

90-102 Regent Street, Redfern

Report for Above Ground Vibration Monitoring

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Document Title	Report for Above Ground Vibration Monitoring
Attention To	Richard Crookes Constructions Pty Ltd

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## 1 INTRODUCTION

Acoustic Logic has been engaged to carry out ground vibration monitoring for the vibration impacts associated with the demolition activities at the 90-102 Regent Street development site in Redfern.

This monitoring report presents the vibration monitoring for the period as follows:

- 19<sup>th</sup> of January 2022 to the 10<sup>th</sup> of February 2022

The location of the 90-102 Regent Street construction site and the nearest and most affected receivers are shown in Figure 1. The location of the on-site monitor relative to the site is also shown.

The vibration management levels have been derived from DIN 4150-3 *Vibrations in buildings - Part 3: Effects on structures* as no site specific vibration criteria have been specified.

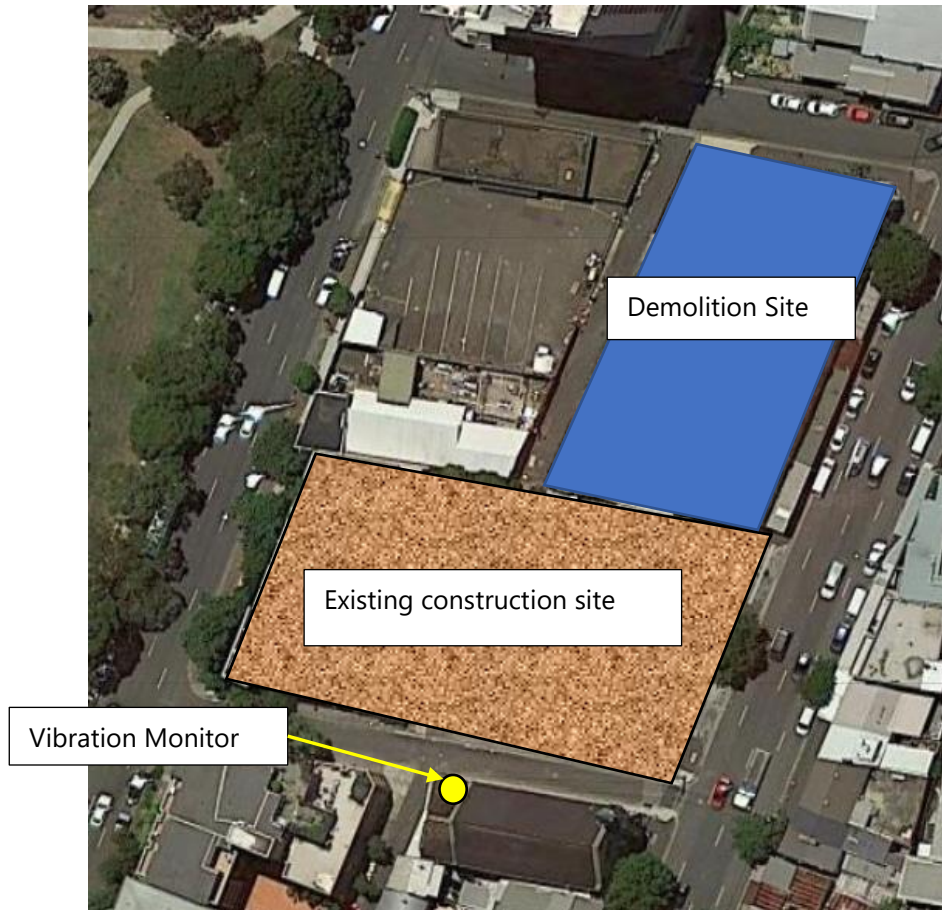
## 2 SITE DESCRIPTION AND SENSITIVE RECEIVERS

The subject site is located between William Lane, Marian, Regent Streets and the existing Gibbons Street construction site.

The vibration generating activities scheduled to be carried out on site are the demolition of buildings on the blocks from 90 to 102 Regent Street, Redfern.

The monitor location for the receiver for this monitoring period is as follows:

- Receiver – A heritage category church building. The monitor is located in a Hot Water Heater/ Cleaner's closet.



**Figure 1 –Heritage Category receiver**

### **3 VIBRATION CRITERIA**

Vibration caused by construction at any structure outside the subject site must be limited to:

- For structural damage vibration, German Standard DIN 4150-3 Structural Vibration: Effects of Vibration on Structures; and

The criteria and the application of this standard are discussed in separate sections below.

### 3.1 DAMAGE CRITERIA

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (2016-12) are presented in Table 2 of the standard.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

**Table 1 – DIN 4150-3 (2016-12) Safe Limits for Building Vibration**

Type of Structure		Peak Particle Velocity (mms <sup>-1</sup> )				
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey	Floor Slabs, Vertical Direction
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies	All Frequencies
<b>1</b>	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
<b>2</b>	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15	20
<b>3</b>	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8	*20

\* May be required to be lower to suit condition and construction of floor.

### 4 VIBRATION MONITORING

Vibration monitoring was conducted using a Texcel ETM vibration monitor with an external Tri axial geophone. The monitor is programmed to store statistical vibration data over every 5-minute period, along with any 'triggered' events that occur throughout the monitoring period.

The vibration monitor installation location is shown in Figure 2. The vibration sensor (geophone) in the ex-Church is adhered to the on-grade ground slab. The foundation monitoring location is suitable for construction vibration monitoring at the receiving structures

- This period presents the results of vibration monitoring for the period between the 19<sup>th</sup> of January 2022 to the 10<sup>th</sup> of February 2022



Vibration monitor

**Figure 2 – Vibration Monitor Location**

## **5 MEASUREMENT RESULTS**

The following Table summarises the frequency analysed events recorded at the vibration monitor. The charts of daily vibration levels and the corresponding frequency analyses are presented in the Appendix.

## 5.1 RECEIVER 1 – CHEFS WAREHOUSE (EX CHURCH)

**Table 3 – Ground Slab Vibration Levels**

<b>Vibration Geophone Location</b>	<b>Date</b>	<b>Maximum Measured Component Vibration Level mm/s</b>	<b>Criteria Vibration Level</b>	<b>Complies</b>
Ground Slab	19/01/22-10/2/2022	1 mm/s PPV	3mm/s PPV	Yes

## 5.2 ANALYSES OF VIBRATION LEVELS

Daily plots of the Vibration levels versus Time and versus Frequency are attached to the Appendix.

The vibration levels were under the frequency independent vibration limit, so no further analysis was necessary.

## 6 MANAGEMENT OF VIBRATION LEVELS

No exceedances of the nominated criteria have occurred at monitoring locations in this monitoring period.

Vibration monitoring data are collated and reported on a fortnightly basis however the remote real time vibration monitoring system sends SMS alerts when trigger levels are exceeded and the monitors are downloaded daily. This allows for the prompt investigation of sources and the review and adjustment of work practices if necessary.

A register of vibration events is maintained by Richard Crookes when and where vibrations are excessive.



## 7 CONCLUSION

Acoustic Logic has carried out above ground vibration monitoring for the vibration impacts associated with the demolition works carried out at 90-102 Regent Street, Redfern.

This monitoring report presents the vibration monitoring for the periods as follows:

- 19<sup>th</sup> of January 2022 to the 10<sup>th</sup> of February 2022

Acoustic Logic has undertaken a detailed analysis of the vibration events captured in that period and has made comments in the Sections above.

We trust this information is satisfactory. Please contact us should you have any further queries.

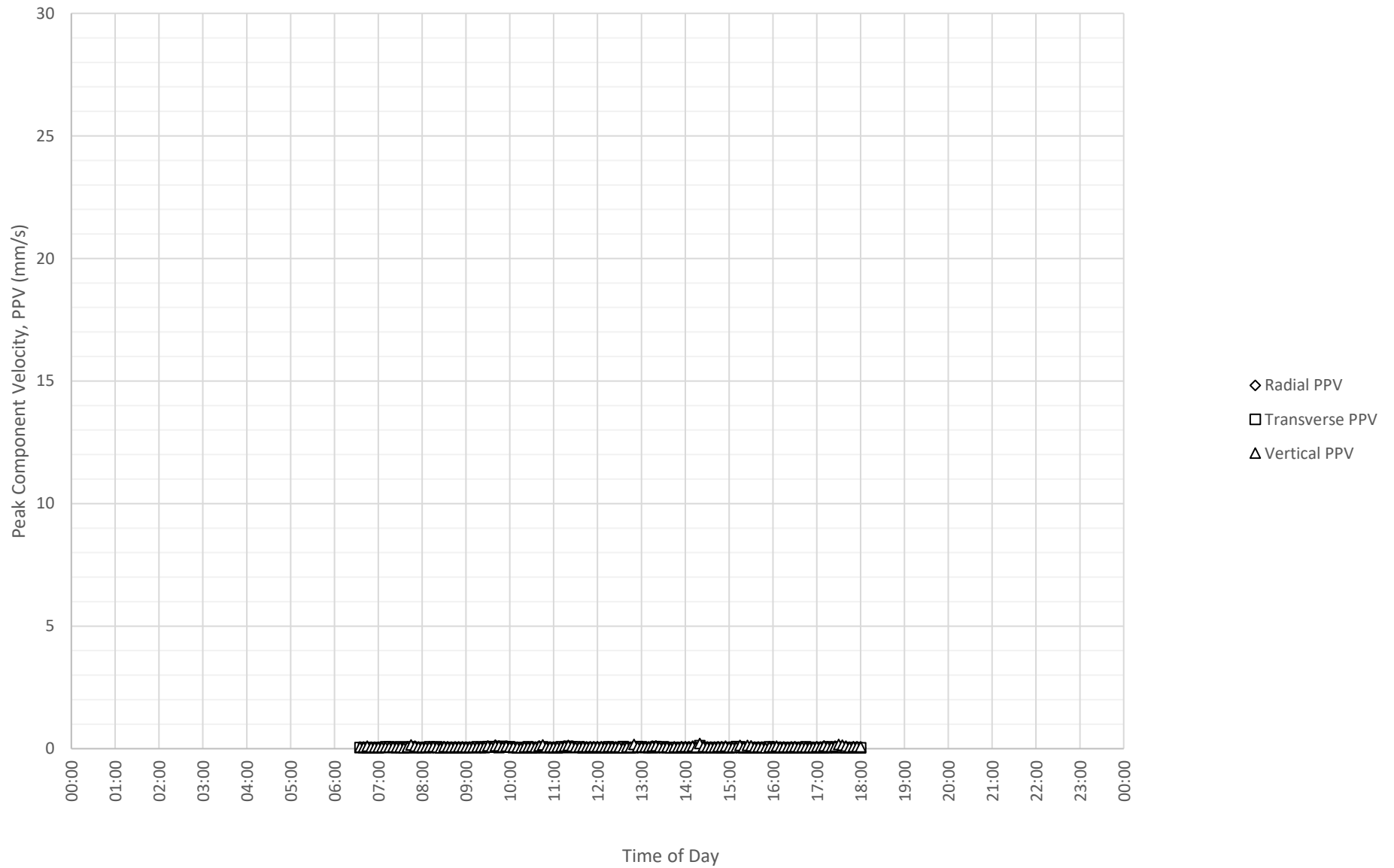
Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Tomas Bohdan', is written over a light blue horizontal line.

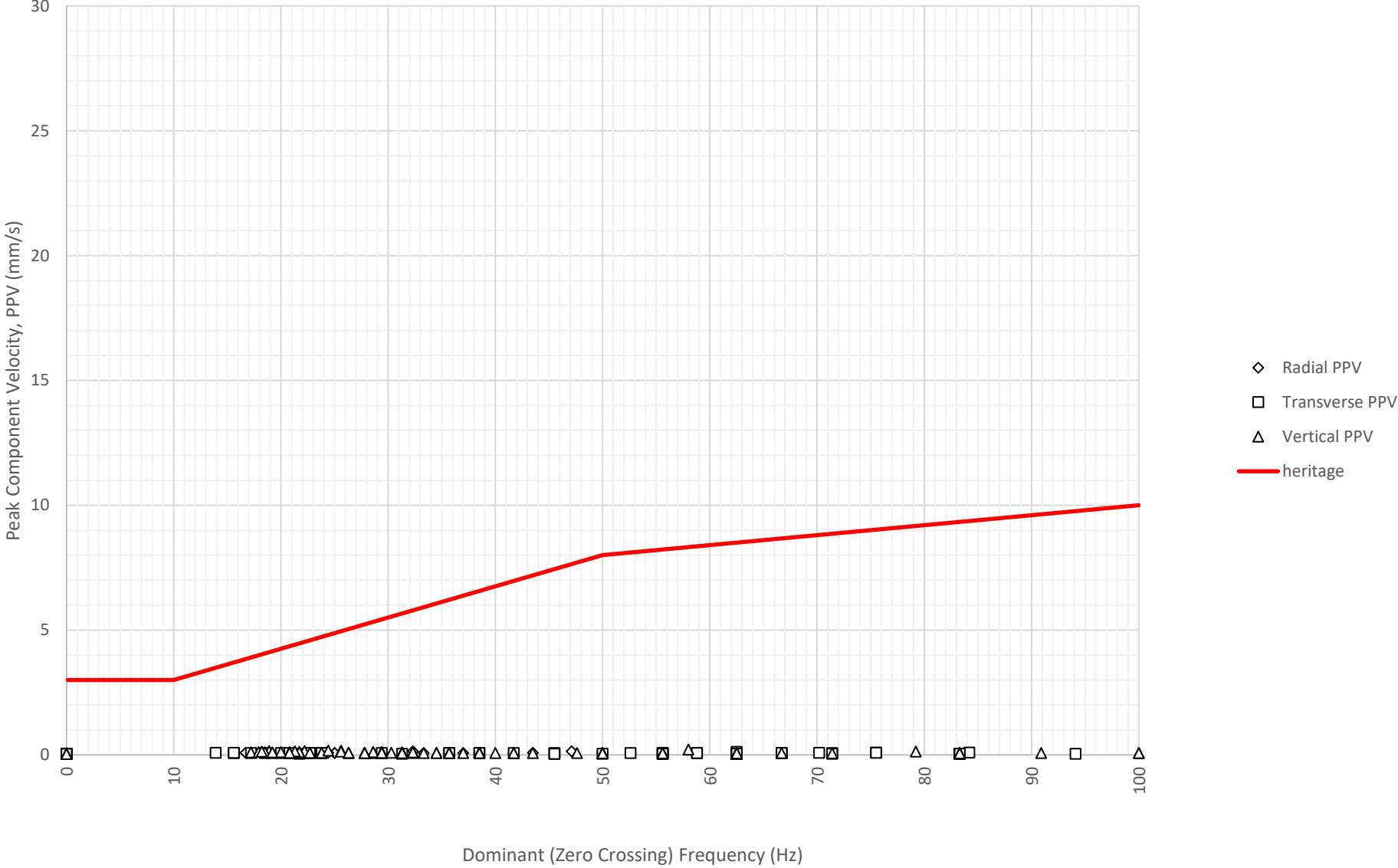
Acoustic Logic Pty Ltd  
Tomas Bohdan

## APPENDIX 1 – VIBRATION MONITORING DATA – RECEIVER 1-EX CHURCH

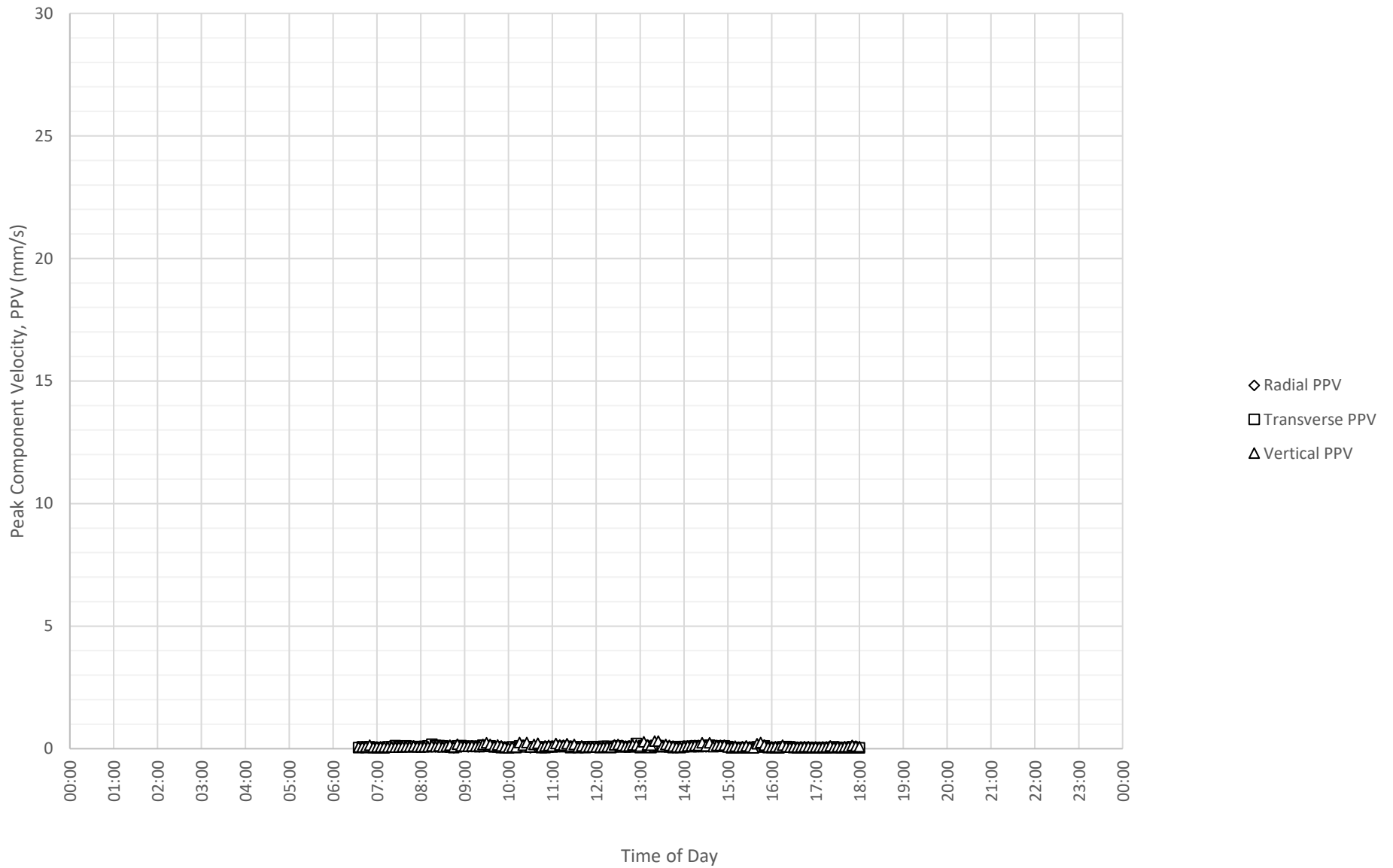
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 19-01-2022



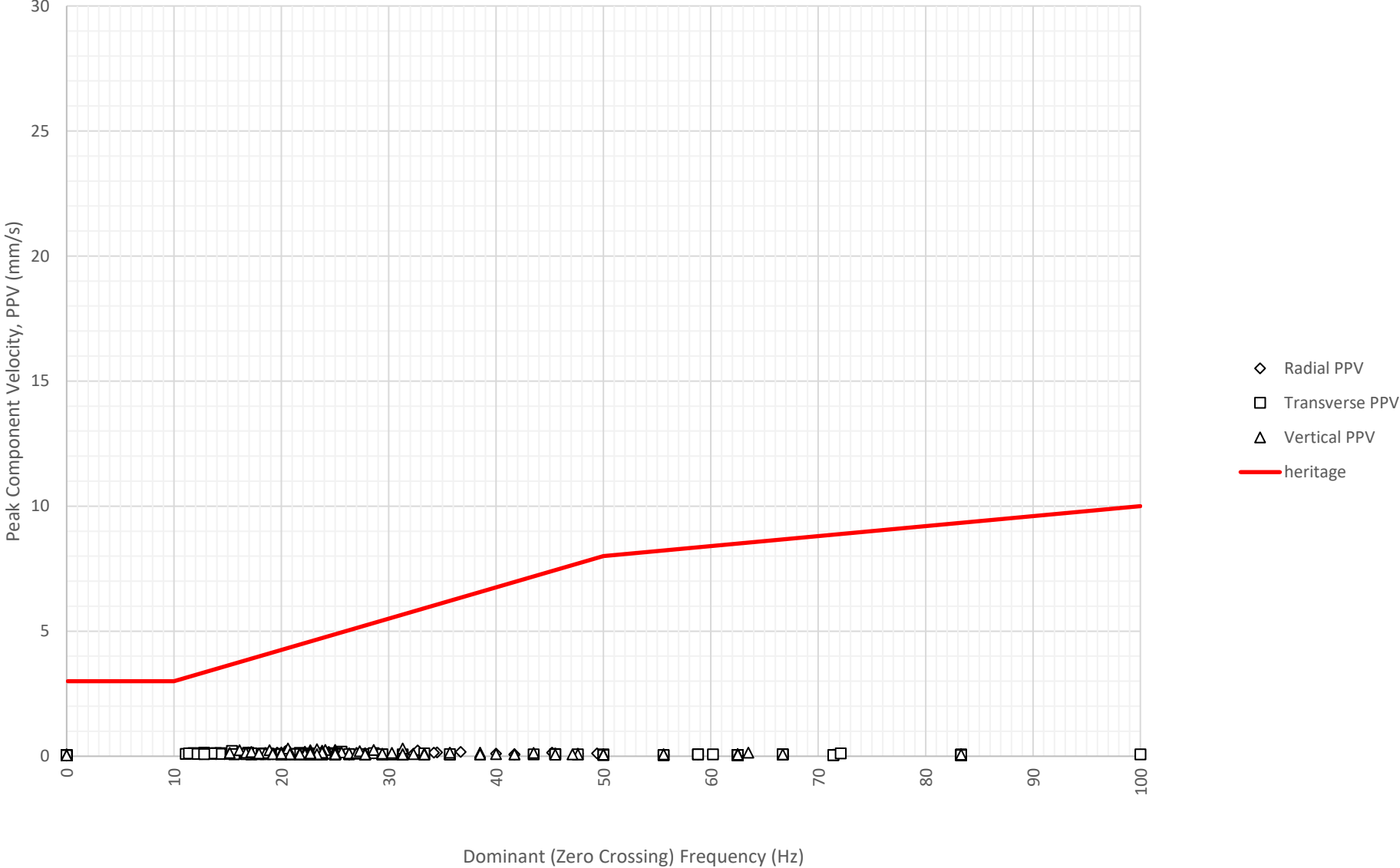
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 19-01-2022



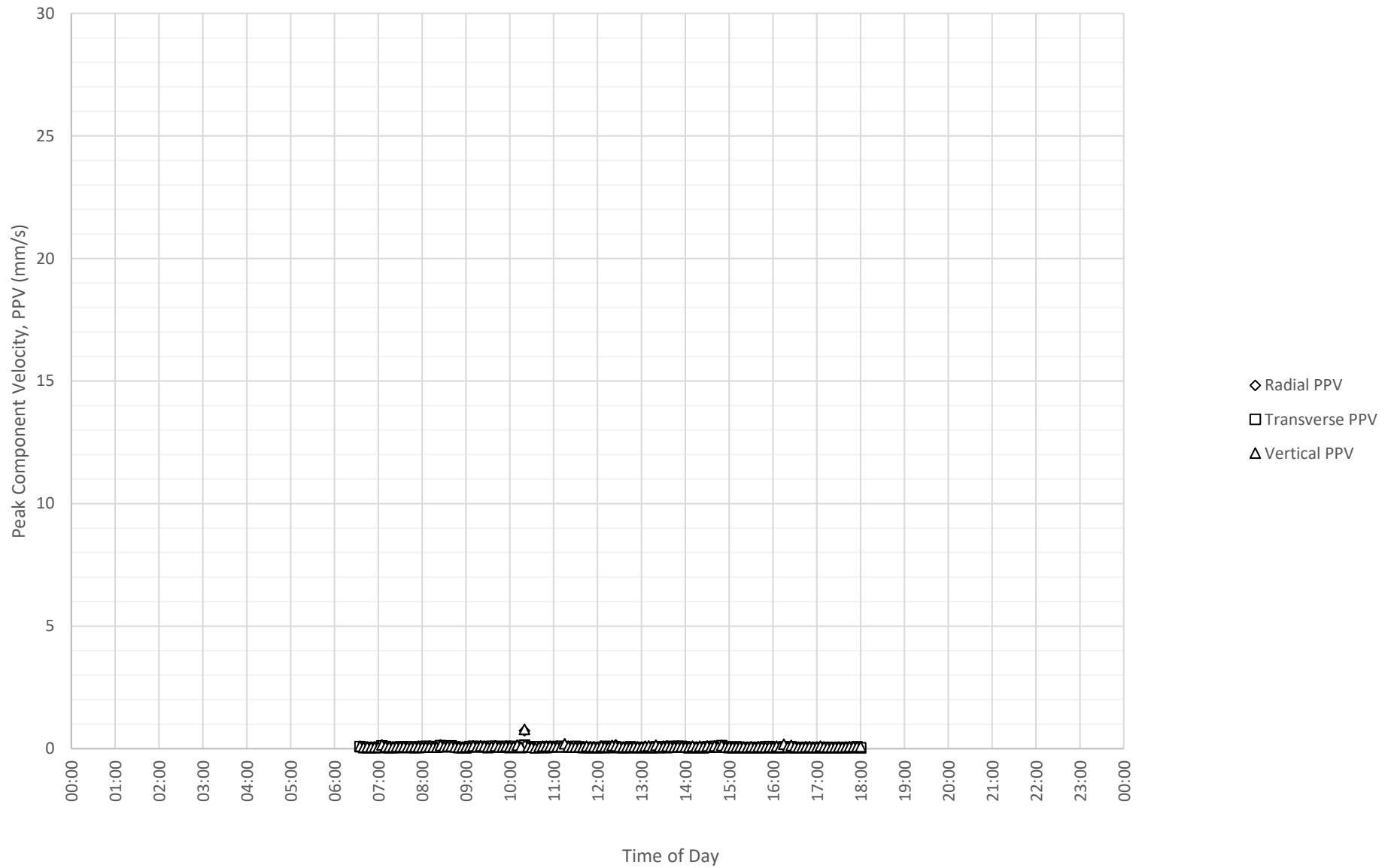
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 20-01-2022



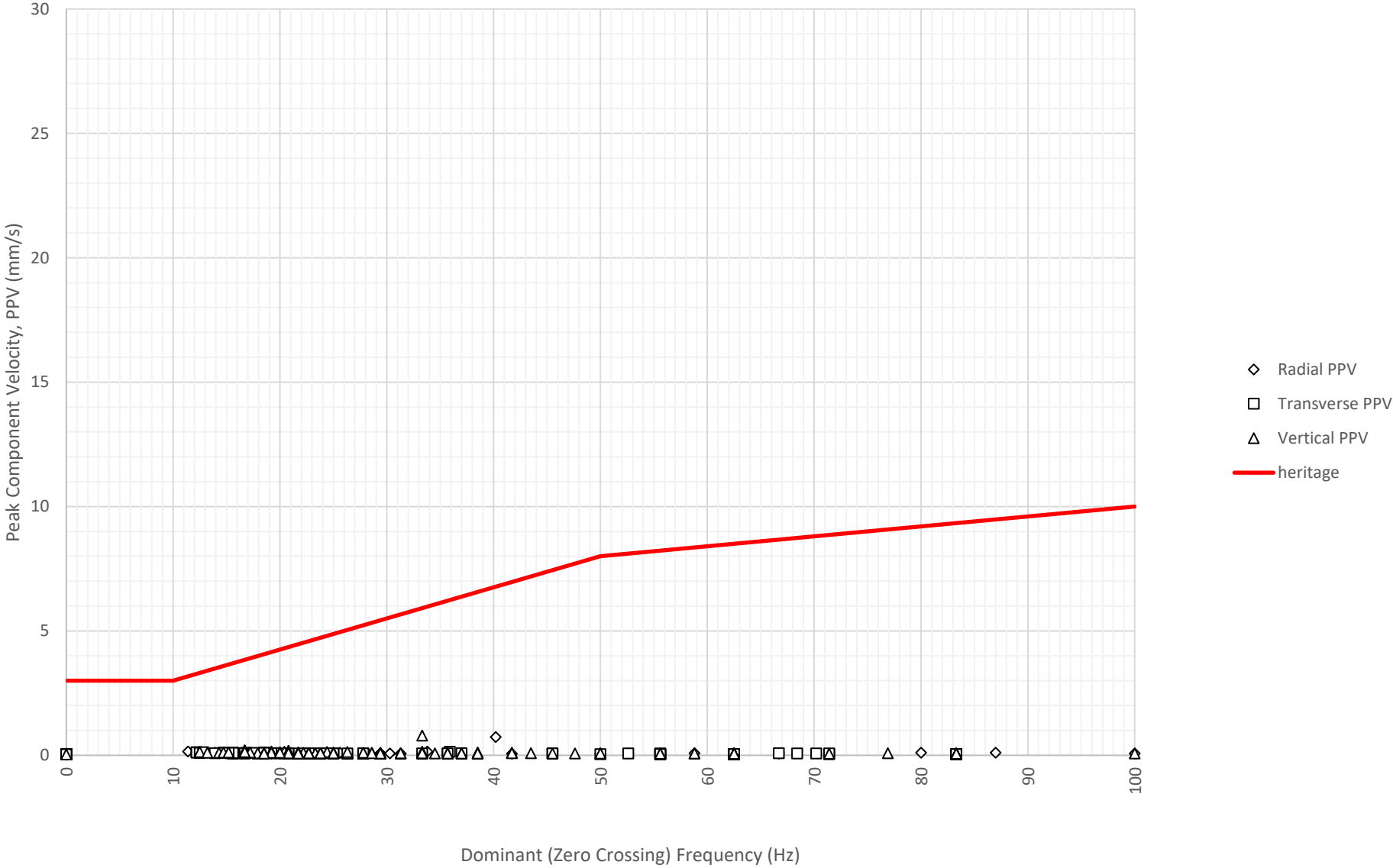
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 20-01-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 21-01-2022

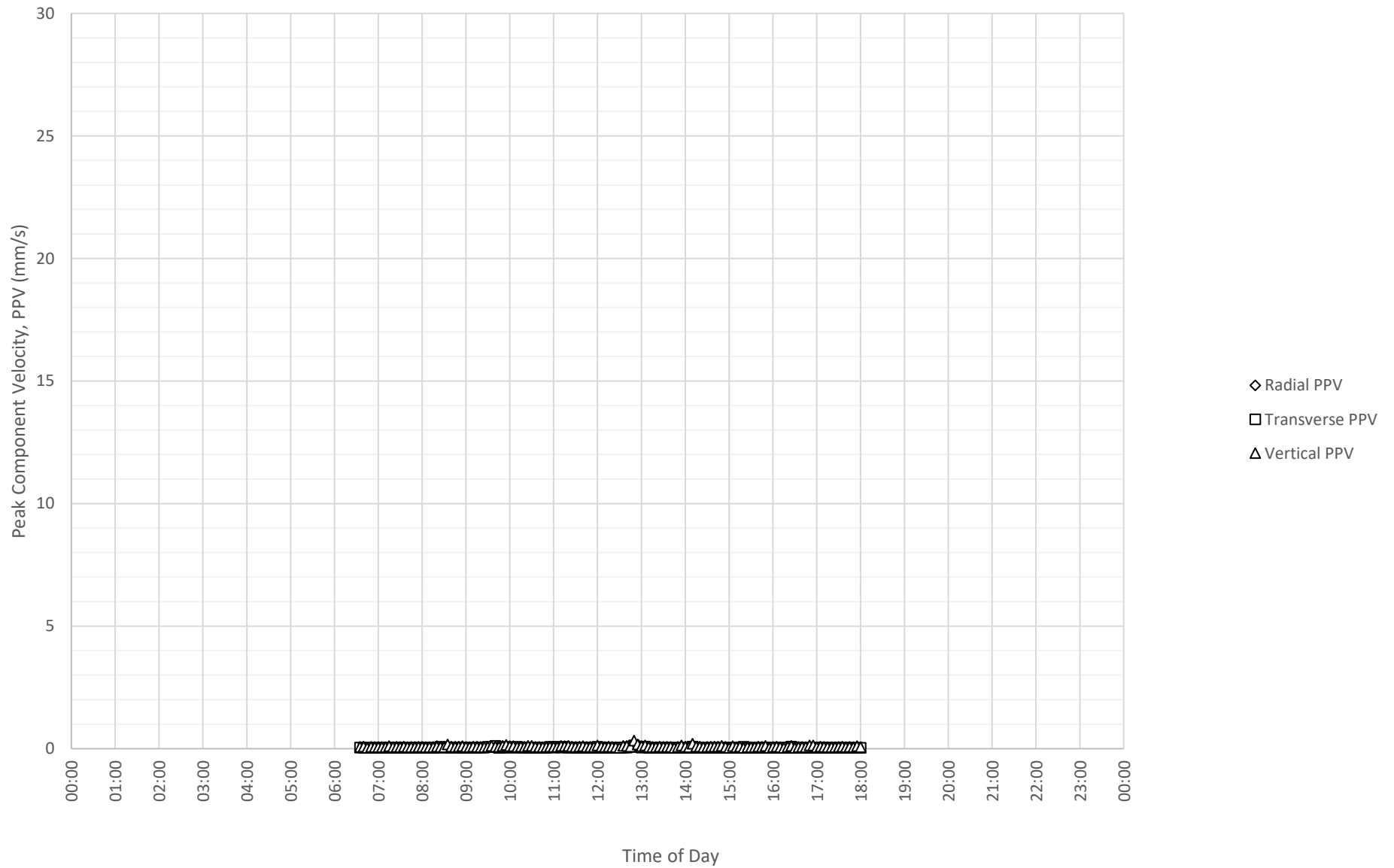


Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 21-01-2022

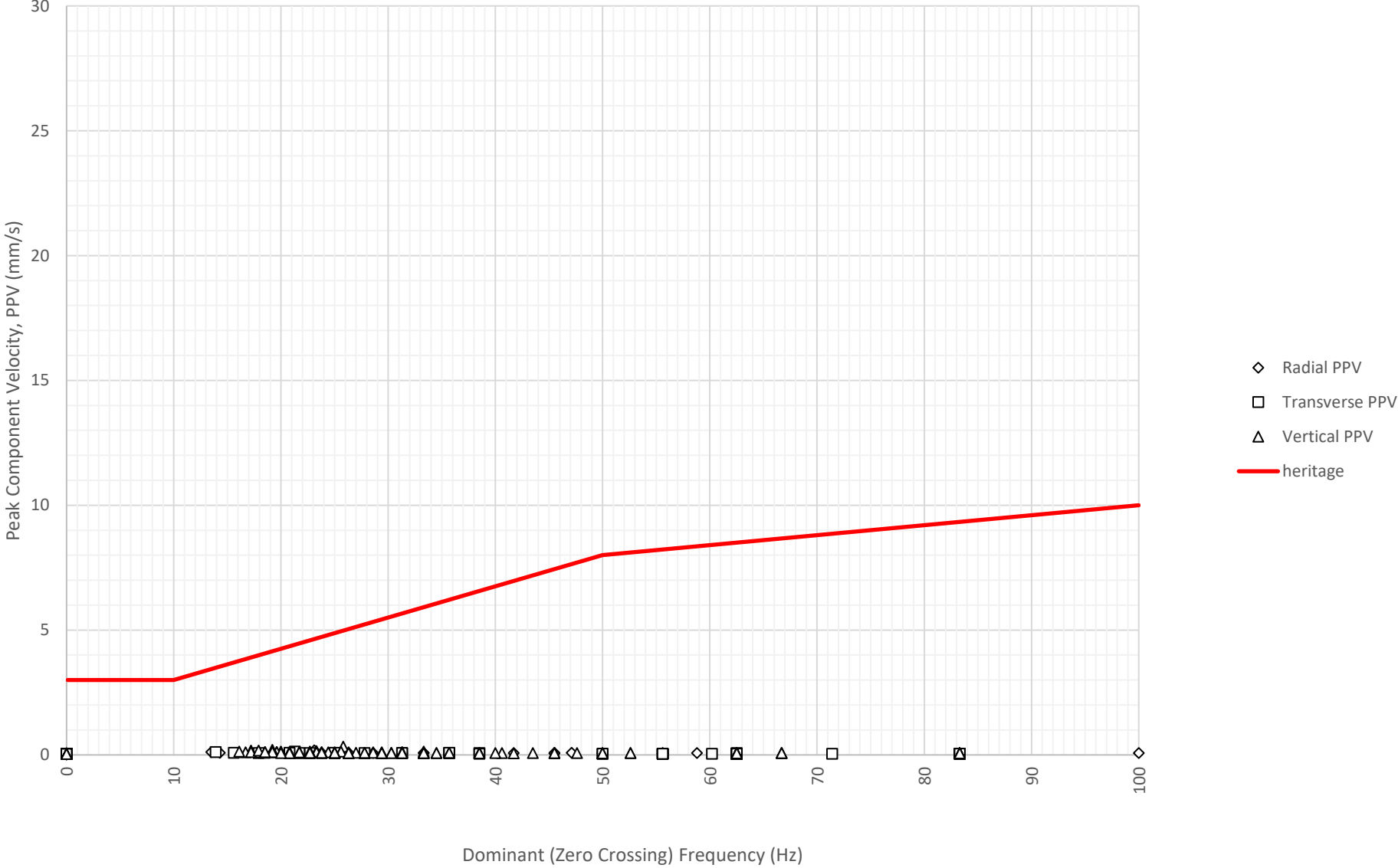




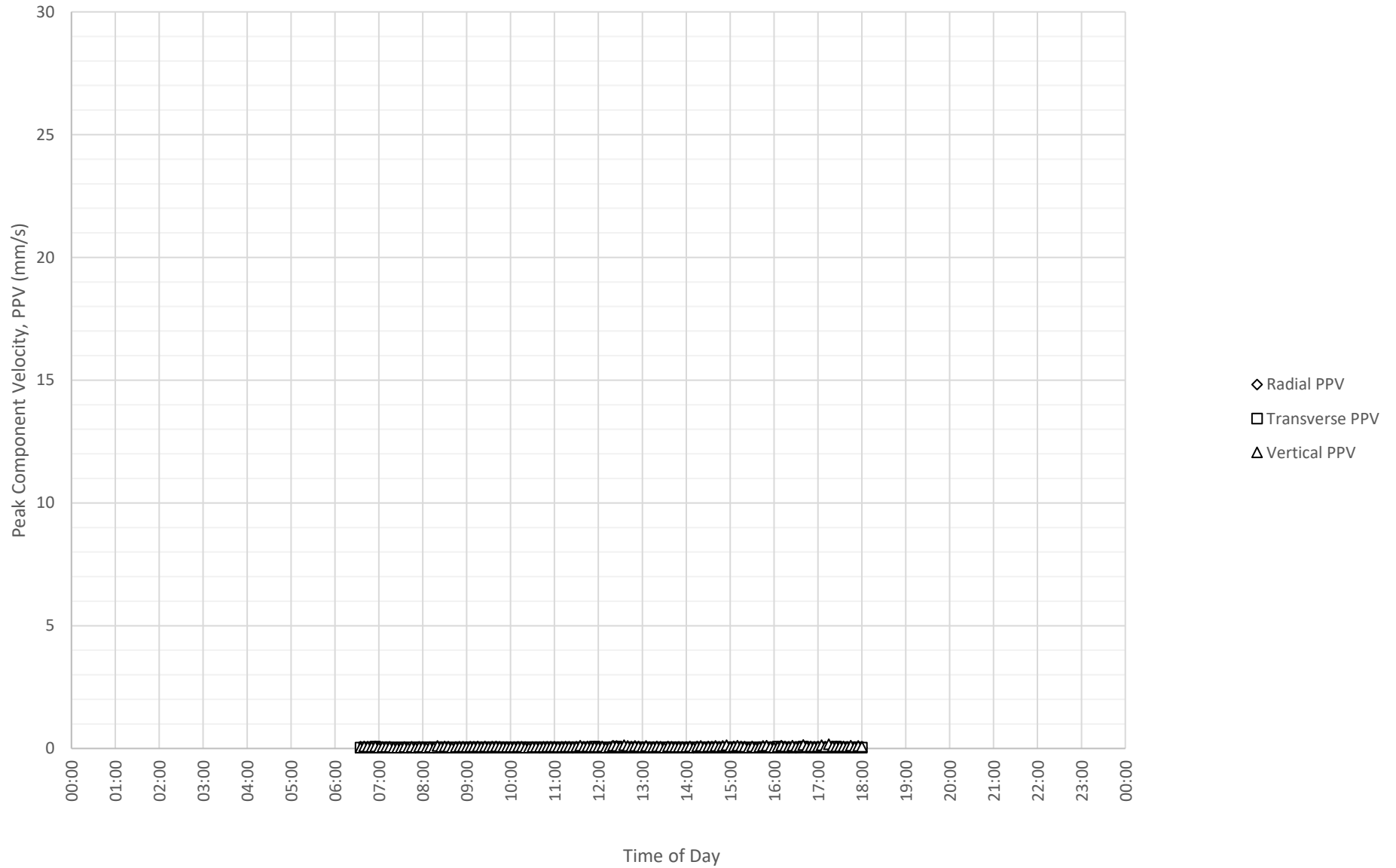
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 22-01-2022



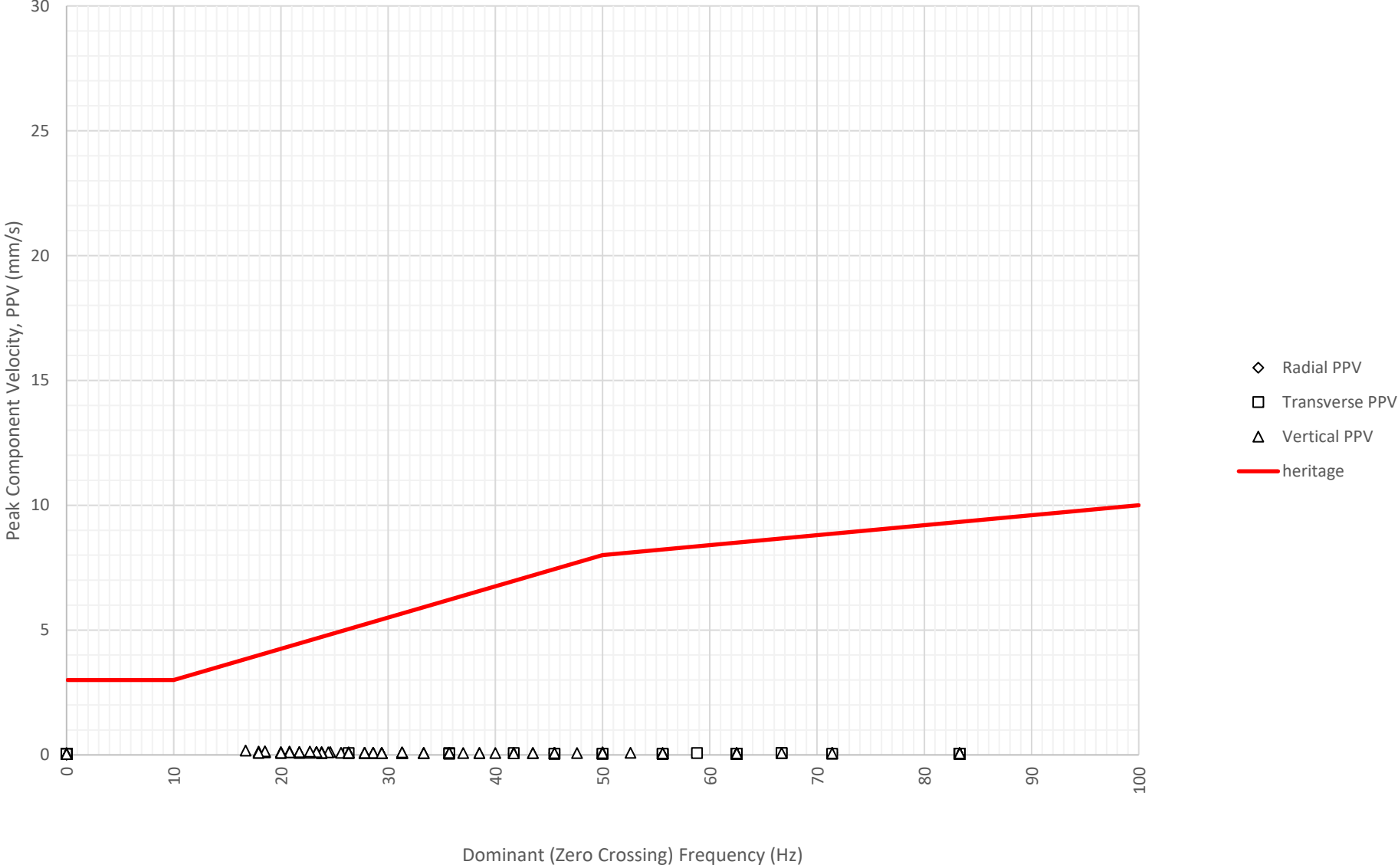
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 22-01-2022



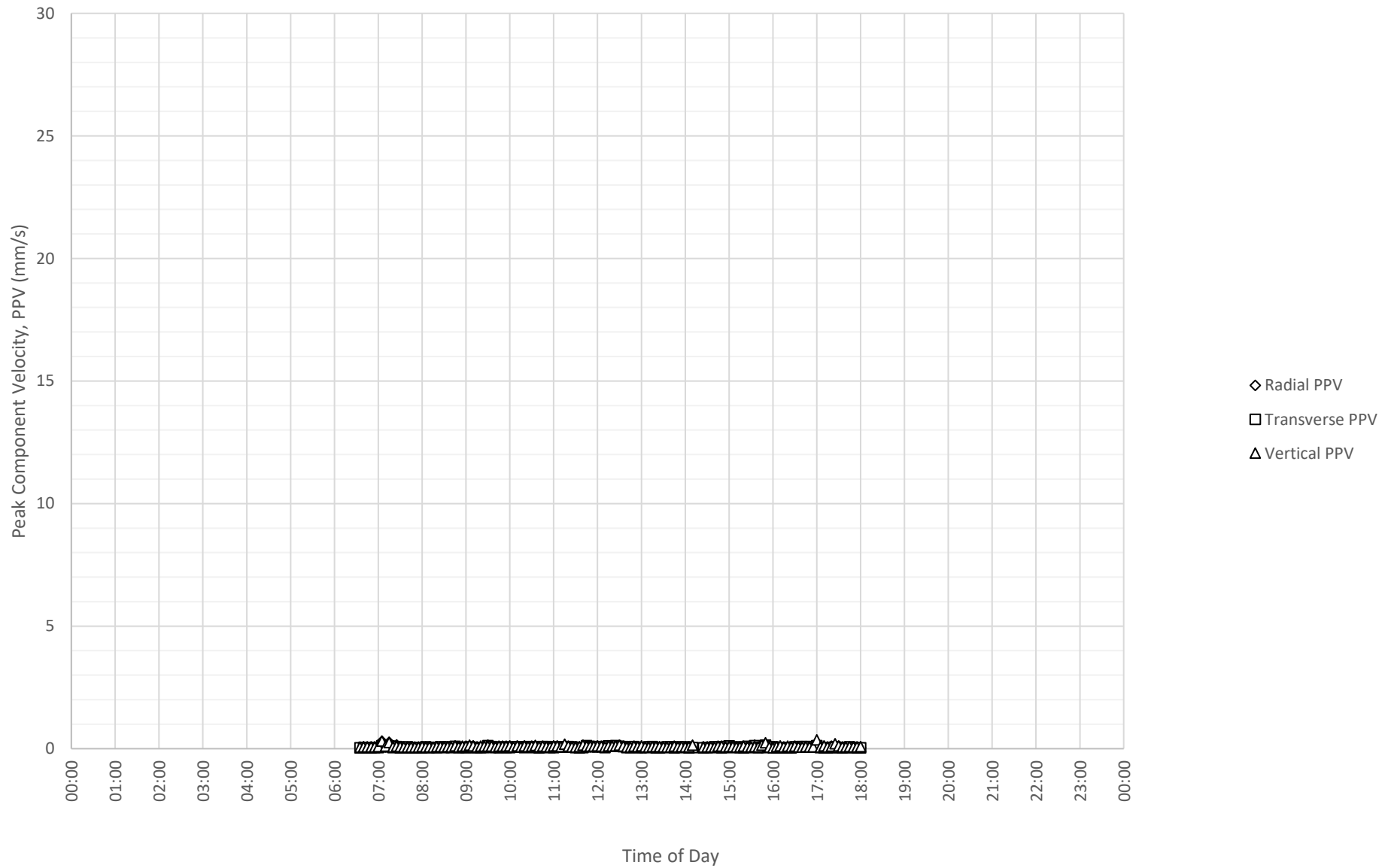
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 23-01-2022



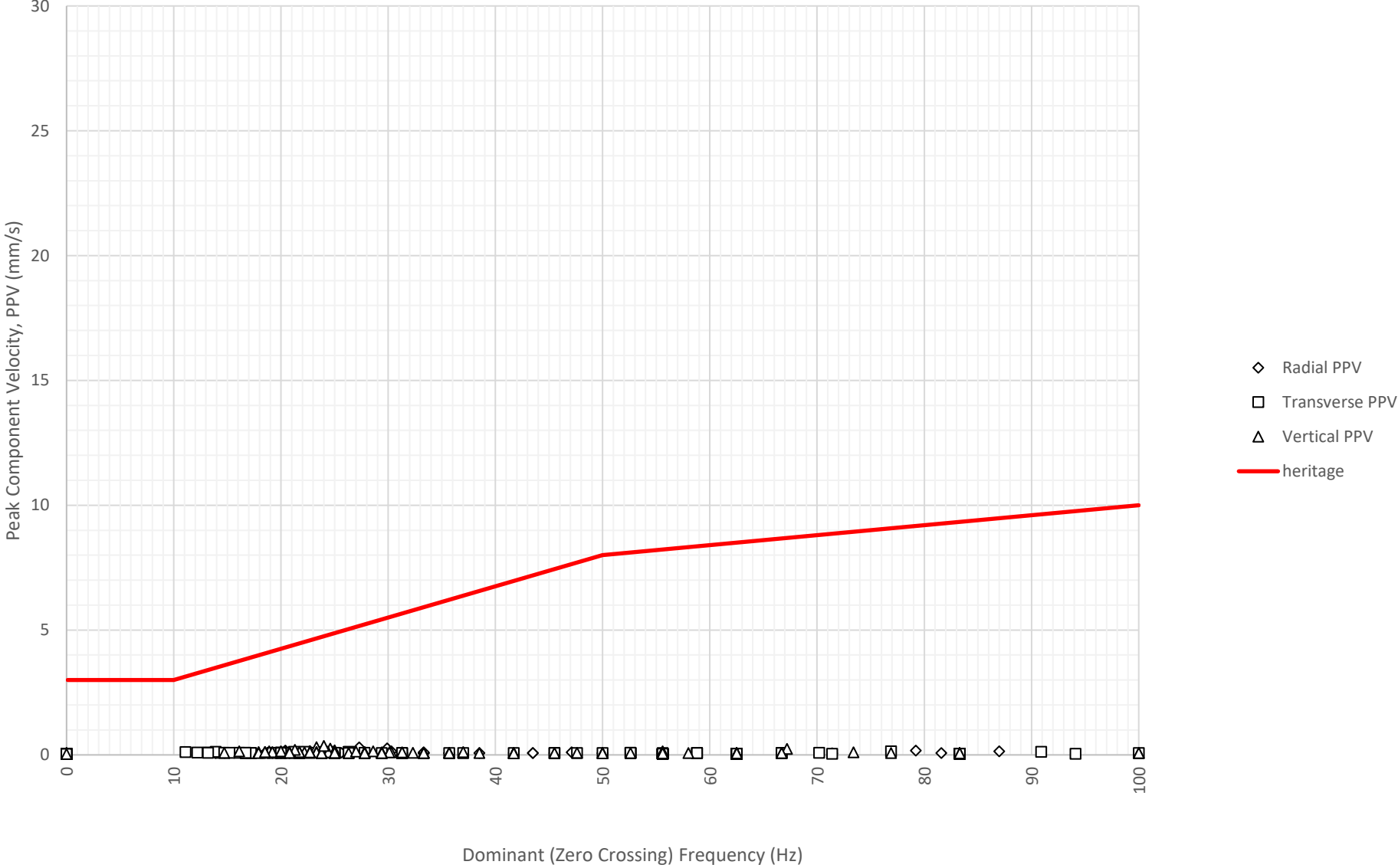
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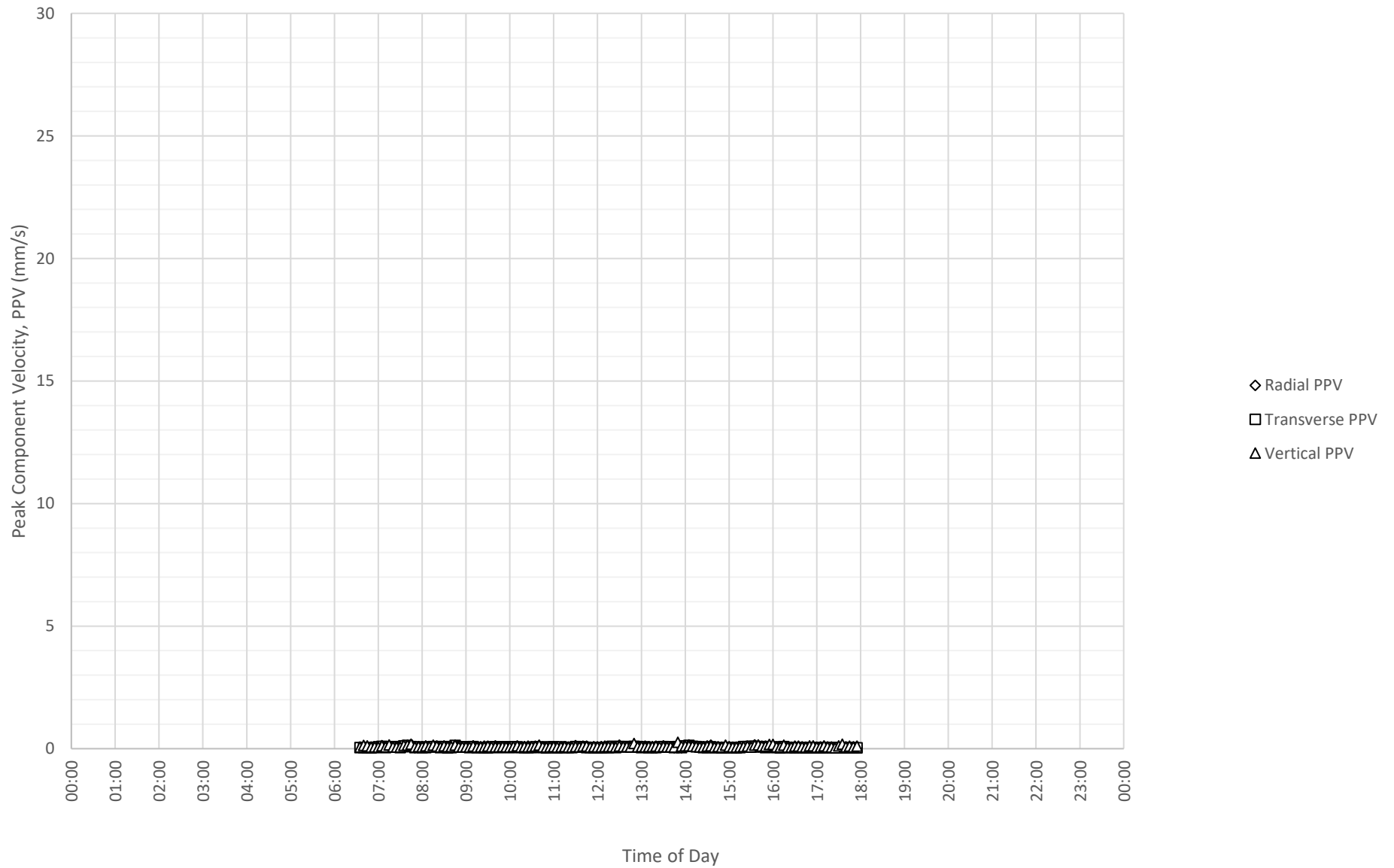
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 24-01-2022



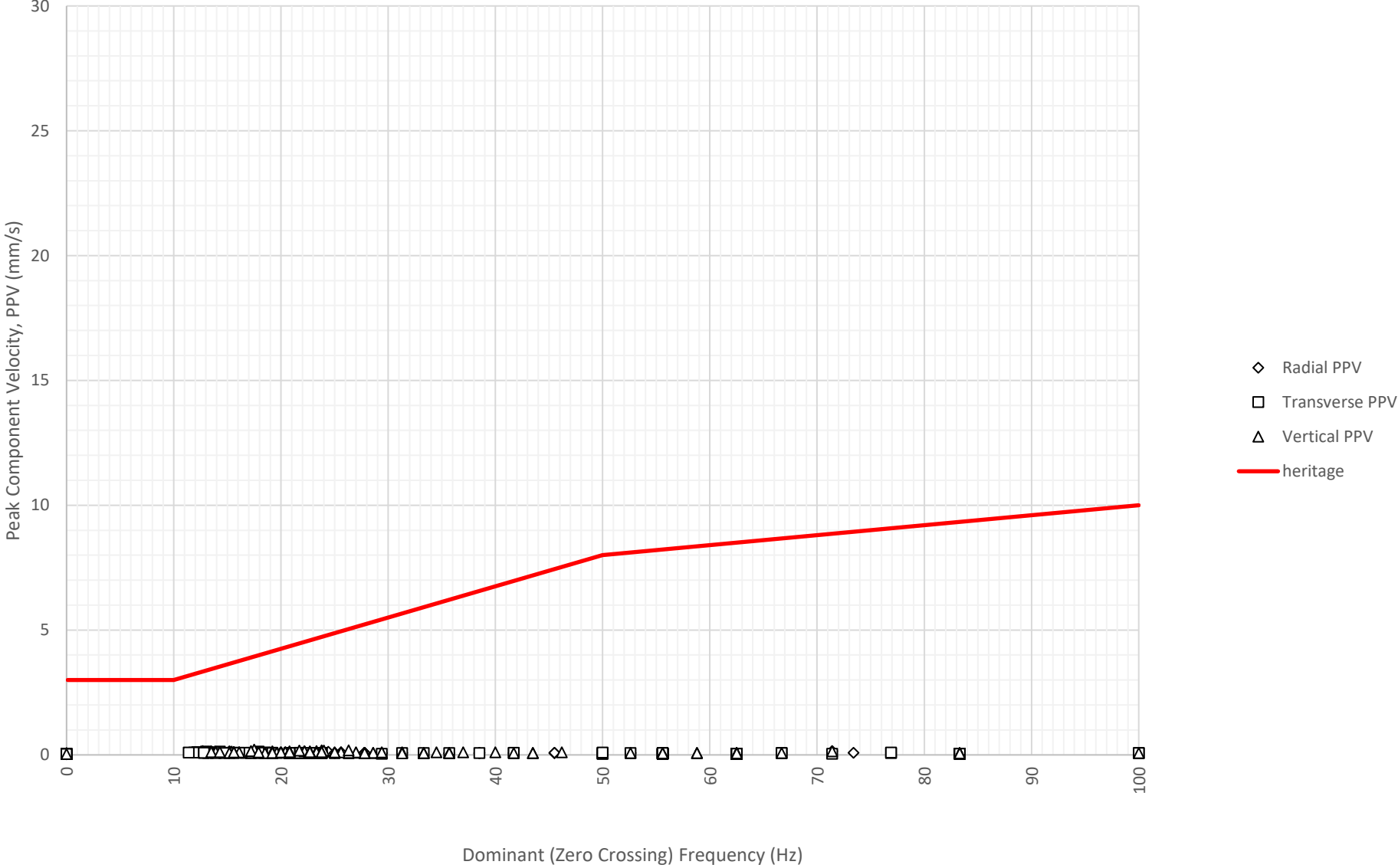
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 24-01-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 25-01-2022

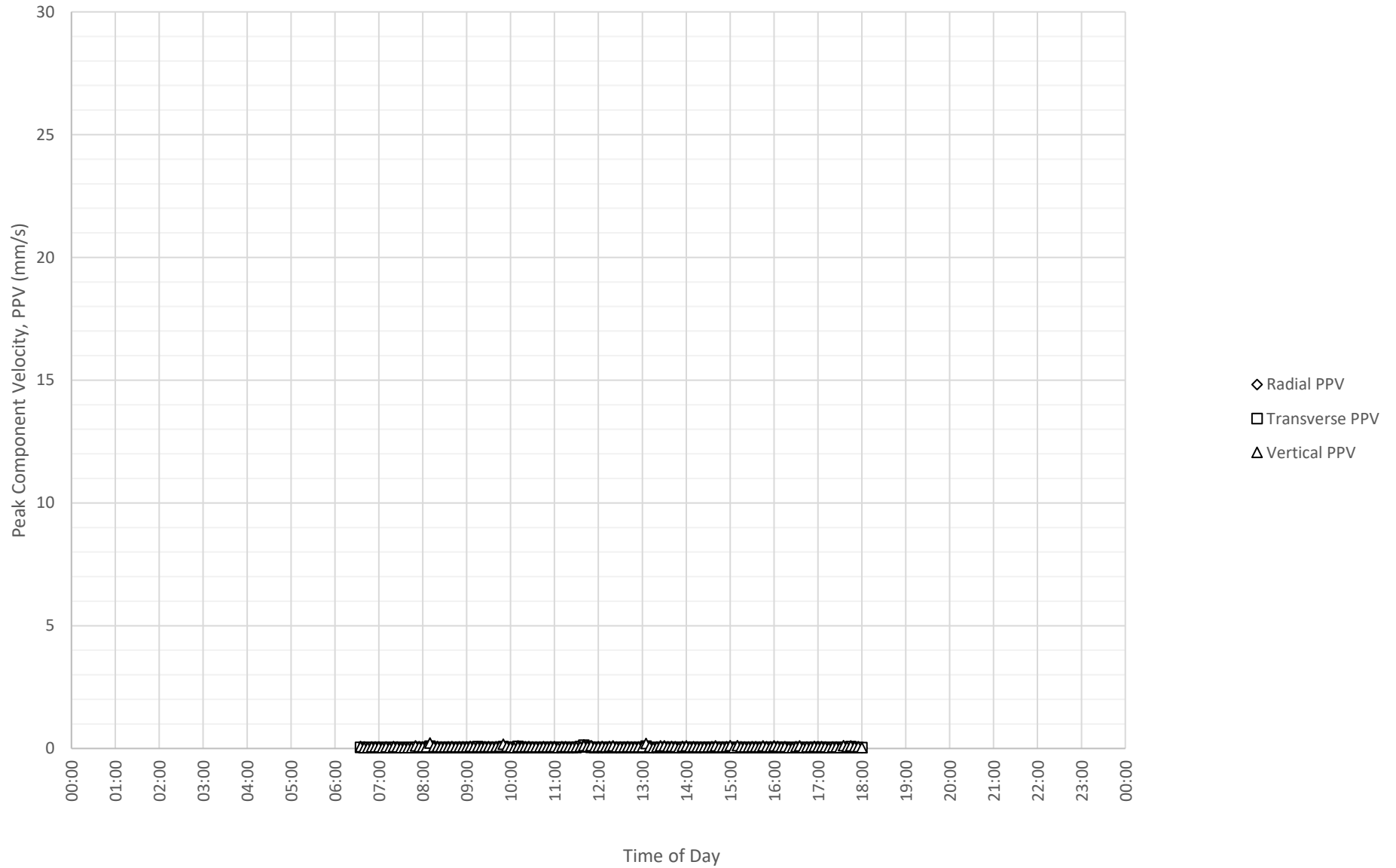


Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 25-01-2022

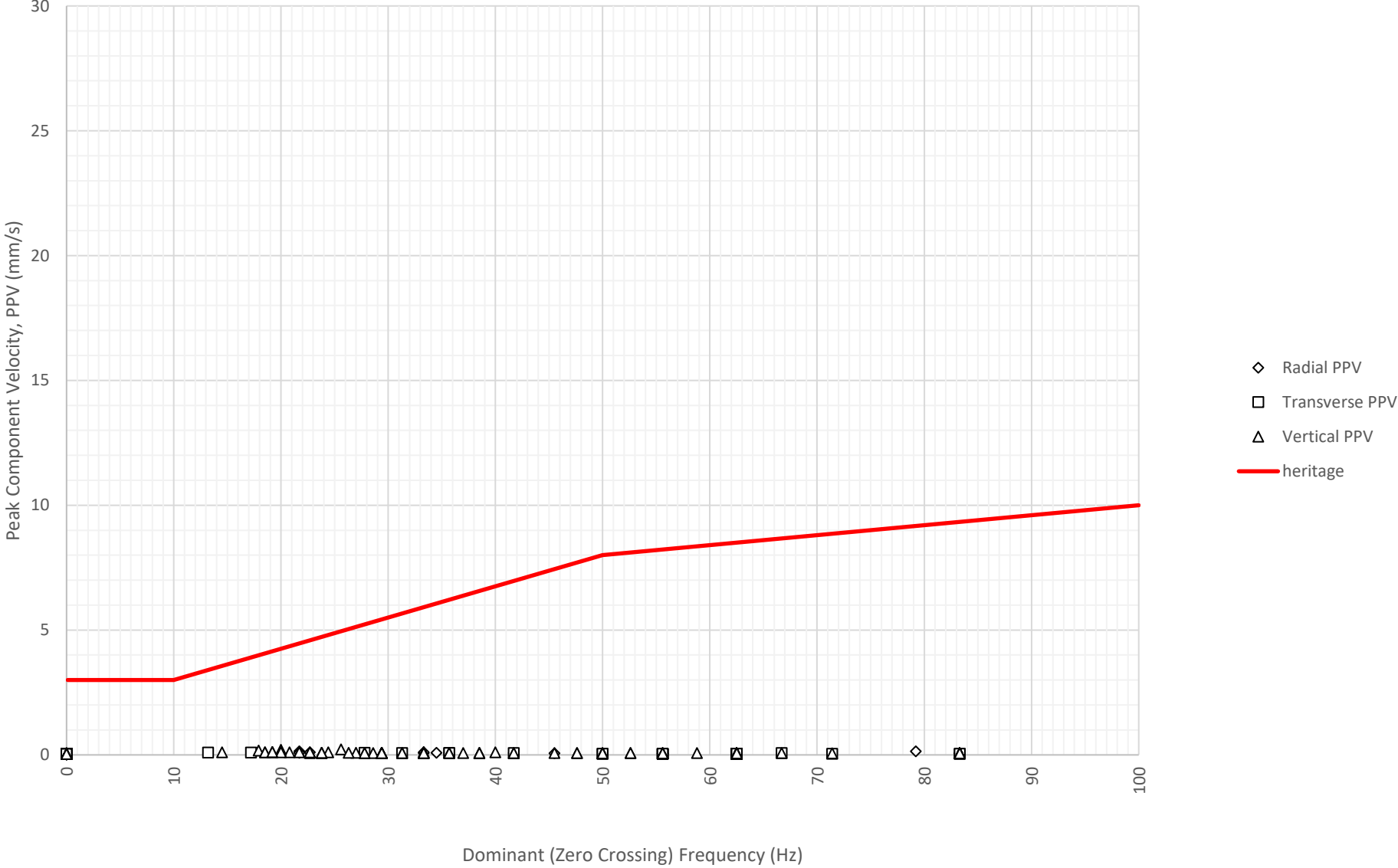




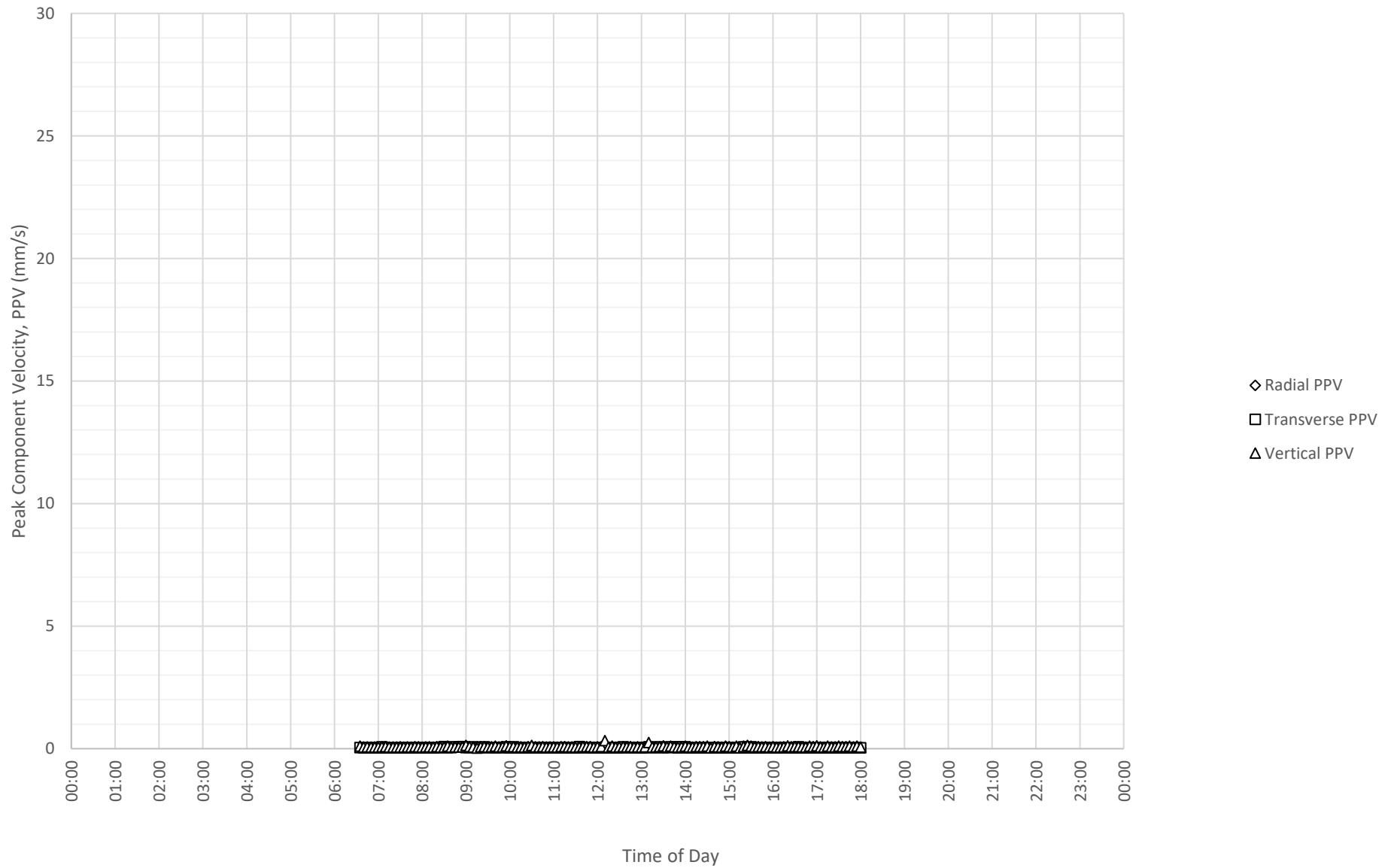
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 26-01-2022



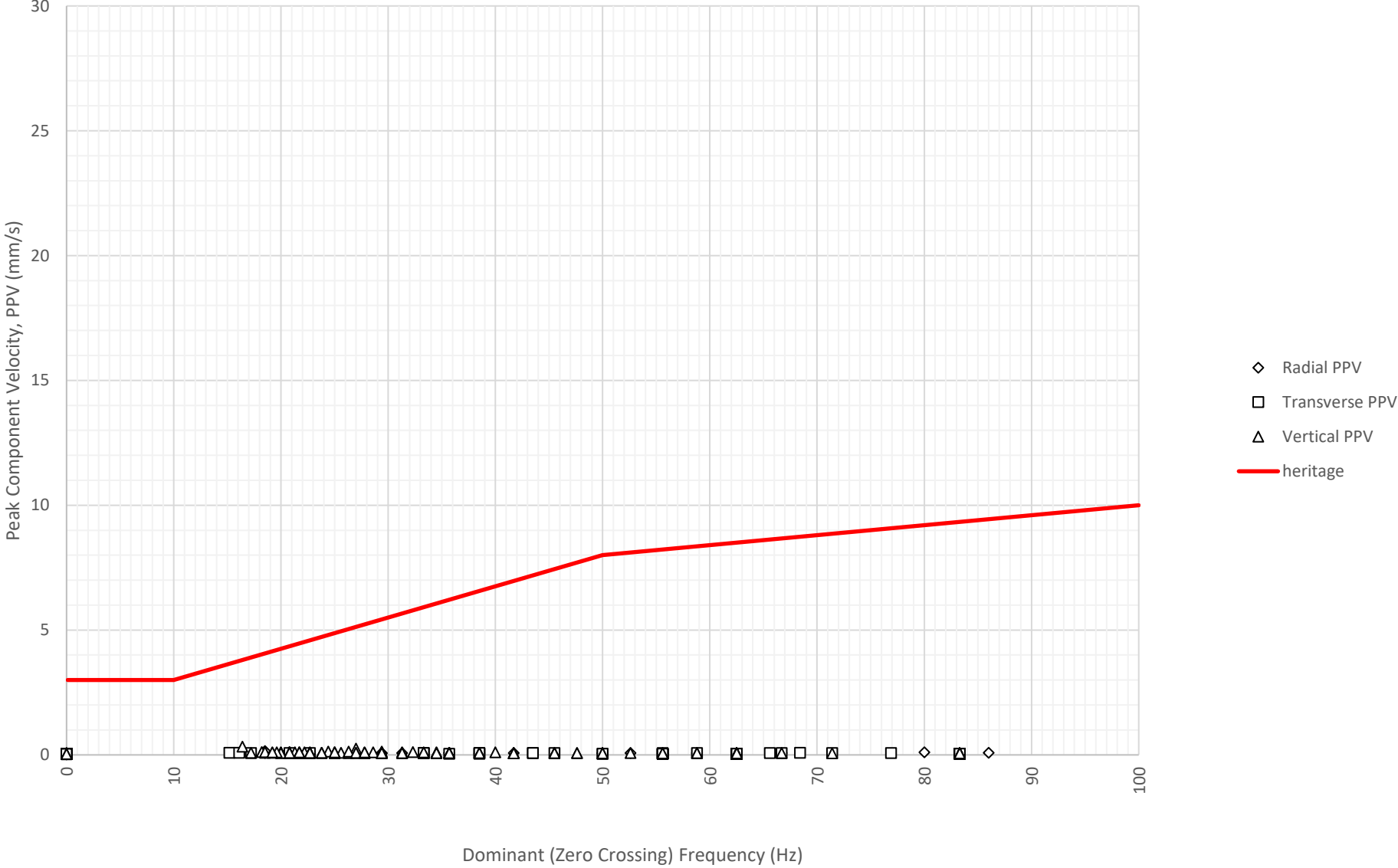
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 26-01-2022



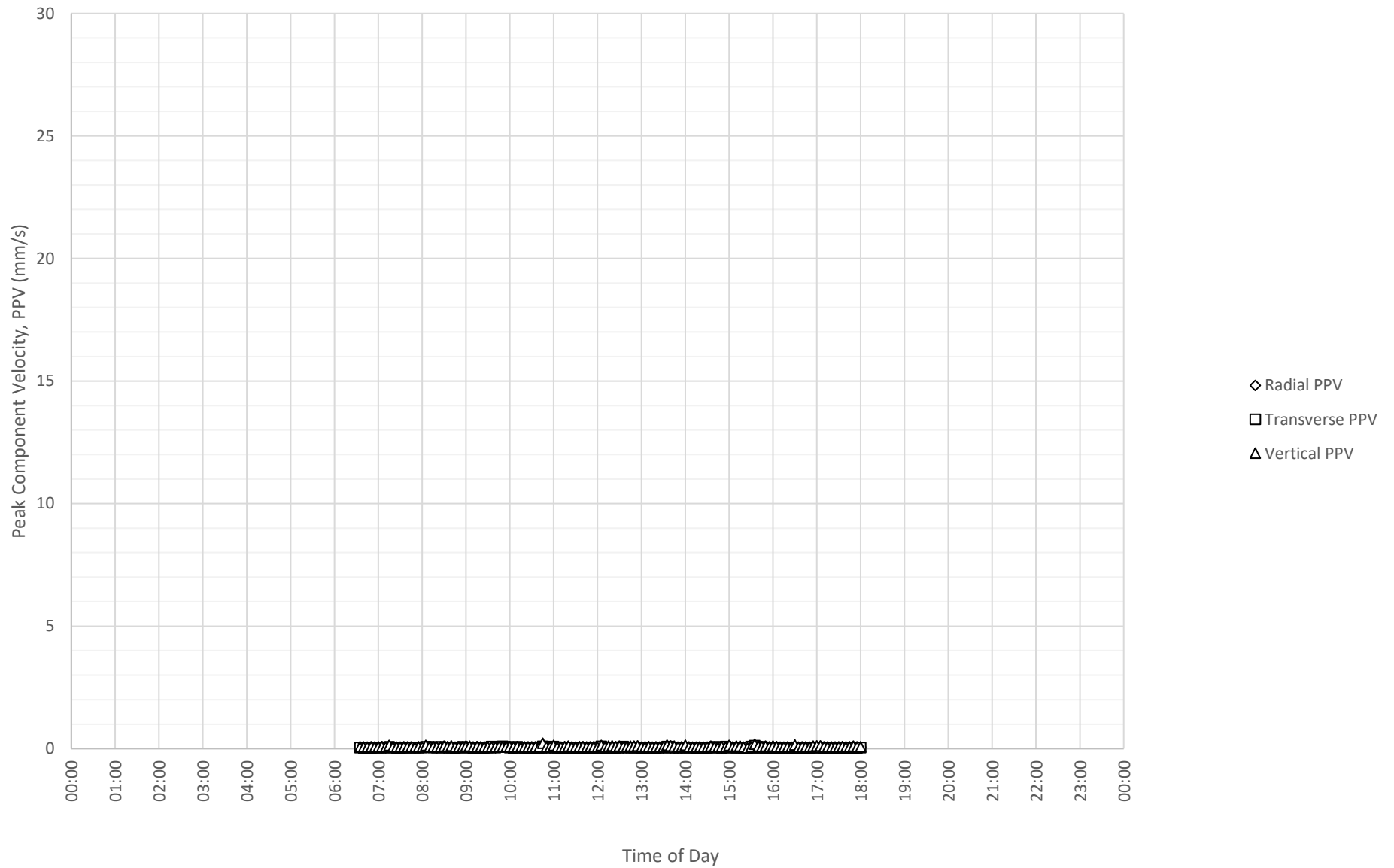
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 27-01-2022



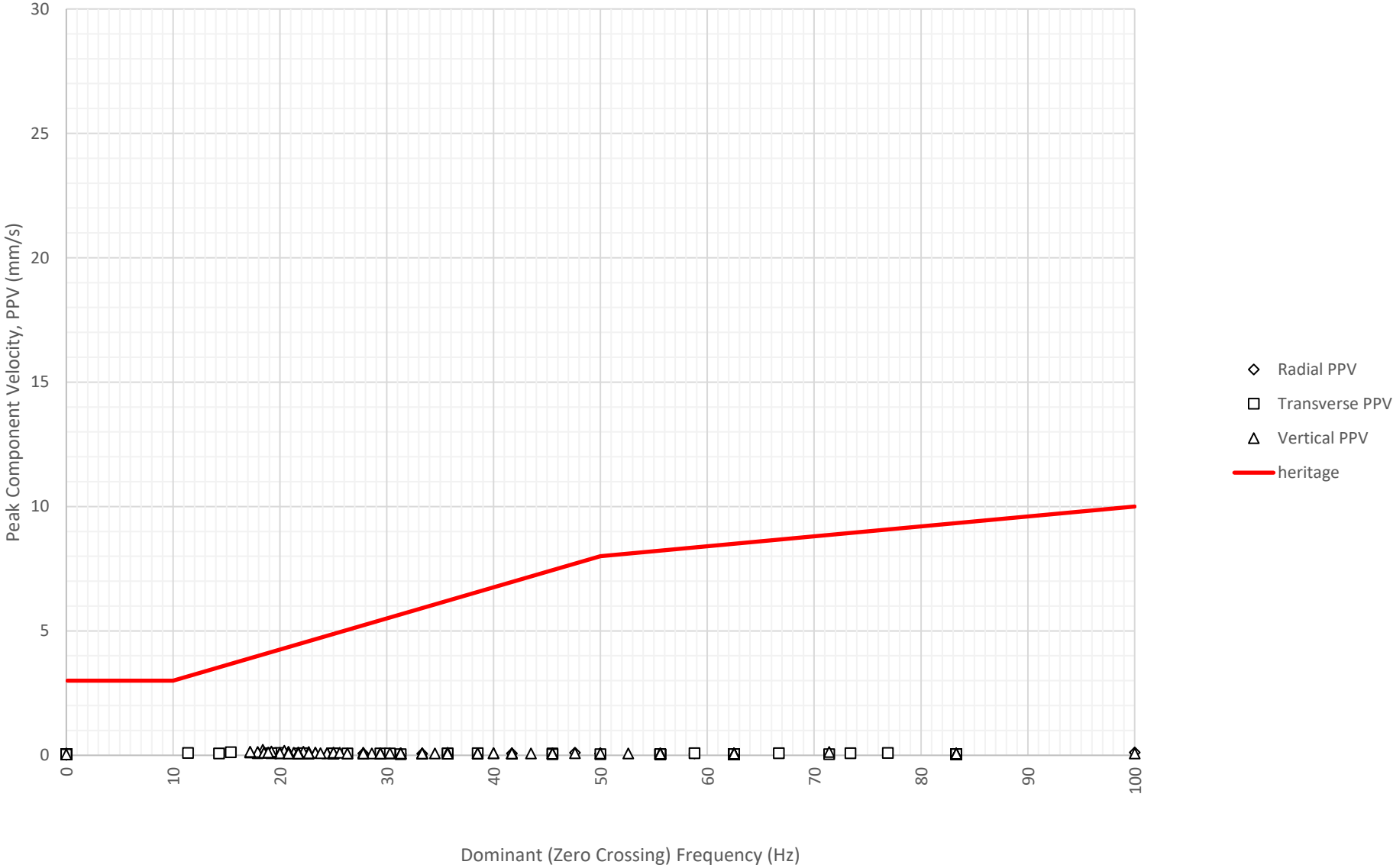
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 27-01-2022



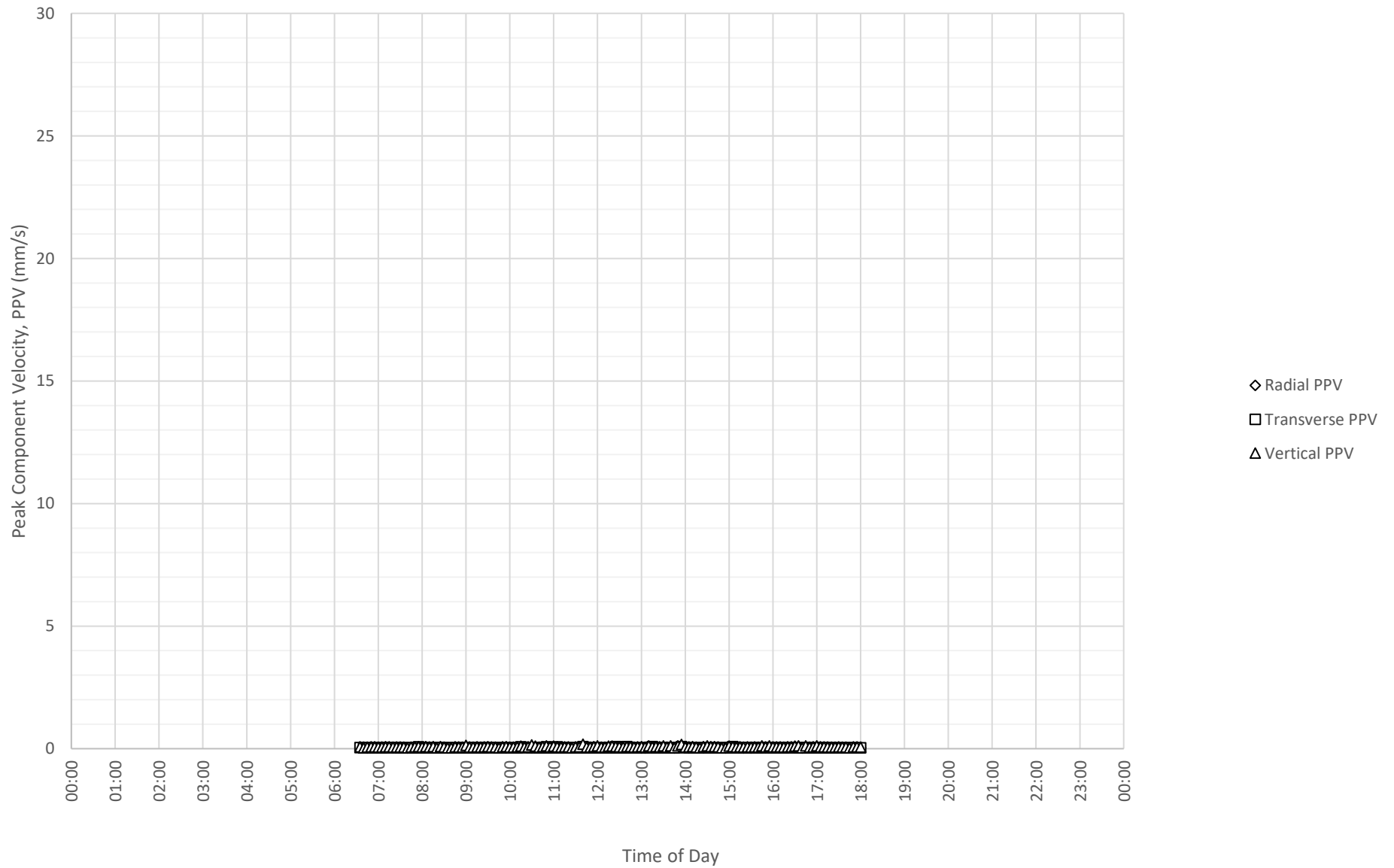
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 28-01-2022



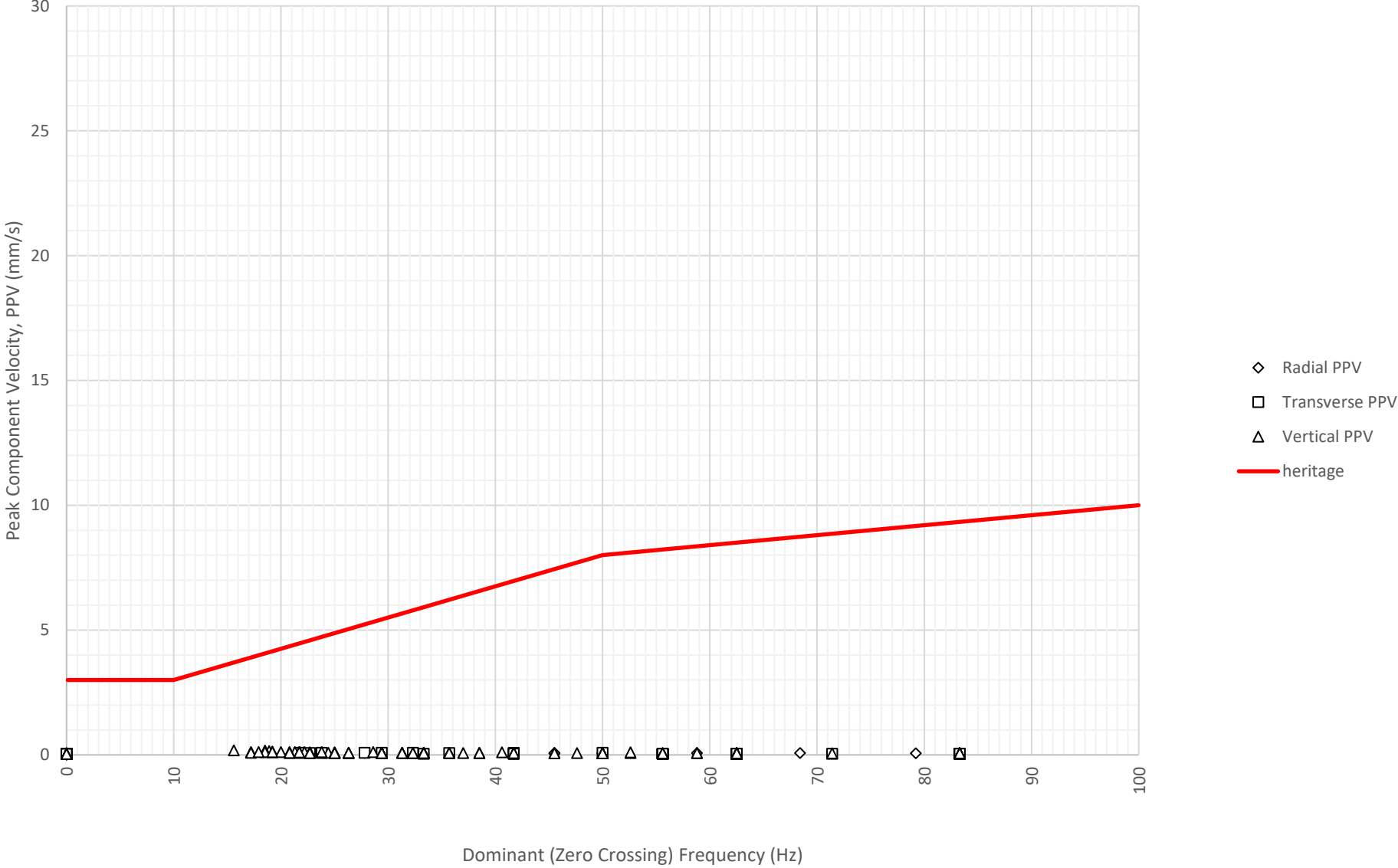
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 28-01-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 29-01-2022

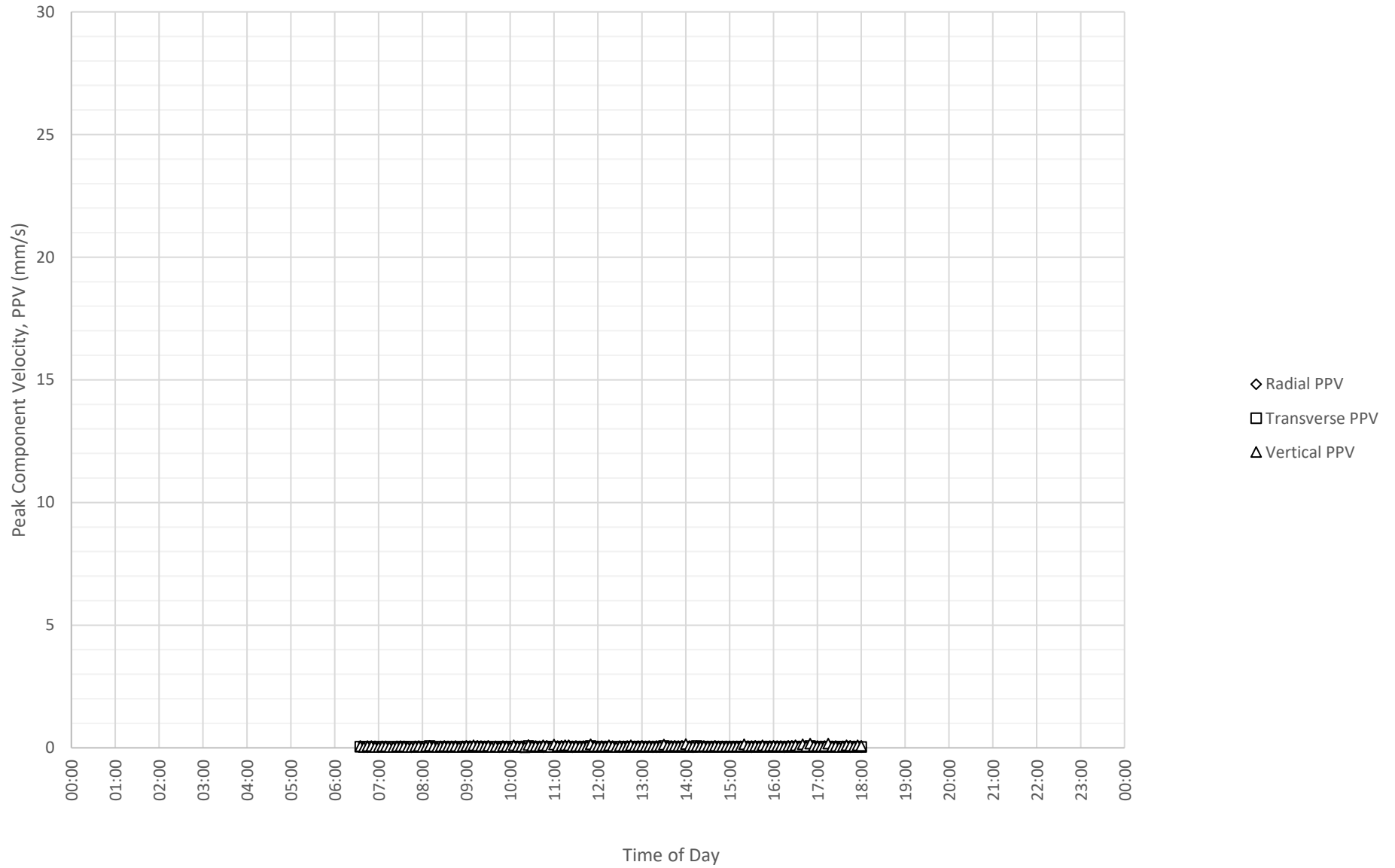


Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 29-01-2022

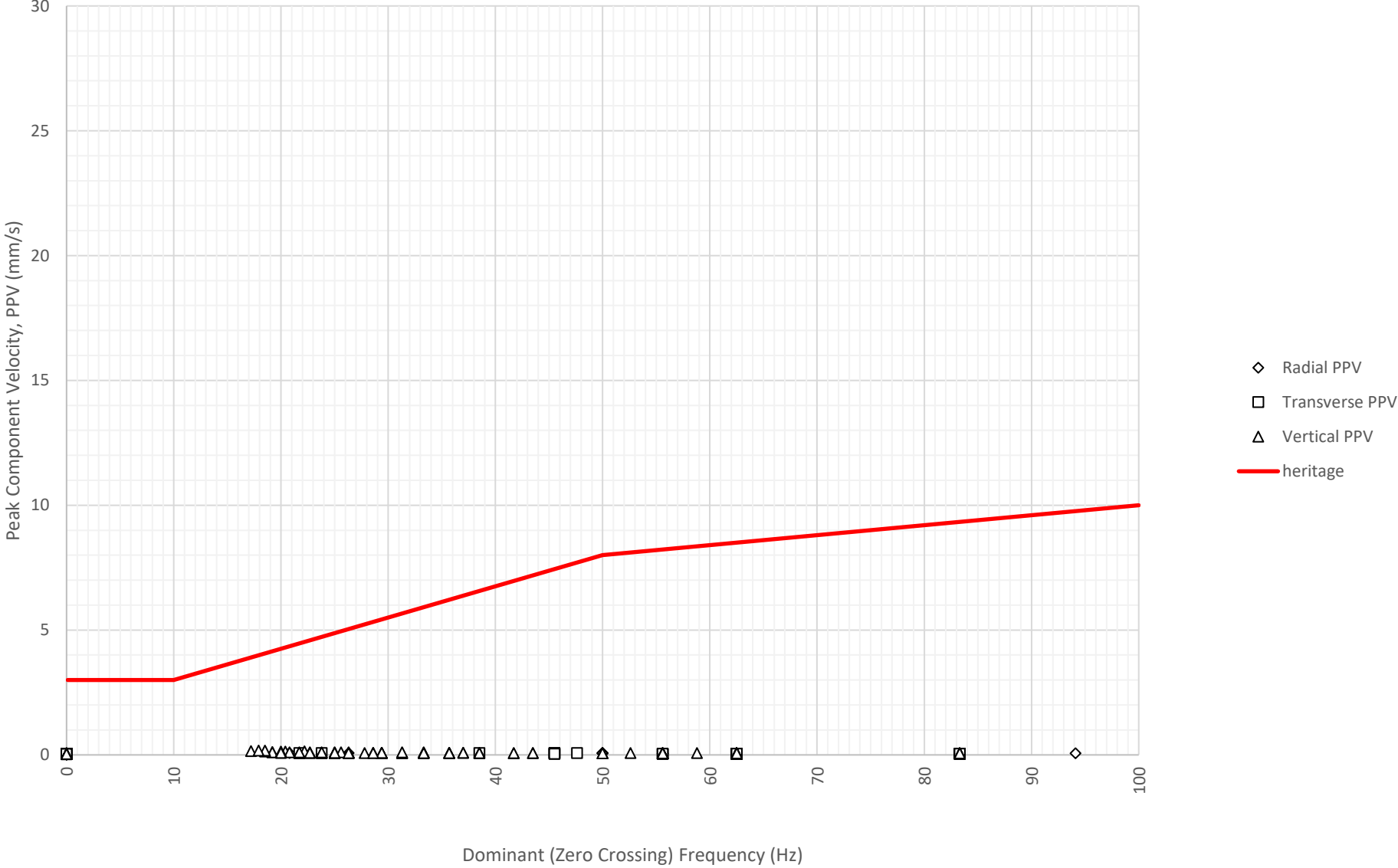




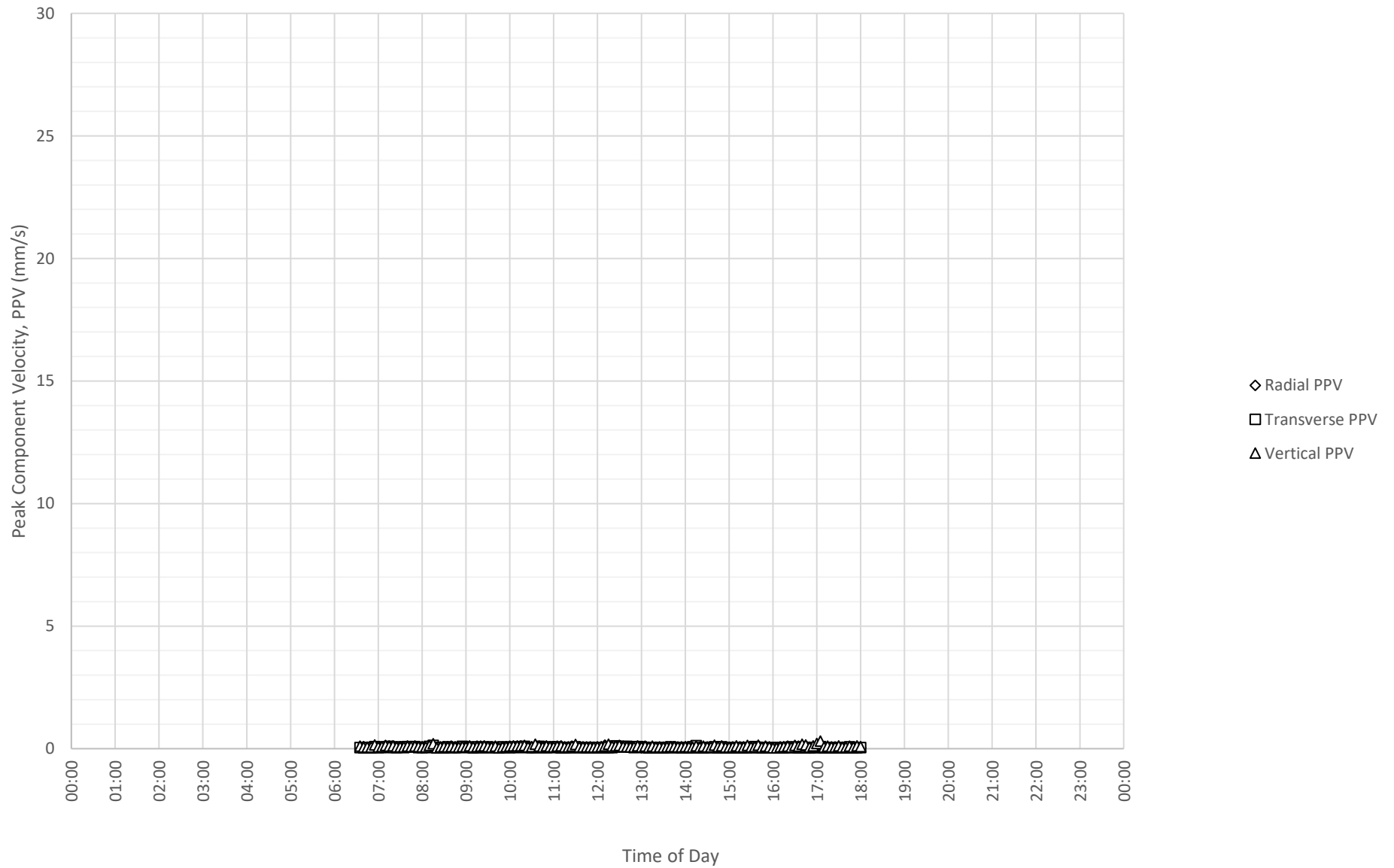
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 30-01-2022



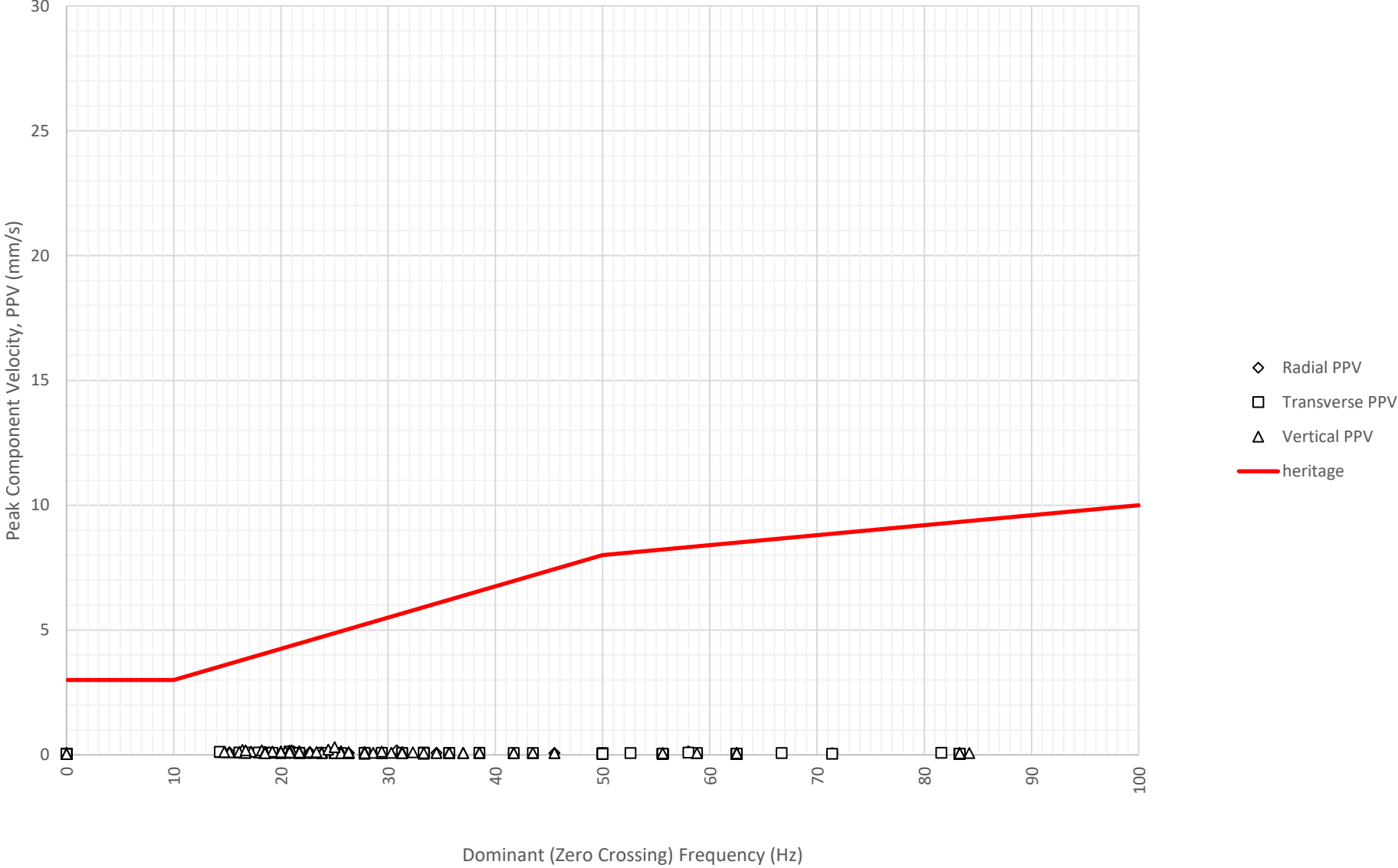
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 30-01-2022



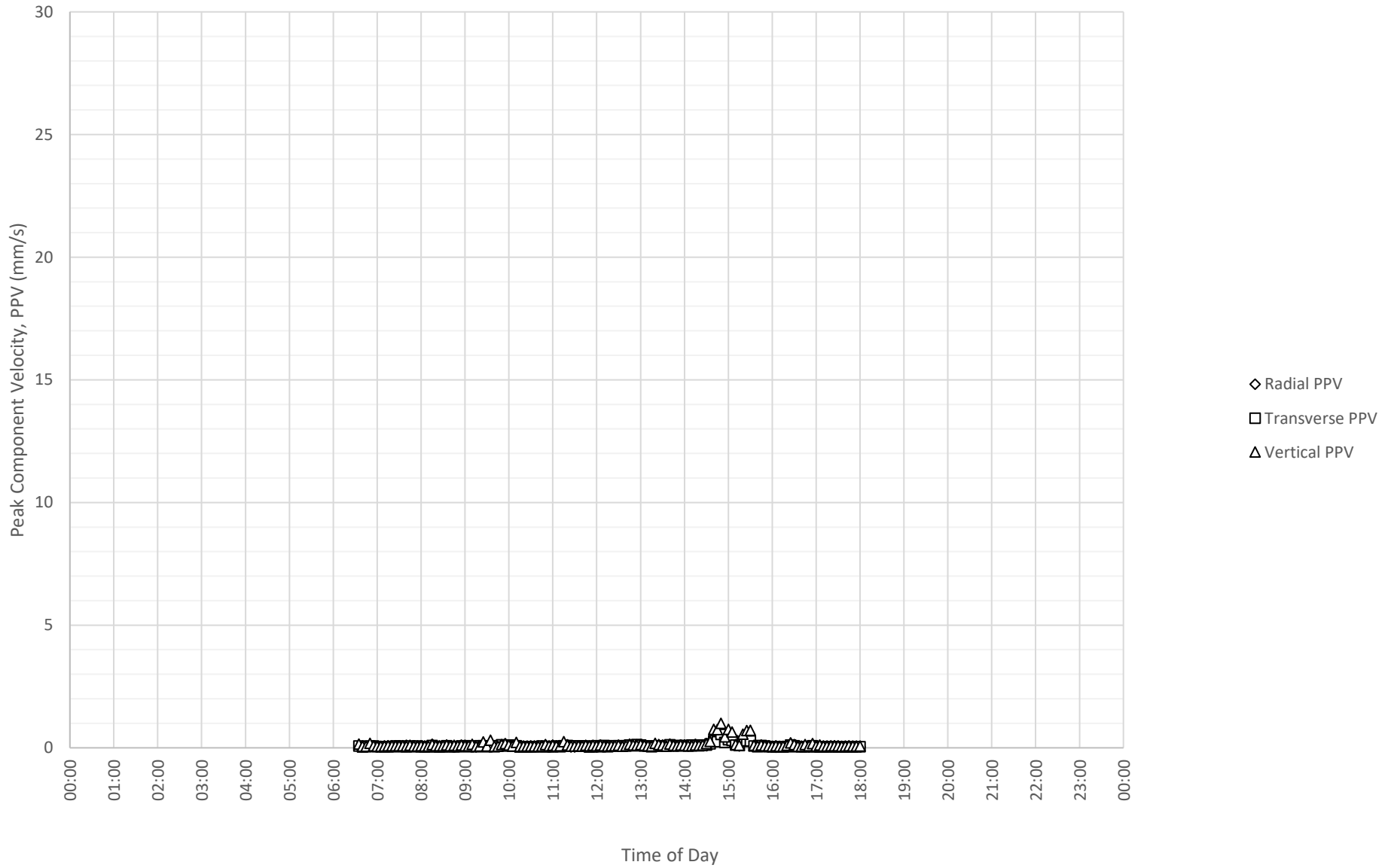
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 31-01-2022



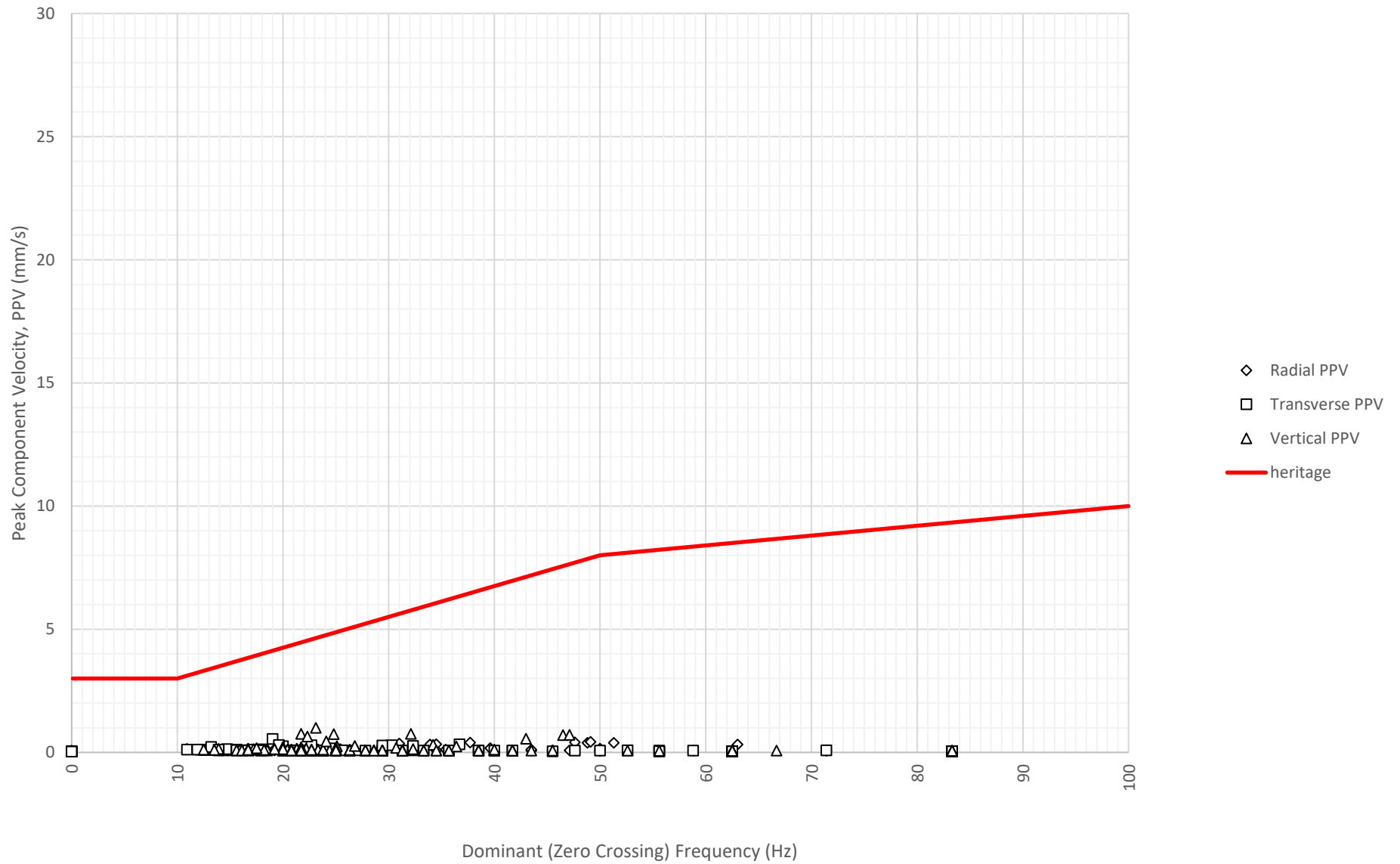
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 31-01-2022



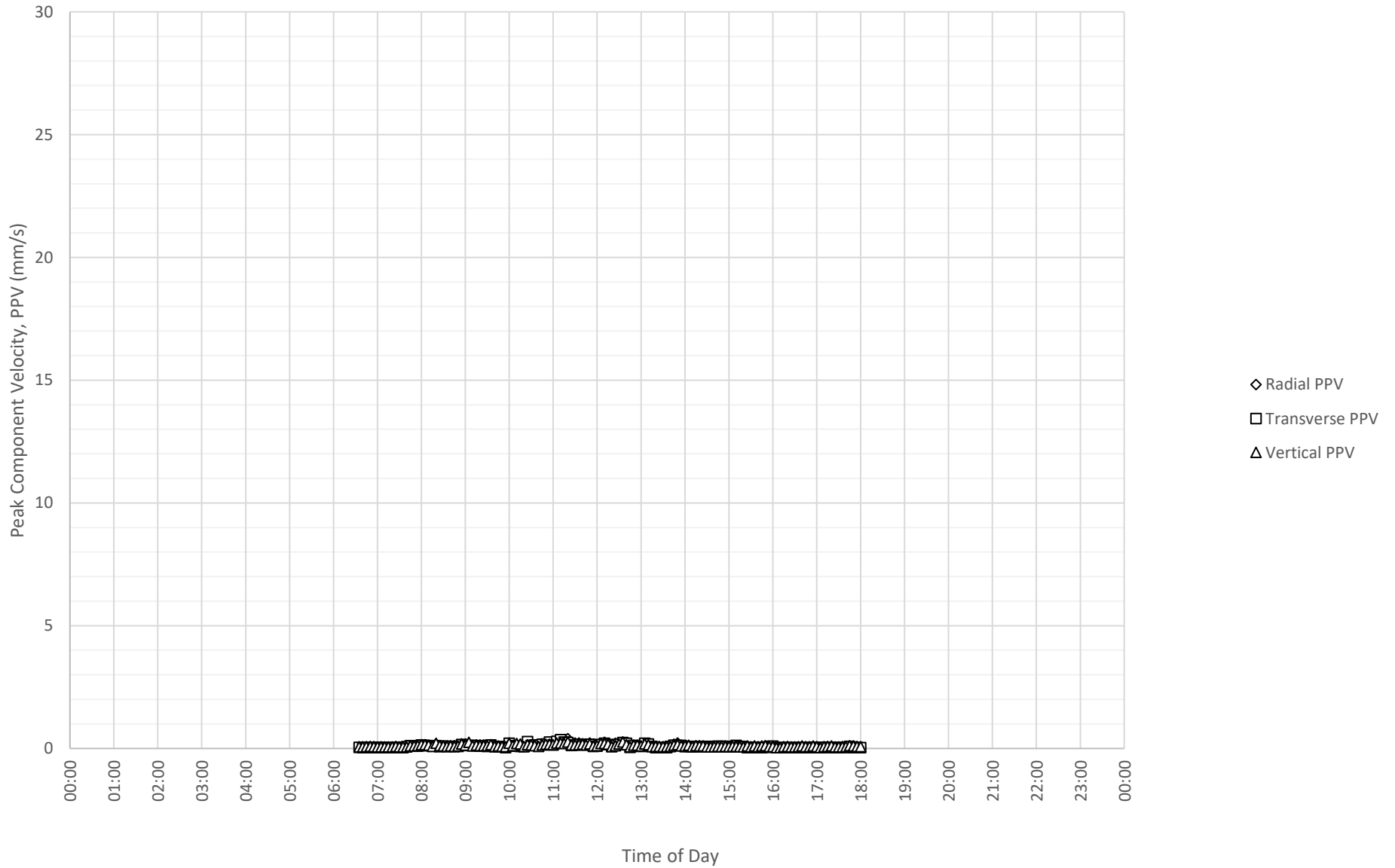
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 1-02-2022



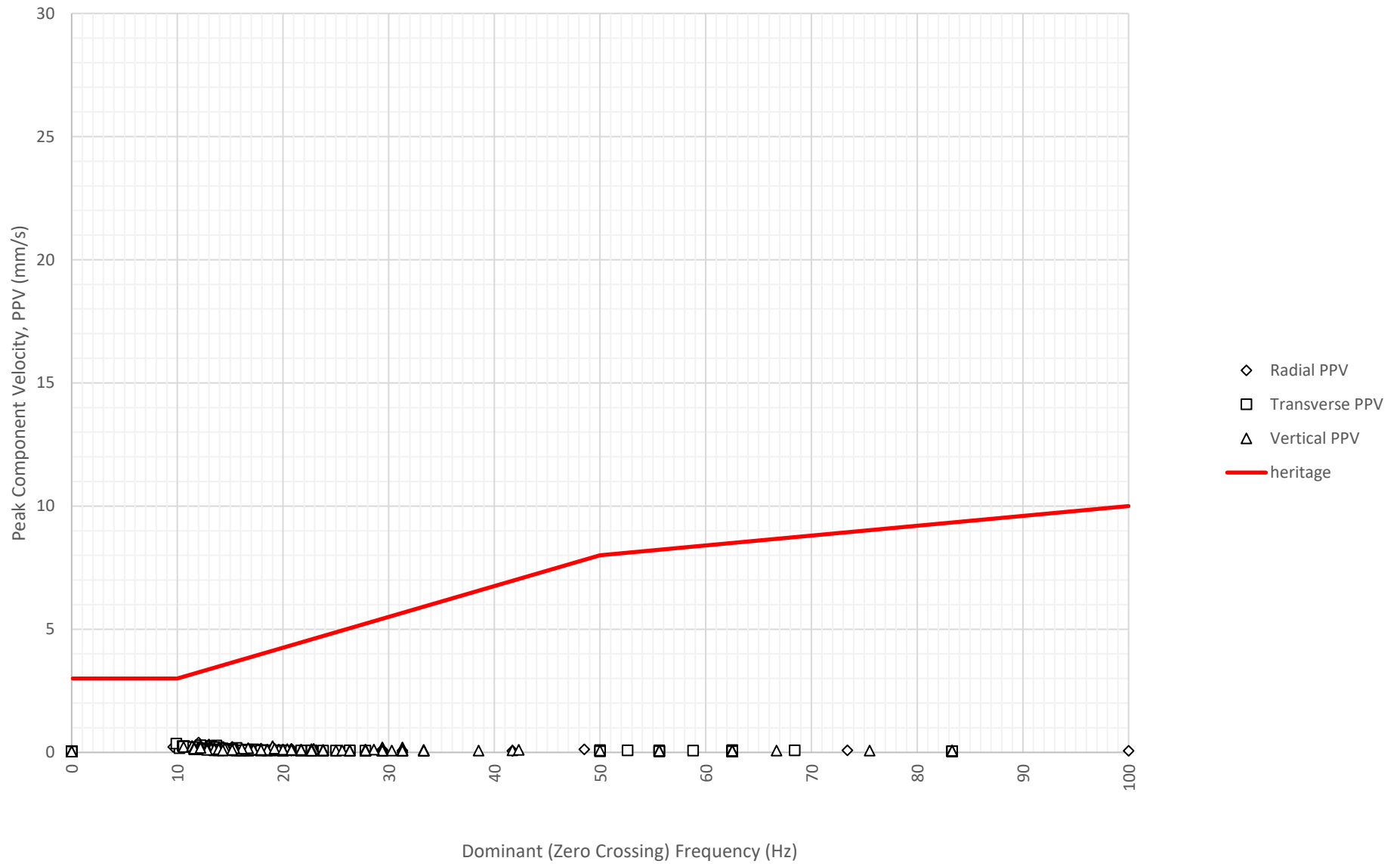
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 1-02-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 2-02-2022

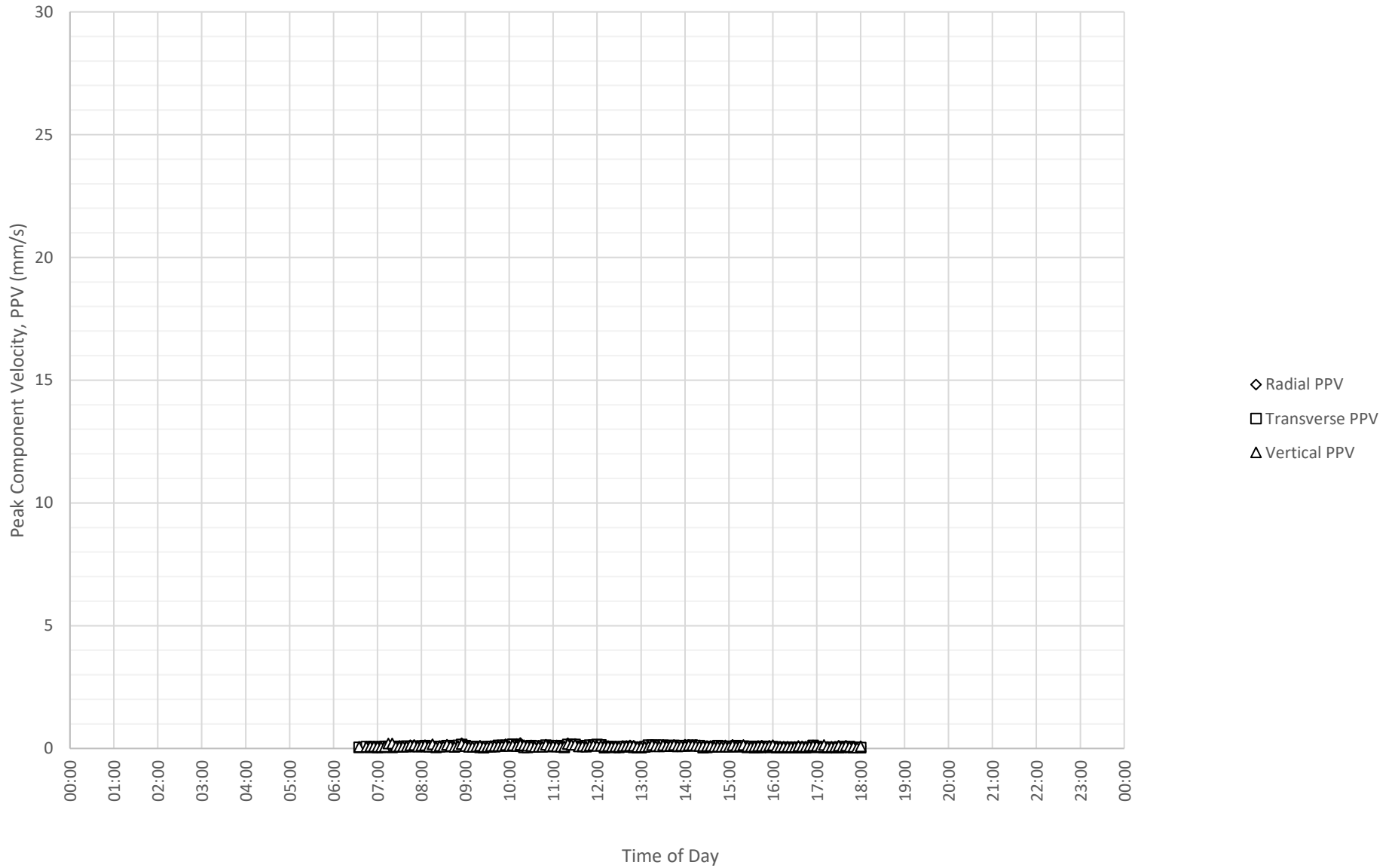


Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 2-02-2022

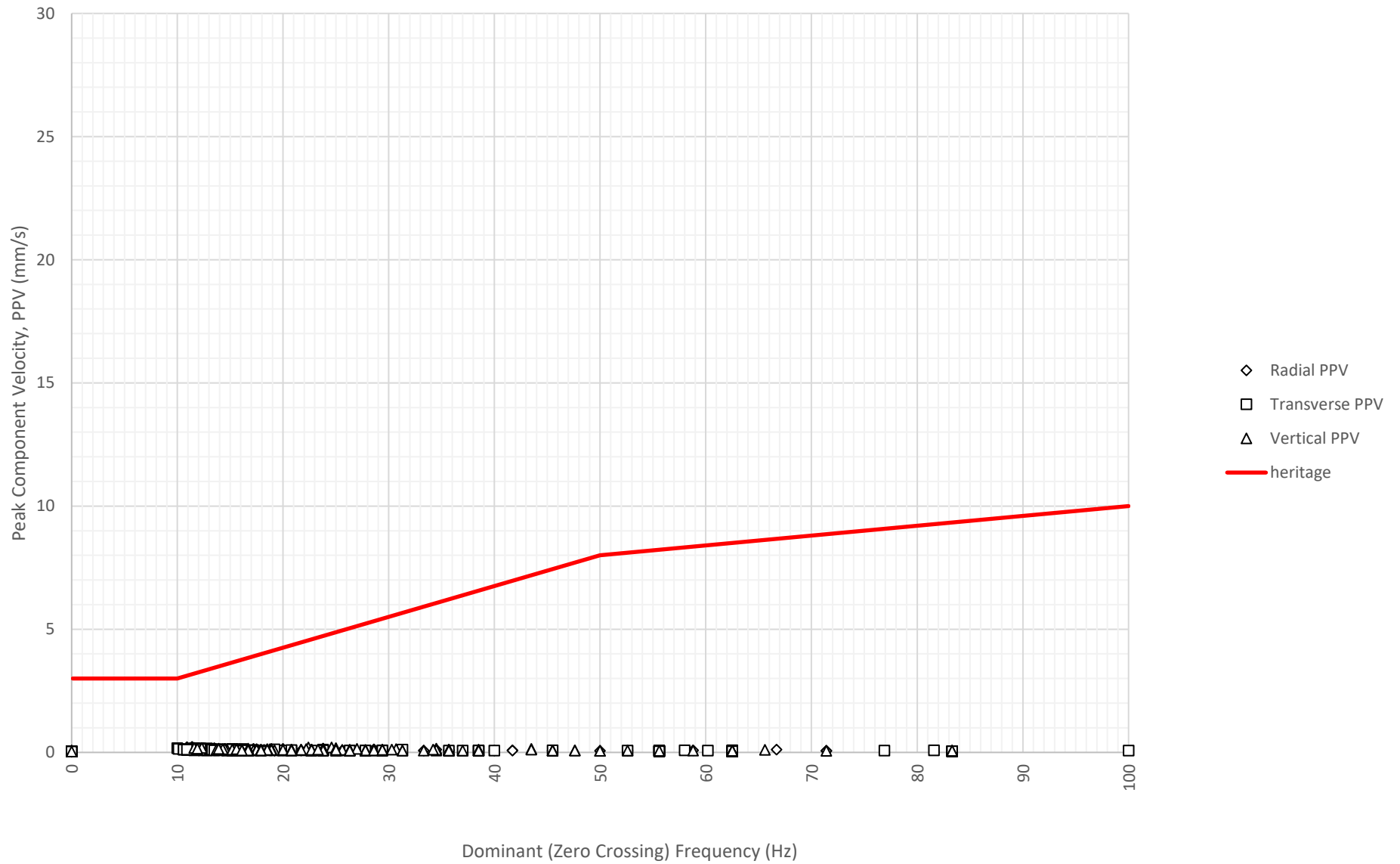




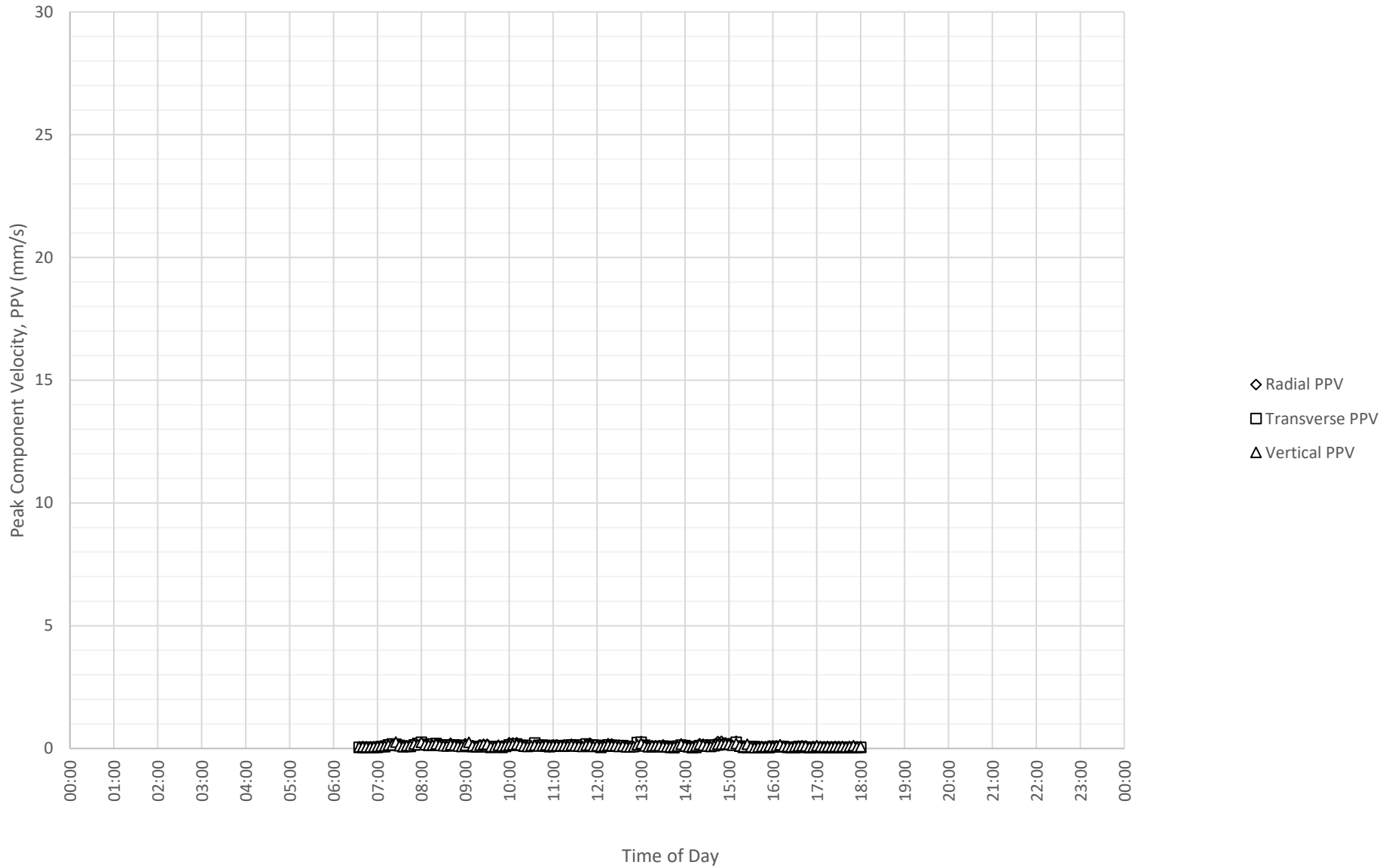
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 3-02-2022



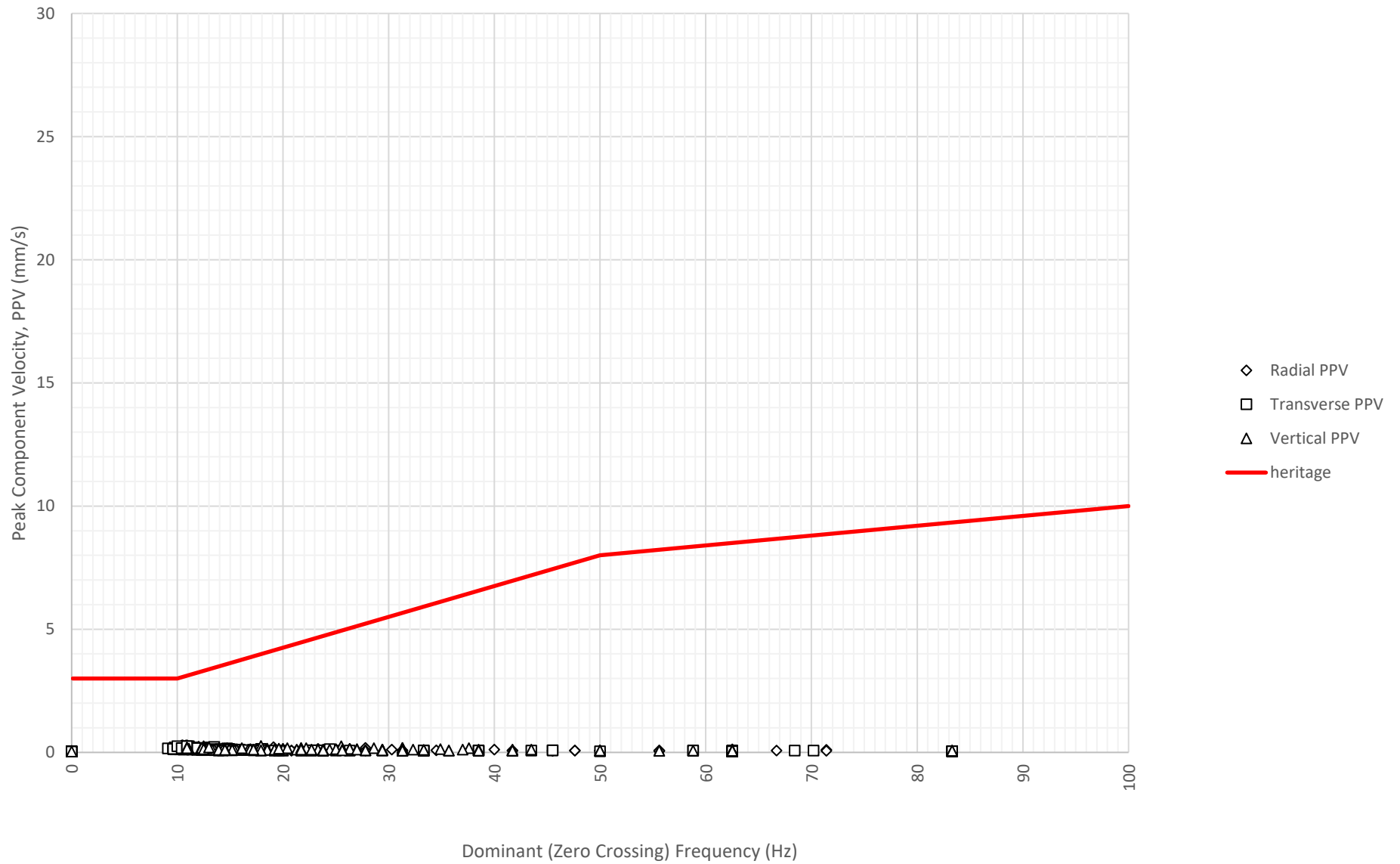
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 3-02-2022



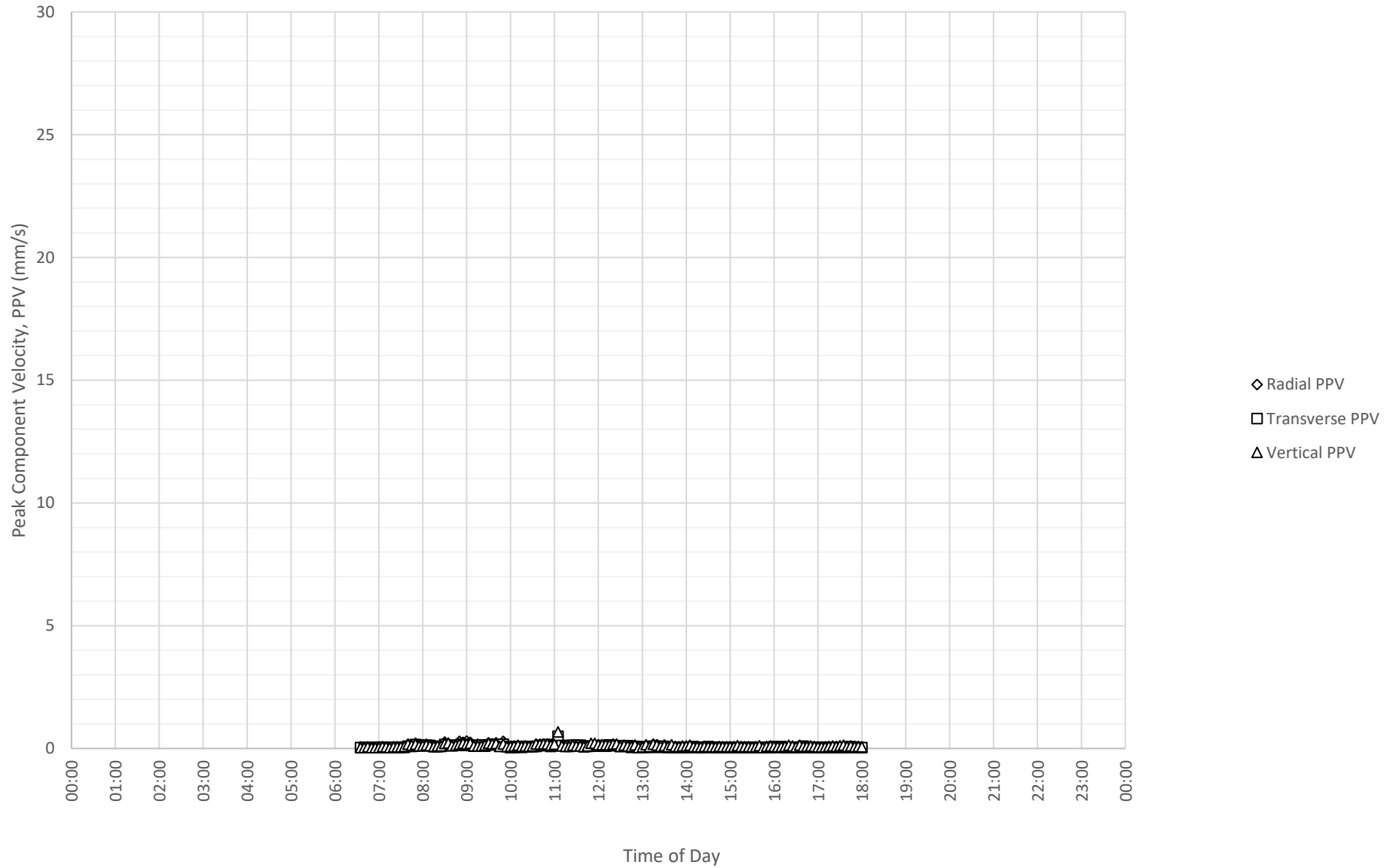
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 4-02-2022



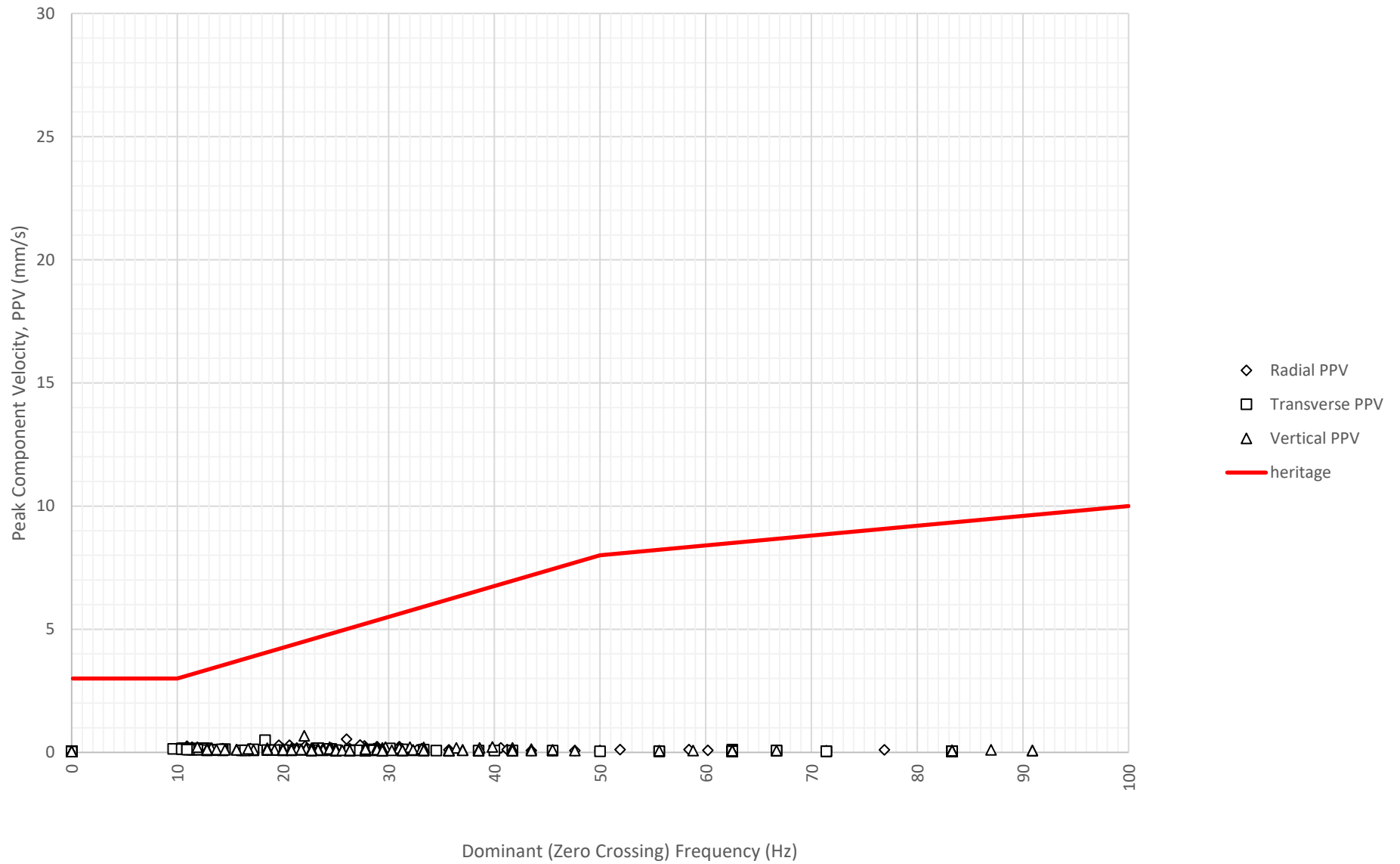
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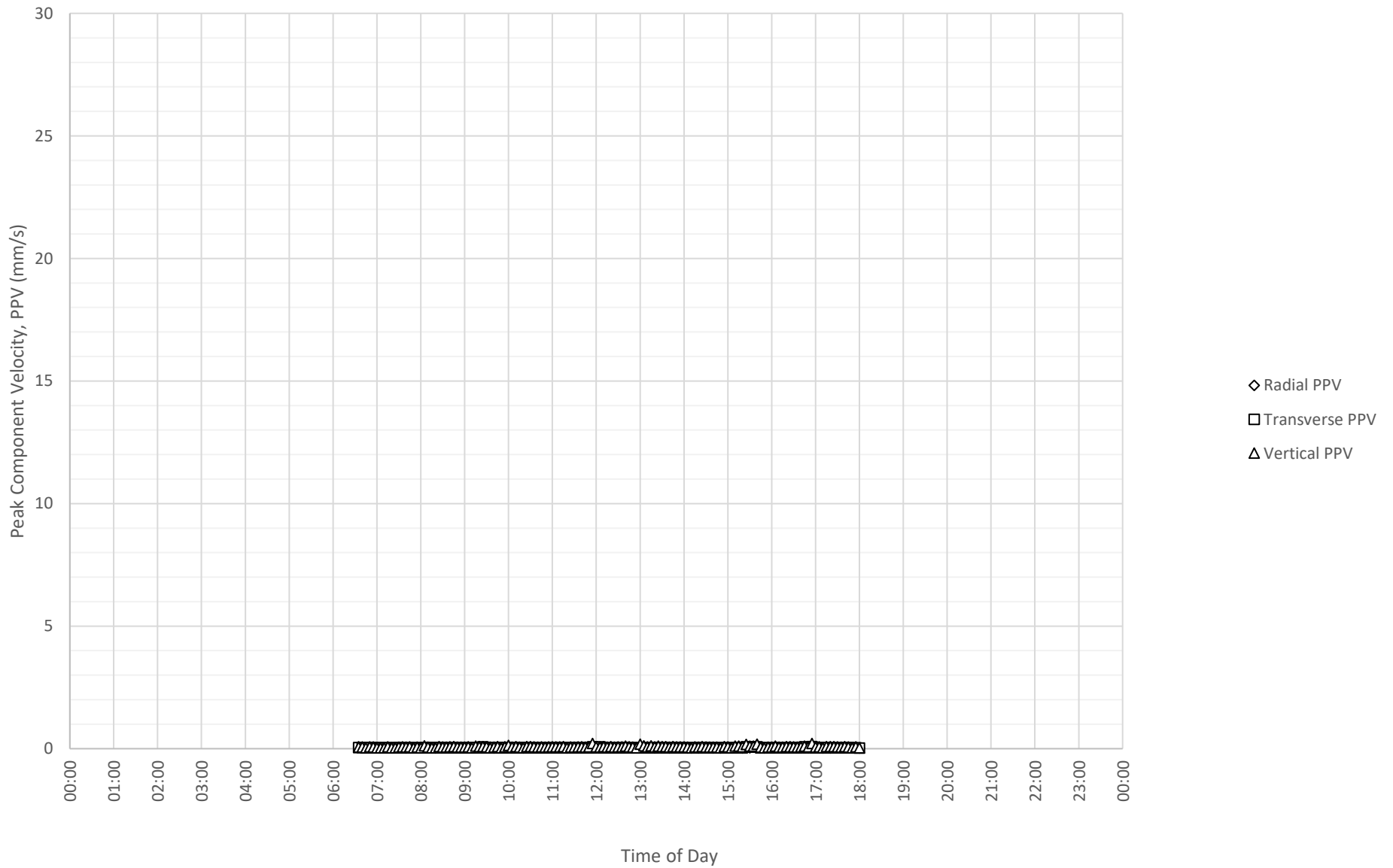
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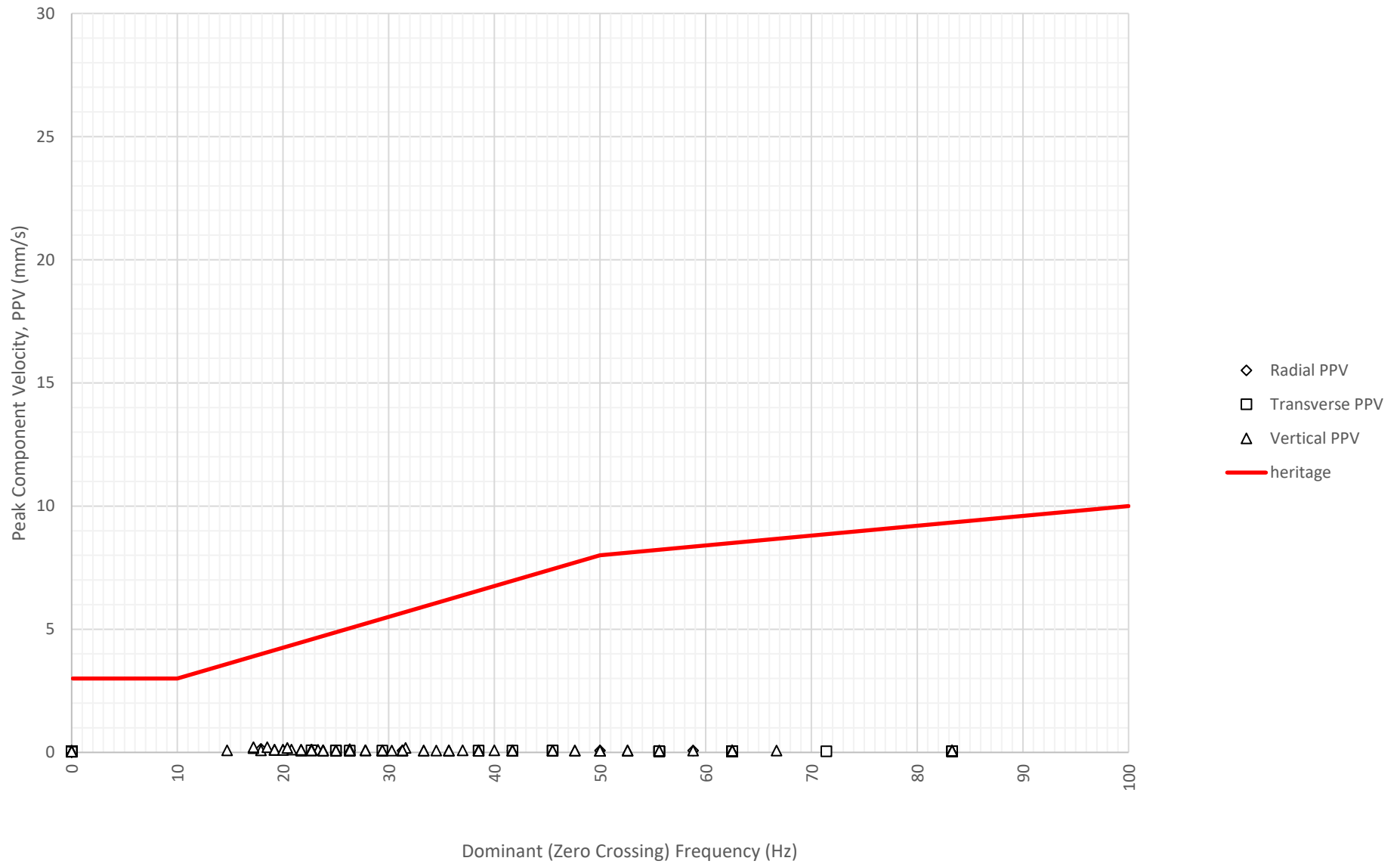
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 5-02-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 6-02-2022

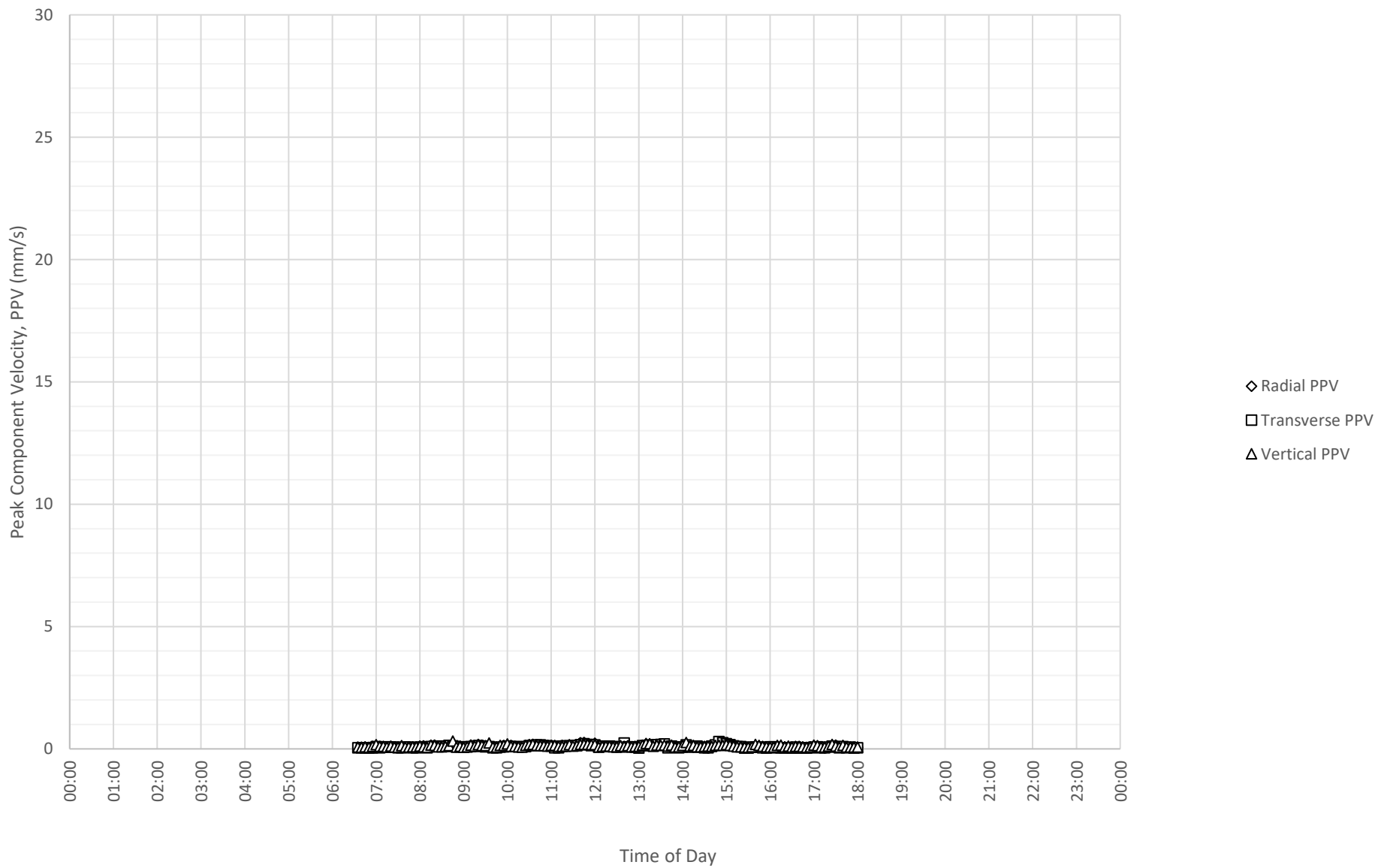


Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 6-02-2022

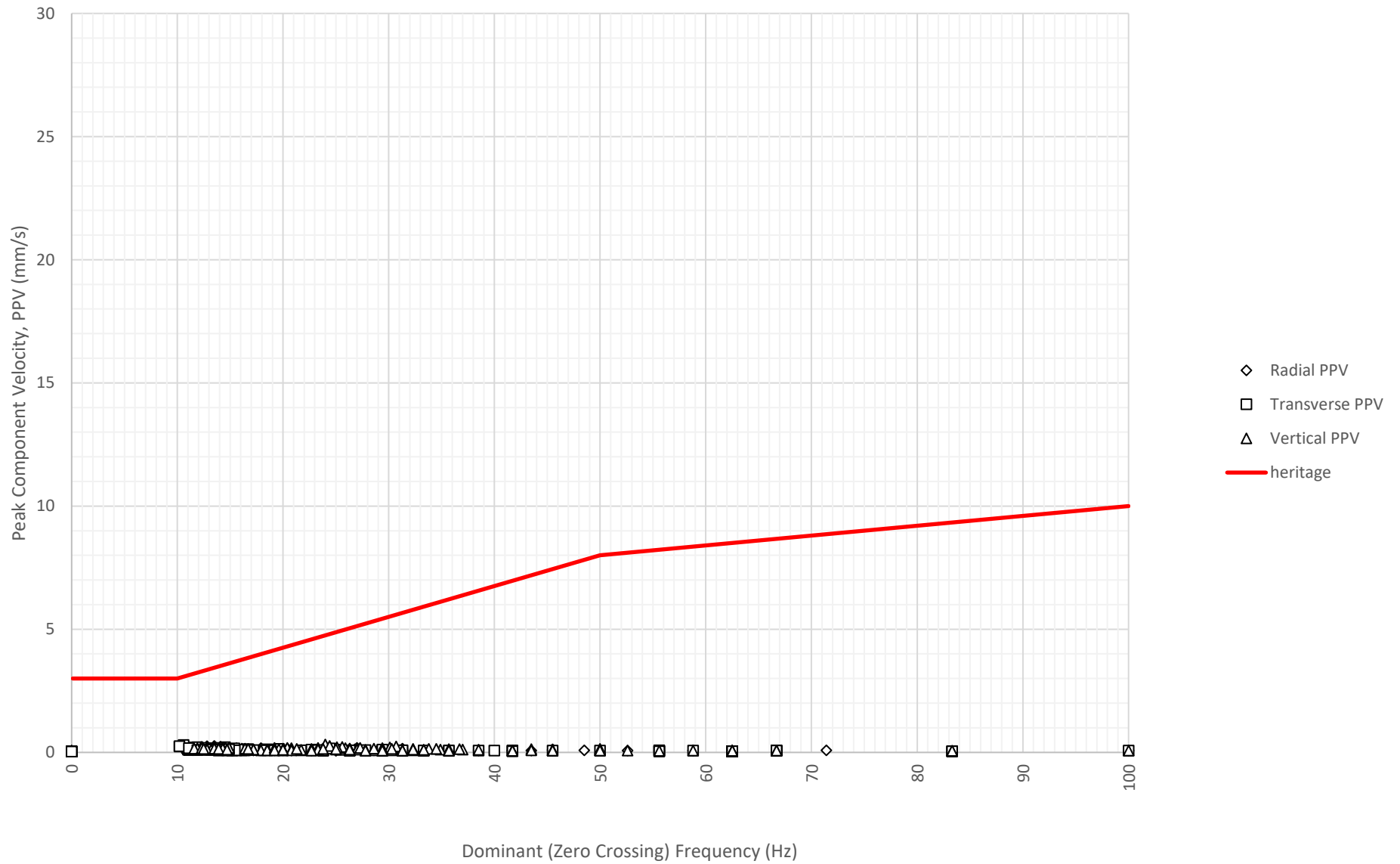




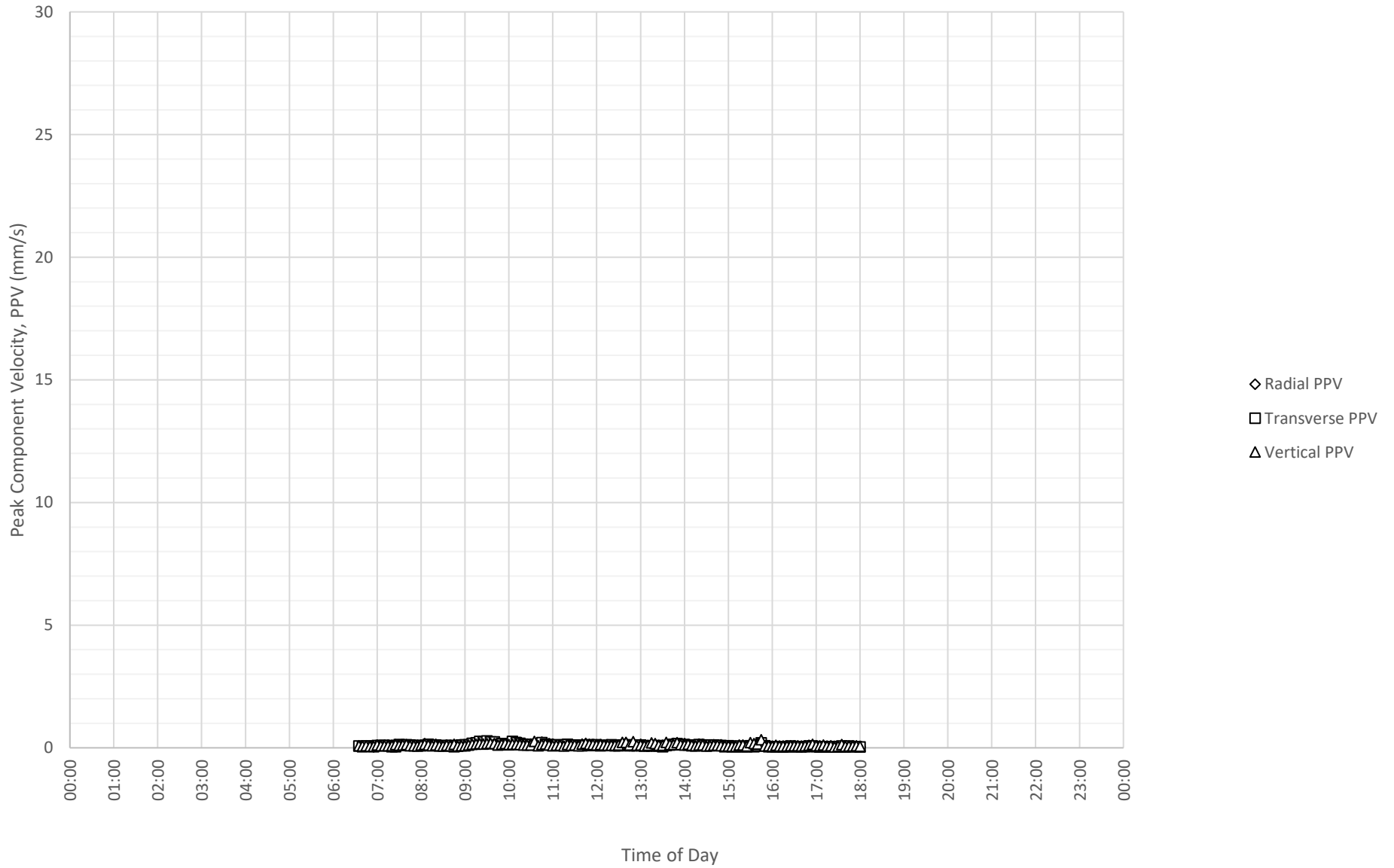
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 7-02-2022



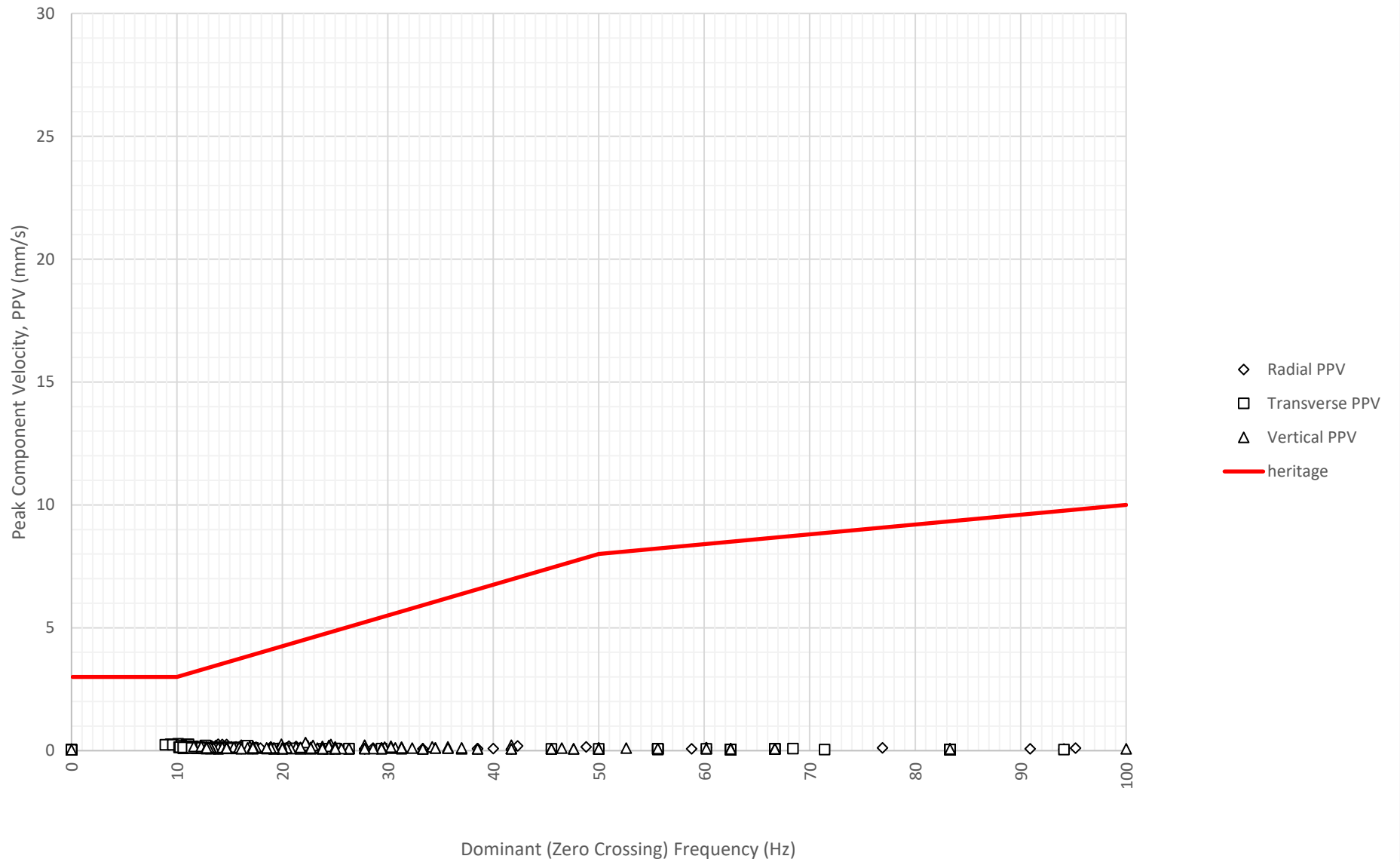
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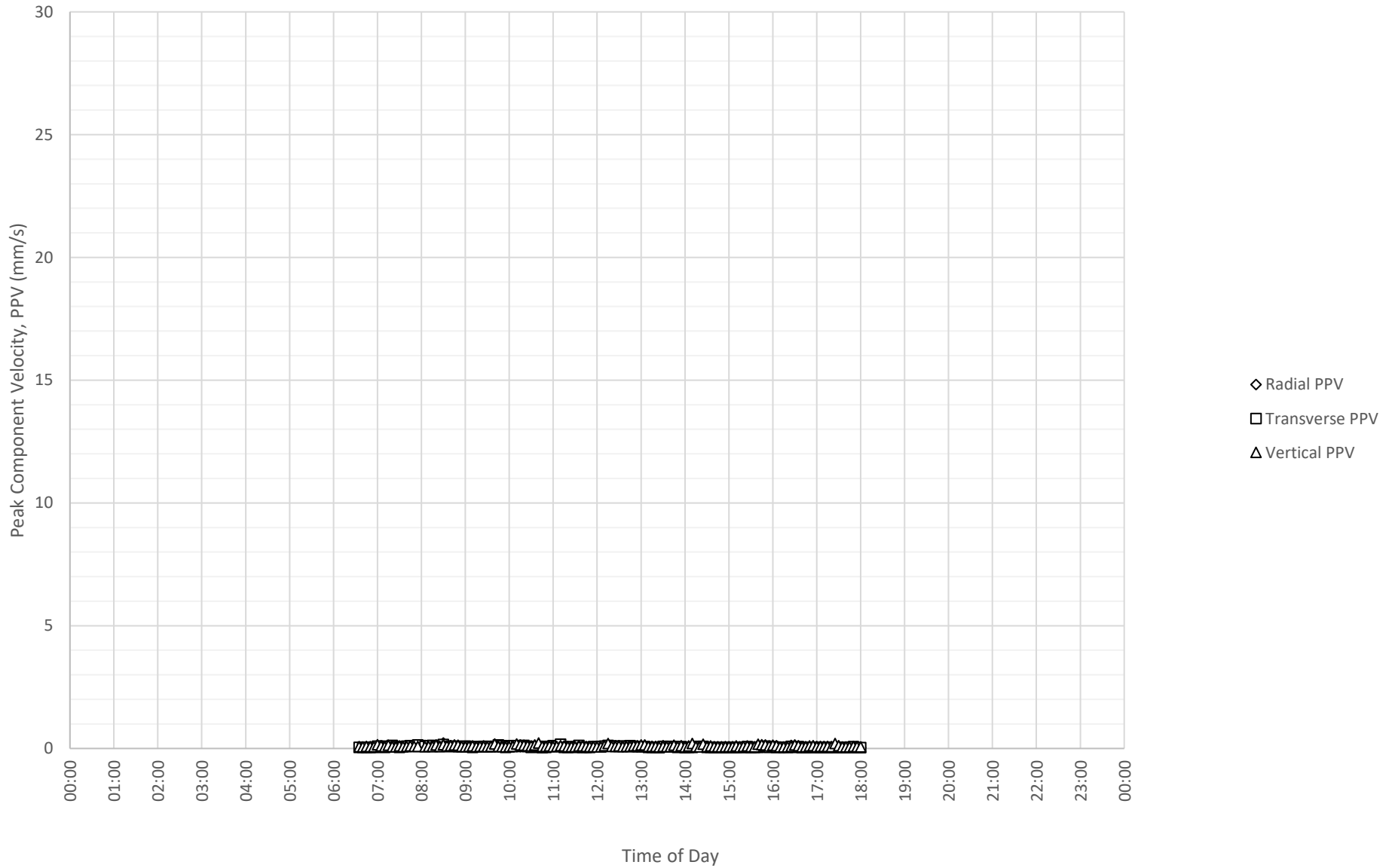
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 8-02-2022



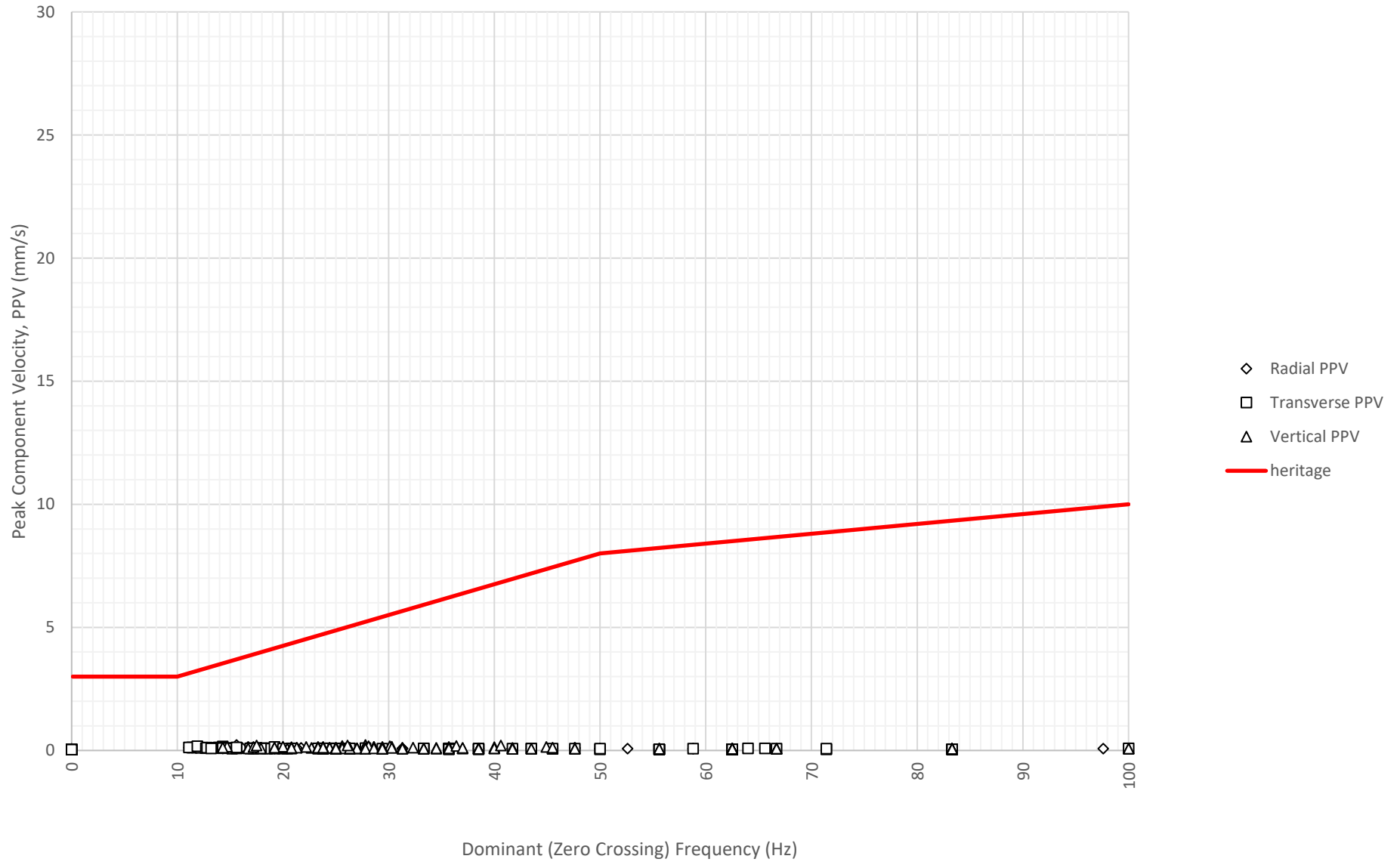
Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 8-02-2022



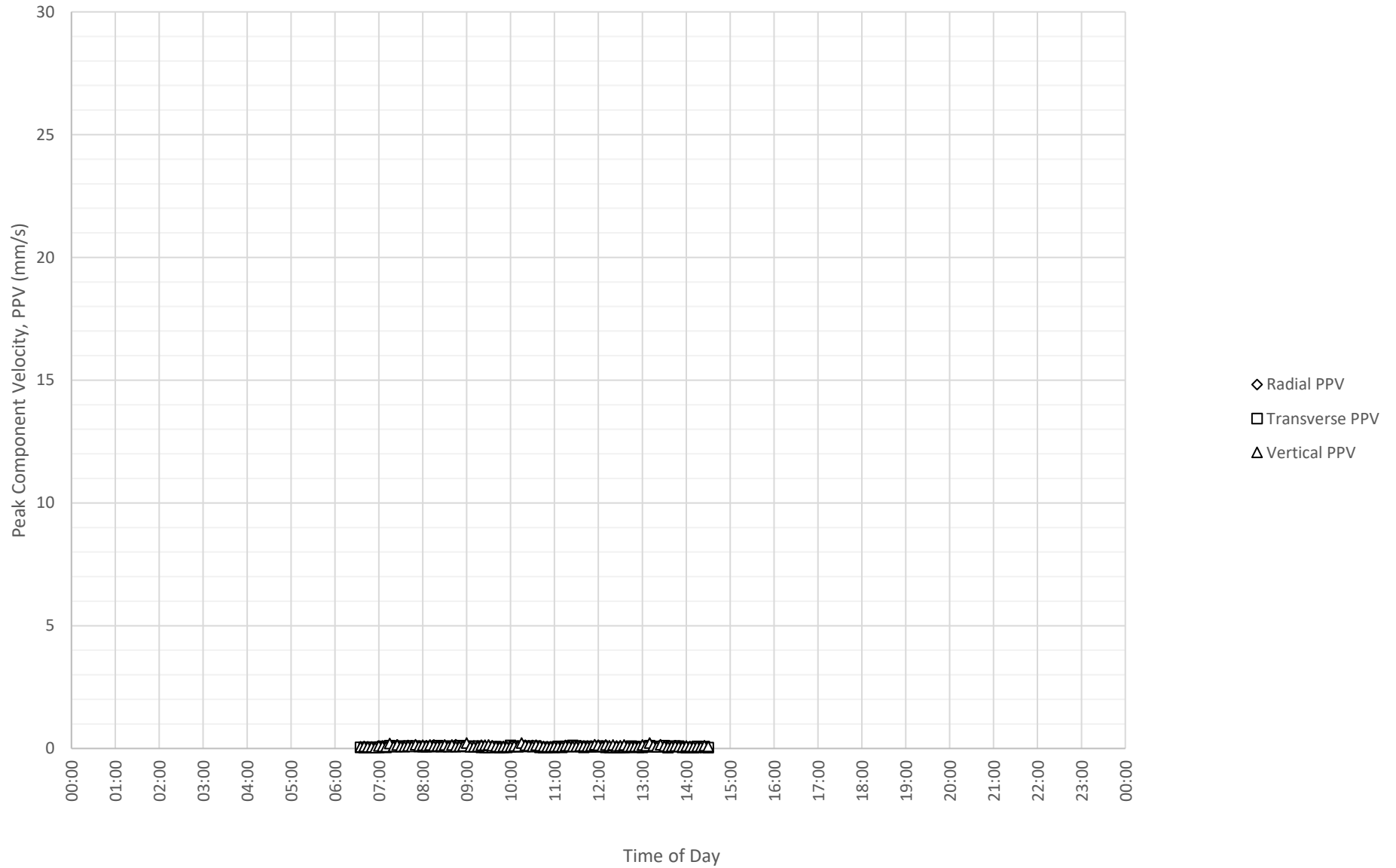
Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 9-02-2022



Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 9-02-2022



Daily Monitored Vibration Levels at Chefs Warehouse (Ex Church) on 10-02-2022



Frequency Content of Vibration Levels at Chefs Warehouse (Ex Church) on 10-02-2022

