Pacific Geotech
Consulting Geotechnical Engineers

# VIBRATION MONITORING PLAN: Proposed High Rise Development

19-21 Anne Avenue

Broadbeach

Maryanne Developments Pty Ltd

November 2025

PG-13778

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Ref: PG-13778, 2025-11-27, VMP VER 1
Author: Peter Elkington

28th November, 2025

Maryanne Developments Pty Ltd
Email: leo@bassargroup.com
CC: kyle.patience@hutchonsonbuilders.com.au

**ATTN: LEO SARRIS**

Dear Sir,

**VIBRATION MONITORING PLAN – PROPOSED HIGH RISE DEVELOPMENT**
**19-21 ANNE AVENUE, BROADBEACH**

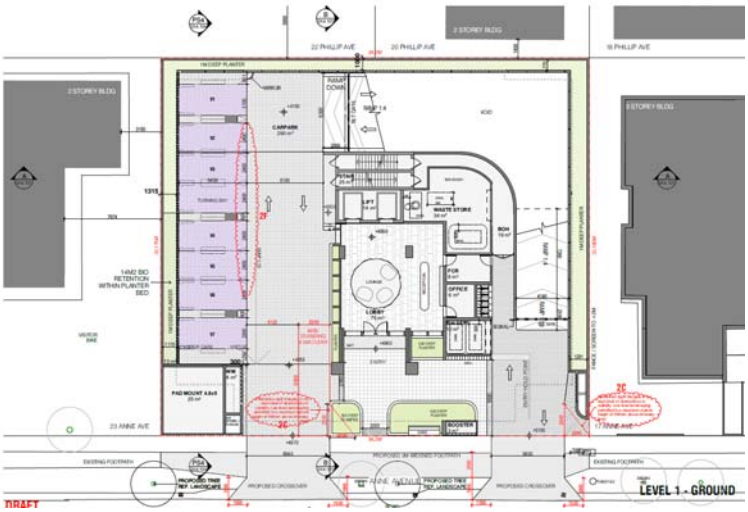
## 1.0 INTRODUCTION

A Vibration Monitoring Plan (VMP) is required for the proposed development located at 19-21 Anne Avenue, Broadbeach to ensure the development does not cause excessive vibrational impacts during its construction through unreasonable loss of amenity to adjacent members of the public.

## 2.0 PROPOSED DEVELOPMENT

It is understood that the proposed development is to comprise the construction of a 32 storey tower over a double level basement. Earthworks are envisaged to consist of cuts of up to 7m for the basement. The proposed development is indicated below.

**PROPOSED LAYOUT**

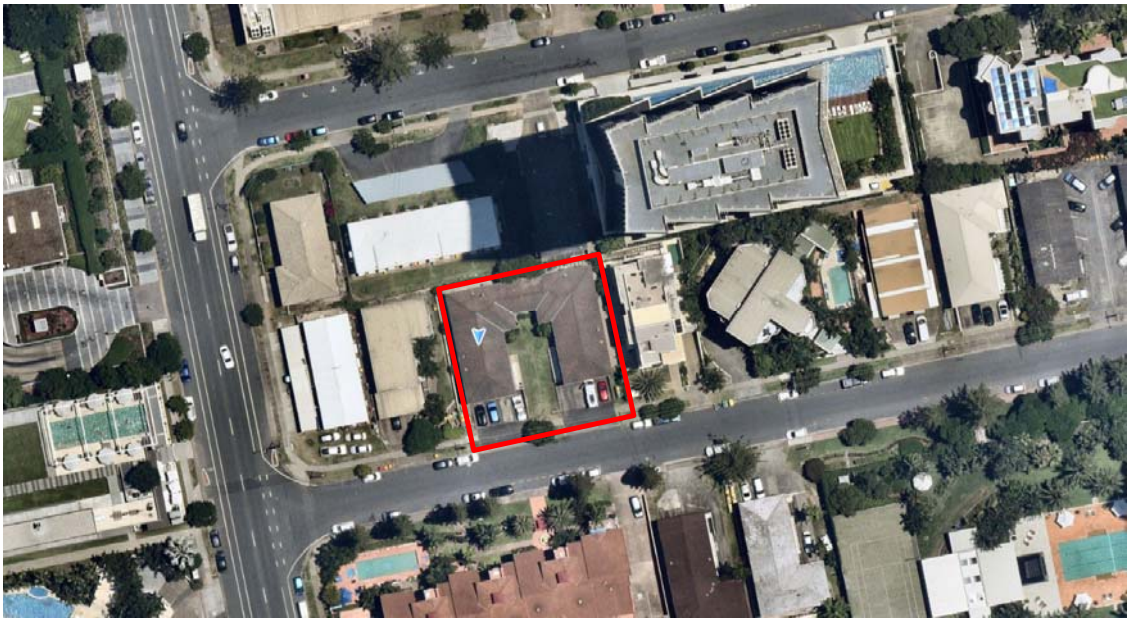


## 3.0 ADJACENT DEVELOPMENT

The The site is bounded by Anne Avenue to the south and existing residential buildings to the east, west and north. The roads support underground infrastructure including sewer, stormwater, telecommunications, water and gas.

Refer following aerial image for site location.

**AERIAL IMAGE**



## 4.0 VIBRATION CRITERIA

The effects of vibration can be divided into concerns over structural damage and human annoyance. This section will outline the relevant vibration criteria for the two concerns, below:

Vibration caused by the construction works at any residence or structure outside the Subject Site is limited to:

a) for structural damage vibration, German Standard *DIN 4150 Part 3 Structural Vibration in Buildings. Effects on Structures;*

b) for human exposure to vibration, the evaluation criteria presented in British Standard *BS 6472 – Guide to Evaluate Human Exposure to Vibration in Buildings* (1 Hz to 80 Hz) for low probability of adverse comment.

***Structural Damage Criteria***

Table 1 below gives a guideline value for short term vibration velocity at the foundation, as outlined in the German Standard DIN 4150-3 (Structural Vibration: Effects of Vibration on Structures). Short term vibration is classified as vibrations which do not occur often enough to cause structural fatigue.

**TABLE 1 STRUCTURAL DAMAGE - SHORT TERM VIBRATION (mm/s)**

| Type of Structure | Velocity values in mm/s at the foundation at a frequency of | | | Plane of floor of uppermost storey |
|---|---|---|---|---|
| | Less than 10Hz | 10-50Hz | 50-100Hz | All frequencies |
| Building use for commercial purposes, industrial buildings and buildings of similar design | 20 | 20-40 | 40-50 | 40 |
| **Dwelling and buildings of similar design and/or occupancy** | **5** | **5-15** | **15-20** | **15** |
| **Structures that because of their particular sensitivity to vibration and are of great intrinsic value (e.g. heritage listed structures)** | **3** | **3-8** | **8-10** | **8** |

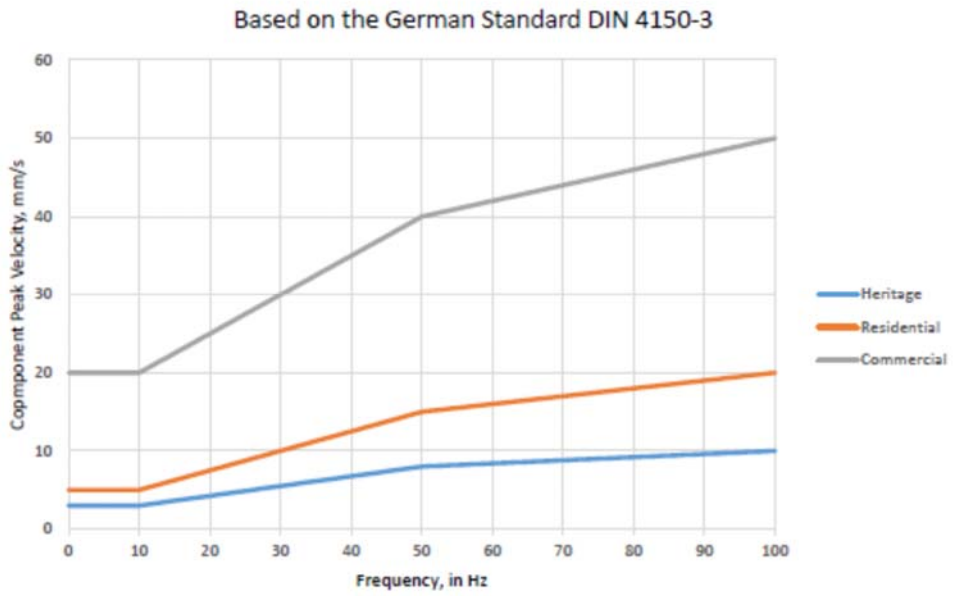



**FIGURE 1**

***Human Comfort Criteria***

The human annoyance vibration assessment can be undertaken using the NSW EPA's publication *'Assessing Vibration: a technical Guideline'*, based on the BS 6472 Standard. This Guideline covers the appropriate methods and criteria for the

assessment of the intrusive vibration on living and working space. The guideline describes the following:

- The characteristics of vibration and associated effects that can cause community disturbance and concern to people, in particular the occupants of buildings.
- Criteria defining values of vibration to protect amenity.
- Procedures for the measurement and evaluation of vibration values and other associated emissions.

A summary of the VDV criteria for human comfort limits are adopted from the NSW EPA's publication '*Assessing Vibration: a technical Guideline'* and are presented in Table 2 below.

**TABLE 2 - ACCEPTABLE VIBRATION DOSE VALUES FOR INTERMITTENT VIBRATION (m/s$^{1.75}$)**

| Location | Daytime | | Night Time | |
|---|---|---|---|---|
| | Preferred Value | Maximum Value | Preferred Value | Maximum Value |
| **Critical Areas** | 0.10 | 0.20 | 0.10 | 0.20 |
| **Residents** | 0.20 | 0.40 | 0.13 | 0.26 |
| **Offices, Schools, Educational, Institutions and Places of Worship** | 0.40 | 0.80 | 0.40 | 0.80 |
| **Workshops** | 0.80 | 1.60 | 0.80 | 1.60 |

## 5.0 VIBRATION TRANSMISSION

The relationship between vibration level and distance can be described using the following formula (*Richart et al. 1970*):

$$V_2 = V_1 \left(\frac{R_2}{R_1}\right)^n$$

Where: $V_1$ and $V_2$ is the velocity at location 1 and 2;

$R_1$ and $R_2$ are the distances to vibration source;

n is the function of the wave type, where n = 1 for body waves in the ground that spread spherically, except at the surface where n = 2, and n = 0.5 for Rayleigh waves.

Vibrations on site are expected to be generated through the installation of sheet piles and CFA piles.

**TABLE 3 TYPICAL VIBRATION LEVELS**

| | Typical Vibration Level |
|---|---|
| **CFA Piling** | 7.5mm/s at 2m[1] |
| **Sheet Piling** | Up to 23mm/s at 1.5m |

Notes:
(1) The vibration level is provided by Construction Noise and Vibration Strategy (CNVS).

Coefficients can vary substantially between sites and therefore in addition, the effect of exponents of n=0.5 and n=2 have also included in calculation for the worst-case scenario.

**Data Analysis**

Table 4 shows the predicted safety distances to comply with the PPV threshold of 5mm/s.

**TABLE 4 SAFE DISTANCES TO STAY BELOW PPV THRESHOLD**

| Work | Scenario | Safety Distance (rounded up to nearest half meter) |
|---|---|---|
| **CFA Piling** | General | 1.5 m |
| | Worst Case | 2.5 m |
| **Sheet Piling** | General | 7 m |
| | Worst Case | 28 m |

**Monitoring**

It is recommended vibration monitoring be undertaken during the construction works that are expected to generate vibration. Suggested monitoring locations are indicated on the appended Vibration Monitoring Plan drawing PG-13778-02.

Monitoring equipment should be installed prior to the commencement of construction and should incorporate real time monitoring and alerts to ensure suitable control of vibration inducing works is maintained.

## 6.0 COMPLAINT PROCESS

The Site Manager is the point of contact for all site related activities. Contact details and name are placed on the perimeter fence for public information.

All complaints will be investigated and actioned in a timely manner to minimise community disruption. In the unlikely event that vibration is generated from the site

that exceeds environmental standards or contributes to neighbourhood discomfort or risk of exposure, then the site activities will be carefully monitored through the installed vibration monitors to ensure that the activities are within the required parameters. If the vibration levels are found to have exceeded the required parameters then the activity will cease until additional controls are implemented. The Site Manager and Construction Manager will liaise with the complainant and any other relevant party.

## 7.0 LIMITATIONS

We have prepared this report for the Proposed High Rise Development at 19-21 Anne Avenue, Broadbeach. The report is provided for the exclusive use of Maryanne Developments Pty Ltd, for this project only and for the purposes outlined in the report. It should not be used by, or relied upon, for other projects on the same or different sites or by a third party. In preparing this report, we have relied upon information provided by the client or their agents.

It is recommended that Pacific Geotech be engaged to provide advice and ensure the development is undertaken in accordance with the assumptions made in writing this report.

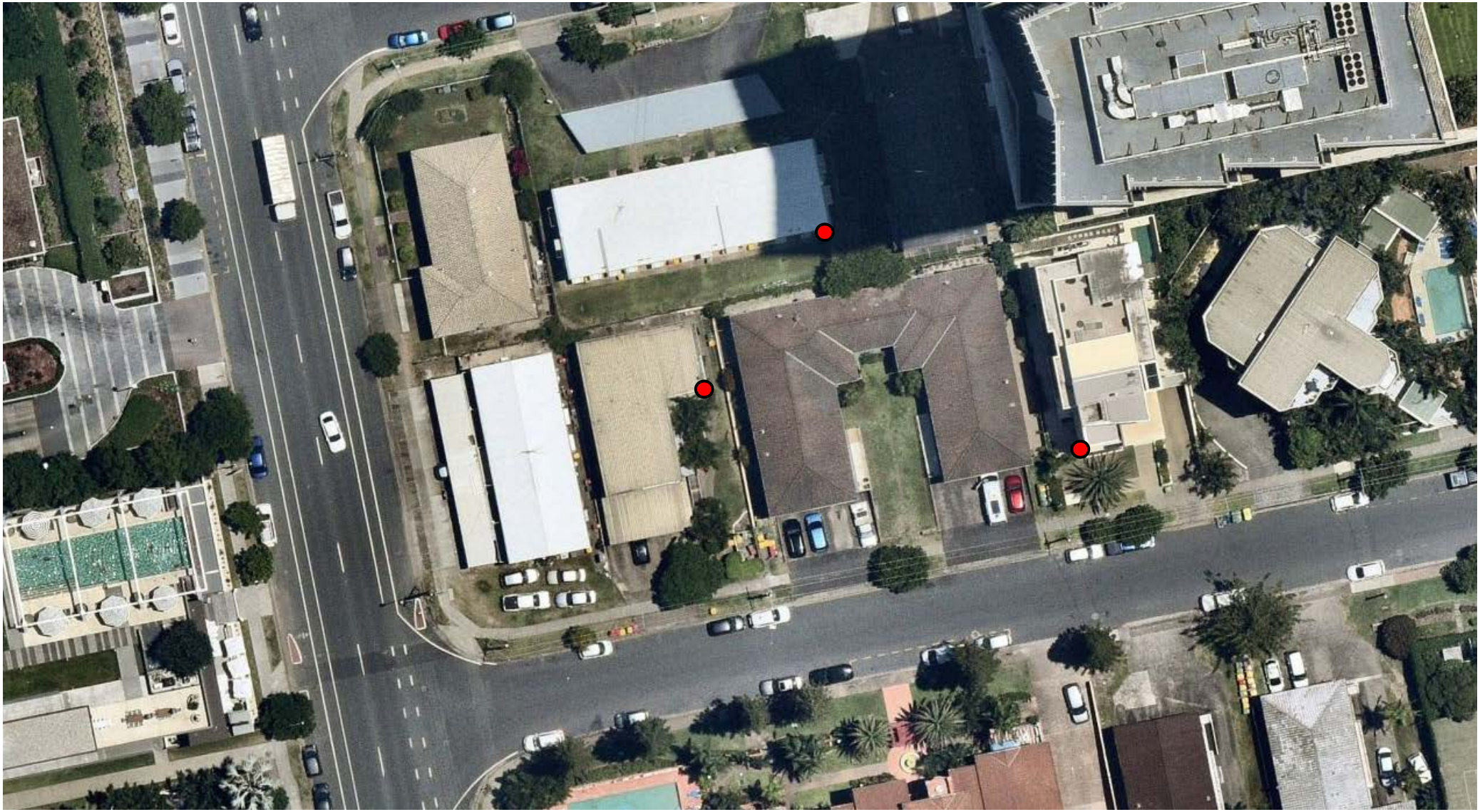
This is not to reduce the level of responsibility accepted by Pacific Geotech, but rather to ensure that the parties who may rely on the information contained in this report are aware of the responsibilities they assume in doing so.



**P. ELKINGTON (RPEQ 7226)**

For and on behalf of
**PACIFIC GEOTECH PTY LTD**

Attached: Suggested Vibration Monitoring Plan



**PROPOSED VIBRATION MONITOR LOCATIONS**

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| | | | | |
|---|---|---|---|---|
| Drawn<br>BI | Project: | Proposed Highrise Development | Drawing No.<br>PG-13778-02 | A4 |
| Date<br>NOV 25 | Location: | 19-21 Anne Avenue, Broadbeach | | |
| Checked | Client: | Maryanne Developments Pty Ltd | | |