description of works to be authorised within the NoR, and the typical construction methodologies that will be used to implement this work. These have been reviewed by the author of this report and have been considered as part of this assessment of construction noise and vibration effects. As such, they are not repeated here. Where a description of an activity is necessary to understand the potential effects, it has been included in this report for clarity.

New designations are sought for each of the four described NoR areas. This report only considers noise and vibration effects resulting from construction activities within each of the NoRs. It is anticipated that construction activities required for works located outside the NoRs, if necessary, will be consented as a part of a separate authorisation process. Operational noise effects are addressed in the separate Traffic Noise Assessment.

## 1.2 Report Structure

In order to provide a clear assessment of the NoRs, this report follows as appropriate, the structure set out in the AEE. This report contains an assessment of the actual and potential effects of the Project as a whole (the four NoRs). Where appropriate, measures to avoid, remedy or mitigate effects are recommended. The sections of this report are arranged accordingly. Table 1-1 below provides an overview of the report structure and where the description of effects can be found in this report.

The report follows a nested structure where each of the four proposed NoRs is assessed.

**Table 1-1: Report Structure**

Report Section #	Extent Assessed (Route and/or NoR)
6	All NoRs
7	NoR 1 – Great South Road FTN Upgrade
8	NoR 2 – Great South Road Upgrade (Drury section)
9	NoR 3 – Takaanini FTN – Weymouth, Alfriston, and Great South Road Upgrades

Report Section #	Extent Assessed (Route and/or NoR)
10	NoR 4 – Takaanini FTN – Porchester Road and Popes Road Upgrades

### 1.3 Preparation for this report

Work undertaken for this report commenced in July 2023. In summary, the preparation for this report has included:

- Review of information from other experts, namely traffic, construction, design and planning amongst others;
- A site visit of all NoRs on 17th July 2023; and
- Ambient noise level surveys in the Project areas (refer Section 5.2).

Where information we relied on was provided by other experts, this is noted in the report.

## 2 Project Description

### 2.1 Context – South FTN Network

As described further in the AEE, the South FTN is one of the transport works packages proposed for South Auckland between Manukau and Drury as part of Te Tupu Ngātahi Supporting Growth (**Te Tupu Ngātahi**) programme.<sup>1</sup> The South FTN is in turn part of a wider planned multi-modal transport network intended to support growth and enable mode shift in South Auckland.

The South FTN comprises a range of road upgrades including bus priority measures, new and upgraded active mode facilities, and intersection improvements along existing arterial road corridors in South Auckland. In particular, the proposed road upgrades provide for:

- Operation of high-quality FTN<sup>2</sup> bus services along Great South Road between Manukau and Drury (the Great South Road FTN route);
- Operation of high-quality FTN bus services along existing roads between Manurewa, Takaanini, and Papakura (the Takaanini FTN route); and
- Urbanisation of adjoining key connections to FTN routes – Popes Road West, and the Drury section of Great South Road between Waihoehoe Road and SH1.

The total extent of the South FTN network is shown in Figure 2-1.

### 2.2 The NoRs – proposed spatial extent

Of the full South FTN network extent shown in Figure 2-1, only a portion falls within the NoRs/Project (see Figure 2-2). This is because the proposed corridor upgrades do not always require additional land take, can be undertaken within the existing road reserve, and therefore do not require new designations<sup>3</sup>.

Accordingly, this assessment is focussed on the activities proposed to be authorised by the four NoRs. The NoRs seek generally to provide for road widening to accommodate bus priority measures, walking, and cycling facilities, key intersection upgrades, replacement of existing bridges and other associated works. These are described in more detail in Table 2-1, and the extents are shown in Figure 2-2.

Further detail on the proposed activities and works in each NoR are provided in the AEE.

<sup>1</sup> The Programme is a collaboration between Auckland Transport (**AT**) and Waka Kotahi NZ Transport Agency (**Waka Kotahi**) to investigate, plan, and undertake route protection for the strategic transport networks needed to support Auckland's growth over the next 30 years.

<sup>2</sup> FTN services are defined in AT's Regional Public Transport Plan (RPTP) as bus routes operating at least every 15 minutes between 7am-7pm, 7 days-a-week, often supported by priority measures such as bus or transit lanes.

<sup>3</sup> Some limited additional third-party land may be required in the future to provide for intersection upgrades between Takaanini and Ōpaheke. The relative cost-benefit assessment of these areas did not favour route protection at this time given the projected time scale for future urban growth in this area.

Table 2-1: South FTN – Summary of NoRs

NoR reference	Project component	Description
NoR 1	Great South Road FTN Upgrade	<ul style="list-style-type: none"> <li>Road upgrades and transport upgrades providing for the Great South Road FTN route along Great South Road between Manukau and Drury.</li> <li>NoR comprises eight separate areas along Great South Road (see Figure 2-2) providing for bus priority measures, walking and cycling facilities, key intersection upgrades, replacement of the existing Otūwairoa / Slippery Creek bridge, and stormwater management devices.</li> </ul>
NoR 2	Great South Road Upgrade (Drury section)	<ul style="list-style-type: none"> <li>Road upgrades and transport upgrades providing for upgrade of a 520m section of Great South Road in Drury between Waihoehoe Road and the SH1 Drury Interchange.</li> <li>NoR enables road widening to provide for four lanes, active mode facilities, replacement of the existing Hingaia Stream bridge, and stormwater management devices.</li> </ul>
NoR 3	Takaanini FTN – Weymouth, Alfriston, and Great South Road Upgrades	<ul style="list-style-type: none"> <li>Road upgrades and transport upgrades providing for the Takaanini FTN route along Weymouth and Alfriston Roads between Selwyn Road and Saralee Drive; and for an adjoining section of the Great South Road FTN route between Halver Road and Myers Road.</li> <li>NoR enables road widening to accommodate bus priority measures, walking and cycling facilities, key intersection upgrades, replacement of existing bridges along Weymouth Road over the NIMT and Alfriston Road over SH1, and stormwater management devices.</li> </ul>
NoR 4	Takaanini FTN – Porchester Road and Popes Road Upgrade	<ul style="list-style-type: none"> <li>Road upgrades and transport upgrades providing for the Takaanini FTN route along Porchester Road generally between Alfriston Road and Walters Road; and for the urbanisation of Popes Road generally between Takanini School Road and Porchester Road.</li> <li>NoRs provide for urbanisation of both corridors – two traffic lanes, walking and cycling facilities, key intersection upgrades, and stormwater management devices.</li> </ul>

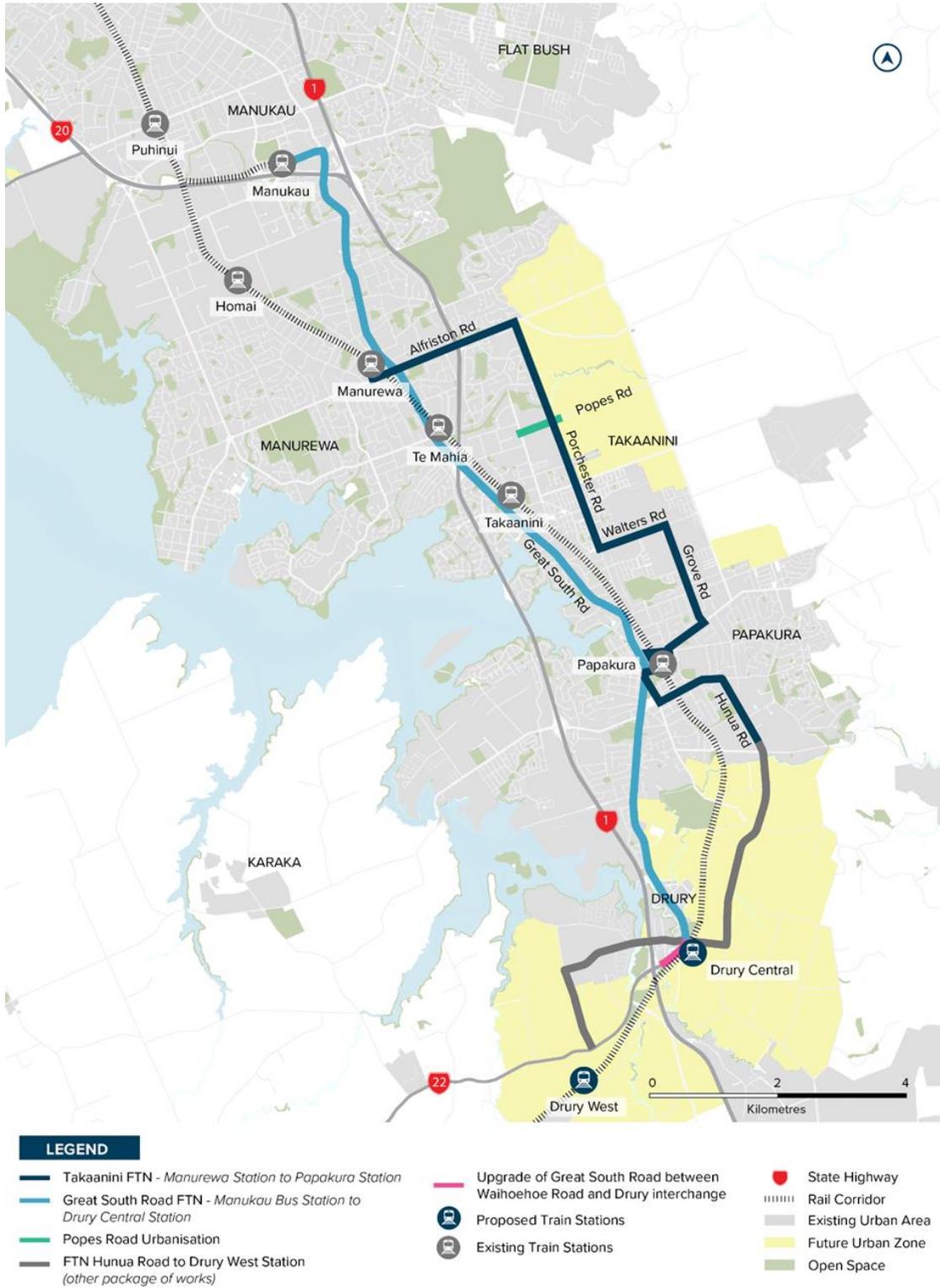


Figure 2-1: South FTN – full network extent



Figure 2-2: South FTN – NoR extents (the Project)

## 3 Assessment criteria

### 3.1 Construction noise

#### 3.1.1 Criteria

The following guidelines and standards have been reviewed for the assessment of construction noise:

- Auckland Unitary Plan: Operative in Part (**AUP:OP**), specifically rules E25.6.27 (relating to construction noise in all zones except the City Centre and Metropolitan Centre zones), E.25.6.28 (relating to construction noise in the Business – Metropolitan Centre Zone), and E25.6.29 (relating to construction noise in the road corridor); and
- NZS 6803:1999 Acoustics – Construction Noise.

Table 3-1 and Table 3-2 below set out the recommended construction noise criteria for works in all zones except the Business – Metropolitan Centre zone. These criteria align with the long duration (more than 20 weeks) noise criteria of NZS 6803, and largely reflect the AUP:OP criteria.

**Table 3-1: Construction noise criteria for occupied sensitive receivers**

Day of the week	Time period	Noise level >20 weeks	
		dB L <sub>Aeq</sub>	dB L <sub>Amax</sub>
<b>Weekdays</b>	6:30 – 7:30	55	75
	7:30 – 18:00	70	85
	18:00 – 20:00	65	80
	20:00 – 06:30	45	75
<b>Saturdays</b>	6:30 – 7:30	45	75
	7:30 – 18:00	70	85
	18:00 – 20:00	45	75
	20:00 – 06:30	45	75
<b>Sunday and public holidays</b>	6:30 – 7:30	45	75
	7:30 – 18:00	55	85
	18:00 – 20:00	45	75
	20:00 – 06:30	45	75

**Table 3-2: Construction noise criteria for all other occupied receivers**

Time period	Noise level dB L <sub>Aeq</sub> >20 weeks
07:30 – 18:00	70
18:00 – 07:30	75



NZS 6803 anticipates that at times construction noise cannot be made to comply with the recommended criteria. Statements such as “*construction noise from any site should not generally exceed the numerical noise limits*”<sup>4</sup> suggest that intermittent exceedances are not unreasonable, as long as the Best Practicable Option (**BPO**) has been applied to the management and mitigation of that construction noise.

The AUP:OP in its Objectives and Policies also appropriately anticipates exceedances from construction noise and states:

*“(4) Construction activities that cannot meet the noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects.”*

and

*“(10) Avoid, remedy or mitigate the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to:*

*[...]*

*The practicability of complying with permitted noise and vibration standards.”*

Whether the duration of a construction activity that exceeds the standards can be considered reasonable, depends on site specific circumstances, and may vary from site to site and activity to activity. For instance, where daytime noise standards are exceeded for several days, but neighbouring residents are not at home, no one would be affected and therefore mitigation may not be required beyond communication with the residents.

If night-time works occur, these will likely only happen for a few nights in any one location. In that instance, this may be acceptable if residents have been informed and a clear timeframe has been provided. However, if night-time works are expected to be ongoing for several consecutive nights, and at a noise level that affects residents’ ability to sleep, then alternative strategies may need to be implemented, such as offering temporary relocation for those affected residents.

## 3.2 Construction Vibration

The main objective of controlling construction vibration is to avoid vibration-related damage to buildings, structures, and services, in the vicinity of the works. Any adverse effects of construction vibration on human comfort would typically only be experienced for short durations, for most types of construction work.

It should be noted that the level of vibration perceived by humans, and the level of vibration that is likely to result in annoyance for some people, are magnitudes lower than the level of vibration capable of damaging structures. This means that vibration levels which readily comply with the building damage criteria will likely cause annoyance and adverse reaction from building occupants who mistakenly believe that their building is sustaining damage.

The following guidelines and standards have been reviewed for the assessment of construction vibration:

<sup>4</sup> NZS 6803:1999 Acoustics – Construction Noise, Section 7.1.2.

- AUP:OP rule E25.6.30 relating to construction vibration, amenity and avoidance of any damage to buildings;
- German Standard DIN 4150-3 (1999) Structural vibration – Part 3 Effects of vibration on structures; and
- British Standard (**BS**) 5228-2: 2009 “Code of practice for noise and vibration control on construction and open sites”.

Rule E25.6.30 of the AUP:OP relates to construction vibration and contains criteria for both building damage and amenity. The building vibration criteria are based on the German Standard DIN 4150-3:1999 "Structural Vibration - Part 3: Effects of Vibration on Structures". This Standard is conservative and designed to avoid all (including cosmetic) damage to buildings. Significantly higher limits would be applied if damage to structural foundations was the only consideration.

The amenity criteria act as trigger levels for consultation and communication.

Table 3-4 below shows the recommended vibration criteria for all NoRs. These criteria are based on the AUP:OP.

**Table 3-4: Vibration limits at all buildings**

Receiver	Details	Category A	Category B
<b>Occupied activities sensitive to noise</b>	Night-time 2000h-0630h	0.3 mm/s PPV	2mm/s PPV
	Daytime 0630h-2000h	2mm/s PPV	5mm/s PPV
<b>Other occupied buildings</b>	Daytime 0630h-2000h	2mm/s PPV	5mm/s PPV
<b>All other buildings</b>	At all times	Tables 1 and 3 of DIN4150-3:1999	

The two category criteria are to facilitate a progressive management response to the increasing risks and effects during construction.

Category A sets the criteria for the amenity effects where vibrations may be perceived by occupants within a building and is an indicator of when communication and consultations should be initiated to manage effects. The Category A criteria aim to generally avoid annoyance of building occupants.

If the Category A criteria cannot be practicably achieved, the focus shifts to avoiding building damage rather than avoiding annoyance by applying the Category B criteria. Building damage is unlikely to occur if the Category B criteria are complied with. If predictions indicate that the Category B criteria may be exceeded, building condition surveys must be carried out prior to works commencing and vibration monitoring must be carried out during the works. This allows an assessment of and response to any effects on buildings.

## 4 Assessment Methodology

A consistent approach has been adopted for the Project as set out in this section. Any buildings within the proposed designation footprint are assumed to be removed, as confirmed by the Project Team, and are not assessed.

Construction noise setback distances and vibration emission radii have been determined (based on assumptions of construction activities and equipment) for each of the NoRs.

The construction boundary is assumed to be the edge of the proposed alignment. Affected receivers have been identified using construction noise setback distances and vibration emission radii. The construction noise setback distances and vibration emission radii were used to determine where any potential construction noise and vibration exceedances of the relevant criteria could occur. Potential effects of construction noise and vibration have then been assessed and construction management and mitigation measures identified where appropriate. To avoid and/or minimise exceedances of the Project construction noise and vibration criteria, BPO mitigation and management measures should be utilised.

This report proposes a framework for construction noise and vibration management such that the most effective and practicable methods for mitigation will be planned and implemented, taking into account the extent of predicted effects. At the core of this framework is the Construction Noise and Vibration Management Plan (**CNVMP**) as discussed in Section 11.1, which will be developed prior to commencement of construction, and updated as necessary throughout the duration of construction.

### 4.1 Buildings to be removed

We have assumed that all existing buildings inside the designation areas will be removed. We have therefore not assessed the potential effects on these buildings. Should they be retained, they will need to be assessed and mitigation will need to be determined where necessary, during production of the CNVMP. Table 4-1 lists buildings inside designation boundaries of each NoR which are not assessed.

**Table 4-1: Buildings inside designation areas (not assessed)**

NoR	Address
1	322, 1/324, 330 Great South Road, Ōpaheke 1/70, 1-2/68 Great South Road, Manurewa 135 Great South Road, Drury 9, 64, 72 Great South Road, Manurewa
2	1, 1/1 Firth Street 280, 280A, 280B Great South Road, Drury
3	1/110, 1/19, 1/32, 1/77, 1/79, 1/81, 1/84, 11A, 125, 127, 141, 141A, 1-8/17, 2/77, 2/81, 23/110, 30A, 36A, 38, 40, 42, 50, 52B, 52C, 54, 59C, 6/15, 60, 7, 7A, 70, 76, 86, 90, 92 Alfriston Road 44 Claude Road

NoR	Address
	1/236A, 1/241, 1/243, 1/249, 1/251, 1-2/247, 207-209, 228, 231, 237, 253, 255, 257 Great South Road, Manurewa 25 Index Place 1/4, 1B, 1C, 2/4, 2A, 2B Scotts Road 1 Shifnal Drive 2, 4, 6, 10, 12, 1-3/11, 15, 16, 18 Weymouth Road
4	1-7 Whakarato Way

## 4.2 Construction methodology

An indicative construction methodology has been provided by the Project team to inform the assessment of each of the NoR.

The outline is based on a generic transport construction project and has not taken into consideration any project specific scope of works, constraints or staging requirements that may be applicable for each project. The indicative construction programme assumes a linear construction sequence.

The indicative construction methodology for the projects is as follows:

### Site establishment

- Site access construction;
- Tree removal and vegetation clearance;
- Remove footpath, streetlights, grass verge berm;
- Property/ building modification or demolition, including fencing, driveways and gates;
- Install environmental controls e.g. silt fencing, sediment retention ponds;
- Implement traffic management to establish the construction zones;
- Establishment of site compounds and construction areas
- Service protection works; and
- Construct access tracks/ haul roads (if any).

### Early works

- Site/ ground investigations;
- Relocation of utilities services; and
- Temporary works establishment, e.g. road diversion, closures, minor improvements.

### Main works

- Topsoil stripping and earthworks (cut and fill) to formation level;
- Construct new drainage and culvert facilities;
- Bridge construction works (if any) as follows:
  - Construct substructure including foundations, piles, piers and abutments;
  - Construct superstructure including bridge beams and deck construction;

- Complete bridge finishing works, approaches, barriers, landscaping;
- Retaining wall construction (if any);
- Construct new pavement and widening works in available areas;
- Move traffic to newly constructed pavement areas and continue with the remaining widening works;
- Construct lane reconfiguration, including pavement reconstruction and/or rehabilitation;
- Complete tie in works, footpaths, cycleways, lighting and landscaping;
- Construct permanent stormwater wetlands;
- Install road safety barriers and other traffic services facilities (traffic signals, pedestrian crossing, islands); and
- Install signage and street lighting.

### Finishing works and demobilisation

- Final road surfacing / resurfacing and road markings;
- Commission new services, including traffic signals (if any);
- Finishing works e.g. landscaping, street furniture, fencing and outstanding accommodation works;
- Move traffic to the final road configuration; and
- Contractor to demobilise from site.

## 4.3 Plant and Equipment

Table 4-2 provides an indicative list of plant and equipment which may be required for construction across each designation.

**Table 4-2: Indicative construction equipment**

Construction	Construction Activity
<b>Typical across all works</b>	<ul style="list-style-type: none"> <li>• Light vehicles</li> <li>• Trucks and transporters, (Hiab, concrete, tip trucks, truck and trailer, 6-wheeler) Traffic control truck units</li> <li>• Portable electric generators, air compressors, temporary light towers</li> </ul>
<b>Earthworks</b>	<ul style="list-style-type: none"> <li>• Excavators (various sizes 1.5T - 45T)</li> <li>• Rollers and vibration compactor</li> <li>• Water cart</li> <li>• Dump trucks</li> <li>• Stabilizers</li> </ul>
<b>Drainage</b>	<ul style="list-style-type: none"> <li>• Excavators (various sizes)</li> <li>• Loaders and skid steer loader</li> <li>• Plate compactors</li> <li>• Concrete pump</li> </ul>
<b>Pavement Construction</b>	<ul style="list-style-type: none"> <li>• Graders, loaders and excavators</li> <li>• Water cart</li> <li>• Smooth drum roller</li> <li>• Tip Trucks</li> <li>• Kerbing machine</li> <li>• Plate compactor</li> </ul>

Construction	Construction Activity
	<ul style="list-style-type: none"> <li>Asphalt pavers</li> </ul>
<b>Bridges and structures</b>	<ul style="list-style-type: none"> <li>Excavators (various sizes)</li> <li>Cranes (mobiles or crawlers)</li> <li>Piling rigs with vibration equipment</li> <li>Telehandlers, forklifts</li> <li>Concrete pumps</li> </ul>

## 4.4 Construction Noise

The expected duration of the construction phase for the Project ranges from 1 – 2 years to 5 – 6 years. Predictions have been assessed against the noise criteria for greater than 20 weeks “long-duration” under NZS 6803:1999 as presented in Table 3-1. It is expected that the majority of the works will be carried out between 7am – 6pm Monday to Saturday. There may be extended hours during summer earthworks season (e.g., 6am to 8pm, Monday to Saturday), and there is also the possibility of night works for critical activities (e.g. culvert and bridge construction, and road surfacing).

Various construction activities and pieces of equipment will act as noise sources on site during construction works. An indicative construction equipment list has been provided by the Project team to assess the noise and vibration effects. Given construction will occur in the future, the current methodology may not be inclusive of all equipment used nearer the time of construction. Equipment tables will need to be updated to reflect selection at the time of development of the CNVMP. A minimum set back distance from receivers to comply with the day-time noise criterion of 70 dB  $L_{Aeq}$  without mitigation has been calculated.

### 4.4.1 Equipment Noise Levels

Table 4-3 details the sound power levels from the likely significant noise sources and the various receiver setback distances required to achieve compliance with the 70 dB  $L_{Aeq}$  day-time noise criterion without mitigation. The noise data has been taken from BS 5228-1:2009 “Code of practice for noise and vibration control on construction and open sites”, manufacturer’s data or the AECOM database of noise measurements. Equipment selection at detailed design stage may include equipment with different sound power levels than those presented. The equipment list should be reassessed nearer the time at production of the CNVMP.

Table 4-3: Construction equipment sound levels and indicative compliance distance

Equipment	Sound power level (dB L <sub>WA</sub> )	Facade noise level at varying distances (dB L <sub>Aeq</sub> )				Minimum Setback distance to comply with day-time criteria without mitigation, metres
		5 m	10 m	20 m	50 m	
30T excavator	105	86	80	73	66	30
20T excavator	99	80	74	67	60	13
Roller compactor	101	82	76	69	62	20
Tipper Truck	107	88	82	75	68	36
Loader	105	86	80	73	66	30
Vibratory Plate Compactor	110	91	85	78	71	45
Hydrovac Truck	104	85	79	73	65	28
Smooth Drum Roller	103	84	78	71	64	25
Paver	103	84	78	71	64	25
Grader	99	80	74	67	60	13
<b>Bridge Construction Only</b>						
Concrete Truck	107	88	82	75	68	36
Cranes	99	80	74	67	60	13
Bored Piling Rig	111	89	83	77	69	49

#### 4.4.2 Activity noise levels

Table 4-4 details the sound power levels for key construction activities, combining the equipment sound power levels detailed in Table 4-3 where multiple items of equipment may be operating simultaneously. Table 4-4 also details the minimum setback distance at which compliance can be achieved for each activity.

**Table 4-4: Activity Sound Power Levels and Compliance Distance**

Construction Type	Activity Sound Power Level (dB L <sub>WA</sub> )	Minimum set back distance from receivers to comply with day-time limit (70 dB L <sub>Aeq</sub> ) without mitigation, metres
Typical across all works	110	48
Earthworks	111	52
Drainage works	113	56
Pavement Construction	115	76
Bridge Construction	113	55

## 4.5 Construction Vibration

Vibration generation and propagation is highly site specific. The generation of vibration is dependent on the local site geology, the equipment being used, the nature of the works, and even the operator.

To account for the inaccuracy in the prediction of vibration, the likely worst-case vibration has been calculated based on the equipment and hard ground geology.

Vibration from a source transmits in a spherical pattern and reduces with distance. There will be a particular distance from each source at which the vibration level equals the relevant vibration criteria. This distance is called the 'emission radii. The vibration criteria and emission radii for high vibration generating equipment in terms of Peak Particle Velocity (**PPV**) are detailed in Table 4-5.

The vibration data have been taken from BS 5228-2:2009 "Code of practice for noise and vibration control on construction and open sites", manufacturer's data or the AECOM database of vibration measurements.

**Table 4-5: Vibration sources and indicative emission radii**

Equipment	Night-time Occupied Buildings (0.3 mm/s PPV)	Daytime Occupied Buildings (2 mm/s PPV)	DIN 4150 Vibration Criteria		
			Historic and Sensitive (2.5 mm/s PPV)	Residential (5 mm/s PPV)	Commercial (10 mm/s PPV)
<b>Roller Compactor</b>	140m	21m	17m	8m	4m
<b>Bored Piling Rig</b>	17m	4m	2m	1m	1m
<b>Excavator</b>	80m	12m	10m	6m	2m
<b>Tipper Truck</b>	16m	2m	2m	1m	0m

Equipment	Night-time Occupied Buildings (0.3 mm/s PPV)	Daytime Occupied Buildings (2 mm/s PPV)	DIN 4150 Vibration Criteria		
			Historic and Sensitive (2.5 mm/s PPV)	Residential (5 mm/s PPV)	Commercial (10 mm/s PPV)
<b>Vibratory Plate Compactor</b>	20m	3m	2m	1m	1m

We recommend that vibration measurements are undertaken at specific locations as identified through the CNVMP and Schedules (refer Section 11.2) at the commencement of construction activities to establish vibration propagation site laws for vibration generating equipment. This approach will confirm the emission radii used in this assessment and ensure the applicable criteria are complied with. It has been found on other major construction projects, that the measured vibration levels for a particular activity are generally much lower than those predicted during the assessment stage.

## 5 Existing and Future Receiving Environment

### 5.1 Planning and land use context

The existing and anticipated future environment is further discussed in the accompanying AEE. In summary, the implementation timeframe for the Project has yet to be confirmed but is likely to be in approximately 10-15 years' time subject to funding availability. The assessment considers the effects of the Project at both the existing environment (as it exists today) and the likely future (planned) environment which consider potential urban development and intensification sought under Plan Change 78 (PC78).

The Project will be constructed and will operate in the existing urban environment or planned environment (i.e. what can be built under the existing AUP:OP live zones):

- **Existing environment:** The corridors are situated primarily within existing urban areas with live zoning including residential, commercial, and open space zones. There is some Future Urban Zone land in the wider area to the northeast/east. The existing activities within the area are generally reflective of the existing underlying zoning; and
- **Planned environment:** The planned environment is anticipated to remain urban and comprised of similar activities as the existing environment. The density of residential development is however anticipated to change and increase in future. In particular, this includes in the residential zones around Te Mahia and Takaanini stations, in line with the implementation of the National Policy Statement on Urban Development (NPS-UD) in the AUP:OP. The remaining residential areas will experience an uplift of density through the implementation of the Medium Density Residential Standards (MDRS) through the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021. Plan Change 78 (notified at the time of assessment) seeks to give effect to the NPS-UD and incorporate the MDRS into residential zoning. It is noted that there are some areas of existing residential zoned land (particularly east of the NIMT) that have recently been intensified (i.e., new builds), as such are unlikely to change in the near future.

The likelihood and magnitude of land use change regarding the land use planning context has been identified in Table 5-1 below. This has been used to inform the assumptions made on the likely future environment.

**Table 5-1: South FTN – existing and future environment**

Existing Environment	Current AUP:OP Zoning	Likelihood of Change for the environment <sup>5</sup>	Magnitude of potential change	Likely Receiving Environment <sup>6</sup>
Residential <sup>7</sup>	Residential (Mixed Housing Suburban)	Low - Moderate <sup>8</sup>	Low - Moderate	Residential
	Residential (Mixed Housing Urban)	Low - Moderate <sup>9</sup>	Low - Moderate	Residential

<sup>5</sup> Based on AUP:OP zoning/policy direction.

<sup>6</sup> Based on AUP:OP zoning/policy direction.

<sup>7</sup> Based on the NPS-UD and MDRS, these residential areas are likely to experience increased density.

<sup>8</sup> There are areas of existing Residential Zone land that has recently been intensified (i.e. new build developments), as such is unlikely to change in the near future.

<sup>9</sup> There are areas of existing Residential Zone land that has recently been intensified (i.e. new build developments), as such is unlikely to change in the near future.

Existing Environment	Current AUP:OP Zoning	Likelihood of Change for the environment <sup>5</sup>	Magnitude of potential change	Likely Receiving Environment <sup>6</sup>
	Residential (Mixed Housing Suburban and Urban) around train stations	Moderate	Moderate - High	Residential and Commercial/Retail <sup>10</sup>
Business	Business (Heavy Industry)	Low	Low	Business (Industrial)
	Business (Light Industry)	Low	Low	Business (Industrial)
	Business (Neighbourhood Centre)	Low	Low	Business (Neighbourhood Centre)
	Business (Town Centre)	Low	Low	Business (Town Centre)
Open Space	Informal Recreation	Low	Low	Informal Recreation
	Community	Low	Low	Community
Greenfield areas	Future Urban	Low - Moderate	High	Urban

## 5.2 Existing Environment – Noise

The existing noise environments for all NoRs are controlled by traffic on existing major roads (either close by or distant), the NIMT, and natural sounds.

We undertook short and long duration noise level surveys in the vicinity of the Project in August and September 2023. The location of the surveys is shown in Figure 5-1.

### 5.2.1 Noise Monitoring Procedure

Noise survey equipment, meteorological conditions, data analysis and results are described below. The noise monitoring was undertaken in general accordance with the relevant requirements of NZS 6801, 6802 and 6806. This meant the results could adequately inform both the operational and construction noise assessments.

Measurements were undertaken at the following locations:

- 21 Great South Road, Manurewa;
- 26 Alfriston Road; and
- Opposite 438 Porchester Road.

The measurement positions were chosen to avoid extraneous factors which could have influenced the sound levels, where practicable. Measurement and calibration details required by NZS 6801 are held on file.

<sup>10</sup> Note that much of the commercial operations between Manuia Road and Taka Street occur on residentially zoned land.

### 5.2.2 Meteorological conditions

During the surveys, meteorological data was obtained from Auckland, Mangere Ews 2 (43711) weather station operated by NIWA. This is the closest station where data was available at an hourly resolution or less.

The meteorological data from this weather station was used to identify periods when conditions were likely to have been outside the meteorological restrictions given in NZS 6801, and therefore data measured during these periods has been excluded from the noise analysis.

### 5.2.3 Data Analysis

Road traffic was the dominant noise source at all measurement locations. There is a natural variation in the noise environment throughout the day, and often variations for the weekends. The  $L_{Aeq(24h)}$  and  $L_{A90}$  was calculated for each day where there was sufficient data after unsatisfactory meteorological conditions and abnormal events were excluded. The average  $L_{Aeq(24h)}$  and  $L_{A90}$  for the attended and unattended measurements are shown in Figure 5-1. It should be noted that measurement positions MP1 and MP2 were attended 1-hour measurements, while MP3 was an unattended measurement taken over a seven-day duration. Table 5-2 displays these noise survey results.



Figure 5-1: Noise survey locations

Table 5-2: Noise survey results

Measurement Position	Location	NoR	Ambient noise level	Background noise level
			dB $L_{Aeq(24h)}$	dB $L_{A90}$
MP1	21 Great South Road, Manurewa	NoR 3	66	59

Measurement Position	Location	NoR	Ambient noise level	Background noise level
			dB L <sub>Aeq(24h)</sub>	dB L <sub>A90</sub>
MP2	26 Alfriston Road, Manurewa East	NoR 1	67	60
MP3	Opposite 438 Porchester Road, Randwick Park	NoR 4	72	60

## 6 Construction Noise and Vibration Effects – Relating to All NoRs

### 6.1 Construction noise

Table 6-1 gives examples of the potential effects on receivers at different noise levels based on NZS6803 with the most exposed façades providing a 20 dB reduction. Depending on the construction of the house, façades may provide up to a 25 – 30 dB reduction, therefore assumptions and effects provided below are based on a conservative approach.

**Table 6-1: Potential construction noise effects on receivers**

External Noise Level	Potential Daytime Effects Outdoors	Corresponding Internal Noise Level	Potential Daytime Effects Indoors
65 dB $L_{Aeq}$	Conversation becomes strained, particularly over longer distances	45 dB $L_{Aeq}$	Noise levels would be noticeable but unlikely to interfere with residential or office daily activities.
65 to 70 dB $L_{Aeq}$	People would not want to spend any length of time outside, except when unavoidable through workplace requirements	45 to 50 dB $L_{Aeq}$	Concentration would start to be affected. TV and telephone conversations would begin to be affected.
70 to 75 dB $L_{Aeq}$	Businesses that involve substantial outdoor use (for example garden centres) would experience considerable disruption.	50 to 55 dB $L_{Aeq}$	Phone conversations would become difficult. Personal conversations would need slightly raised voices. Office work can generally continue, but 55 dB is considered by the experts to be a tipping point for offices. For residential activity, TV and radio sound levels would need to be raised.
75 to 80 dB $L_{Aeq}$	Some people may choose protection for long periods of exposure. Conversation would be very difficult, even with raised voices.	55 to 60 dB $L_{Aeq}$	Continuing office work would be extremely difficult and become unproductive. In a residential context, people would actively seek respite.
80 to 90 dB $L_{Aeq}$	Hearing protection would be required for prolonged exposure (8 hours at 85	60 to 70 dB $L_{Aeq}$	Untenable for both office and residential environments. Unlikely to

External Noise Level	Potential Daytime Effects Outdoors	Corresponding Internal Noise Level	Potential Daytime Effects Indoors
	dB) to prevent hearing loss.		be tolerated for any extent of time.

With effective management of construction activities (refer to Section 11), which includes consultation and communication with affected parties and scheduling noisy works during the daytime rather than night-time period, noise levels can be controlled for each of the Projects so that the effects on the nearest residential receivers are reduced. Barriers will not be effective at all locations, particularly where receivers are more than one storey high. Where barriers are not going to be effective, the use of enclosures or local screening of equipment should be considered and implemented, where practicable. If noisy activities must take place during the night-time, and screening or other mitigation measures do not provide sufficient attenuation to meet the night-time noise criteria or are not practicable, it may be necessary to offer temporary relocation to affected residents. Temporary relocation should be considered on a case-by-case basis and as a last resort.

## 6.2 Construction Vibration

The vibration effects associated with construction of the Project are considered in terms of human response and building damage. However, in our experience the main concern for building occupants during construction is damage to the building itself.

Humans can generally perceive vibrations at a much lower level than when building damage is likely to occur. The adverse effects of construction vibration on building occupants may be significant in some buildings adjacent to the areas of works. Adverse effects may range from annoyance to loss of amenity or inability to carry out work. Vibration effects will reduce with distance from the source, and the level of vibration transmission into a building will depend on a number of factors, such as the foundation type and building construction.

Potential effects and human perception of the vibration levels found within the AUP:OP / DIN 4150 criteria have been combined below and adopted for this assessment (see Table 6-2).

**Table 6-2: Potential vibration effects on human perception summary against AUP:OP /DIN criteria**

Vibration level (mm/s PPV)	Potential effects Indoors
0.14 mm/s	The threshold of perception for stationary people. Just perceptible in particularly sensitive environments.
0.3 mm/s	Can be just perceptible during normal residential activities, particularly for more sensitive receivers. Levels above may wake most people from their sleep.  This is the AUP:OP limit for construction vibration generated at night-time for sensitive receivers.

Vibration level (mm/s PPV)	Potential effects Indoors
1 mm/s	Is typically tolerable with prior notification. Complaint or adverse reaction is likely in office or residential environments, particularly if there is no prior warning. What people actually feel would be subject to the source but could include a steady vibration from sources such as vibratory compaction, or a small jolt such as from the movement of a large digger either of which could rattle crockery and glassware. Sleep disturbance would be almost certain for most people.
2 mm/s	Vibration would clearly be felt. However, it can typically be tolerated in indoor environments such as offices, houses and retail if it occurs intermittently during the day and where there is effective prior engagement. Effects experienced would be somewhere between levels of 1 and 5 mm/s.  This is the AUP:OP limit for large construction projects generating vibration.
5 mm/s	Unlikely to be tolerable in a workplace. Highly unsettling for both workplaces and dwellings. If exposure is prolonged, some people may want to leave the building. Computer screens would shake, and items could fall off shelves if they are not level.  This is the threshold below which no cosmetic damage will occur in the DIN standard.
10 mm/s	Likely to be intolerable for anything other than a very brief exposure.

The AUP:OP sets the criteria for amenity to 2 mm/s PPV during the day. Based on the worst-case source of a roller compactor, any receiver within a 21m radius of the construction area may experience vibration of 2 mm/s inside their property. Whilst at this level the likelihood of building damage approaches zero, human perception may result in slight concerns but can generally be tolerated if activity occurs intermittently and with prior notice.

The AUP:OP sets the night-time vibration criterion at 0.3 mm/s. At this level, the emission radii could be up to 140m from construction areas, and at this level people could feel slight vibrations especially during the night-time, which may cause sleep disturbance. High vibratory activities should therefore be avoided, where practicable, during the night-time and careful management of the type of equipment used at night should be included within the CNVMP (refer Section 11.1) and night-time works should require the preparation of a Schedule (refer Section 11.2).

Construction vibration effects generally have a short timeframe, typically a few days at a time. The use of high vibratory equipment, such as a roller compactor, should be managed through a CNVMP to limit potential vibration effects, and alternative equipment with lower vibratory effect should be used where practicable.

## 7 NoR 1 – Great South Road FTN Upgrade

As outlined in the Project description (see Section 2), NoR 1 comprises a range of interventions providing for the Great South Road FTN route along Great South Road between Manukau and Drury. These include eight intersection upgrades, and the replacement of the Otūwairoa / Slippery Creek bridge. The wider corridor will provide for either three or four lanes in the midblock including bus lanes in one or both directions, and active mode facilities.

Buildings which have been flagged for acquisition prior to construction commencing are summarised in Section 4.1.

### 7.1 Construction effects

#### 7.1.1 Noise

Existing receivers are located at varying distances from the construction boundary with the closest receivers being approximately 2m away from potential works. High noise generating activities may not occur right on the construction boundary but if they do, 522 existing receivers could experience unmitigated noise levels that exceed the daytime noise criterion. Details of all properties where the criteria could be exceeded without mitigation are provided in Appendix A.

With mitigation in place as set out in Section 11, noise levels of up to 90 dB  $L_{Aeq}$  could still occur intermittently at the closest receivers, if high noise generating activities occur on the construction boundary. At this level, effects are likely to include loss of concentration, annoyance, and a reduction in speech intelligibility. We note that the existing receivers may not be present at the time of construction.

Future receivers constructed within 76m of the works could experience unmitigated noise levels that exceed the 70 dB  $L_{Aeq}$  noise criterion during high noise generating activities, such as the pavement works.

Bridge construction for the replacement of the Otūwairoa / Slippery Creek bridge is the noisiest activity that is currently proposed for this NoR. It will only occur for a limited duration during bridge construction at the section of Great South Road where the bridge is located.

Operation of the construction equipment will be intermittent in nature. Construction will likely follow a linear path along the site, so as the equipment moves away from the receiver, noise levels will decrease. The worst-case situations where mitigated noise levels could reach 90 dB  $L_{Aeq}$  at the closest receivers, are not expected to be frequent, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works. It is therefore predicted that mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

If a critical activity has to be carried out during the night-time in close proximity to residential receivers (e.g. bridge construction works), consultation and mitigation measures will be essential. The use of noisy equipment should be avoided, where practicable, to prevent sleep disturbance. Any night-time works are likely to be limited in duration and will be managed through the CNVMP (as per Section 11.1) and a Schedule (as per Section 11.2).

### 7.1.2 Vibration

Existing receivers near Great South Road between Manukau and Drury are predominantly residential type structures.

74 existing dwellings may experience vibration levels above 5mm/s PPV, exceeding the daytime Category B criterion, if the roller compactor is used on the construction boundary in the closest position to them. 14 existing commercial type buildings may experience vibration levels above the 10mm/s PPV daytime criteria. The addresses of receivers where the Category B criteria may be exceeded are listed in Appendix B. Once the compactor is 8m away from the dwellings and 4m from the commercial receivers the Category B criteria will be met. The Category B criteria would be met at future residential structures that are 8m or more from the proposed works and commercial structures that are 4m or more from the proposed works.

Without mitigation, at these receivers there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to achieve compliance with the criteria.

The daytime Category A vibration amenity criteria could be exceeded in existing or future buildings if they are occupied during the works and within 21m of the roller compactor or within the emission radii identified for the other vibration generating equipment in Table 4-5. The effect on receivers would be subject to their respective proximity to the works but could include steady vibration from the roller compactor or a small jolt from a digger, which could rattle crockery and glassware.

Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration, and where there is effective prior engagement.

High vibration generating activities should not occur during the night-time in close proximity to residential receivers to avoid sleep disturbance unless it is a critical activity and there is no alternative.

It should be noted that the emission radii are conservative and vibration levels measured on site tend to be much lower than those predicted at the NoR stage of a project.

## 8 NoR 2 – Great South Road Upgrade (Drury section)

As outlined in the Project description (see Section 2), NoR 2 comprises a range of interventions providing for the upgrade of Great South Road in Drury between Waihoehoe Road and the SH1 Drury Interchange. These include road widening to provide four lanes, active mode facilities, and the replacement of the Hingaia Stream bridge.

Buildings which have been flagged for acquisition prior to construction commencing are summarised in Section 4.1.

### 8.1 Construction effects

#### 8.1.1 Noise

Existing receivers are located at varying distances from the construction boundary with the closest receivers being approximately 4m away from potential works. High noise generating activities may not occur right on the construction boundary but if they do, 18 existing receivers could experience unmitigated noise levels that exceed the daytime noise criterion. Details of all properties where the criteria could be exceeded are provided in Appendix A.

With mitigation in place, as set out in Section 11, noise levels of up to 85 dB  $L_{Aeq}$  could still occur intermittently at the closest receivers, if high noise generating activities occur on the construction boundary. At this level, effects are likely to include loss of concentration, annoyance, and a reduction in speech intelligibility. We note that some dwellings may be unoccupied at the time of construction, particularly considering this Project is located mostly within existing urban zones. It should also be noted that predicted noise levels are conservative and measured noise levels on site are likely to be lower.

Future receivers constructed within 76m of the works could experience noise levels that exceed the 70 dB  $L_{Aeq}$  noise criterion during high noise generating activities, such as the pavement works, without mitigation.

Operation of the construction equipment will be intermittent in nature. Construction will likely follow a linear path along the site, so as the equipment moves away from the receiver, noise levels will decrease. The worst-case situations where the closest receivers could experience mitigated noise levels of up to 85 dB  $L_{Aeq}$  are not expected to be frequent, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works. It is therefore predicted that mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

If a critical activity has to be carried out during the night-time in close proximity to residential receivers (e.g. works requiring road closures), consultation and mitigation measures will be essential. The use of noisy equipment should be avoided, where practicable, to prevent sleep disturbance. Any night-time works are likely to be limited in duration and will be managed through the CNVMP (as per Section 11.1) and a Schedule (as per Section 11.2).

#### 8.1.2 Vibration

Existing receivers near Great South Road (Drury) are predominantly commercial type structures.

Vibration levels are predicted to meet the Category B criterion at existing residential receivers. One existing commercial type building may experience vibration levels above the 10mm/s PPV daytime criteria. The address of this receiver is listed in Appendix B. Once the compactor is 4m from the commercial receiver the Category B criterion will be met. The Category B criteria would be met at future residential structures that are 8m or more from the proposed works and commercial structures that are 4m or more from the proposed works.

Without mitigation, at this receiver there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to achieve compliance with the criteria.

The daytime Category A vibration amenity criteria could be exceeded in existing or future buildings if they are occupied during the works and within 21m of the roller compactor or within the emission radii identified for the other vibration generating equipment in Table 4-5. The effect on receivers would be subject to their respective proximity to the works but could include steady vibration from the roller compactor or a small jolt from a digger, which could rattle crockery and glassware.

Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration, and where there is effective prior engagement.

High vibration-generating activities should not occur during the night-time in close proximity to residential receivers to avoid sleep disturbance unless it is a critical activity and there is no alternative.

It should be noted that the emission radii are conservative and vibration levels measured on site tend to be much lower than those predicted at the NoR stage of a project.

## 9 NoR 3 – Takaanini FTN – Weymouth, Alfriston, and Great South Road Upgrades

As outlined in the Project description (see Section 2), NoR 3 comprises a range of interventions providing for the Takaanini FTN route along Weymouth and Alfriston Roads generally between Selwyn Road and Alfriston Park; as well as for the Great South Road FTN route between Alfriston Road and Myers Road. These interventions include road widening to provide for four lanes (general traffic and bus lanes in both directions), active mode facilities, eight intersection upgrades, stormwater treatment wetlands, and replacements of bridges over the NIMT and SH1.

Buildings which have been flagged for acquisition prior to construction commencing are summarised in Section 4.1.

### 9.1 Construction effects

#### 9.1.1 Noise

Existing receivers are located at varying distances from the construction boundary with the closest receivers being approximately 2m away from potential works. High noise generating activities may not occur right on the construction boundary but if they do, 410 existing receivers could experience unmitigated noise levels that exceed the daytime noise criterion. Details of all properties where the criteria could be exceeded are provided in Appendix A.

With mitigation in place, as set out in Section 11, noise levels of up to 90 dB  $L_{Aeq}$  could still occur intermittently at the closest receivers, if high noise generating activities occur on the construction boundary. At this level, effects are likely to include loss of concentration, annoyance, and a reduction in speech intelligibility. We note that the existing receivers may not be present at the time of construction.

Future receivers constructed within 76m of the works could experience unmitigated noise levels that exceed the 70 dB  $L_{Aeq}$  noise criterion during high noise generating activities such as the pavement works.

Operation of the construction equipment will be intermittent in nature. Construction will likely follow a linear path along the site, so as the equipment moves away from the receiver, noise levels will decrease. The worst-case situations where mitigated noise levels could reach 90 dB  $L_{Aeq}$  at the closest receivers are not expected to be frequent, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works. It is therefore predicted that mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

If a critical activity has to be carried out during the night-time in close proximity to residential receivers (e.g. works requiring road closures), consultation and mitigation measures will be essential. The use of noisy equipment should be avoided, where practicable, to prevent sleep disturbance. Any night-time works are likely to be limited in duration and will be managed through the CNVMP (as per Section 11.1) and a Schedule (as per Section 11.2).

### 9.1.2 Vibration

Existing receivers near Alfriston Road are mostly residential type structures.

76 existing dwellings may experience vibration levels above 5mm/s PPV, exceeding the daytime Category B criterion, if the roller compactor is used on the construction boundary in the closest position to them. 12 existing commercial type buildings may experience vibration levels above the 10mm/s PPV daytime criteria. The addresses of receivers where the Category B criteria may be exceeded are listed in Appendix B. Once the compactor is 8m away from the dwellings and 4m from the commercial receivers the Category B criteria will be met. The Category B criteria would be met at future residential structures that are 8m or more from the proposed works and commercial structures that are 4m or more from the proposed works.

Without mitigation, at these receivers there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to achieve compliance with the criteria.

The daytime Category A vibration amenity criteria could be exceeded in existing or future buildings if they are occupied during the works and within 21m of the roller compactor or within the emission radii identified for the other vibration generating equipment in Table 4-5. The effect on receivers would be subject to their respective proximity to the works but could include steady vibration from the roller compactor or a small jolt from a digger, which could rattle crockery and glassware.

Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration, and where there is effective prior engagement.

High vibration-generating activities should not occur during the night-time in close proximity to residential receivers to avoid sleep disturbance unless it is a critical activity and there is no alternative.

It should be noted that the emission radii are conservative and vibration levels measured on site tend to be much lower than those predicted at the NoR stage of a project.

## 10 NoR 4 – Takaanini FTN – Porchester Road and Popes Road Upgrades

As outlined in the Project description (see Section 2), NoR 4 comprises a range of interventions providing for the Takaanini FTN route along Porchester Road generally between Alfriston Road and Walters Road; and for the urbanisation of Popes Road generally between Takanini School Road and Mill Road. These interventions provide for the urbanisation of both corridors, with two traffic lanes, widening for active mode facilities, seven intersection upgrades, and stormwater treatment wetlands.

Buildings which have been flagged for acquisition prior to construction commencing are summarised in Section 4.1.

### 10.1 Construction effects

#### 10.1.1 Noise

Existing receivers are located at varying distances from the construction boundary with the closest receivers being approximately 2m away from potential works. High noise generating activities may not occur right on the construction boundary but if they do, 438 existing receivers could experience unmitigated noise levels that exceed the daytime noise criterion. Details of all properties where the criteria could be exceeded are provided in Appendix A.

With mitigation in place, as set out in Section 11, noise levels of up to 90 dB  $L_{Aeq}$  could still occur intermittently at the closest receivers, if high noise generating activities occur on the construction boundary. At this level, effects are likely to include loss of concentration, annoyance, and a reduction in speech intelligibility. We note that the existing receivers may not be present at the time of construction.

Future receivers constructed within 76m of the works could experience noise levels that exceed the 70 dB  $L_{Aeq}$  noise criterion during high noise generating activities, such as the pavement works, without mitigation.

Operation of the construction equipment will be intermittent in nature. Construction will likely follow a linear path along the site, so as the equipment moves away from the receiver, noise levels will decrease. The worst-case situations where the closest receivers could experience mitigated noise levels of up to 90 dB  $L_{Aeq}$  are not expected to be frequent, due to the setback distances to most of the proposed works and the use of equipment with lower source noise levels for large portions of the works. It is therefore predicted that mitigated noise levels can comply with the 70 dB  $L_{Aeq}$  noise criterion for most of the construction works.

If a critical activity has to be carried out during the night-time in close proximity to residential receivers (e.g. works requiring road closures), consultation and mitigation measures will be essential. The use of noisy equipment should be avoided, where practicable, to prevent sleep disturbance. Any night-time works are likely to be limited in duration and will be managed through the CNVMP (as per Section 11.1) and a Schedule (as per Section 11.2).

#### 10.1.2 Vibration

Existing receivers near Porchester Road are mainly residential type structures.

98 existing dwellings may experience vibration levels above 5mm/s PPV, exceeding the daytime Category B criterion, if the roller compactor is used on the construction boundary in the closest position to them. One existing commercial type building may experience vibration levels above the 10mm/s PPV daytime criteria. The addresses of receivers where the Category B criteria may be exceeded are listed in Appendix B. Once the compactor is 8m away from the dwellings and 4m from the commercial receivers the Category B criteria will be met. The Category B criteria would be met at future residential structures that are 8m or more from the proposed works and commercial structures that are 4m or more from the proposed works.

Without mitigation, at these receivers there is potential for cosmetic damage to buildings (such as cracking) and annoyance from perception of vibration. Mitigation such as the use of non-vibratory compaction equipment within 8m of buildings is recommended to achieve compliance with the criteria.

The daytime Category A vibration amenity criteria could be exceeded in existing or future buildings if they are occupied during the works and within 21m of the roller compactor or within the emission radii identified for the other vibration generating equipment in Table 4-5. The effect on receivers would be subject to their respective proximity to the works but could include steady vibration from the roller compactor or a small jolt from a digger, which could rattle crockery and glassware.

Vibration can typically be tolerated inside buildings if it occurs intermittently during the day, is of limited duration, and where there is effective prior engagement.

High vibration-generating activities should not occur during the night-time in close proximity to residential receivers to avoid sleep disturbance unless it is a critical activity and there is no alternative.

It should be noted that the emission radii are conservative and vibration levels measured on site tend to be much lower than those predicted at the NoR stage of a project.

# 11 Recommended measures to avoid, remedy, or mitigate construction effects

## 11.1 Construction Noise and Vibration Management Plan

Implementing noise management and mitigation measures via a CNVMP is the most effective way to control construction noise and vibration impacts. The objective of the CNVMP is to provide a framework for the development and implementation of best practicable options to avoid, remedy or mitigate the adverse effects on receivers of noise and vibration resulting from construction. AUP:OP Rule E25.6.29(5) sets out the minimum level of information that must be provided in a CNVMP. As a minimum, we recommend that the CNVMP should include the following content:

- Description of the works and anticipated equipment/processes;
- Hours of operation, including times and days when construction activities would occur;
- The construction noise and vibration standards for the Project;
- Identification of receivers where noise and vibration standards apply;
- Management and mitigation options, including alternative strategies adopting best practices where full compliance with the relevant noise and/or vibration standards cannot be achieved;
- Methods and frequency for monitoring and reporting on construction noise and vibration, including:
  - Updating the predicted noise and vibration levels based on the final methodology and construction activities;
  - Confirming which buildings will be included in a pre and post building condition survey;
  - Identifying appropriate monitoring locations for receivers of construction noise and vibration;
  - Procedures to respond to complaints received on construction noise and vibration, including methods to monitor and identify noise and vibration sources;
  - Procedure for responding to monitored exceedances; and
  - Procedures for monitoring construction noise and vibration and reporting to the Auckland Council (**AC**) Consent Monitoring officer.
- Procedures for maintaining contact with stakeholders, notifying of proposed construction activities, the period of construction activities, and handling noise and vibration complaints;
- Contact details of the site supervisor or Project manager and the Requiring Authority's Project Liaison Person (phone, postal address, email address);
- Procedures for the regular training of the operators of construction equipment to minimise noise and vibration as well as expected construction site behaviours for all workers;
- Identification of areas where compliance with the noise and/or vibration standards will not be practicable and where a Site Specific Construction Noise and/or Vibration Management Schedule will be required;
- Procedures for how remedial works will be undertaken, should they be required as a result of the building condition surveys; and
- Procedures and timing of reviews of the CNVMP.

## 11.2 Schedules

In addition to a CNVMP, it may be necessary to produce Site Specific or Activity Specific Construction Noise and Vibration Management Schedules (**Schedules**) where noise and/or vibration limits are

predicted to be exceeded for a more sustained period or by a large margin. A schedule to the CNVMP provides a specific assessment of an activity and/or location and should include details such as:

- Activity location, start and finish dates;
- The nearest neighbours to the activity;
- A location plan;
- Predicted noise/vibration levels and best practice for mitigation for the activity and/or location;
- Communication and consultation with the affected neighbours;
- Location, times, and type of monitoring; and
- Any pre-condition survey of buildings predicted to receive vibration levels approaching the Category B vibration limits, which document their current condition and any existing damage.

### 11.3 Noise mitigation measures

A hierarchy of mitigation measures will be adopted through the CNVMP and Schedules (where produced), as follows:

- Managing times of activities to avoid night works and other sensitive times;
- Liaising with neighbours so they can work around specific activities;
- Selecting equipment and methodologies to restrict noise;
- Using screening/enclosures/barriers; and
- Offering neighbours temporary relocation.

By following this hierarchy, the best practicable option (**BPO**) for mitigation will be implemented, whilst avoiding undue disruption to the community. In particular, temporary relocation of neighbours can cause significant inconvenience and should only be offered where other options have been exhausted and noise levels still require mitigation.

Some activities are likely to be set back a considerable distance from the nearest receivers and require very little or no mitigation to achieve compliance with the relevant Project noise limits. Alternative methodologies, such as careful equipment selection and use of noise barriers or localised screening (e.g., for concrete cutting) may be suitable management and mitigation measures and should be implemented where they are practicable and effective.

### 11.4 Vibration mitigation measures

Similarly to noise, a hierarchy of vibration mitigation measures will be adopted through the CNVMP and Schedules (where produced) as follows:

- Managing times of activities to avoid night works and other sensitive times (communicated through community liaison);
- Liaising with neighbours so they can work around specific activities;
- Operating vibration generating equipment as far from sensitive sites as possible;
- Selecting equipment and methodologies to minimise vibration;
- Offering neighbours temporary relocation; and
- In specific situations, a cut-off trench may be used as a vibration barrier if located close to the source.

In general, there are less options available to mitigate vibration propagation and insulate receiver buildings, compared to noise. Mitigation will therefore focus on scheduling of activities, effective communication with neighbours, and selection of appropriate equipment and methods, where practicable.

Appropriate vibration mitigation measures for each activity will be listed in the CNVMP and Schedules (where produced).

## 11.5 Building condition survey

A detailed building precondition survey should be undertaken by a suitably qualified engineer prior to the start of construction at all buildings where the daytime Category B vibration criteria may be exceeded. The survey shall include, but not be limited to, the following:

- Determination of building classification: commercial, industrial, residential or a historic or sensitive structure;
- Determination of building specific vibration damage risk thresholds; and
- Recording (including photographs) the major features of the buildings including location, type, construction (including foundation type), age and present condition, including existing levels of any aesthetic damage or structural damage.

A post-construction condition survey of the same buildings shall be conducted when construction is completed, and any damage shown to have been caused by the Project construction rectified by the Project Team.

## 11.6 Night works

Night works have the potential to cause the greatest disturbance to residents and should be avoided where practicable. However, it is possible that night works will be required during the construction period for critical activities that cannot be carried out at any other time. Before night works are programmed, it is important to determine if there are alternative options that would avoid working at night and, if so, whether those options are technically and practicably feasible.

Where there are no practicable alternative options to night works, it may be necessary to implement enhanced noise and vibration management measures, but this will depend on the location of the worksite and the proposed activities.

When work must be carried out at night, it may be necessary to:

- Increase the frequency of communications with stakeholders; and
- Carry out regular noise and vibration monitoring to confirm noise and vibration levels; or
- Offer temporary relocation to neighbours if unreasonable noise and/or vibration levels cannot be avoided.

## 11.7 Services

The works will be occurring in an existing built-up area with a number of underground services. Any services in the area of the works will be dealt with appropriately at the time of construction such that

compliance with standard DIN 4150-3:1999 "Structural Vibration - Part 3: Effects of Vibration on Structures" will be achieved.

## 12 Conclusion

An assessment of the construction noise and vibration effects due to the Project has been undertaken considering a worst-case scenario. The predicted noise and vibration levels and effects are based on indicative information as provided by the Project Team and any assessment conclusions should be confirmed during the detailed design stage, taking account of the final equipment selections, methodology and receivers as they exist at the time of construction.

Construction noise and vibration can be mitigated and managed, utilising the measures set out in Section 11, to comply with the applicable limits for the majority of the works. Exceedances of the criteria could occur intermittently across all NoRs, if high noise or vibration generating equipment is used near occupied buildings. The most impacted receivers are located within 10m of the construction boundary.

Night works should be limited to critical activities that cannot be carried out at any other time.

A CNVMP will be prepared prior to construction commencing in accordance with Section 11.1 of this report. The CNVMP will provide a framework for the development and implementation of best practicable options to avoid, remedy or mitigate the adverse effects of construction noise and vibration on receivers that exist at the time of construction. Communication and consultation will occur with the affected receivers and Schedules will be prepared if required.

Elevated noise levels should be avoided and mitigated where possible to reduce the likelihood of adverse effects such as loss of concentration, annoyance and sleep disturbance (for night works).

Whilst vibration levels at the daytime Category A criteria can generally be tolerated if activity occurs intermittently and with prior notice, communication and consultation will be the key management measure to avoid annoyance and concern. Where vibration levels are predicted to exceed the Category B criteria, and where the construction methodology cannot be changed to reduce vibration levels, building condition surveys are recommended.

Overall, construction noise and vibration can be controlled for all NoRs to reasonable levels with the implementation of appropriate mitigation and management measures.

# 1 Appendix A – Receivers predicted to receive noise levels exceeding 70 dB L<sub>Aeq</sub>

## 1.1 NoR 1

Address	Building Type / Structure
1 Butterworth Avenue, Ōpaheke, Papakura	Residential
1 Grande Vue Road, Hillpark, Auckland	Residential
1 Opaheke Road, Papakura	Residential
1 Park Estate Road, Rosehill, Papakura	Residential
1 Parkhaven Drive, Rosehill, Papakura	Residential
1 Walter Strevens Drive, Conifer Grove, Takanini	Residential
1/1 Manse Road, Pahurehure, Papakura	Residential
1/14 Great South Road, Manurewa, Auckland	Residential
1/2 Park Estate Road, Rosehill, Papakura	Residential
1/299 Great South Road, Manurewa, Auckland	Residential
1/305 Great South Road, Manurewa, Auckland	Residential
1/327 Great South Road, Papakura	Residential
1/34 Great South Road, Manurewa, Auckland	Residential
1/326 Great South Road, Ōpaheke, Papakura	Residential
1/332 Great South Road, Ōpaheke, Papakura	Residential
1/355 Great South Road, Ōpaheke, Papakura	Commercial
1/359 Great South Road, Ōpaheke, Papakura	Residential
1/37 Great South Road, Manurewa, Auckland	Residential
1/40 Great South Road, Manurewa, Auckland	Residential
1/42 Great South Road, Manurewa, Auckland	Residential
1/444 Great South Road, Ōpaheke, Papakura	Residential
1/446 Great South Road, Ōpaheke, Papakura	Residential
1/450 Great South Road, Ōpaheke, Papakura	Residential
1/454 Great South Road, Ōpaheke, Papakura	Residential
1/458 Great South Road, Ōpaheke, Papakura	Residential
1/468 Great South Road, Ōpaheke, Papakura	Residential
1/48 Great South Road, Manurewa, Auckland	Residential
1/49 Great South Road, Manurewa, Auckland	Residential
1/52 Great South Road, Manurewa, Auckland	Residential
1/53 Great South Road, Manurewa, Auckland	Residential
1/54 Great South Road, Manurewa, Auckland	Residential
1/55 Great South Road, Manurewa, Auckland	Residential
1/59 Great South Road, Manurewa, Auckland	Residential
1/65 Great South Road, Manurewa, Auckland	Residential
1/72 Great South Road, Manurewa, Auckland	Residential
10 Great South Road, Manurewa, Auckland	Residential
1-16/38 Great South Road, Manurewa, Auckland	Residential
12 Great South Road, Manurewa, Auckland	Residential
1-2/2 Walter Strevens Drive, Conifer Grove, Takanini	Residential
1-2/3 Park Estate Road, Rosehill, Papakura	Residential
1-2/45 Great South Road, Manurewa, Auckland	Residential
1-2/461 Great South Road, Ōpaheke, Papakura	Residential
1-2/462 Great South Road, Ōpaheke, Papakura	Residential

<b>Address</b>	<b>Building Type / Structure</b>
1-2/465 Great South Road, Ōpaheke, Papakura	Residential
1-2/47 Great South Road, Manurewa, Auckland	Residential
1-2/61 Great South Road, Manurewa, Auckland	Residential
1-2/78A Great South Road, Manurewa, Auckland	Residential
1-2/79 Great South Road, Manurewa, Auckland	Residential
1-3/2 Browns Road, Manurewa, Auckland	Residential
1-3/319-323 Great South Road, Papakura	Commercial
134 Great South Road, Drury	Residential
134A Great South Road, Drury	Residential
136 Great South Road, Drury	Residential
14 Great South Road, Manurewa, Auckland	Residential
1-4/1A Halsey Road, Manurewa, Auckland	Residential
141 Great South Road, Drury	Commercial
1-5/83 Great South Road, Manurewa, Auckland	Residential
152 Great South Road, Takanini	Commercial
154 Great South Road, Takanini	Commercial
155 Great South Road, Takanini	Residential
157 Great South Road, Takanini	Residential
159 Great South Road, Takanini	Residential
16 Great South Road, Manurewa, Auckland	Residential
160 Great South Road, Takanini	Commercial
160A Great South Road, Takanini	Residential
162 Great South Road, Takanini	Residential
166-168 Great South Road, Takanini	Commercial
167 Great South Road, Takanini	Commercial
170-172 Great South Road, Takanini	Commercial
18 Great South Road, Manurewa, Auckland	Residential
2 Beach Road, Pahurehure, Papakura	Commercial
2/2 Park Estate Road, Rosehill, Papakura	Residential
2/3 Liverpool Street, Papakura	Residential
2/321 Great South Road, Manurewa, Auckland	Commercial
2/326 Great South Road, Ōpaheke, Papakura	Residential
2/34 Great South Road, Manurewa, Auckland	Residential
2/42 Great South Road, Manurewa, Auckland	Residential
2/451 Great South Road, Ōpaheke, Papakura	Residential
2/469 Great South Road, Ōpaheke, Papakura	Residential
2/49 Great South Road, Manurewa, Auckland	Residential
2/52 Great South Road, Manurewa, Auckland	Residential
2/53 Great South Road, Manurewa, Auckland	Residential
2/54 Great South Road, Manurewa, Auckland	Residential
2/55 Great South Road, Manurewa, Auckland	Residential
2/70 Great South Road, Manurewa, Auckland	Residential
20 Great South Road, Manurewa, Auckland	Residential
21 Great South Road, Manurewa, Auckland	Commercial
22 Great South Road, Manurewa, Auckland	Residential
23 Great South Road, Manurewa, Auckland	Residential
24 Great South Road, Manurewa, Auckland	Residential
25 Great South Road, Manurewa, Auckland	Residential
250-260 Great South Road, Papakura	Commercial
282 Great South Road, Manurewa, Auckland	Commercial

Address	Building Type / Structure
288 Great South Road, Manurewa, Auckland	Commercial
29 Great South Road, Manurewa, Auckland	Residential
290 Great South Road, Manurewa, Auckland	Commercial
293-297 Great South Road, Papakura	Commercial
299 Great South Road, Papakura	Commercial
3/61 Great South Road, Manurewa, Auckland	Residential
301 Great South Road, Manurewa, Auckland	Residential
302 Great South Road, Manurewa, Auckland	Commercial
303-305, 311-317 Great South Road, Papakura	Commercial
304 Great South Road, Manurewa, Auckland	Commercial
307A Great South Road, Manurewa, Auckland	Residential
309 Great South Road, Manurewa, Auckland	Commercial
31 Great South Road, Manurewa, Auckland	Residential
311 Great South Road, Manurewa, Auckland	Commercial
313 Great South Road, Manurewa, Auckland	Residential
314 Great South Road, Manurewa, Auckland	Commercial
315 Great South Road, Manurewa, Auckland	Residential
317-319 Great South Road, Manurewa, Auckland	Commercial
318 Great South Road, Manurewa, Auckland	Commercial
32 Great South Road, Manurewa, Auckland	Residential
320 Great South Road, Ōpaheke, Papakura	Residential
322A Great South Road, Ōpaheke, Papakura	Residential
323 Great South Road, Manurewa, Auckland	Commercial
324 Great South Road, Manurewa, Auckland	Commercial
325 Great South Road, Manurewa, Auckland	Commercial
328 Great South Road, Ōpaheke, Papakura	Residential
33 Great South Road, Manurewa, Auckland	Residential
330A Great South Road, Ōpaheke, Papakura	Residential
334 Great South Road, Ōpaheke, Papakura	Residential
336 Great South Road, Ōpaheke, Papakura	Residential
338 Great South Road, Ōpaheke, Papakura	Residential
3-4/464 Great South Road, Ōpaheke, Papakura	Residential
3-4/79 Great South Road, Manurewa, Auckland	Residential
340 Great South Road, Ōpaheke, Papakura	Residential
35 Great South Road, Manurewa, Auckland	Residential
357 Great South Road, Ōpaheke, Papakura	Residential
357A Great South Road, Ōpaheke, Papakura	Residential
361 Great South Road, Ōpaheke, Papakura	Residential
365-367 Great South Road, Ōpaheke, Papakura	Commercial
369-371 Great South Road, Ōpaheke, Papakura	Commercial
36A Great South Road, Manurewa, Auckland	Residential
373-375 Great South Road, Ōpaheke, Papakura	Residential
377 Great South Road, Ōpaheke, Papakura	Residential
39 Great South Road, Manurewa, Auckland	Residential
4 Walter Strevens Drive, Conifer Grove, Takanini	Residential
41 Great South Road, Manurewa, Auckland	Residential
43A Great South Road, Manurewa, Auckland	Residential
44A Great South Road, Manurewa, Auckland	Residential
44B Great South Road, Manurewa, Auckland	Residential
452 Great South Road, Ōpaheke, Papakura	Residential

<b>Address</b>	<b>Building Type / Structure</b>
453 Great South Road, Ōpaheke, Papakura	Residential
456 Great South Road, Ōpaheke, Papakura	Residential
459 Great South Road, Ōpaheke, Papakura	Residential
463A/B Great South Road, Ōpaheke, Papakura	Residential
466 Great South Road, Ōpaheke, Papakura	Residential
469 Great South Road, Ōpaheke, Papakura	Residential
46A Great South Road, Manurewa, Auckland	Residential
46B Great South Road, Manurewa, Auckland	Residential
470 Great South Road, Ōpaheke, Papakura	Residential
471 Great South Road, Ōpaheke, Papakura	Residential
473 Great South Road, Ōpaheke, Papakura	Residential
5 Park Estate Road, Rosehill, Papakura	Residential
50 Great South Road, Manurewa, Auckland	Residential
51A Great South Road, Manurewa, Auckland	Residential
51B Great South Road, Manurewa, Auckland	Residential
5-6/79 Great South Road, Manurewa, Auckland	Residential
57 Great South Road, Manurewa, Auckland	Residential
57 Wood Street, Papakura	Commercial
58 Wood Street, Papakura	Commercial
589B Great South Road, Rosehill, Papakura	Residential
589E Great South Road, Rosehill, Papakura	Residential
593 Great South Road, Rosehill, Papakura	Residential
595 Great South Road, Rosehill, Papakura	Residential
6/34 Great South Road, Manurewa, Auckland	Residential
63 Great South Road, Manurewa, Auckland	Residential
66 Great South Road, Manurewa, Auckland	Residential
67 Great South Road, Manurewa, Auckland	Residential
67 Great South Road, Papakura	Commercial
69 Great South Road, Papakura	Commercial
69A Great South Road, Manurewa, Auckland	Residential
69B Great South Road, Manurewa, Auckland	Residential
71 Great South Road, Manurewa, Auckland	Residential
71-75 Great South Road, Papakura	Commercial
73 Great South Road, Manurewa, Auckland	Residential
74 Great South Road, Manurewa, Auckland	Residential
75 Great South Road, Manurewa, Auckland	Residential
75A Great South Road, Manurewa, Auckland	Residential
77 Great South Road, Papakura	Commercial
79-83 Great South Road, Papakura	Commercial
81 Great South Road, Manurewa, Auckland	Residential
82 Great South Road, Manurewa, Auckland	Residential
84 Great South Road, Papakura	Commercial
86 Great South Road, Manurewa, Auckland	Residential
86-88 Great South Road, Papakura	Commercial
89-91 Great South Road, Papakura	Commercial

## 1.2 NoR 2

Address	Building Type / Structure
1/250 Great South Road, Drury	Commercial
1/257 Great South Road, Drury	Commercial
1/260 Great South Road, Drury	Commercial
2/257 Great South Road, Drury	Commercial
236 Great South Road, Drury	Commercial
250 Great South Road, Drury	Commercial
251 Great South Road, Drury	Commercial
255 Great South Road, Drury	Commercial
257-261 Great South Road, Drury	Commercial
263 Great South Road, Drury	Commercial
267 Great South Road, Drury	Commercial
271 Great South Road, Drury	Commercial

## 1.3 NoR 3

Address	Building Type / Structure
1 Beaumonts Way, Manurewa, Auckland	Residential
1 Scotts Road, Manurewa East, Auckland	Residential
1/124 Alfriston Road, Manurewa, Auckland	Residential
1/15 Alfriston Road, Manurewa East, Auckland	Residential
1/18A Weymouth Road, Manurewa, Auckland	Residential
1/20 Weymouth Road, Manurewa, Auckland	Residential
1/24 Alfriston Road, Manurewa East, Auckland	Residential
1/24 Weymouth Road, Manurewa, Auckland	Residential
1/252 Great South Road, Manurewa, Auckland	Residential
1/254 Great South Road, Manurewa, Auckland	Residential
1/256 Great South Road, Manurewa, Auckland	Residential
1/258 Great South Road, Manurewa, Auckland	Residential
1/26 Alfriston Road, Manurewa East, Auckland	Residential
1/262 Great South Road, Manurewa, Auckland	Residential
1/28 Alfriston Road, Manurewa East, Auckland	Residential
1/51 Alfriston Road, Manurewa East, Auckland	Residential
1/55 Alfriston Road, Manurewa East, Auckland	Residential
1/57 Alfriston Road, Manurewa East, Auckland	Residential
1/63 Alfriston Road, Manurewa East, Auckland	Residential
1/66 Alfriston Road, Manurewa East, Auckland	Residential
1/71 Alfriston Road, Manurewa East, Auckland	Residential
1/72 Alfriston Road, Manurewa East, Auckland	Residential
100 Alfriston Road, Manurewa, Auckland	Residential
106 Alfriston Road, Manurewa, Auckland	Residential
112 Alfriston Road, Manurewa, Auckland	Residential
116 Alfriston Road, Manurewa, Auckland	Residential
116A Alfriston Road, Manurewa, Auckland	Residential
12 Selwyn Road, Manurewa, Auckland	Commercial
120 Alfriston Road, Manurewa, Auckland	Residential
122A Alfriston Road, Manurewa, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
122H Alfriston Road, Manurewa, Auckland	Residential
128 Alfriston Road, Manurewa, Auckland	Residential
129 Alfriston Road, Manurewa, Auckland	Residential
1-3/245 Great South Road, Manurewa, Auckland	Residential
1-3/78 Alfriston Road, Manurewa East, Auckland	Residential
130 Alfriston Road, Manurewa, Auckland	Residential
131 Alfriston Road, Manurewa, Auckland	Residential
131A Alfriston Road, Manurewa, Auckland	Residential
132 Alfriston Road, Manurewa, Auckland	Residential
133 Alfriston Road, Manurewa, Auckland	Residential
134 Alfriston Road, Manurewa, Auckland	Residential
135 Alfriston Road, Manurewa, Auckland	Residential
137 Alfriston Road, Manurewa, Auckland	Residential
139 Alfriston Road, Manurewa, Auckland	Residential
141B Alfriston Road, Manurewa, Auckland	Residential
141C Alfriston Road, Manurewa, Auckland	Residential
141D Alfriston Road, Manurewa, Auckland	Residential
141E Alfriston Road, Manurewa, Auckland	Residential
141F Alfriston Road, Manurewa, Auckland	Residential
143 Alfriston Road, Manurewa, Auckland	Residential
143A Alfriston Road, Manurewa, Auckland	Residential
16 Alfriston Road, Manurewa East, Auckland	Residential
1-8/261 Great South Road, Manurewa, Auckland	Residential
185 Great South Road, Manurewa, Auckland	Commercial
18A Weymouth Road, Manurewa, Auckland	Residential
1A Scotts Road, Manurewa East, Auckland	Residential
2 Alfriston Road, Manurewa, Auckland	Commercial
2 Beaumonts Way, Manurewa, Auckland	Residential
2/110 Alfriston Road, Manurewa, Auckland	Residential
2/124 Alfriston Road, Manurewa, Auckland	Residential
2/15 Alfriston Road, Manurewa East, Auckland	Residential
2/18A Weymouth Road, Manurewa, Auckland	Residential
2/19 Alfriston Road, Manurewa East, Auckland	Residential
2/236A Great South Road, Manurewa, Auckland	Commercial
2/24 Alfriston Road, Manurewa East, Auckland	Residential
2/256 Great South Road, Manurewa, Auckland	Residential
2/258 Great South Road, Manurewa, Auckland	Residential
2/26 Alfriston Road, Manurewa East, Auckland	Residential
2/28 Alfriston Road, Manurewa East, Auckland	Residential
2/32 Alfriston Road, Manurewa East, Auckland	Residential
2/51 Alfriston Road, Manurewa East, Auckland	Residential
2/72 Alfriston Road, Manurewa East, Auckland	Residential
2/84 Alfriston Road, Manurewa East, Auckland	Residential
2/86 Alfriston Road, Manurewa East, Auckland	Residential
203-205 Great South Road, Manurewa, Auckland	Commercial
20A Alfriston Road, Manurewa East, Auckland	Residential
214-216 Great South Road, Manurewa, Auckland	Commercial
215 Great South Road, Manurewa, Auckland	Residential
217 Great South Road, Manurewa, Auckland	Residential
218-220 Great South Road, Manurewa, Auckland	Commercial

<b>Address</b>	<b>Building Type / Structure</b>
219 Great South Road, Manurewa, Auckland	Residential
22 Skelton Avenue, Randwick Park, Auckland	Residential
22 Weymouth Road, Manurewa, Auckland	Residential
22/110 Alfriston Road, Manurewa, Auckland	Residential
221 Great South Road, Manurewa, Auckland	Residential
222A Great South Road, Manurewa, Auckland	Commercial
223 Great South Road, Manurewa, Auckland	Residential
225-227 Great South Road, Manurewa, Auckland	Commercial
229 Great South Road, Manurewa, Auckland	Residential
2-3/63 Alfriston Road, Manurewa East, Auckland	Residential
2-3/66 Alfriston Road, Manurewa East, Auckland	Residential
230 Great South Road, Manurewa, Auckland	Commercial
232 Great South Road, Manurewa, Auckland	Commercial
233 Great South Road, Manurewa, Auckland	Residential
234 Great South Road, Manurewa, Auckland	Commercial
235 Great South Road, Manurewa, Auckland	Residential
237A Great South Road, Manurewa, Auckland	Residential
240 Great South Road, Manurewa, Auckland	Residential
242 Great South Road, Manurewa East, Auckland	Commercial
246 Great South Road, Manurewa, Auckland	Residential
250 Great South Road, Manurewa, Auckland	Residential
250A Great South Road, Manurewa, Auckland	Residential
252B Great South Road, Manurewa, Auckland	Residential
259 Great South Road, Manurewa, Auckland	Residential
25A Alfriston Road, Manurewa East, Auckland	Residential
25B Alfriston Road, Manurewa East, Auckland	Residential
26 Weymouth Road, Manurewa, Auckland	Residential
260 Great South Road, Manurewa, Auckland	Residential
27A Alfriston Road, Manurewa East, Auckland	Residential
29 Alfriston Road, Manurewa East, Auckland	Commercial
29 Index Place, Manurewa, Auckland	Residential
2A-C Fleming Street, Manurewa East, Auckland	Residential
3 Beaumonts Way, Manurewa, Auckland	Residential
3 Shifnal Drive, Randwick Park, Auckland	Residential
3/32 Alfriston Road, Manurewa East, Auckland	Residential
3/81 Alfriston Road, Manurewa East, Auckland	Residential
30B Alfriston Road, Manurewa East, Auckland	Residential
33 Alfriston Road, Manurewa East, Auckland	Residential
33A Alfriston Road, Manurewa East, Auckland	Residential
34 Alfriston Road, Manurewa East, Auckland	Residential
36 Alfriston Road, Manurewa East, Auckland	Residential
37 Alfriston Road, Manurewa East, Auckland	Residential
38A Alfriston Road, Manurewa East, Auckland	Residential
39 Alfriston Road, Manurewa East, Auckland	Residential
4 Beaumonts Way, Manurewa, Auckland	Residential
4/32 Alfriston Road, Manurewa East, Auckland	Residential
4/81 Alfriston Road, Manurewa East, Auckland	Residential
40A Alfriston Road, Manurewa East, Auckland	Residential
41 Alfriston Road, Manurewa East, Auckland	Residential
42A Alfriston Road, Manurewa East, Auckland	Residential

Address	Building Type / Structure
45 Alfriston Road, Manurewa East, Auckland	Residential
4-6 Alfriston Road, Manurewa East, Auckland	Commercial
47 Alfriston Road, Manurewa East, Auckland	Residential
49 Alfriston Road, Manurewa East, Auckland	Residential
49 Claude Road, Hillpark, Auckland	Residential
5 Alfriston Road, Manurewa, Auckland	Commercial
5 Beaumonts Way, Manurewa, Auckland	Residential
5 Scotts Road, Manurewa East, Auckland	Residential
5/15 Alfriston Road, Manurewa East, Auckland	Residential
5/81 Alfriston Road, Manurewa East, Auckland	Residential
52 Alfriston Road, Manurewa East, Auckland	Residential
52A Alfriston Road, Manurewa East, Auckland	Residential
56 Claude Road, Hillpark, Auckland	Residential
59B Alfriston Road, Manurewa East, Auckland	Residential
6 Skelton Avenue, Randwick Park, Auckland	Residential
60 Claude Road, Manurewa East, Auckland	Residential
61 Alfriston Road, Manurewa East, Auckland	Residential
62 Alfriston Road, Manurewa East, Auckland	Residential
64 Alfriston Road, Manurewa East, Auckland	Residential
65 Alfriston Road, Manurewa East, Auckland	Residential
67 Alfriston Road, Manurewa East, Auckland	Residential
68 Alfriston Road, Manurewa East, Auckland	Residential
70A Alfriston Road, Manurewa East, Auckland	Residential
8 Scotts Road, Manurewa East, Auckland	Residential
80 Alfriston Road, Manurewa East, Auckland	Residential
88 Alfriston Road, Manurewa East, Auckland	Residential
88 Magic Way, Randwick Park, Auckland	Residential
90A Alfriston Road, Manurewa East, Auckland	Residential
92A Alfriston Road, Manurewa, Auckland	Residential

## 1.4 NoR 4

Address	Building Type / Structure
1 Giani Court, Manurewa, Auckland	Residential
1 Ricardo Court, Manurewa, Auckland	Residential
1 Sarteano Drive, Manurewa, Auckland	Residential
1 Sheriff Place, Randwick Park, Auckland	Residential
1/1 Clarice Place, Takanini	Residential
1/133 Manuroa Road, Takanini	Residential
1/156 Porchester Road, Papakura	Residential
1/160 Porchester Road, Papakura	Residential
1/2 Glenburn Place, Papakura	Residential
1/256 Porchester Road, Takanini	Residential
1/258 Porchester Road, Takanini	Residential
1/263 Porchester Road, Takanini	Residential
1/268 Porchester Road, Takanini	Residential
1/274 Porchester Road, Takanini	Residential
1/276 Porchester Road, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
1/277 Porchester Road, Takanini	Residential
1/281 Porchester Road, Takanini	Residential
1/282 Porchester Road, Takanini	Residential
1/4 Glenburn Place, Papakura	Residential
1/460 Porchester Road, Randwick Park, Auckland	Residential
1/474 Porchester Road, Randwick Park, Auckland	Residential
1/476 Porchester Road, Randwick Park, Auckland	Residential
1/478 Porchester Road, Randwick Park, Auckland	Residential
1/480 Porchester Road, Randwick Park, Auckland	Residential
1/482 Porchester Road, Randwick Park, Auckland	Residential
1/490 Porchester Road, Randwick Park, Auckland	Residential
1/5 Berwyn Avenue, Takanini	Residential
1/50 Airfield Road, Takanini	Residential
1/511 Porchester Road, Randwick Park, Auckland	Commercial
1/6 Berwyn Avenue, Takanini	Residential
10 Abilene Place, Manurewa, Auckland	Residential
10 Amarillo Place, Manurewa, Auckland	Residential
10 Berwyn Avenue, Takanini	Residential
100 Takanini School Road, Takanini	Commercial
106 Hyperion Drive, Randwick Park, Auckland	Residential
108 Hyperion Drive, Randwick Park, Auckland	Residential
108 Riverton Drive, Randwick Park, Auckland	Residential
10A/B Dittmer Place, Papakura	Residential
11 Phar Lap Crescent, Takanini	Residential
11 Sheriff Place, Randwick Park, Auckland	Residential
11 Zoe Court, Manurewa, Auckland	Residential
110 Hyperion Drive, Randwick Park, Auckland	Residential
110 Riverton Drive, Randwick Park, Auckland	Residential
112 Riverton Drive, Randwick Park, Auckland	Residential
114 Riverton Drive, Randwick Park, Auckland	Residential
1185 Alfriston Road, Alfriston, Auckland	Commercial
11A/B Dittmer Place, Papakura	Residential
12 Abilene Place, Manurewa, Auckland	Residential
12 Nerissa Place, Randwick Park, Auckland	Residential
1-2/14 Nerissa Place, Randwick Park, Auckland	Residential
1-2/162 Porchester Road, Papakura	Residential
1-2/286 Porchester Road, Takanini	Residential
1-2/299 Porchester Road, Takanini	Residential
1-2/3 Berwyn Avenue, Takanini	Residential
121 Riverton Drive, Randwick Park, Auckland	Residential
123 Riverton Drive, Randwick Park, Auckland	Residential
125 Riverton Drive, Randwick Park, Auckland	Residential
125A-F Manuroa Road, Takanini	Residential
127 Manuroa Road, Takanini	Residential
127 Riverton Drive, Randwick Park, Auckland	Residential
129 Hyperion Drive, Randwick Park, Auckland	Residential
129 Manuroa Road, Takanini	Residential
129 Riverton Drive, Randwick Park, Auckland	Residential
13 Calumet Way, Takanini	Residential
13 Phar Lap Crescent, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
13 Sheriff Place, Randwick Park, Auckland	Residential
13 Zoe Court, Manurewa, Auckland	Residential
1-3/150 Porchester Road, Papakura	Residential
131 Hyperion Drive, Randwick Park, Auckland	Residential
131 Manuroa Road, Takanini	Residential
13-17 Biplane Street, Takanini	Residential
133 Hyperion Drive, Randwick Park, Auckland	Residential
133A Manuroa Road, Takanini	Residential
135 Hyperion Drive, Randwick Park, Auckland	Residential
135 Porchester Road, Papakura	Residential
137 Porchester Road, Papakura	Residential
139 Porchester Road, Papakura	Residential
139A Porchester Road, Papakura	Residential
140 Porchester Road, Papakura	Residential
141 Porchester Road, Papakura	Residential
145 Porchester Road, Takanini	Residential
147 Porchester Road, Takanini	Residential
149 Porchester Road, Takanini	Residential
15 Calumet Way, Takanini	Residential
15 Phar Lap Crescent, Takanini	Residential
15 Sheriff Place, Randwick Park, Auckland	Residential
15 Zoe Court, Manurewa, Auckland	Residential
150 Manuroa Road, Takanini	Residential
150A Manuroa Road, Takanini	Residential
151 Porchester Road, Takanini	Residential
152 Manuroa Road, Takanini	Residential
153 Porchester Road, Takanini	Residential
154 Manuroa Road, Takanini	Residential
155 Porchester Road, Takanini	Residential
156 Manuroa Road, Takanini	Residential
156A Manuroa Road, Takanini	Residential
157 Porchester Road, Takanini	Residential
158 Manuroa Road, Takanini	Residential
158 Porchester Road, Papakura	Residential
158A Porchester Road, Papakura	Residential
159 Porchester Road, Takanini	Residential
16 Amarillo Place, Manurewa, Auckland	Residential
160 Manuroa Road, Takanini	Residential
164A/B Porchester Road, Papakura	Residential
165 Porchester Road, Takanini	Residential
166A Porchester Road, Papakura	Residential
166B Porchester Road, Papakura	Residential
167 Alfriston Road, Manurewa, Auckland	Residential
167 Porchester Road, Takanini	Residential
168 Porchester Road, Takanini	Residential
169 Alfriston Road, Manurewa, Auckland	Residential
17 Calumet Way, Takanini	Residential
17 Phar Lap Crescent, Takanini	Residential
17 Sarteano Drive, Manurewa, Auckland	Residential
17 Sheriff Place, Randwick Park, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
17 Zoe Court, Manurewa, Auckland	Residential
170 Alfriston Road, Manurewa, Auckland	Residential
170 Porchester Road, Takanini	Residential
172 Porchester Road, Takanini	Residential
174 Porchester Road, Takanini	Residential
176 Porchester Road, Takanini	Residential
178 Porchester Road, Takanini	Residential
17A Nerissa Place, Randwick Park, Auckland	Residential
18 Amarillo Place, Manurewa, Auckland	Residential
180 Porchester Road, Takanini	Residential
182 Porchester Road, Takanini	Residential
184 Porchester Road, Takanini	Residential
186 Porchester Road, Takanini	Residential
188 Porchester Road, Takanini	Residential
19 Calumet Way, Takanini	Residential
19 Phar Lap Crescent, Takanini	Residential
19 Sheriff Place, Randwick Park, Auckland	Residential
19 Yatterina Avenue, Takanini	Residential
19 Zoe Court, Manurewa, Auckland	Residential
190 Porchester Road, Takanini	Residential
192 Porchester Road, Takanini	Residential
194 Porchester Road, Takanini	Residential
196 Porchester Road, Takanini	Residential
198 Porchester Road, Takanini	Residential
1A Berwyn Avenue, Takanini	Residential
2 Berwyn Avenue, Takanini	Residential
2 Braeburn Place, Takanini	Residential
2 Bruce Pulman Drive, Takanini	Residential
2 Clarice Place, Takanini	Residential
2 Giani Court, Manurewa, Auckland	Residential
2 Popes Road, Takanini	Residential
2 Ricardo Court, Manurewa, Auckland	Residential
2 Sarteano Drive, Manurewa, Auckland	Residential
2 Sheriff Place, Randwick Park, Auckland	Residential
2 Taipan Place, Randwick Park, Auckland	Residential
2/1 Clarice Place, Takanini	Residential
2/133 Manuroa Road, Takanini	Residential
2/154 Manuroa Road, Takanini	Residential
2/156 Porchester Road, Papakura	Residential
2/160 Porchester Road, Papakura	Residential
2/2 Clarice Place, Takanini	Residential
2/2 Glenburn Place, Papakura	Residential
2/256 Porchester Road, Takanini	Residential
2/258 Porchester Road, Takanini	Residential
2/260 Porchester Road, Takanini	Residential
2/263 Porchester Road, Takanini	Residential
2/268 Porchester Road, Takanini	Residential
2/274 Porchester Road, Takanini	Residential
2/276 Porchester Road, Takanini	Residential
2/277 Porchester Road, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
2/280 Porchester Road, Takanini	Residential
2/282 Porchester Road, Takanini	Residential
2/455 Porchester Road, Randwick Park, Auckland	Commercial
2/460 Porchester Road, Randwick Park, Auckland	Residential
2/474 Porchester Road, Randwick Park, Auckland	Residential
2/480 Porchester Road, Randwick Park, Auckland	Residential
2/482 Porchester Road, Randwick Park, Auckland	Residential
2/5 Berwyn Avenue, Takanini	Residential
2/50 Airfield Road, Takanini	Residential
2/550S Porchester Road, Randwick Park, Auckland	Residential
200 Alfriston Road, Manurewa, Auckland	Residential
202 Alfriston Road, Manurewa, Auckland	Residential
204 Alfriston Road, Manurewa, Auckland	Residential
206 Alfriston Road, Manurewa, Auckland	Residential
208 Alfriston Road, Manurewa, Auckland	Residential
21 Calumet Way, Takanini	Residential
21 Phar Lap Crescent, Takanini	Residential
21 Sheriff Place, Randwick Park, Auckland	Residential
210 Alfriston Road, Manurewa, Auckland	Residential
212 Alfriston Road, Manurewa, Auckland	Residential
2-12 Whakarato Way, Takanini	Residential
214 Alfriston Road, Manurewa, Auckland	Residential
216 Alfriston Road, Manurewa, Auckland	Residential
222 Alfriston Road, Manurewa, Auckland	Residential
224 Alfriston Road, Alfriston, Auckland	Residential
226 Alfriston Road, Alfriston, Auckland	Residential
228 Alfriston Road, Alfriston, Auckland	Residential
23 Calumet Way, Takanini	Residential
23 Phar Lap Crescent, Takanini	Residential
23 Popes Road, Takanini	Commercial
230 Alfriston Road, Alfriston, Auckland	Residential
234 Alfriston Road, Alfriston, Auckland	Residential
236 Alfriston Road, Alfriston, Auckland	Residential
238 Alfriston Road, Alfriston, Auckland	Residential
24 Amarillo Place, Manurewa, Auckland	Residential
24 Biplane Street, Takanini	Residential
245 Porchester Road, Takanini	Residential
248D Porchester Road, Takanini	Residential
248E Porchester Road, Takanini	Residential
25 Calumet Way, Takanini	Residential
25 Phar Lap Crescent, Takanini	Residential
250A-E Porchester Road, Takanini	Residential
252A-D Porchester Road, Takanini	Residential
255 Porchester Road, Takanini	Residential
257 Porchester Road, Takanini	Residential
259 Porchester Road, Takanini	Residential
259A Porchester Road, Takanini	Residential
26 Amarillo Place, Manurewa, Auckland	Residential
26 Biplane Street, Takanini	Residential
260 Porchester Road, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
261 Porchester Road, Takanini	Residential
262 Porchester Road, Takanini	Residential
263A Porchester Road, Takanini	Residential
265 Porchester Road, Takanini	Residential
266 Porchester Road, Takanini	Residential
267 Porchester Road, Takanini	Residential
269 Porchester Road, Takanini	Residential
27 Calumet Way, Takanini	Residential
27 Foxlaw Street, Randwick Park, Auckland	Residential
27 Walters Road, Takanini	Residential
270 Porchester Road, Takanini	Residential
271 Porchester Road, Takanini	Residential
271A Porchester Road, Takanini	Residential
272 Porchester Road, Takanini	Residential
273 Porchester Road, Takanini	Residential
273A Porchester Road, Takanini	Residential
279 Porchester Road, Takanini	Residential
279A Porchester Road, Takanini	Residential
279C Porchester Road, Takanini	Residential
279D Porchester Road, Takanini	Residential
279E Porchester Road, Takanini	Residential
28 Amarillo Place, Manurewa, Auckland	Residential
281 Porchester Road, Takanini	Residential
28-34 Biplane Street, Takanini	Residential
284 Porchester Road, Takanini	Residential
289 Porchester Road, Takanini	Residential
29 Calumet Way, Takanini	Residential
29 Foxlaw Street, Randwick Park, Auckland	Residential
29 Phar Lap Crescent, Takanini	Residential
295B Porchester Road, Takanini	Residential
295C Porchester Road, Takanini	Residential
297A Porchester Road, Takanini	Residential
297B Porchester Road, Takanini	Residential
297C Porchester Road, Takanini	Residential
2A Clarice Place, Takanini	Residential
2A Popes Road, Takanini	Residential
2A Sheriff Place, Randwick Park, Auckland	Residential
2B Sheriff Place, Randwick Park, Auckland	Residential
2C Sheriff Place, Randwick Park, Auckland	Residential
3 Arion Road, Takanini	Residential
3 Giani Court, Manurewa, Auckland	Residential
3 Glenburn Place, Papakura	Residential
3 Phar Lap Crescent, Takanini	Residential
3 Ricardo Court, Manurewa, Auckland	Residential
3 Sarteano Drive, Manurewa, Auckland	Residential
3 Sheriff Place, Randwick Park, Auckland	Residential
3 Sires Parkway, Takanini	Residential
3/258 Porchester Road, Takanini	Residential
3/263 Porchester Road, Takanini	Residential
3/286 Porchester Road, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
3/460 Porchester Road, Randwick Park, Auckland	Residential
30 Walters Road, Takanini, Auckland	Commercial
301 Porchester Road, Takanini	Residential
301A Porchester Road, Takanini	Residential
305 Porchester Road, Takanini	Residential
307-309 Porchester Road, Takanini	Residential
31 Calumet Way, Takanini	Residential
31 Foxlaw Street, Randwick Park, Auckland	Residential
31 Phar Lap Crescent, Takanini	Residential
31 Walters Road, Takanini	Residential
311 Porchester Road, Takanini	Residential
33 Calumet Way, Takanini	Residential
33 Foxlaw Street, Randwick Park, Auckland	Residential
33 Phar Lap Crescent, Takanini	Residential
33 Walters Road, Takanini	Residential
333 Porchester Road, Takanini	Residential
33A Walters Road, Takanini	Residential
35 Calumet Way, Takanini	Residential
35 Foxlaw Street, Randwick Park, Auckland	Residential
35 Phar Lap Crescent, Takanini	Residential
35 Walters Road, Takanini	Residential
354 Porchester Road, Takanini	Commercial
354A Porchester Road, Takanini	Commercial
37 Calumet Way, Takanini	Residential
37 Phar Lap Crescent, Takanini	Residential
37 Walters Road, Takanini	Residential
37A Walters Road, Takanini	Residential
39 Calumet Way, Takanini	Residential
39 Phar Lap Crescent, Takanini	Residential
39 Walters Road, Takanini	Residential
391 Porchester Road, Randwick Park, Auckland	Residential
3A Glenburn Place, Papakura	Residential
4 Berwyn Avenue, Takanini	Residential
4 Braeburn Place, Takanini	Residential
4 Bruce Pulman Drive, Takanini	Residential
4 Giani Court, Manurewa, Auckland	Residential
4 Ricardo Court, Manurewa, Auckland	Residential
4 Sarteano Drive, Manurewa, Auckland	Residential
4 Sheriff Place, Randwick Park, Auckland	Residential
4 Sires Parkway, Takanini	Residential
4/263 Porchester Road, Takanini	Residential
4/460 Porchester Road, Randwick Park, Auckland	Residential
41 Calumet Way, Takanini	Residential
41 Phar Lap Crescent, Takanini	Residential
41 Walters Road, Takanini	Residential
423 Porchester Road, Randwick Park, Auckland	Residential
428 Porchester Road, Randwick Park, Auckland	Residential
43 Calumet Way, Takanini	Residential
43 Foxlaw Street, Randwick Park, Auckland	Residential
43 Phar Lap Crescent, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
43 Walters Road, Takanini	Residential
430 Porchester Road, Randwick Park, Auckland	Residential
432 Porchester Road, Randwick Park, Auckland	Residential
434 Porchester Road, Randwick Park, Auckland	Residential
436 Porchester Road, Randwick Park, Auckland	Residential
438 Porchester Road, Randwick Park, Auckland	Residential
438A Porchester Road, Randwick Park, Auckland	Residential
440 Porchester Road, Randwick Park, Auckland	Residential
442 Porchester Road, Randwick Park, Auckland	Residential
444 Porchester Road, Randwick Park, Auckland	Residential
446 Porchester Road, Randwick Park, Auckland	Residential
448 Porchester Road, Randwick Park, Auckland	Residential
45 Foxlaw Street, Randwick Park, Auckland	Residential
45 Walters Road, Takanini	Residential
450 Porchester Road, Randwick Park, Auckland	Residential
452 Porchester Road, Randwick Park, Auckland	Residential
454 Porchester Road, Randwick Park, Auckland	Residential
455 Porchester Road, Randwick Park, Auckland	Commercial
456 Porchester Road, Randwick Park, Auckland	Residential
458 Porchester Road, Randwick Park, Auckland	Residential
460 Porchester Road, Randwick Park, Auckland	Residential
463-471 Porchester Road, Randwick Park, Auckland	Residential
47 Foxlaw Street, Randwick Park, Auckland	Residential
472 Porchester Road, Randwick Park, Auckland	Residential
476 Porchester Road, Randwick Park, Auckland	Residential
478 Porchester Road, Randwick Park, Auckland	Residential
479 Porchester Road, Randwick Park, Auckland	Residential
48 Airfield Road, Takanini	Residential
484 Porchester Road, Randwick Park, Auckland	Residential
487 Porchester Road, Randwick Park, Auckland	Residential
49 Foxlaw Street, Randwick Park, Auckland	Residential
49 Walters Road, Papakura	Residential
494 Porchester Road, Randwick Park, Auckland	Residential
496 Porchester Road, Randwick Park, Auckland	Residential
498 Porchester Road, Randwick Park, Auckland	Residential
49A Walters Road, Papakura	Residential
49B Walters Road, Papakura	Residential
49E Walters Road, Papakura	Residential
4A Berwyn Avenue, Takanini	Residential
4A Sheriff Place, Randwick Park, Auckland	Residential
4B Berwyn Avenue, Takanini	Residential
5 Arion Road, Takanini	Residential
5 Giani Court, Manurewa, Auckland	Residential
5 Phar Lap Crescent, Takanini	Residential
5 Ricardo Court, Manurewa, Auckland	Residential
5 Sarteano Drive, Manurewa, Auckland	Residential
5 Sheriff Place, Randwick Park, Auckland	Residential
5/460 Porchester Road, Randwick Park, Auckland	Residential
503 Porchester Road, Randwick Park, Auckland	Residential
504 Porchester Road, Randwick Park, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
506 Porchester Road, Randwick Park, Auckland	Residential
508 Porchester Road, Randwick Park, Auckland	Residential
51 Popes Road, Takanini	Residential
510 Porchester Road, Randwick Park, Auckland	Residential
511 Porchester Road, Randwick Park, Auckland	Residential
52 Airfield Road, Takanini	Residential
52 Popes Road, Takanini	Residential
526 Porchester Road, Randwick Park, Auckland	Residential
52A Airfield Road, Takanini	Residential
54 Airfield Road, Takanini	Residential
56 Airfield Road, Takanini	Residential
56A Airfield Road, Takanini	Residential
56B Airfield Road, Takanini	Residential
58 Airfield Road, Takanini	Residential
6 Abilene Place, Manurewa, Auckland	Residential
6 Berwyn Avenue, Takanini	Residential
6 Braeburn Place, Takanini	Residential
6 Bruce Pulman Drive, Takanini	Residential
6 Giani Court, Manurewa, Auckland	Residential
6 Ricardo Court, Manurewa, Auckland	Residential
6 Sarteano Drive, Manurewa, Auckland	Residential
6 Sheriff Place, Randwick Park, Auckland	Residential
6/460 Porchester Road, Randwick Park, Auckland	Residential
60 Airfield Road, Takanini	Residential
60A Airfield Road, Takanini	Residential
62 Airfield Road, Takanini	Residential
63 Stratford Road, Manurewa, Auckland	Residential
63A Stratford Road, Manurewa, Auckland	Residential
63B Stratford Road, Manurewa, Auckland	Residential
63C Stratford Road, Manurewa, Auckland	Residential
64 Airfield Road, Takanini	Residential
64 Popes Road, Takanini	Residential
64A Popes Road, Takanini	Residential
65 Stratford Road, Manurewa, Auckland	Residential
65A Stratford Road, Manurewa, Auckland	Residential
66 Airfield Road, Takanini	Residential
67 Stratford Road, Manurewa, Auckland	Residential
68 Airfield Road, Takanini	Residential
6A Braeburn Place, Takanini	Residential
6A Sheriff Place, Randwick Park, Auckland	Residential
7 Abilene Place, Manurewa, Auckland	Residential
7 Arion Road, Takanini	Residential
7 Giani Court, Manurewa, Auckland	Residential
7 Phar Lap Crescent, Takanini	Residential
7 Ricardo Court, Manurewa, Auckland	Residential
7 Sarteano Drive, Manurewa, Auckland	Residential
7 Sheriff Place, Randwick Park, Auckland	Residential
7/460 Porchester Road, Randwick Park, Auckland	Residential
70 Walters Road, Takanini	Residential
73 Popes Road, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
76 Popes Road, Takanini	Residential
76A Rangī Road, Takanini	Commercial
8 Abilene Place, Manurewa, Auckland	Residential
8 Amarillo Place, Manurewa, Auckland	Residential
8 Berwyn Avenue, Takanini	Residential
8 Bruce Pulman Drive, Takanini	Residential
8 Giani Court, Manurewa, Auckland	Residential
8 Ricardo Court, Manurewa, Auckland	Residential
8/460 Porchester Road, Randwick Park, Auckland	Residential
86 Takanini School Road, Takanini	Commercial
88 Takanini School Road, Takanini	Commercial
8A Berwyn Avenue, Takanini	Residential
8B Berwyn Avenue, Takanini	Residential
9 Abilene Place, Manurewa, Auckland	Residential
9 Glenburn Place, Papakura	Residential
9 Phar Lap Crescent, Takanini	Residential
9 Sheriff Place, Randwick Park, Auckland	Residential
9 Zoe Court, Manurewa, Auckland	Residential
9-15 Whakarato Way, Takanini	Residential
92 Takanini School Road, Takanini	Commercial
94 Takanini School Road, Takanini	Commercial
96 Takanini School Road, Takanini	Commercial
98 Takanini School Road, Takanini	Commercial

## 2 Appendix B - Receivers predicted to receive vibration levels exceeding Category B

### 2.1 NoR 1

Address	Building Type / Structure
328 Great South Road, Ōpaheke, Papakura	Residential
1/326 Great South Road, Ōpaheke, Papakura	Residential
1/332 Great South Road, Ōpaheke, Papakura	Residential
1/42 Great South Road, Manurewa, Auckland	Residential
1/468 Great South Road, Ōpaheke, Papakura	Residential
1/48 Great South Road, Manurewa, Auckland	Residential
1/49 Great South Road, Manurewa, Auckland	Residential
1/52 Great South Road, Manurewa, Auckland	Residential
1/53 Great South Road, Manurewa, Auckland	Residential
1/54 Great South Road, Manurewa, Auckland	Residential
1/55 Great South Road, Manurewa, Auckland	Residential
10 Great South Road, Manurewa, Auckland	Residential
1-16/38 Great South Road, Manurewa, Auckland	Residential
1-2/2 Walter Strevens Drive, Conifer Grove, Takapuna	Residential
1-2/47 Great South Road, Manurewa, Auckland	Residential
1-2/61 Great South Road, Manurewa, Auckland	Residential
23 Great South Road, Manurewa, Auckland	Residential
25 Great South Road, Manurewa, Auckland	Residential
3/61 Great South Road, Manurewa, Auckland	Residential
33 Great South Road, Manurewa, Auckland	Residential
336 Great South Road, Ōpaheke, Papakura	Residential
338 Great South Road, Ōpaheke, Papakura	Residential
3-4/79 Great South Road, Manurewa, Auckland	Residential
35 Great South Road, Manurewa, Auckland	Residential
357 Great South Road, Ōpaheke, Papakura	Residential
43A Great South Road, Manurewa, Auckland	Residential
44A Great South Road, Manurewa, Auckland	Residential
466 Great South Road, Ōpaheke, Papakura	Residential
46A Great South Road, Manurewa, Auckland	Residential
50 Great South Road, Manurewa, Auckland	Residential
5-6/79 Great South Road, Manurewa, Auckland	Residential
69A Great South Road, Manurewa, Auckland	Residential
71 Great South Road, Manurewa, Auckland	Residential
74 Great South Road, Manurewa, Auckland	Residential
81 Great South Road, Manurewa, Auckland	Residential
1 Butterworth Avenue, Ōpaheke, Papakura	Residential
1 Grande Vue Road, Hillpark, Auckland	Residential
1 Park Estate Road, Rosehill, Papakura	Residential
1/2 Park Estate Road, Rosehill, Papakura	Residential
1/34 Great South Road, Manurewa, Auckland	Residential
1/359 Great South Road, Ōpaheke, Papakura	Residential
1/446 Great South Road, Ōpaheke, Papakura	Residential
1/65 Great South Road, Manurewa, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
1-2/3 Park Estate Road, Rosehill, Papakura	Residential
1-2/45 Great South Road, Manurewa, Auckland	Residential
1-2/461 Great South Road, Ōpaheke, Papakura	Residential
1-2/78A Great South Road, Manurewa, Auckland	Residential
1-2/79 Great South Road, Manurewa, Auckland	Residential
134 Great South Road, Drury	Residential
14 Great South Road, Manurewa, Auckland	Residential
1-4/1A Halsey Road, Manurewa, Auckland	Residential
155 Great South Road, Takanini	Residential
159 Great South Road, Takanini	Residential
16 Great South Road, Manurewa, Auckland	Residential
160A Great South Road, Takanini	Residential
18 Great South Road, Manurewa, Auckland	Residential
2/469 Great South Road, Ōpaheke, Papakura	Residential
24 Great South Road, Manurewa, Auckland	Residential
29 Great South Road, Manurewa, Auckland	Residential
307A Great South Road, Manurewa, Auckland	Residential
31 Great South Road, Manurewa, Auckland	Residential
313 Great South Road, Manurewa, Auckland	Residential
3-4/464 Great South Road, Ōpaheke, Papakura	Residential
361 Great South Road, Ōpaheke, Papakura	Residential
39 Great South Road, Manurewa, Auckland	Residential
456 Great South Road, Ōpaheke, Papakura	Residential
469 Great South Road, Ōpaheke, Papakura	Residential
471 Great South Road, Ōpaheke, Papakura	Residential
473 Great South Road, Ōpaheke, Papakura	Residential
595 Great South Road, Rosehill, Papakura	Residential
63 Great South Road, Manurewa, Auckland	Residential
67 Great South Road, Manurewa, Auckland	Residential
73 Great South Road, Manurewa, Auckland	Residential
75 Great South Road, Manurewa, Auckland	Residential
1-3/319-323 Great South Road, Papakura	Commercial
152 Great South Road, Takanini	Commercial
166-168 Great South Road, Takanini	Commercial
167 Great South Road, Takanini	Commercial
21 Great South Road, Manurewa, Auckland	Commercial
282 Great South Road, Manurewa, Auckland	Commercial
299 Great South Road, Papakura	Commercial
303-305, 311-317 Great South Road, Papakura	Commercial
309 Great South Road, Manurewa, Auckland	Commercial
311 Great South Road, Manurewa, Auckland	Commercial
369-371 Great South Road, Ōpaheke, Papakura	Commercial
69 Great South Road, Papakura	Commercial
79-83 Great South Road, Papakura	Commercial
86-88 Great South Road, Papakura	Commercial

## 2.2 NoR 2

Address	Building Type / Structure
257-261 Great South Road, Drury	Commercial

## 2.3 NoR 3

Address	Building Type / Structure
1/28 Alfriston Road, Manurewa East, Auckland	Residential
25A Alfriston Road, Manurewa East, Auckland	Residential
129 Alfriston Road, Manurewa, Auckland	Residential
137 Alfriston Road, Manurewa, Auckland	Residential
139 Alfriston Road, Manurewa, Auckland	Residential
1/51 Alfriston Road, Manurewa East, Auckland	Residential
80 Alfriston Road, Manurewa East, Auckland	Residential
27A Alfriston Road, Manurewa East, Auckland	Residential
2/84 Alfriston Road, Manurewa East, Auckland	Residential
1/124 Alfriston Road, Manurewa, Auckland	Residential
135 Alfriston Road, Manurewa, Auckland	Residential
215 Great South Road, Manurewa, Auckland	Residential
20A Alfriston Road, Manurewa East, Auckland	Residential
1/55 Alfriston Road, Manurewa East, Auckland	Residential
2 Beaumonts Way, Manurewa, Auckland	Residential
131A Alfriston Road, Manurewa, Auckland	Residential
1/258 Great South Road, Manurewa, Auckland	Residential
2/32 Alfriston Road, Manurewa East, Auckland	Residential
18A Weymouth Road, Manurewa, Auckland	Residential
2A-C Fleming Street, Manurewa East, Auckland	Residential
217 Great South Road, Manurewa, Auckland	Residential
1/72 Alfriston Road, Manurewa East, Auckland	Residential
1-3/245 Great South Road, Manurewa, Auckland	Residential
122A Alfriston Road, Manurewa, Auckland	Residential
1/57 Alfriston Road, Manurewa East, Auckland	Residential
141B Alfriston Road, Manurewa, Auckland	Residential
2/26 Alfriston Road, Manurewa East, Auckland	Residential
219 Great South Road, Manurewa, Auckland	Residential
128 Alfriston Road, Manurewa, Auckland	Residential
143 Alfriston Road, Manurewa, Auckland	Residential
130 Alfriston Road, Manurewa, Auckland	Residential
141C Alfriston Road, Manurewa, Auckland	Residential
250 Great South Road, Manurewa, Auckland	Residential
16 Alfriston Road, Manurewa East, Auckland	Residential
1-8/261 Great South Road, Manurewa, Auckland	Residential
250A Great South Road, Manurewa, Auckland	Residential
116 Alfriston Road, Manurewa, Auckland	Residential
1/66 Alfriston Road, Manurewa East, Auckland	Residential
1/15 Alfriston Road, Manurewa East, Auckland	Residential
1 Beaumonts Way, Manurewa, Auckland	Residential
221 Great South Road, Manurewa, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
141D Alfriston Road, Manurewa, Auckland	Residential
45 Alfriston Road, Manurewa East, Auckland	Residential
260 Great South Road, Manurewa, Auckland	Residential
1-3/78 Alfriston Road, Manurewa East, Auckland	Residential
240 Great South Road, Manurewa, Auckland	Residential
141E Alfriston Road, Manurewa, Auckland	Residential
100 Alfriston Road, Manurewa, Auckland	Residential
5/81 Alfriston Road, Manurewa East, Auckland	Residential
88 Alfriston Road, Manurewa East, Auckland	Residential
26 Weymouth Road, Manurewa, Auckland	Residential
246 Great South Road, Manurewa, Auckland	Residential
1/256 Great South Road, Manurewa, Auckland	Residential
33 Alfriston Road, Manurewa East, Auckland	Residential
1/24 Weymouth Road, Manurewa, Auckland	Residential
1/24 Alfriston Road, Manurewa East, Auckland	Residential
106 Alfriston Road, Manurewa, Auckland	Residential
3 Shifnal Drive, Randwick Park, Auckland	Residential
1/254 Great South Road, Manurewa, Auckland	Residential
112 Alfriston Road, Manurewa, Auckland	Residential
1/71 Alfriston Road, Manurewa East, Auckland	Residential
61 Alfriston Road, Manurewa East, Auckland	Residential
122H Alfriston Road, Manurewa, Auckland	Residential
49 Alfriston Road, Manurewa East, Auckland	Residential
259 Great South Road, Manurewa, Auckland	Residential
141F Alfriston Road, Manurewa, Auckland	Residential
22 Weymouth Road, Manurewa, Auckland	Residential
143A Alfriston Road, Manurewa, Auckland	Residential
2/86 Alfriston Road, Manurewa East, Auckland	Residential
34 Alfriston Road, Manurewa East, Auckland	Residential
60 Claude Road, Manurewa East, Auckland	Residential
133 Alfriston Road, Manurewa, Auckland	Residential
30B Alfriston Road, Manurewa East, Auckland	Residential
1/252 Great South Road, Manurewa, Auckland	Residential
4 Beaumonts Way, Manurewa, Auckland	Residential
132 Alfriston Road, Manurewa, Auckland	Residential
2 Alfriston Road, Manurewa, Auckland	Commercial
242 Great South Road, Manurewa East, Auckland	Commercial
222A Great South Road, Manurewa, Auckland	Commercial
234 Great South Road, Manurewa, Auckland	Commercial
218-220 Great South Road, Manurewa, Auckland	Commercial
29 Alfriston Road, Manurewa East, Auckland	Commercial
230 Great South Road, Manurewa, Auckland	Commercial
4-6 Alfriston Road, Manurewa East, Auckland	Commercial
232 Great South Road, Manurewa, Auckland	Commercial
214-216 Great South Road, Manurewa, Auckland	Commercial
225-227 Great South Road, Manurewa, Auckland	Commercial
203-205 Great South Road, Manurewa, Auckland	Commercial

## 2.4 NoR 4

Address	Building Type / Structure
1 Sarteano Drive, Manurewa, Auckland	Residential
1 Sheriff Place, Randwick Park, Auckland	Residential
1/133 Manuroa Road, Takanini	Residential
1/156 Porchester Road, Papakura	Residential
1/160 Porchester Road, Papakura	Residential
1/258 Porchester Road, Takanini	Residential
1/263 Porchester Road, Takanini	Residential
1/274 Porchester Road, Takanini	Residential
1/277 Porchester Road, Takanini	Residential
1/281 Porchester Road, Takanini	Residential
1/474 Porchester Road, Randwick Park, Auckland	Residential
1/480 Porchester Road, Randwick Park, Auckland	Residential
1/482 Porchester Road, Randwick Park, Auckland	Residential
11 Sheriff Place, Randwick Park, Auckland	Residential
114 Riverton Drive, Randwick Park, Auckland	Residential
1-2/286 Porchester Road, Takanini	Residential
1-2/299 Porchester Road, Takanini	Residential
129 Riverton Drive, Randwick Park, Auckland	Residential
13 Sheriff Place, Randwick Park, Auckland	Residential
135 Hyperion Drive, Randwick Park, Auckland	Residential
141 Porchester Road, Papakura	Residential
149 Porchester Road, Takanini	Residential
15 Phar Lap Crescent, Takanini	Residential
15 Sheriff Place, Randwick Park, Auckland	Residential
158 Manuroa Road, Takanini	Residential
158 Porchester Road, Papakura	Residential
160 Manuroa Road, Takanini	Residential
164A/B Porchester Road, Papakura	Residential
166B Porchester Road, Papakura	Residential
168 Porchester Road, Takanini	Residential
17 Sheriff Place, Randwick Park, Auckland	Residential
170 Porchester Road, Takanini	Residential
172 Porchester Road, Takanini	Residential
174 Porchester Road, Takanini	Residential
176 Porchester Road, Takanini	Residential
178 Porchester Road, Takanini	Residential
180 Porchester Road, Takanini	Residential
182 Porchester Road, Takanini	Residential
184 Porchester Road, Takanini	Residential
186 Porchester Road, Takanini	Residential
188 Porchester Road, Takanini	Residential
190 Porchester Road, Takanini	Residential
2 Berwyn Avenue, Takanini	Residential
2 Bruce Pulman Drive, Takanini	Residential
2 Ricardo Court, Manurewa, Auckland	Residential
2 Sarteano Drive, Manurewa, Auckland	Residential
200 Alfriston Road, Manurewa, Auckland	Residential
206 Alfriston Road, Manurewa, Auckland	Residential

<b>Address</b>	<b>Building Type / Structure</b>
208 Alfriston Road, Manurewa, Auckland	Residential
2-12 Whakarato Way, Takanini	Residential
214 Alfriston Road, Manurewa, Auckland	Residential
216 Alfriston Road, Manurewa, Auckland	Residential
222 Alfriston Road, Manurewa, Auckland	Residential
224 Alfriston Road, Alfriston, Auckland	Residential
234 Alfriston Road, Alfriston, Auckland	Residential
252A-D Porchester Road, Takanini	Residential
257 Porchester Road, Takanini	Residential
260 Porchester Road, Takanini	Residential
261 Porchester Road, Takanini	Residential
262 Porchester Road, Takanini	Residential
267 Porchester Road, Takanini	Residential
273 Porchester Road, Takanini	Residential
279 Porchester Road, Takanini	Residential
284 Porchester Road, Takanini	Residential
295B Porchester Road, Takanini	Residential
2A Sheriff Place, Randwick Park, Auckland	Residential
2B Sheriff Place, Randwick Park, Auckland	Residential
3 Sarteano Drive, Manurewa, Auckland	Residential
3 Sheriff Place, Randwick Park, Auckland	Residential
3/286 Porchester Road, Takanini	Residential
31 Calumet Way, Takanini	Residential
33 Calumet Way, Takanini	Residential
33 Walters Road, Takanini	Residential
35 Calumet Way, Takanini	Residential
35 Walters Road, Takanini	Residential
37 Calumet Way, Takanini	Residential
37 Walters Road, Takanini	Residential
39 Calumet Way, Takanini	Residential
430 Porchester Road, Randwick Park, Auckland	Residential
446 Porchester Road, Randwick Park, Auckland	Residential
448 Porchester Road, Randwick Park, Auckland	Residential
458 Porchester Road, Randwick Park, Auckland	Residential
460 Porchester Road, Randwick Park, Auckland	Residential
472 Porchester Road, Randwick Park, Auckland	Residential
49 Walters Road, Papakura	Residential
49A Walters Road, Papakura	Residential
5 Sarteano Drive, Manurewa, Auckland	Residential
504 Porchester Road, Randwick Park, Auckland	Residential
506 Porchester Road, Randwick Park, Auckland	Residential
508 Porchester Road, Randwick Park, Auckland	Residential
526 Porchester Road, Randwick Park, Auckland	Residential
56 Airfield Road, Takanini	Residential
56A Airfield Road, Takanini	Residential
58 Airfield Road, Takanini	Residential
7 Giani Court, Manurewa, Auckland	Residential
7 Sarteano Drive, Manurewa, Auckland	Residential
8 Giani Court, Manurewa, Auckland	Residential
9-15 Whakarato Way, Takanini	Residential

<b>Address</b>	<b>Building Type / Structure</b>
1/511 Porchester Road, Randwick Park, Auckland	Commercial