

Royal Prince Alfred Hospital Redevelopment (RPAH
Redevelopment)

Construction Noise and Vibration Monitoring Report 2

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Document Title	Construction Noise and Vibration Monitoring
Attention To	CPB Contractors Pty Limited

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1 INTRODUCTION

This report presents the results of the noise and vibration monitoring conducted by Acoustic Logic during the site establishment works for the RPA Hospital redevelopment, located at 50 Missenden Road, Camperdown. Details presented in this report include monitoring locations, relevant noise and vibration objectives, measured noise and vibration levels over the presented monitoring period and a discussion of results where applicable.

This report covers the second fortnight since the beginning of construction monitoring, being between Thursday 07th December, 2023 and Friday 22nd December, 2023.

Unattended noise and vibration monitoring has been undertaken to satisfy the requirements of Condition B26 of SSD-47662959's Development Consent, in conjunction with the noise and vibration management levels established within the *Early Works Construction Noise and Vibration Management Plan*, prepared by this office, and as they are so updated throughout the construction process where necessitated (Ref: 20230239.9/0610A/R1/LA). Condition B26 of SSD-47662959's Development Consent is provided below for reference:

"Environmental Management Plan Requirements

B26. *Management plans required under this consent must be prepared having regard to the relevant guidelines, including but not limited to the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020).*

Notes:

The Environmental Management Plan Guideline is available on the Planning Portal at: <https://www.planningportal.nsw.gov.au/major-projects/assessment/post-approval>.

The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans."

2 SITE DESCRIPTION

The site is maintained on Lot 1000 DP 1159799, and is bound by the existing operational RPA Hospital to the west, the Centenary Institute to the north, and University of Sydney’s Bruce William Pavilion and Susan Wakil Health Building to the east and south respectively. The site is surrounded by various residential, commercial, hospital, university, research and active recreation sensitive receivers generally.

The works maintained within Early Works and Site Establishment pertain specifically to works along Lambie Dew Drive and John Hopkins Drive.

The surrounding affected sensitive receivers that are investigated within the contents of this monitoring assessment are as presented below:

Table 1 – Surrounding Sensitive Receivers

ID No.	Receiver Description	Receiver Category
Re1	Centenary Institute	Research Facilities
E1	CreateSpace and Susan Wakil Health Building	Education
E2	Charles Perkins Centre	

See an aerial photo in Figure 1 below for detailed receiver locations.

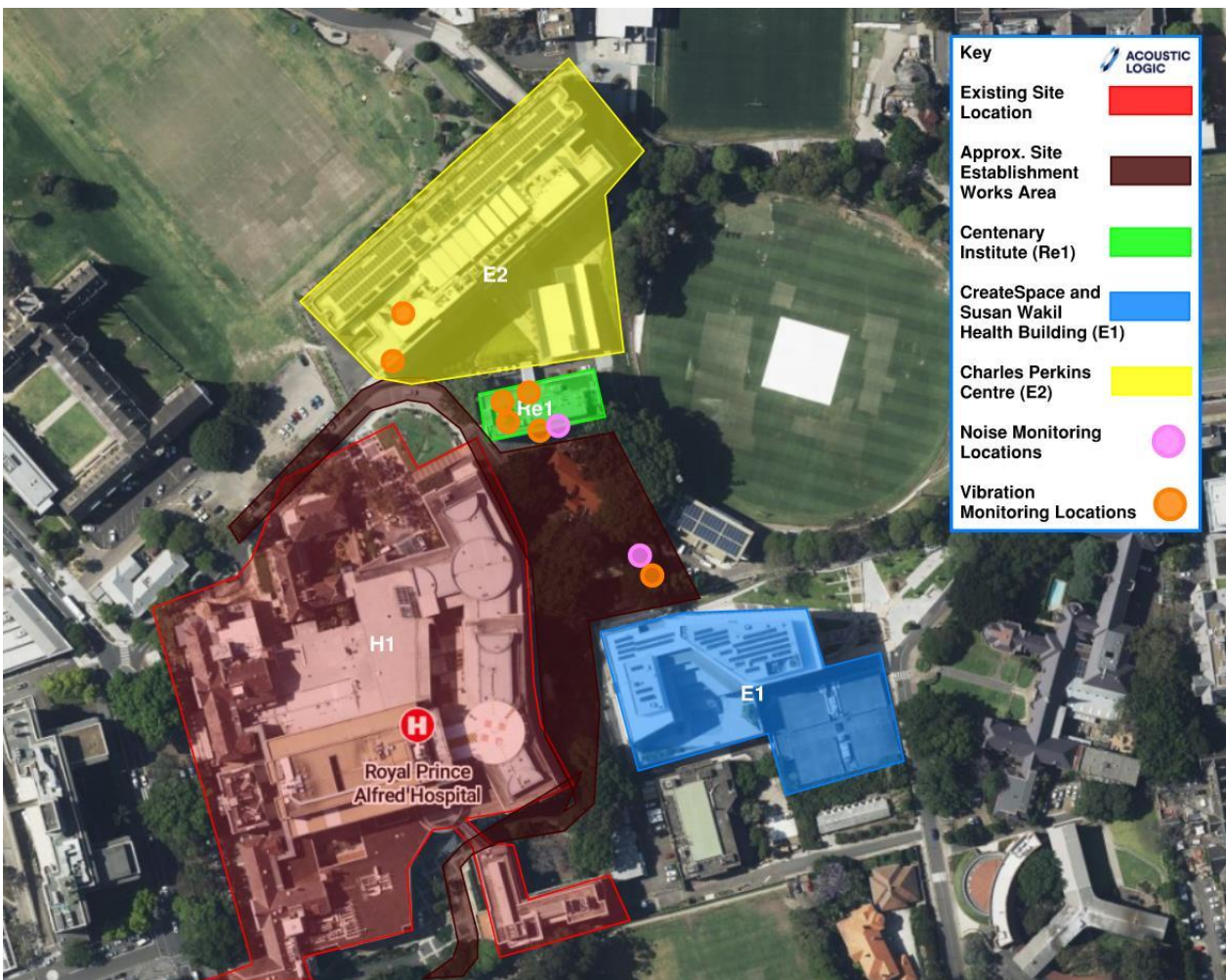


Figure 1: Aerial Site Map with Nearest Sensitive Receivers (Sourced from Sixmaps)

3 NOISE AND VIBRATION MANAGEMENT LEVELS

The following section details the relevant construction noise and vibration requirements assessed throughout the monitoring period.

3.1 NOISE MANAGEMENT LEVELS

Noise Management levels relevant to the contents of this report are summarised in the table below, as provided within the *Early Works Construction Noise and Vibration Management Plan*, prepared for the project by this office (Ref: 20230239.9/0610A/R1/LA):

Table 2 – Noise Management Levels

Receiver	Room Usage	Noise Management Level dB(A) $L_{eq}(15min)$
E1 and E2	All	45 (Internally)
R1	Laser Scanning Microscope	58 (Internally)
	Animal Housing / Breeding / Observation Rooms	64 (Internally)
	Rat Operating Room	46 (Internally)

3.2 PROJECT VIBRATION CRITERIA

Relevant project vibration criteria to the contents of this report are provided within the table below. Vibration criteria presented for spaces within Re1 and E2 have been updated based upon the conclusion of the “Baseline Monitoring Results,” report, as well as the “Construction Noise and Vibration Monitoring Report 1,” both of which were prepared by this office for the project (Ref: 20230239.17/0412A/R1/LA and 20230239.17/2301A/R0/LA):

Table 3 – Summarised Proposed Project Vibration Limits

Receiver	Location	Vibration Criteria (μms^{-1})
Re1 Centenary Institute	L1 Laser Room	VC-B (ASHRAE Handbook) (25 μms^{-1}) RMS Velocity
	L3 Fish Tank Room	400 μms^{-1} Peak Particle Velocity
	L4 – Animal Behaviour / Holding / Breeding Rooms	VC-A (ASHRAE Handbook) (50 μms^{-1}) RMS Velocity
E1 Createspace and Susan Wakil Health Building	All spaces	DIN 4150-3 Type 1 Criteria (20,000 μms^{-1} / 20mms ⁻¹) Peak Particle Velocity
E2 Charles Perkins Centre	Imaging Equipment (Southern Wing Corridor)	VC-B (ASHRAE Handbook) (25 μms^{-1}) RMS Velocity
	Animal Behaviour / Holding / Breeding Rooms	200 μms^{-1} Peak Particle Velocity

4 MONITORING EQUIPMENT AND LOCATIONS

4.1 NOISE MONITORING EQUIPMENT AND LOCATIONS

Unattended noise monitoring was conducted using Acoustic Research Laboratories Pty Ltd noise loggers. The loggers were programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

Two individual noise monitors have been installed surrounding the site at the following locations:

- Centenary Institute Level 4 Surgery (Southern Façade).
- Outside Susan Wakil Health Building, on grade.

Please refer to Figure 1 for detailed monitoring locations. Appendix C provides photos of the monitors installed at the project site.

4.2 VIBRATION MONITORING EQUIPMENT AND LOCATIONS

Vibration monitoring was conducted using either Texcel ETM vibration monitors with external Tri-axial Geophones, or Bruel and Kjaer Type 4450 vibration monitors.

Three Texcel ETM monitors have been placed surrounding the site at the following locations:

- Centenary Institute Level 3, Fish Tanks.
- Charles Perkins Centre Level B1, Southern Wing Observation Room E.
- Outside Susan Wakil Health Building, on grade.

Additionally, four Bruel and Kjaer Type 4450 Vibration monitors have been installed surrounding the site at the following locations:

- Centenary Institute:
 - Level 1 Laser Imaging Room.
 - Level 4 Surgery (Southern Façade).
 - Level 4 Change Rooms (Northern Façade)
- Charles Perkins Centre Level B1, Southern Wing Corridor.

Please refer to Figure 1 for detailed monitoring locations. Appendix C provides photos of the monitors installed at the project site.

5 RESULTS

Appendix A presents the results of the noise monitoring, whilst Appendix B presents the results of the vibration monitoring for the monitoring period as presented within the contents of this report.

A discussion pertaining the findings of the noise and vibration monitoring undertaken during this monitoring period is provided within the proceeding sections.

5.1 NOISE MONITING RESULTS DISCUSSION

Noise monitoring conducted throughout the monitoring period shows general adherence to the noise management levels provided within Section 3 of this letter.

With regards to the noise monitor in place within the L4 Surgery Room of Centenary Institute, we note the following:

- Noise levels are generally in accordance with the noise management levels for Rat Operating Rooms provided within Section 3 of this letter.
- Where the recorded noise levels are above this noise management level, these occurrences are generally either marginal, sporadic and isolated, or are continuous and steady, neither of which are generally characteristics corresponding with measurements of increased construction noise as recorded by other noise monitoring stations surrounding the project site.
- Where continuous noise levels are presented for extend periods of time (≥ 1 hr), this would be indicative of a continuous noise source within the space, such as mechanical services, which were off previous to that period.
- Based on the above, increased noise levels may not inherently be a product of the construction activity, noting that the monitor installed internally in Centenary Institute is also subject to measuring any internal operational noise within the facility.
- One exceedance of the noise management levels for animal behavioural, holding and breeding spaces is observed within the monitoring period on 15/12/2023, however this exceedance is followed by a continuous and steady increase of the existing ambient noise profile of the space , and is therefore indicative of operational activity / set-up of the surgery room, rather than construction activity.

With regards to the noise monitor in place for the Susan Wakil Health Building, we note the following:

- Data for Susan Wakil Monitor to be provided.

5.2 VIBRATION MONITORING RESULTS DISCUSSION

With regards to the vibration measured vibration levels during the monitoring period, we note the following:

- Note that the graphs presented within the Appendix of this document show the maximum recorded velocity for each individual frequency within a given day's monitoring period.
- Centenary Institute:
 - One exceedance of vibration criteria has been attributed to construction activity during the monitoring period. This exceedance occurred at approximately 8:45am on 19th December within the Laser Imaging Room.
 - Level 1 – Laser Imaging Room:
 - Measured vibration levels throughout the monitoring period show ongoing exceedances of the VC-B vibration criteria.
 - Generally, exceedances are sporadic and varying in nature and magnitude. This would generally not be considered consistent with vibration impacts expected from construction activity, noting that construction vibration tends to show gradual peaks of exceedances as continuous construction activity occurs.
 - Due to the highly sensitive vibration criteria set for this space, there are various sources of vibration impacting the monitoring station exclusive of the construction activity which may result in "Phantom" exceedances of criteria within the monitored space.
 - Sources of vibration which may incite phantom exceedances may include, but are not limited to, footsteps (Both within the monitored room and in adjacent rooms), moving of materials and equipment, and operation of surrounding equipment which may produce vibration.
 - Based on these exceedances, the use of vibration curve VC-B may not be appropriate for the monitoring of vibration impacts on the Laser Imaging Room, and the use of this curve for criteria will be assessed throughout future monitoring periods in order to assess its validity for controlling construction vibration.
 - Level 3 Fish Tanks and Level 4 Animal Testing:
 - No exceedances of the relevant imposed vibration criteria were observed during the monitoring period.
- Charles Perkins Centre:
 - One exceedance of vibration criteria has been attributed to construction activity during the monitoring period. This exceedance occurred at approximately 8:45am on 19th December within the Southern Corridor.
 - Southern Corridor (Imaging):
 - Measured vibration levels throughout the monitoring period show ongoing exceedances of the VC-B vibration criteria.
 - Through analysis and comparison of results at separate monitoring stations, it is determined that none of the prolonged periods of exceedance recorded within the monitoring period align with similar spikes measured by other monitoring stations around the works (Exclusive of 19/12), and hence it is concluded that these spikes are caused by operational activity exclusive of the construction works.

- Based on these exceedances, the use of vibration curve VC-B may not be appropriate for the monitoring of vibration impacts on the B1 imaging equipment, and the use of this curve for criteria will be assessed throughout future monitoring periods in order to assess its validity for controlling construction vibration.
 - Observation Room E:
 - No exceedances of the relevant imposed vibration criteria were observed during the monitoring period.
- Susan Wakil Health Building:
 - Exceedances were observed on 12/12/2023 and 13/12/2023.
 - Exceedances were limited to short periods, noting these only occurred for one period on the 12/12 and two periods on the 13/12 of less than 10 minutes at a given time before returning to compliant levels.
 - With regards to this, we note that this monitor is installed within the works zone and may have been impacted by works very close to the monitor location. This monitor is maintained approx.. 15m away from the closest façade of the Susan Wakil Health Building, and hence the experienced vibration levels at the receiver location are expected to be much lower than at the monitoring location.
 - Exclusive of the above, no other exceedances of criteria were observed during the monitoring period.

6 CONCLUSION

Noise and vibration monitoring has been conducted by Acoustic Logic for the Early Works being undertaken for SSD-47662959, the RPA Hospital Redevelopment, located at 50 Missenden Road, Camperdown.

This letter presents the results of the monitoring between the period of Thursday 23rd November 2023 and Wednesday 06th December 2023.

Monitoring results have been provided with reference to the Noise and Vibration Management Levels established within the *Early Works Construction Noise and Vibration Management Plan*, prepared by this office, or as they have been updated throughout the construction process, specifically pertaining to the recommendations of the *Baseline Monitoring Results* and *Construction Noise and Vibration Monitoring Report 1*, both also prepared by this office (Ref: 20230239.9/0610A/R1/LA, 20230239.17/0412A/R1/LA and 20230239.17/2301A/R0/LA).

Noise monitoring results have been provided within Appendix A, whilst vibration monitoring results have been provided throughout Appendix B of this letter.

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

Yours faithfully,



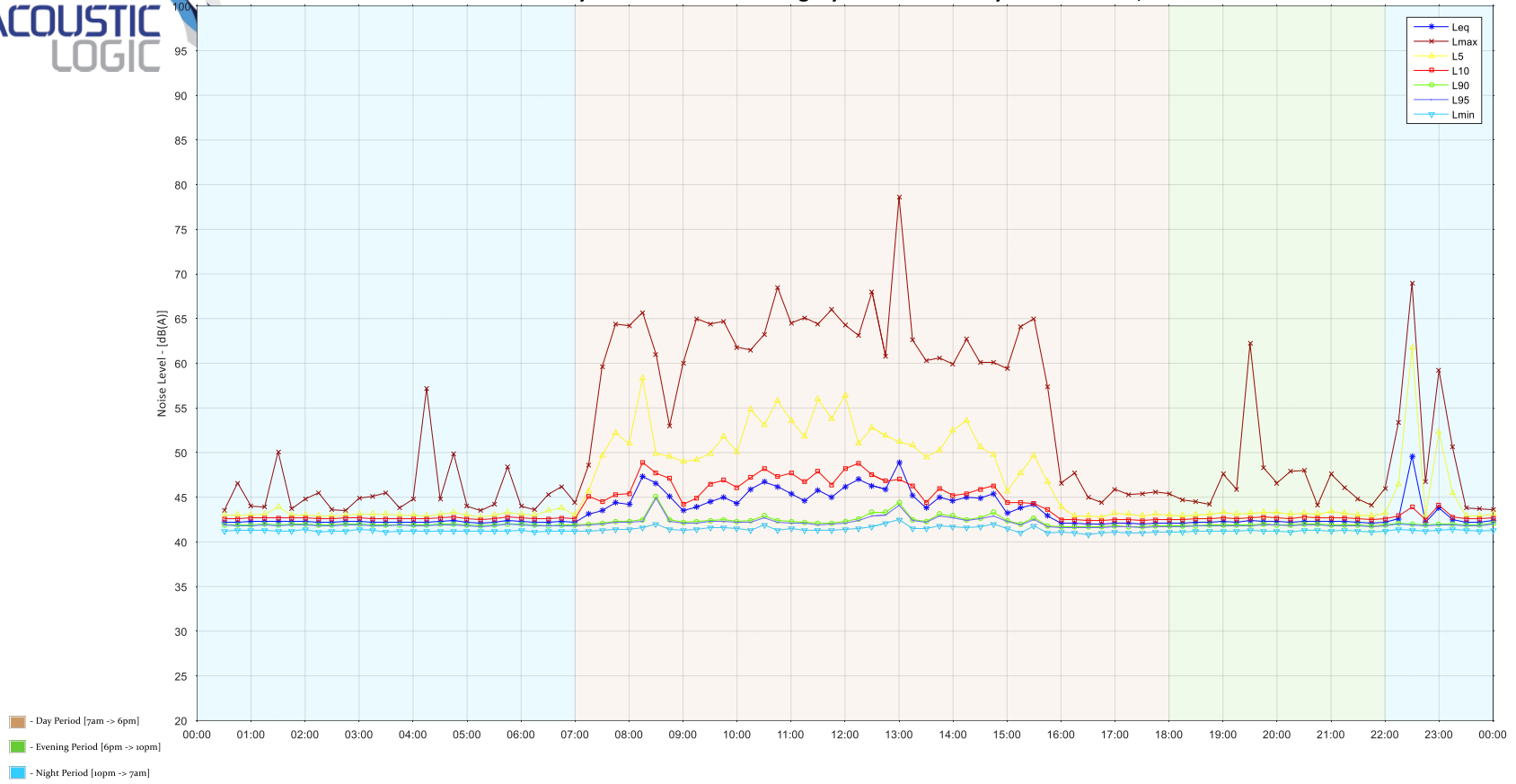
Acoustic Logic Pty Ltd
Lachlan Abood

APPENDIX A – NOISE MONITORING RESULTS

CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE)

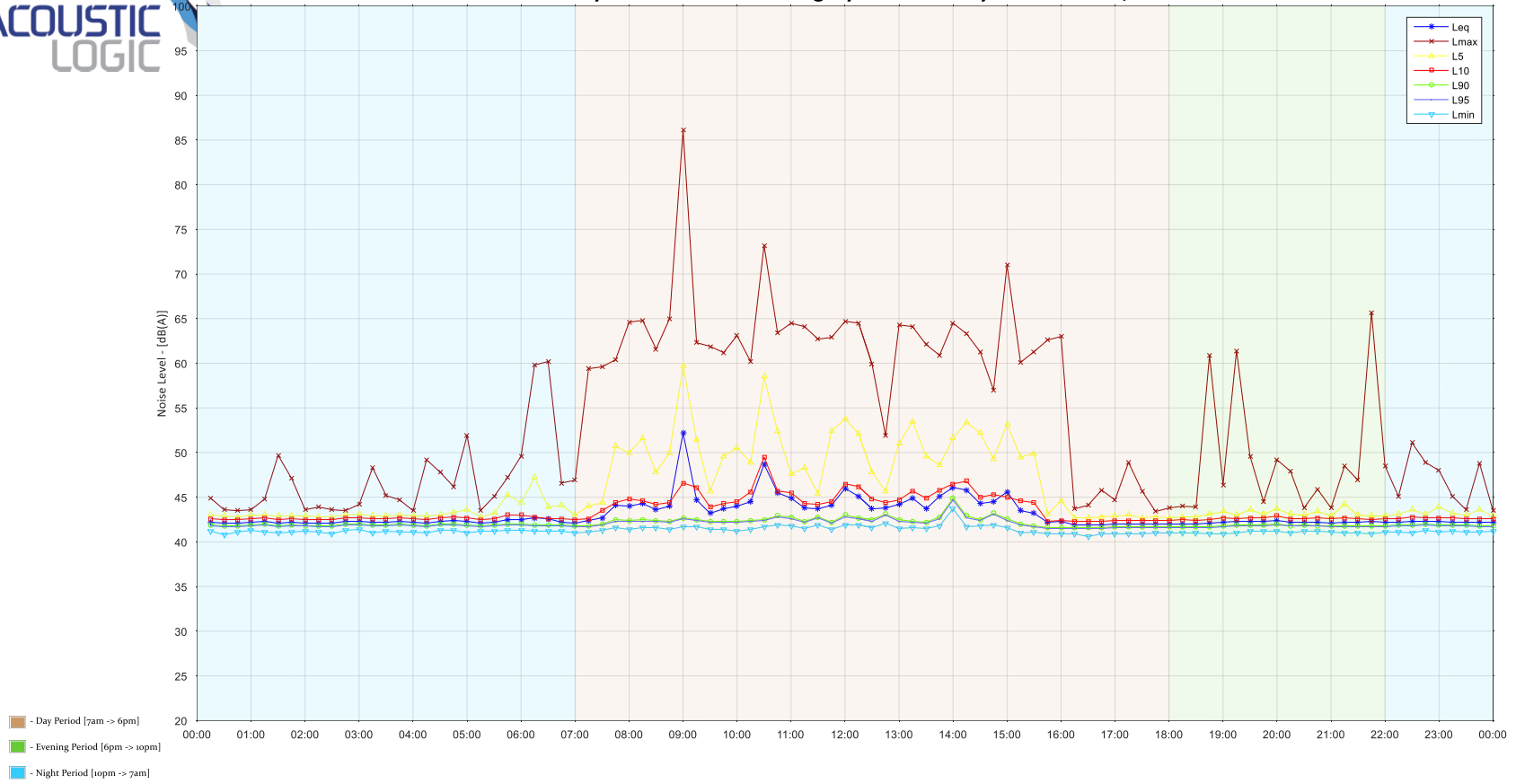


Centenary Institute - Level 4 Surgery Room: Thursday 07 December, 2023



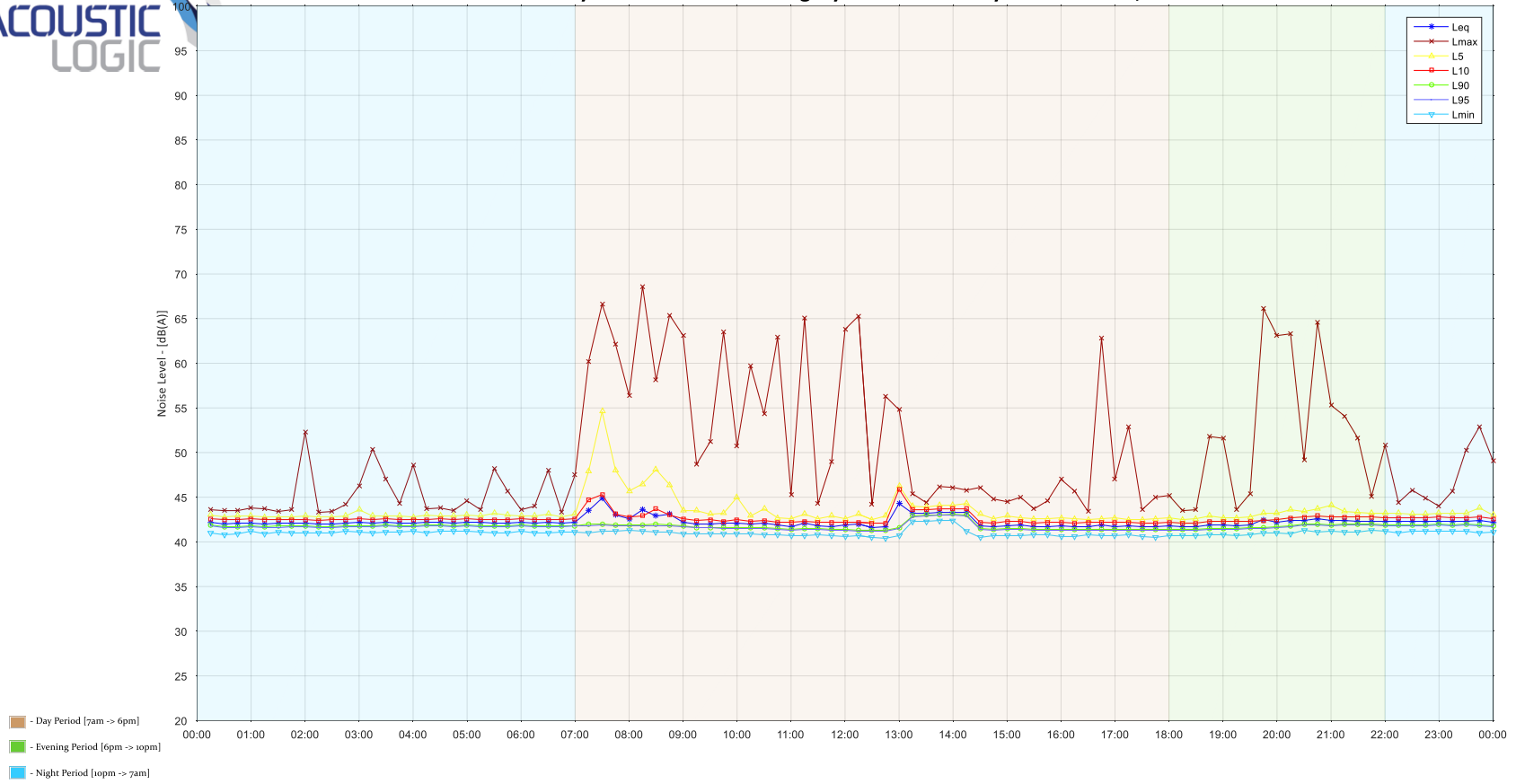


Centenary Institute - Level 4 Surgery Room: Friday 08 December, 2023



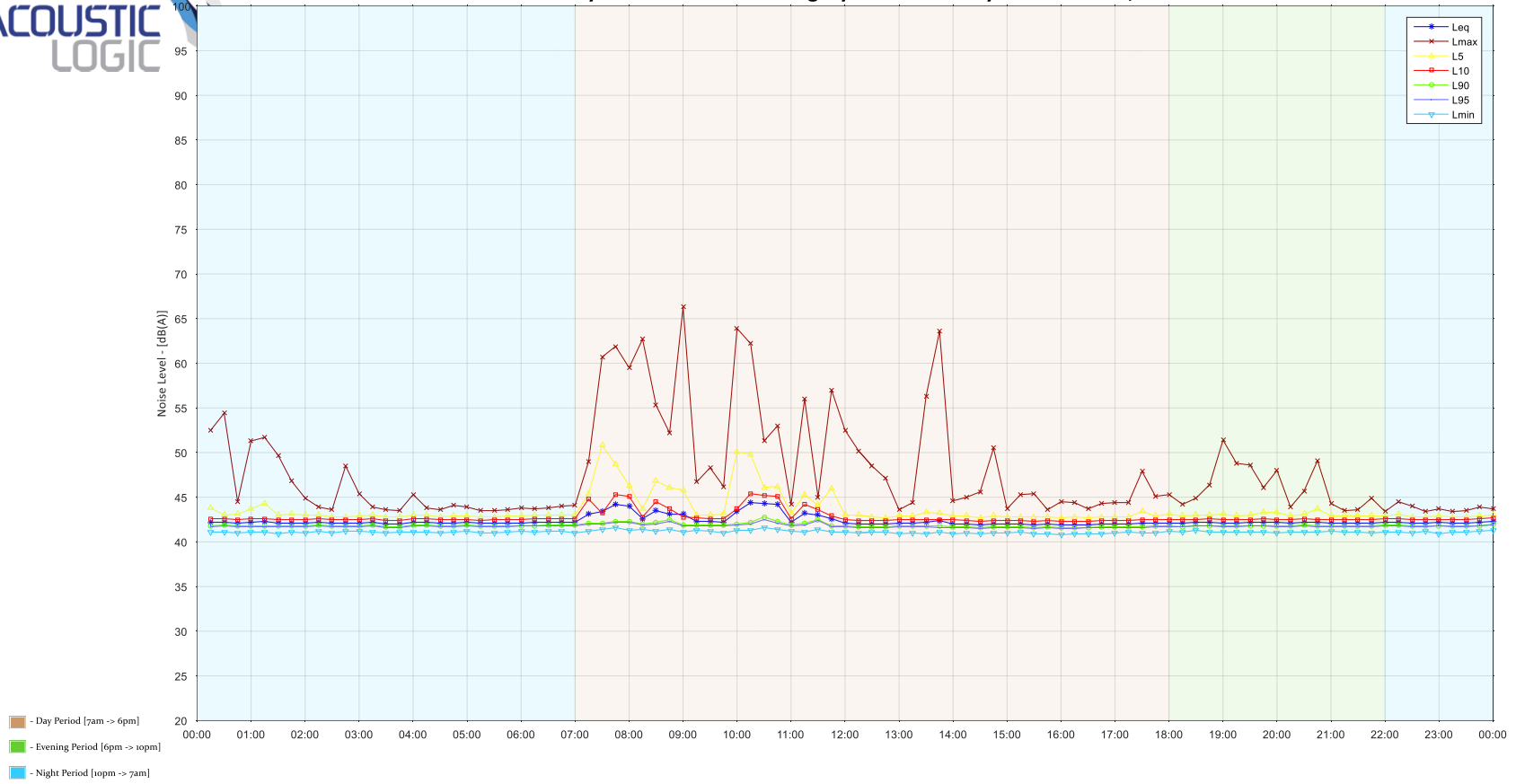


Centenary Institute - Level 4 Surgery Room: Saturday 09 December, 2023



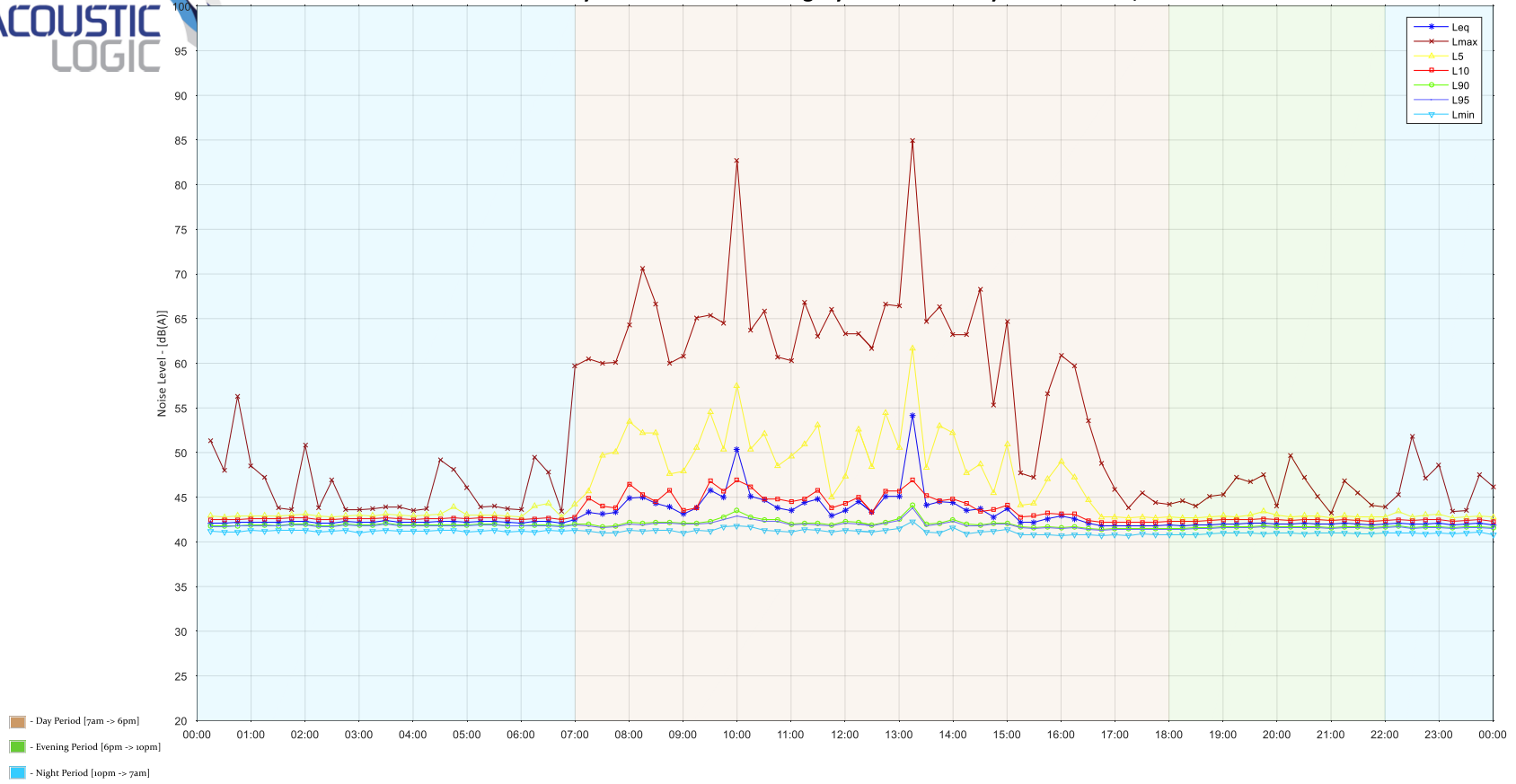


Centenary Institute - Level 4 Surgery Room: Sunday 10 December, 2023



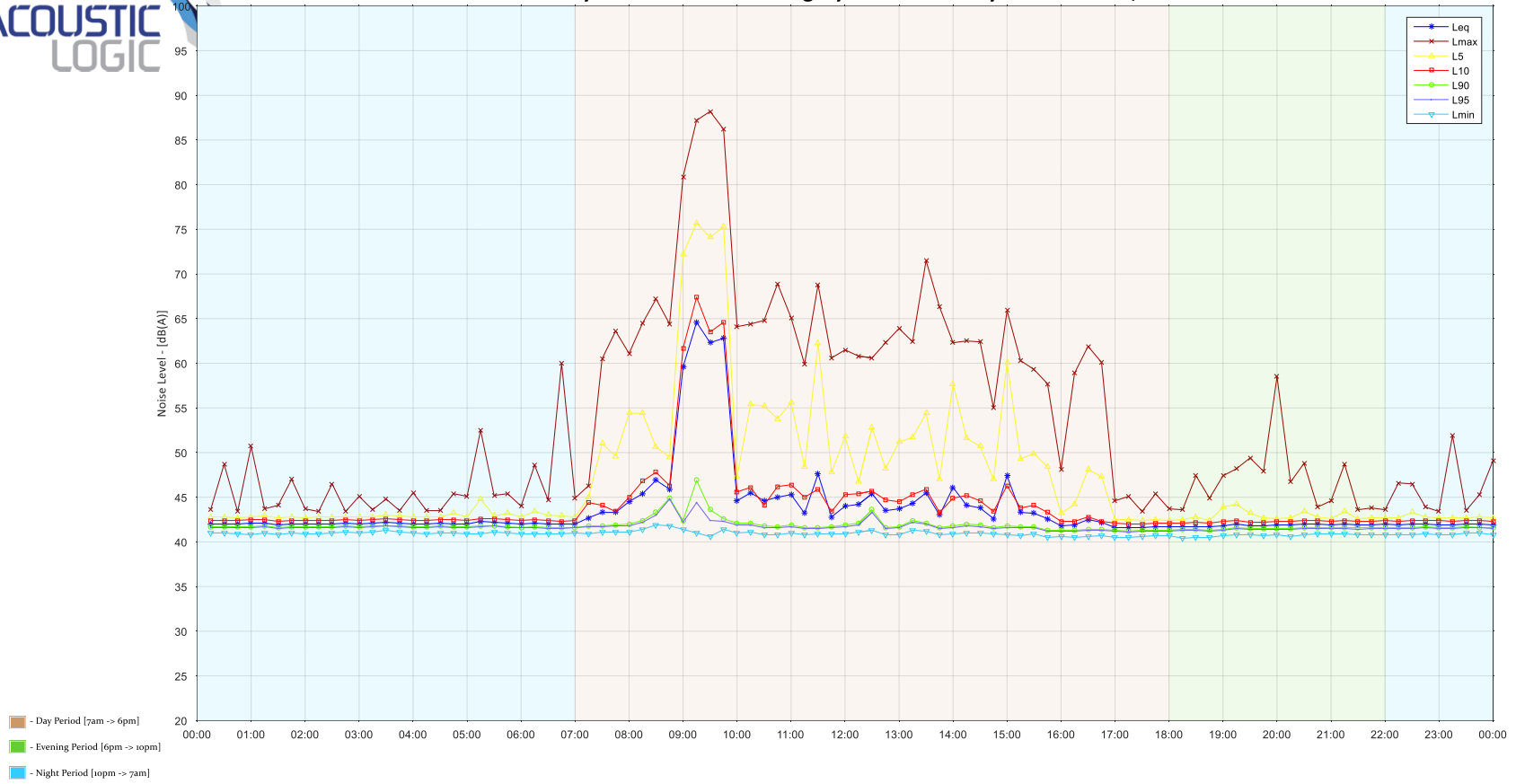


Centenary Institute - Level 4 Surgery Room: Monday 11 December, 2023



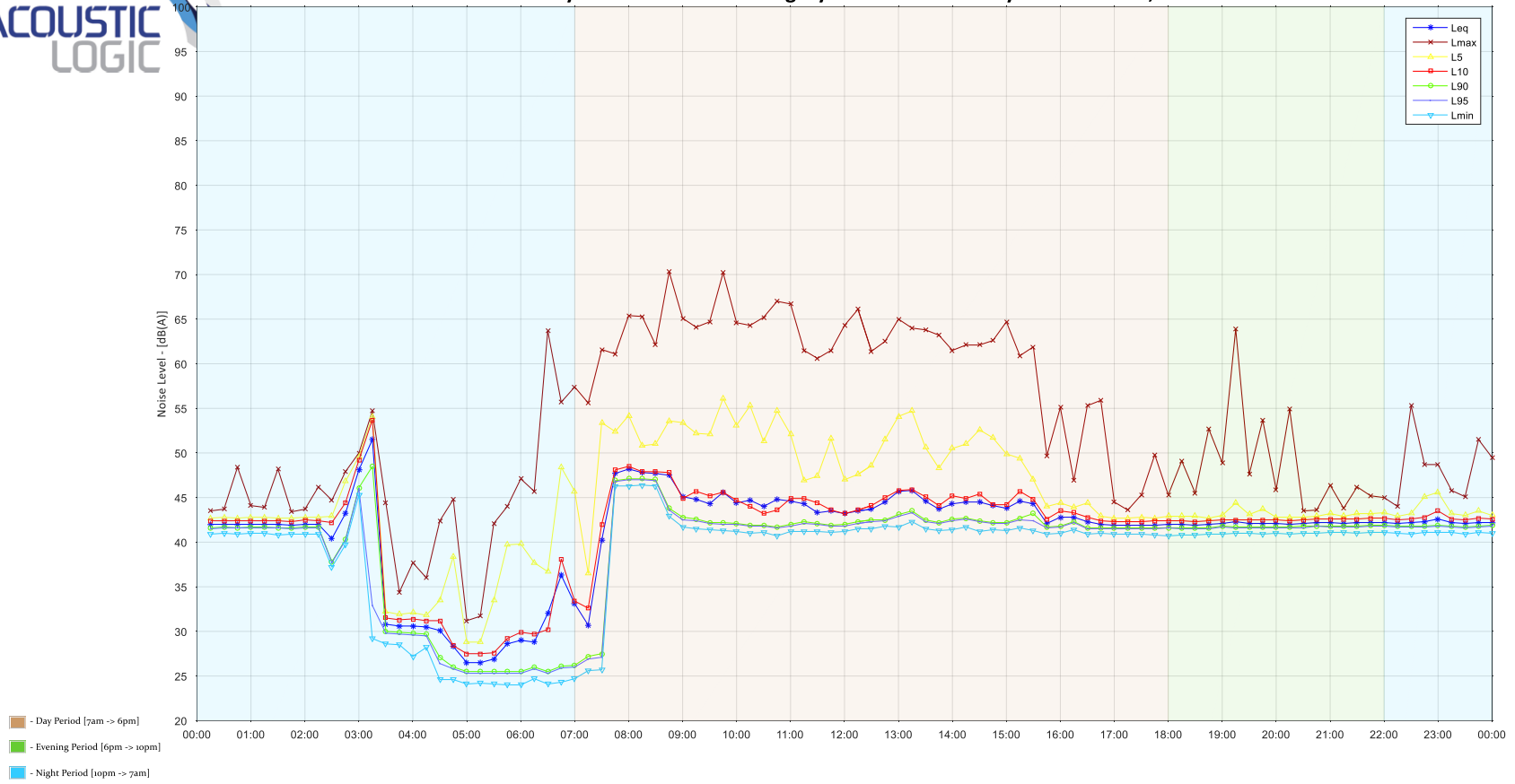


Centenary Institute - Level 4 Surgery Room: Tuesday 12 December, 2023



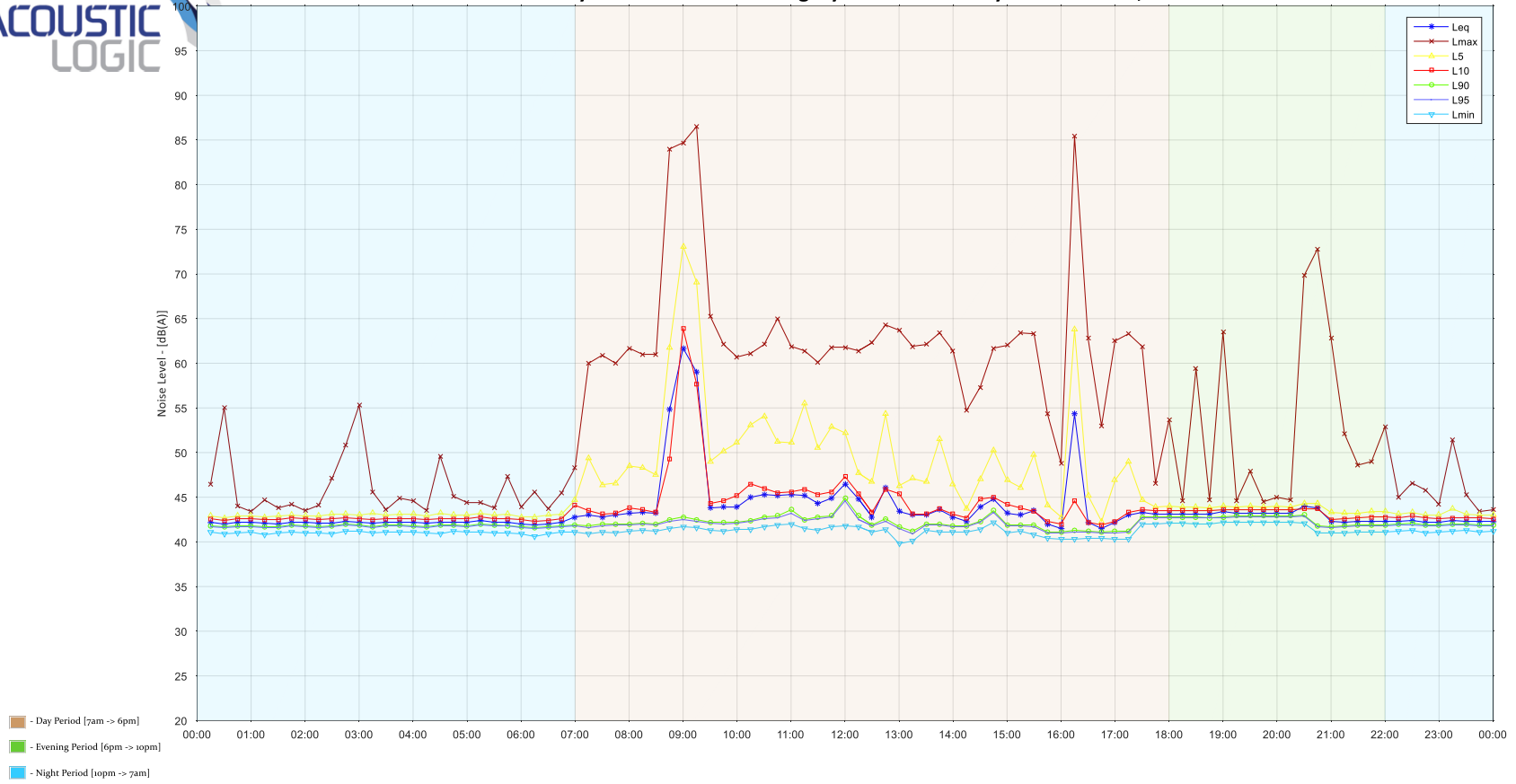


Centenary Institute - Level 4 Surgery Room: Wednesday 13 December, 2023



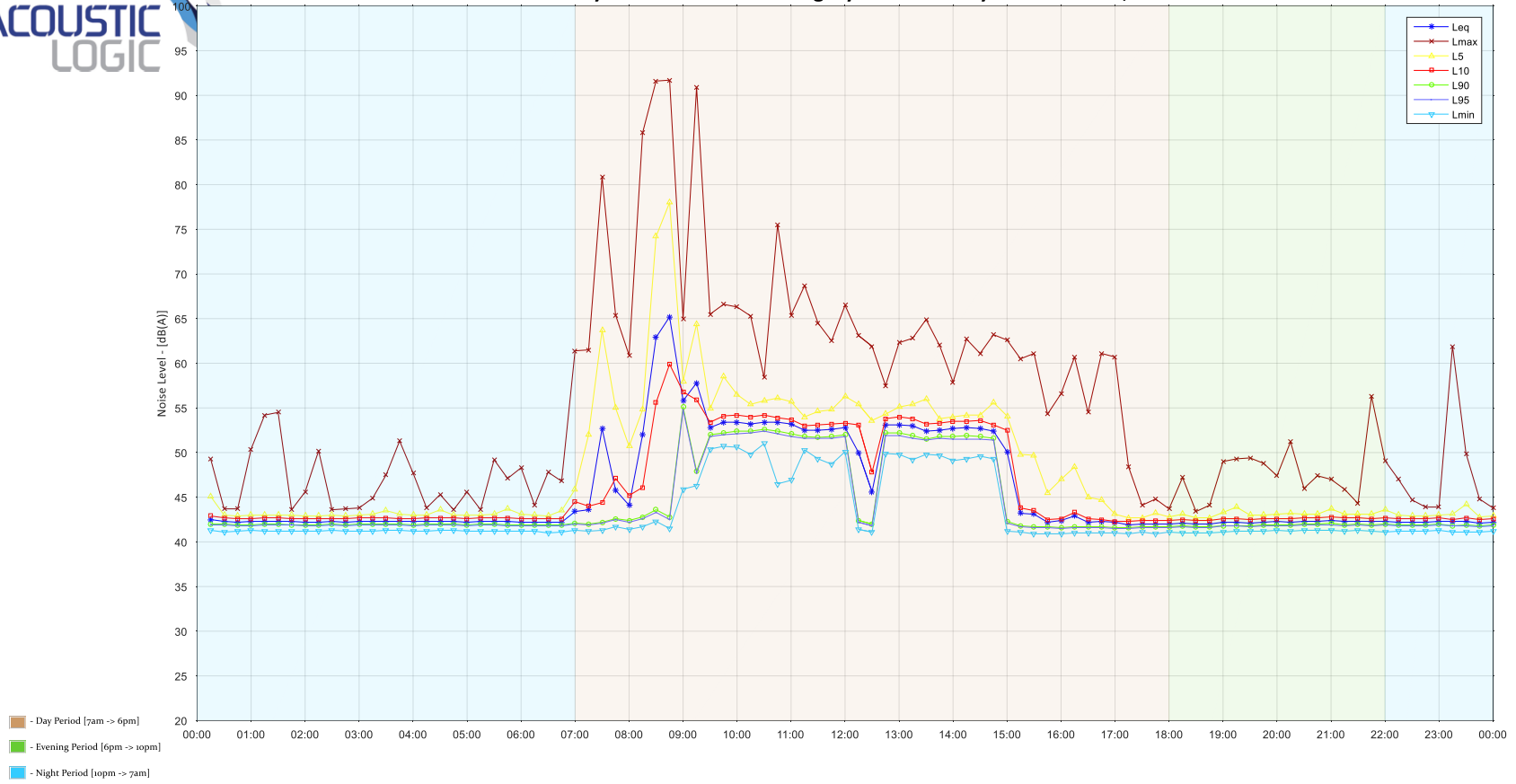


Centenary Institute - Level 4 Surgery Room: Thursday 14 December, 2023



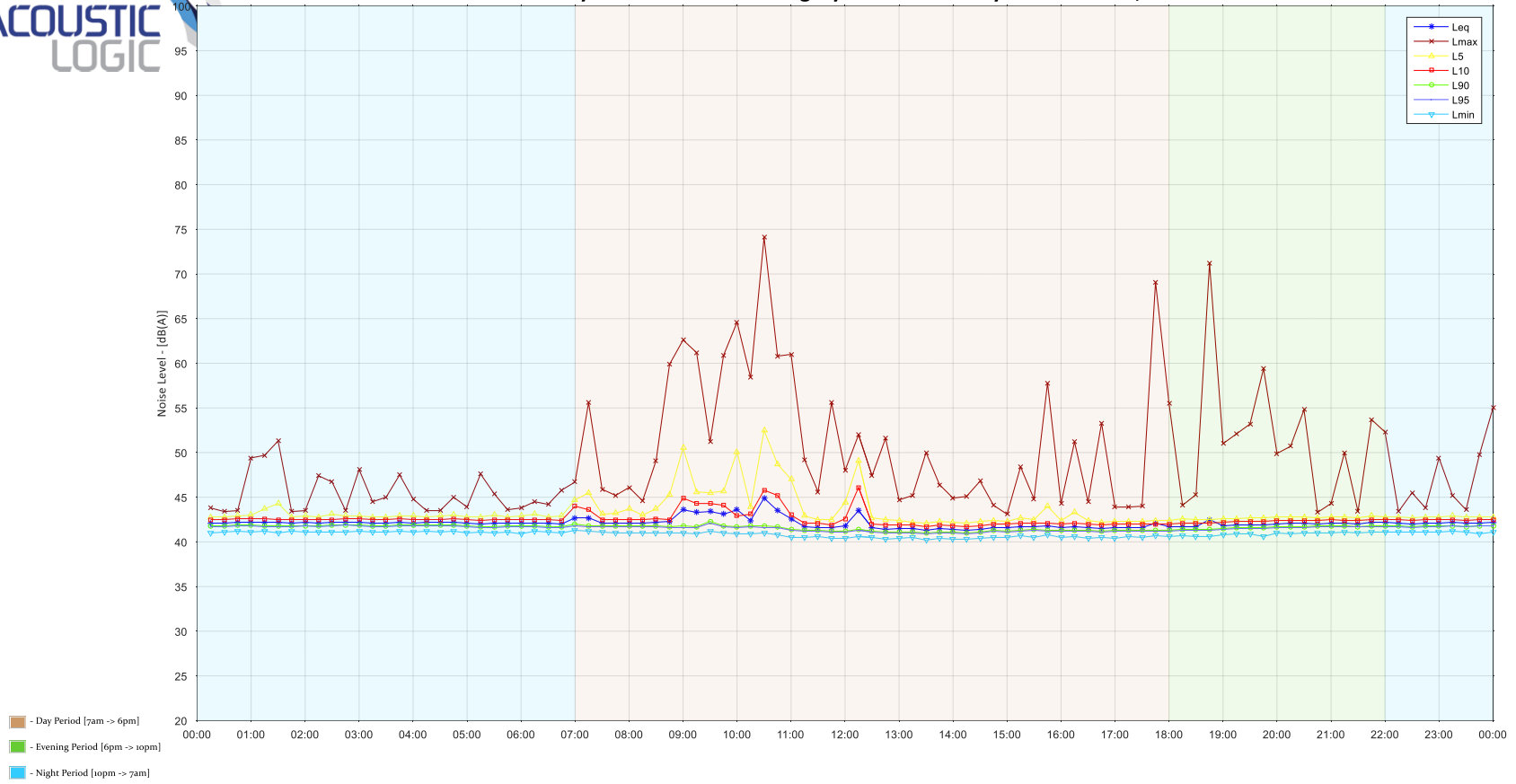


Centenary Institute - Level 4 Surgery Room: Friday 15 December, 2023



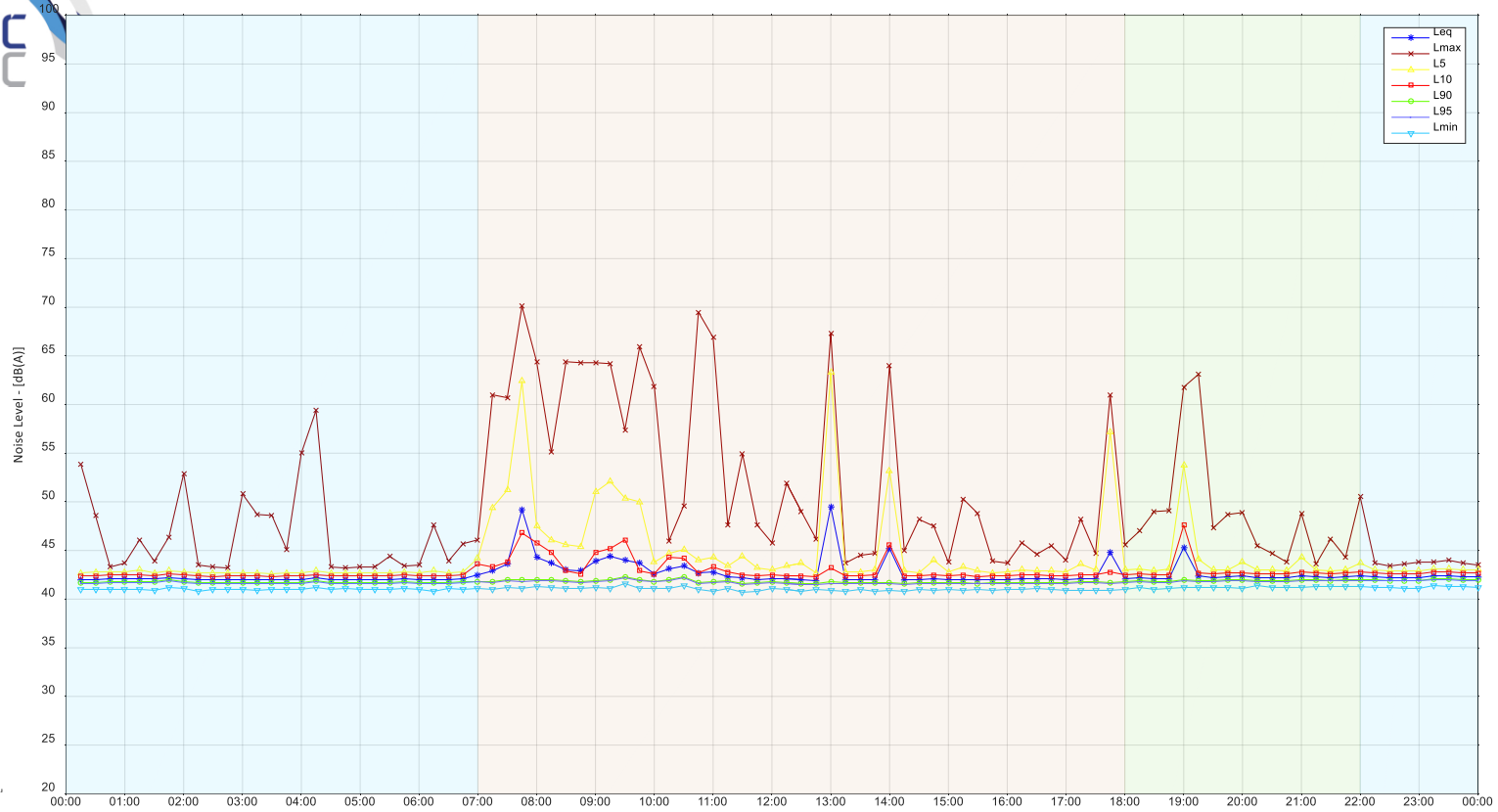


Centenary Institute - Level 4 Surgery Room: Saturday 16 December, 2023





Centenary Institute - Level 4 Surgery Room: Sunday 17 December, 2023



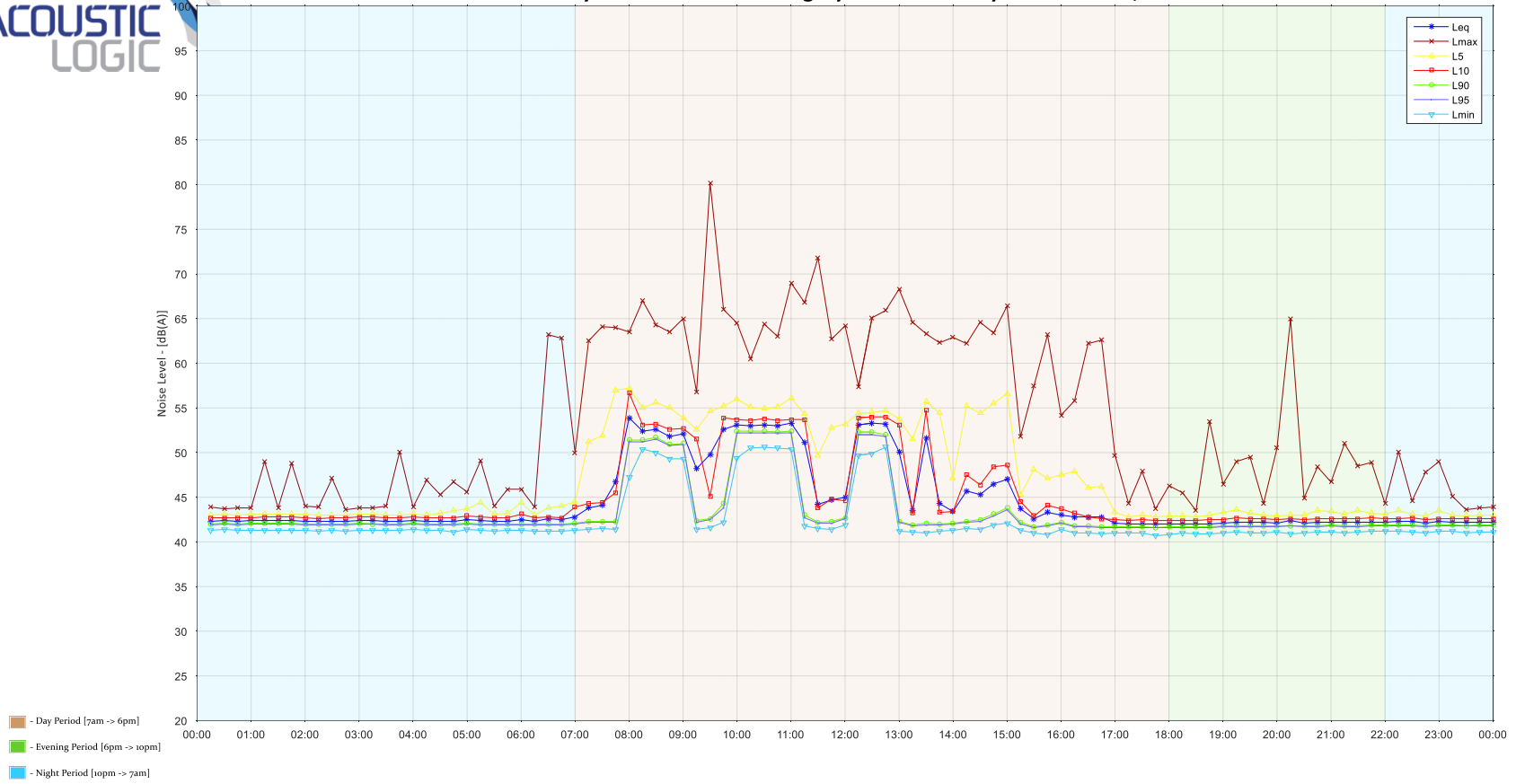
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07:00-18:00 (Day)

18:00-22:00 (Evening)

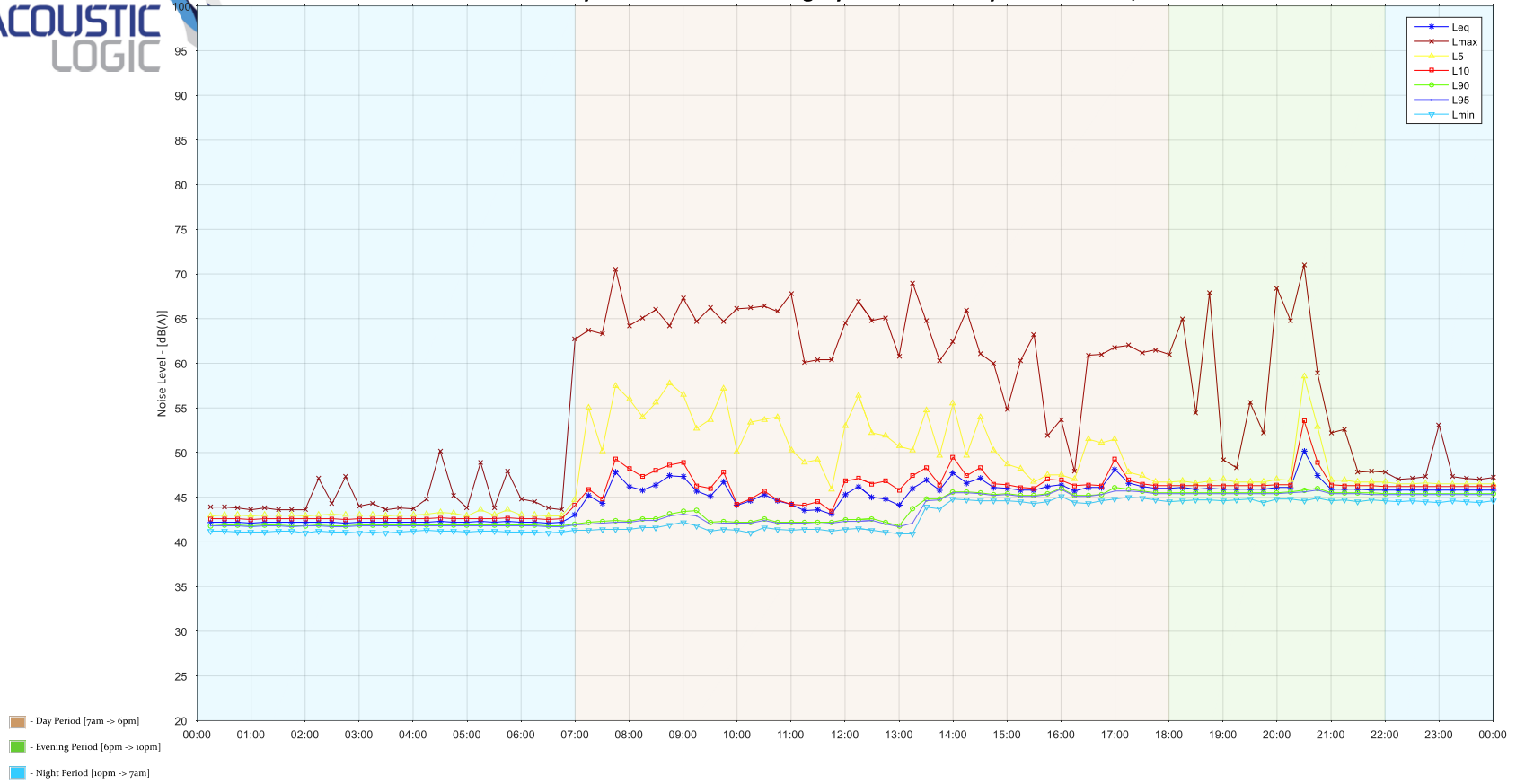


Centenary Institute - Level 4 Surgery Room: Monday 18 December, 2023



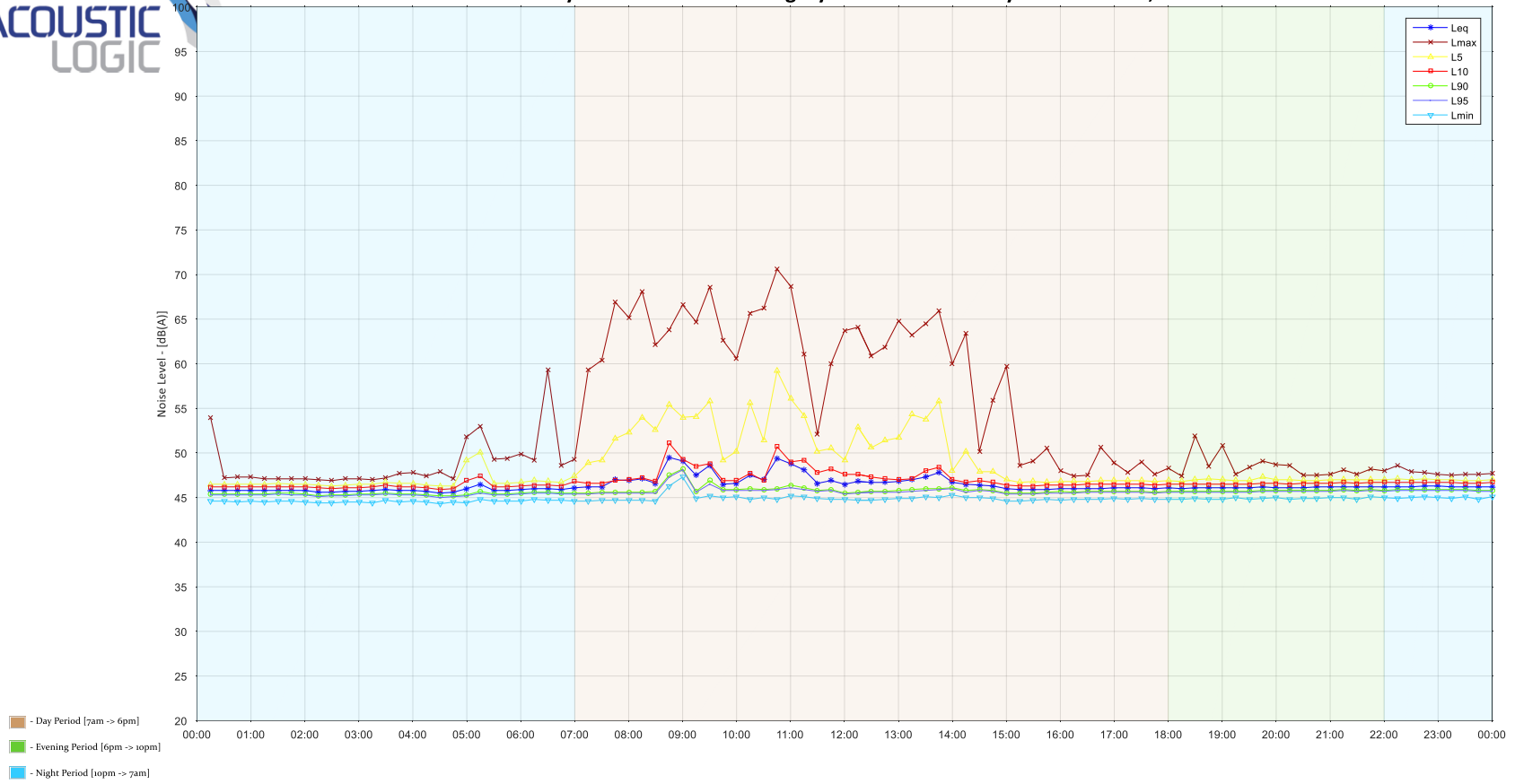


Centenary Institute - Level 4 Surgery Room: Tuesday 19 December, 2023



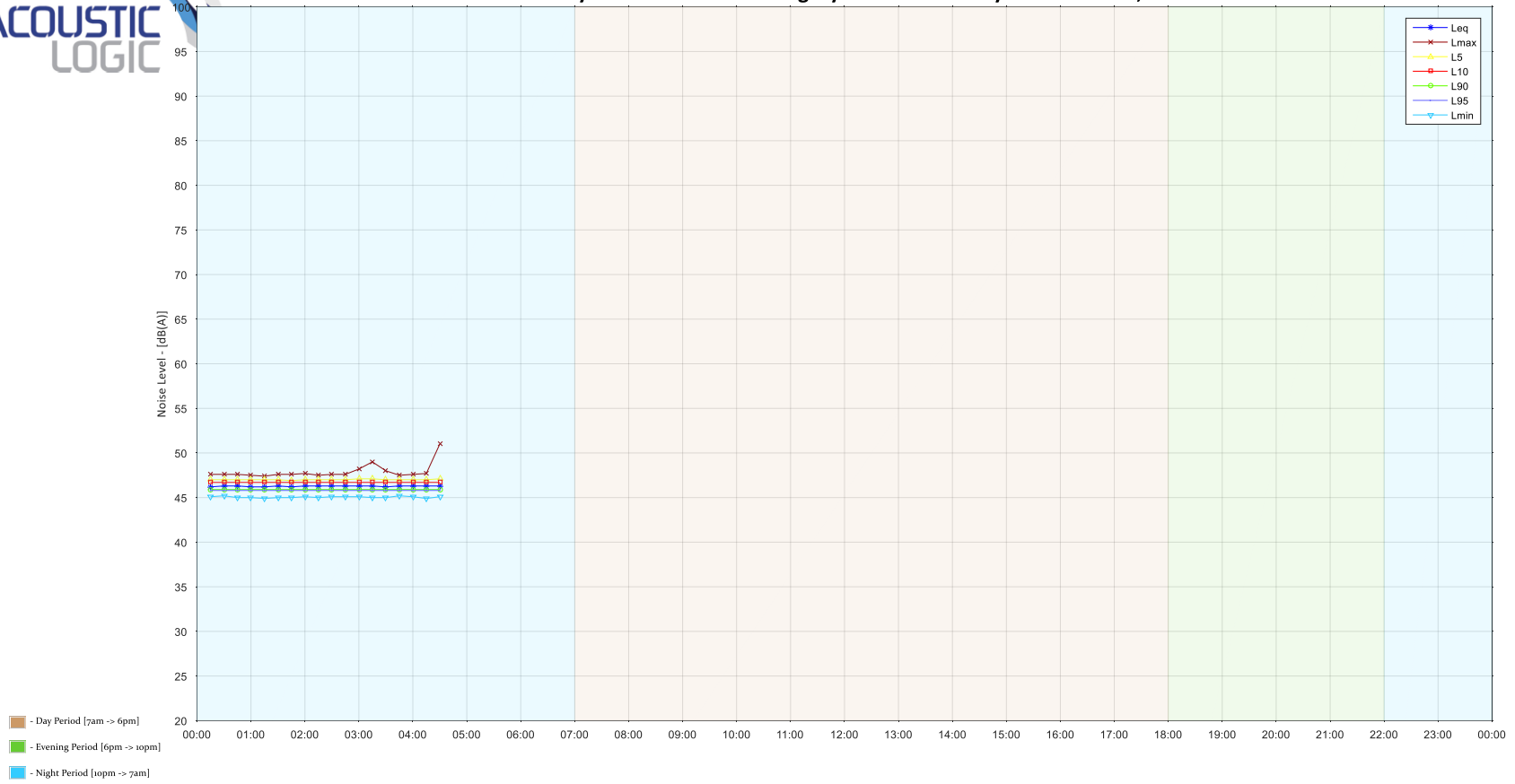


Centenary Institute - Level 4 Surgery Room: Wednesday 20 December, 2023





Centenary Institute - Level 4 Surgery Room: Thursday 21 December, 2023

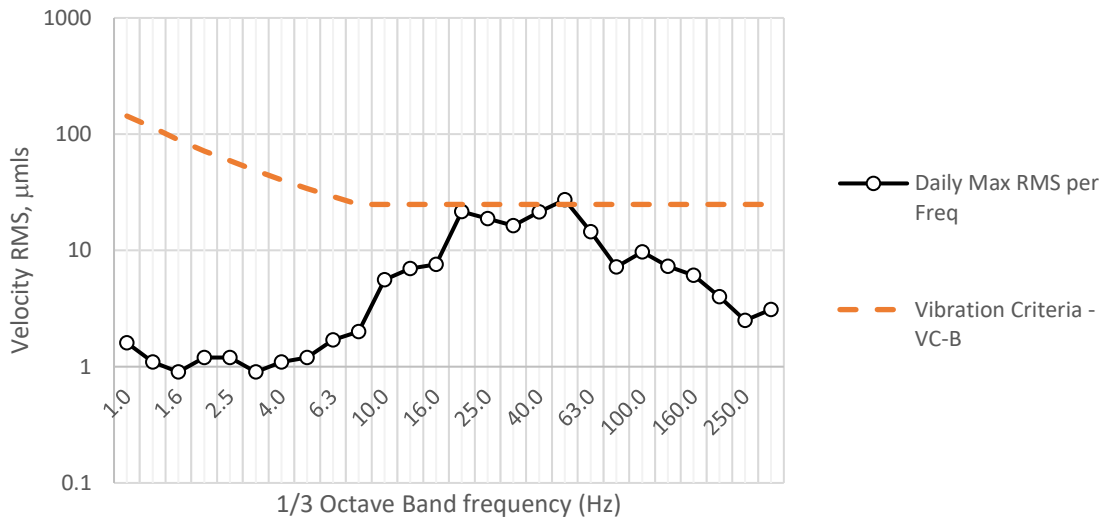


OUTSIDE SUSAN WAKIL HEALTH BUILDING

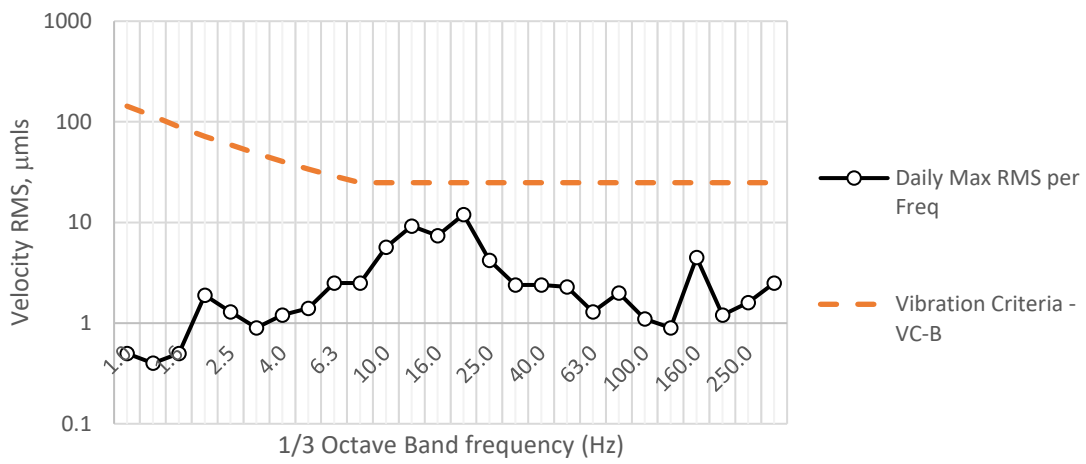
APPENDIX B – VIBRATION MONITORING RESULTS

CENTENARY INSTITUTE – LEVEL 1 LASER IMAGING ROOM

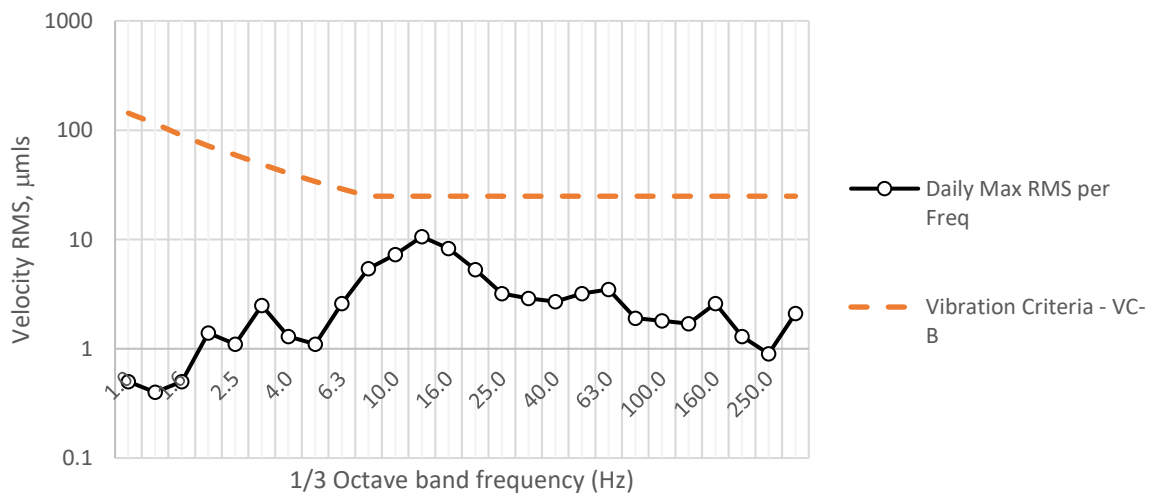
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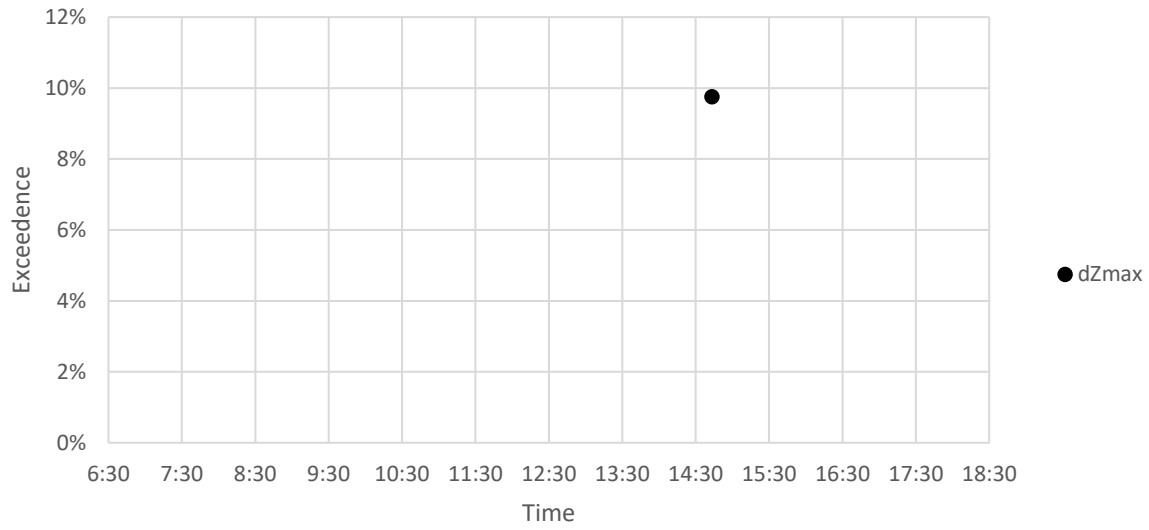
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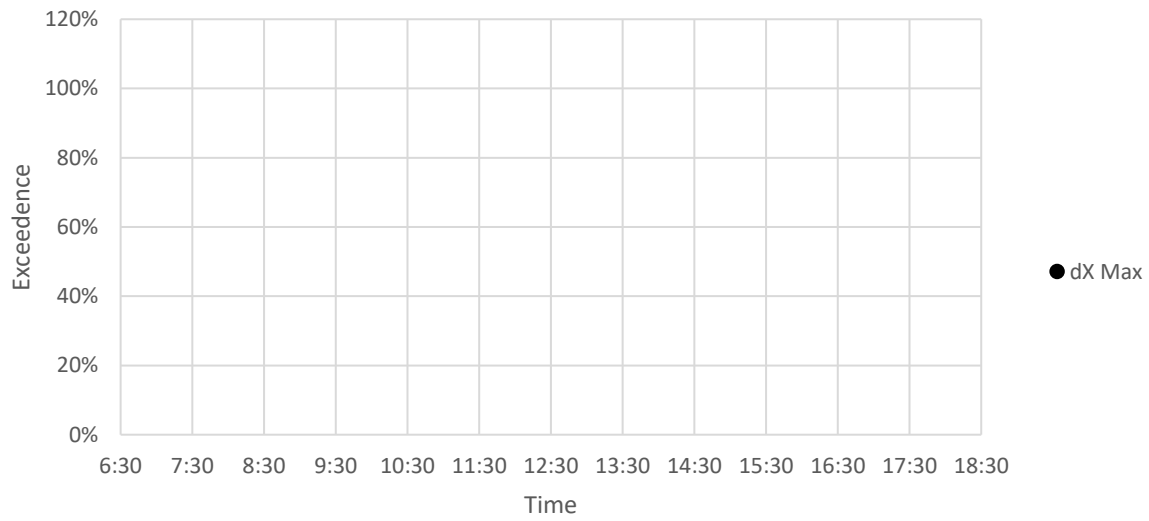
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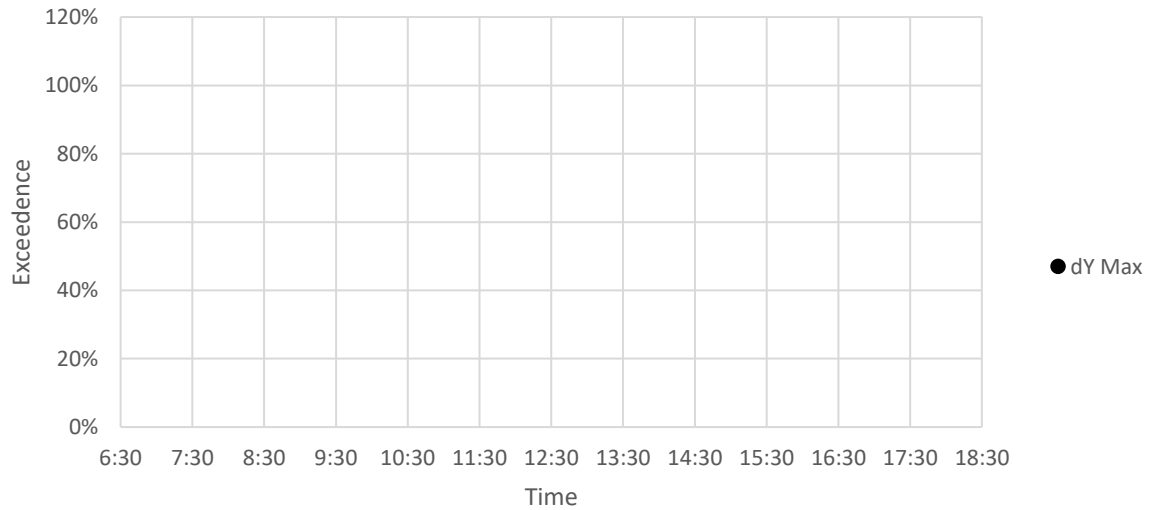
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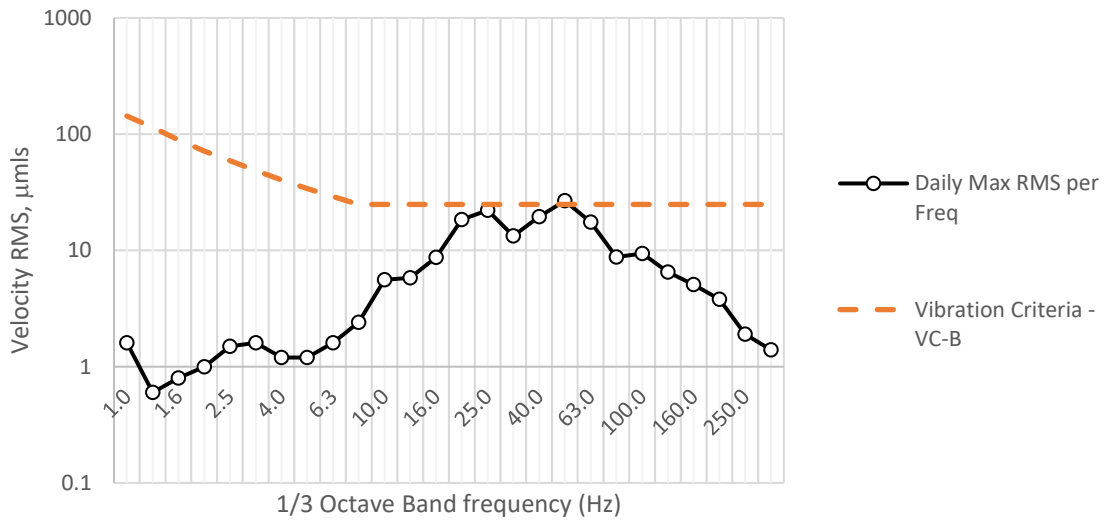
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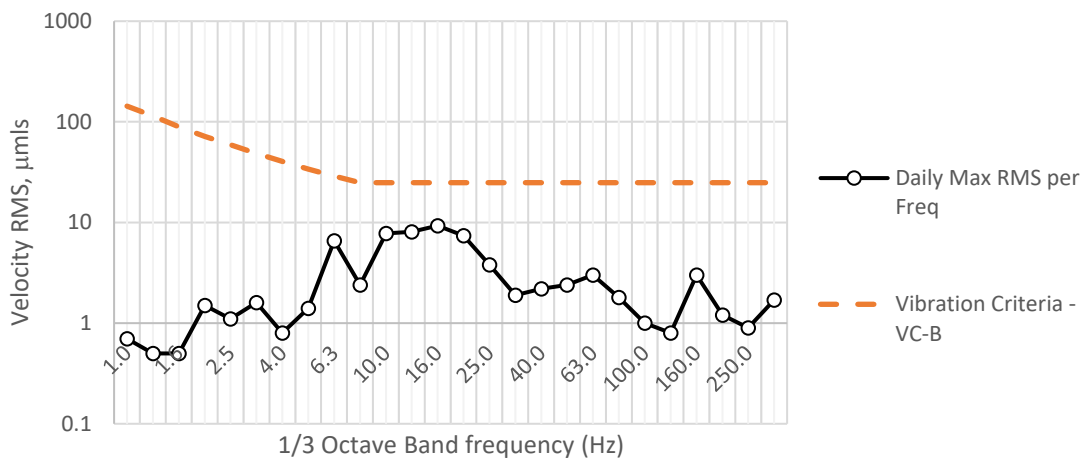
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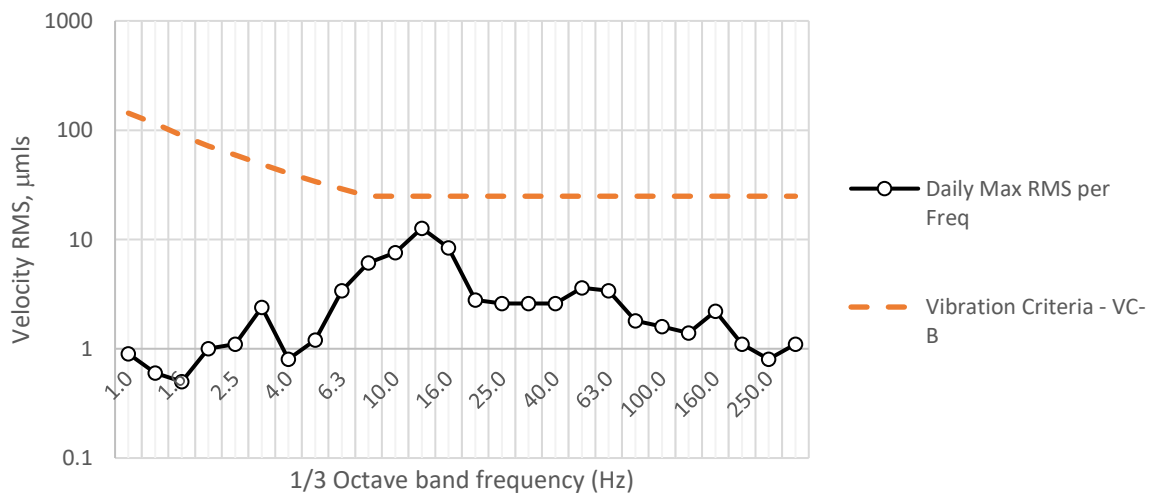
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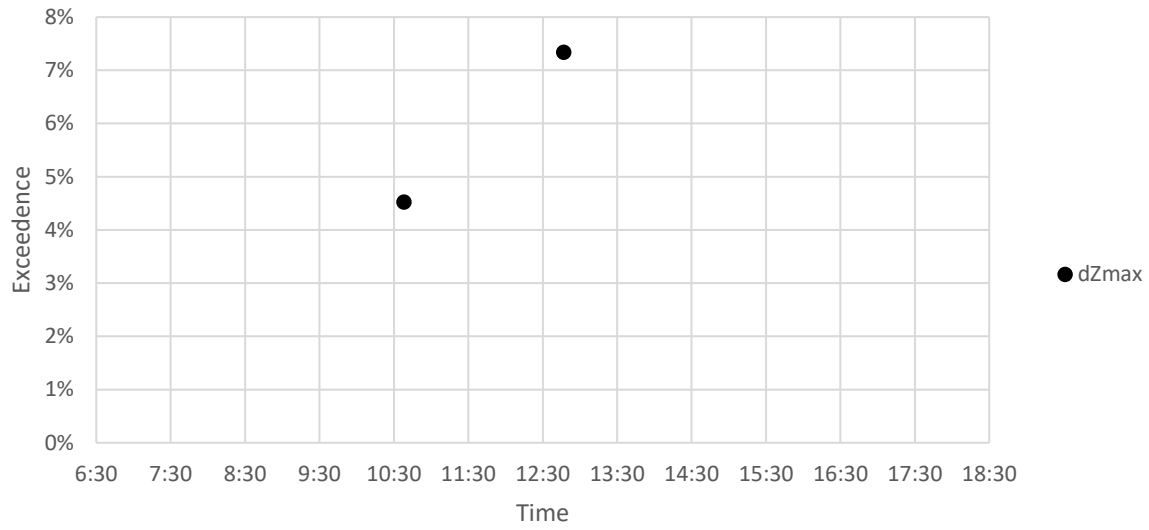
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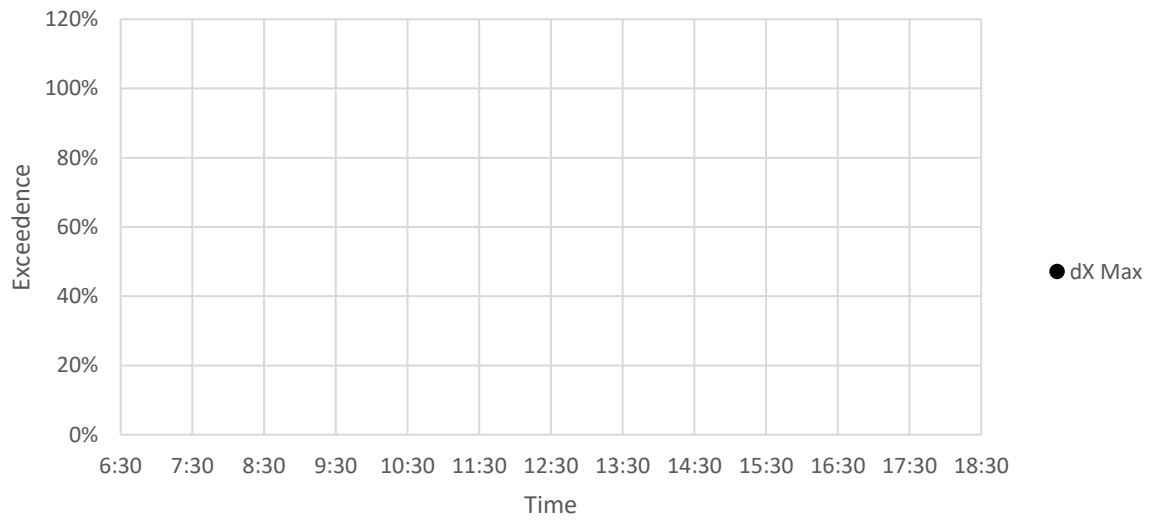
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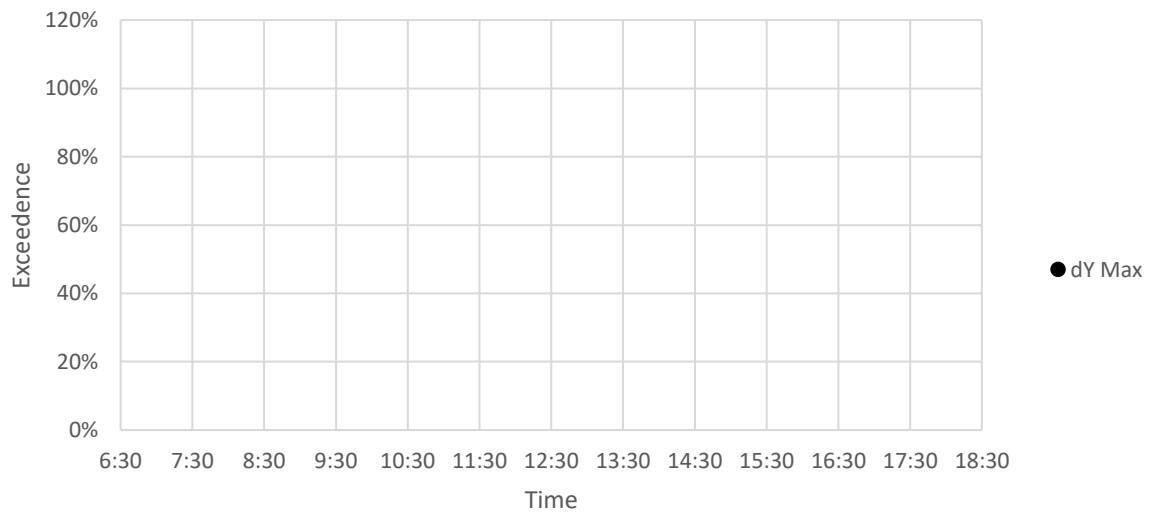
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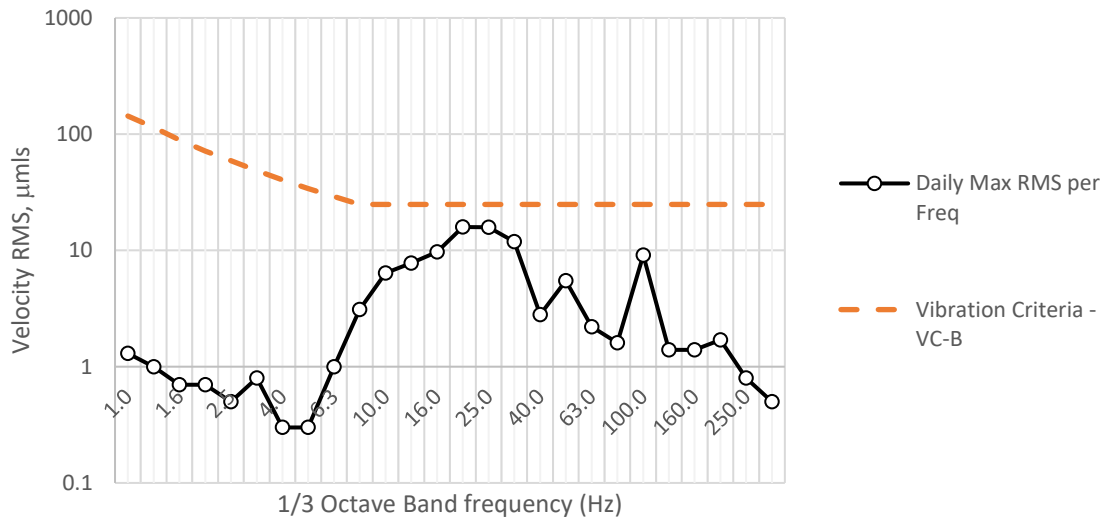
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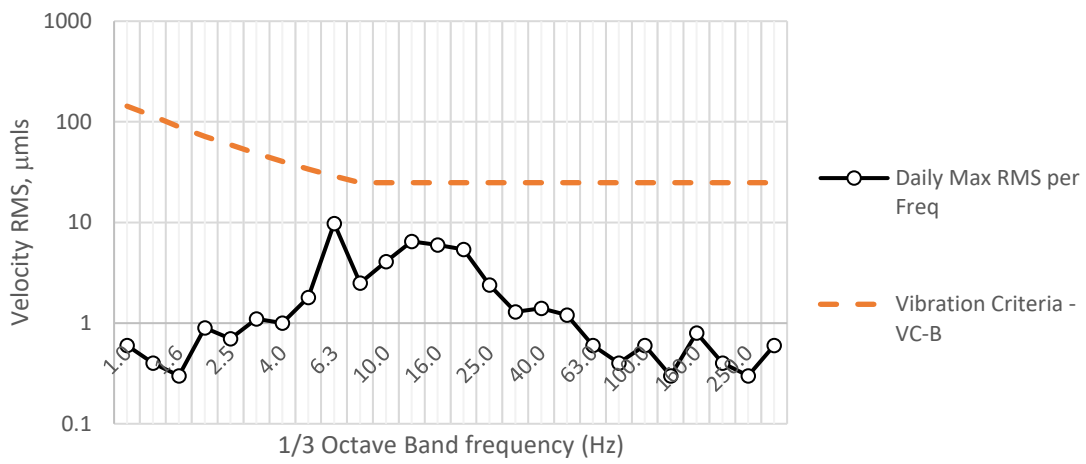
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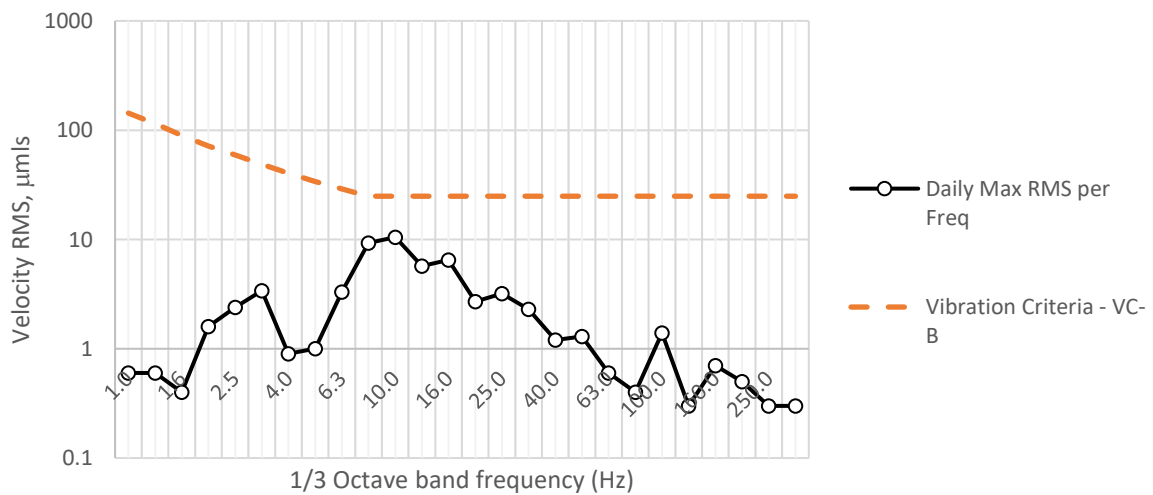
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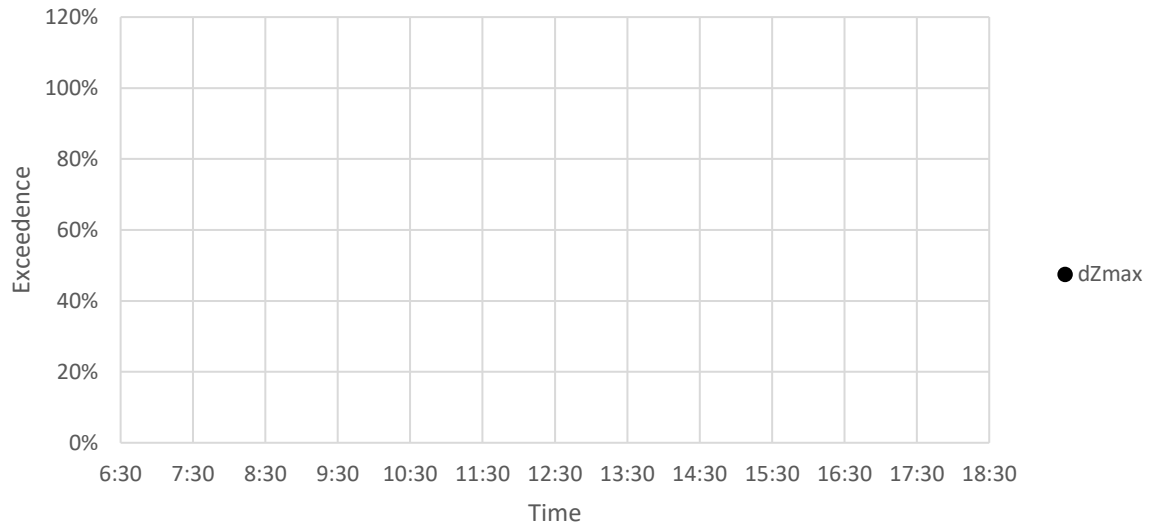
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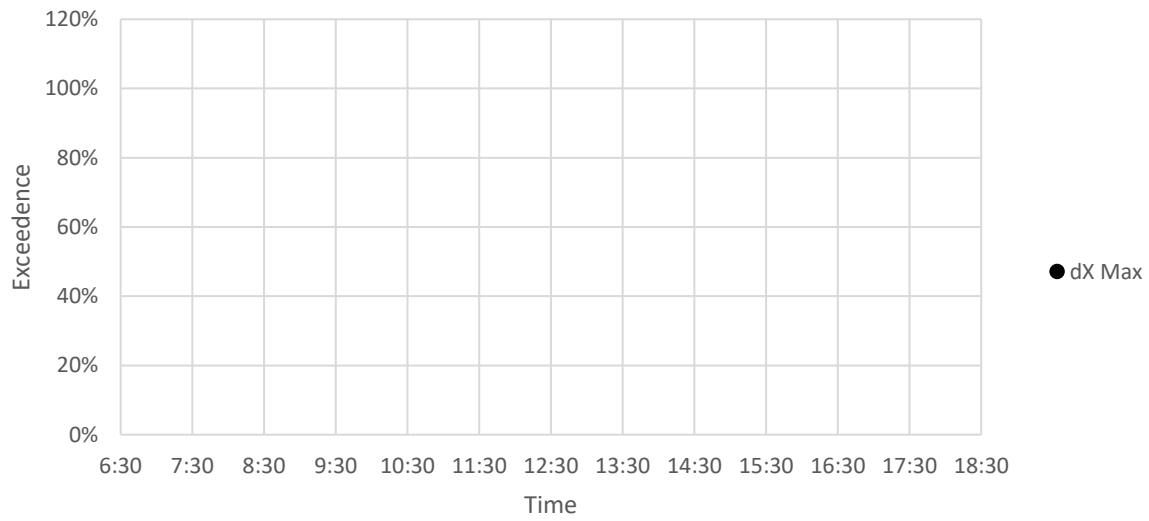
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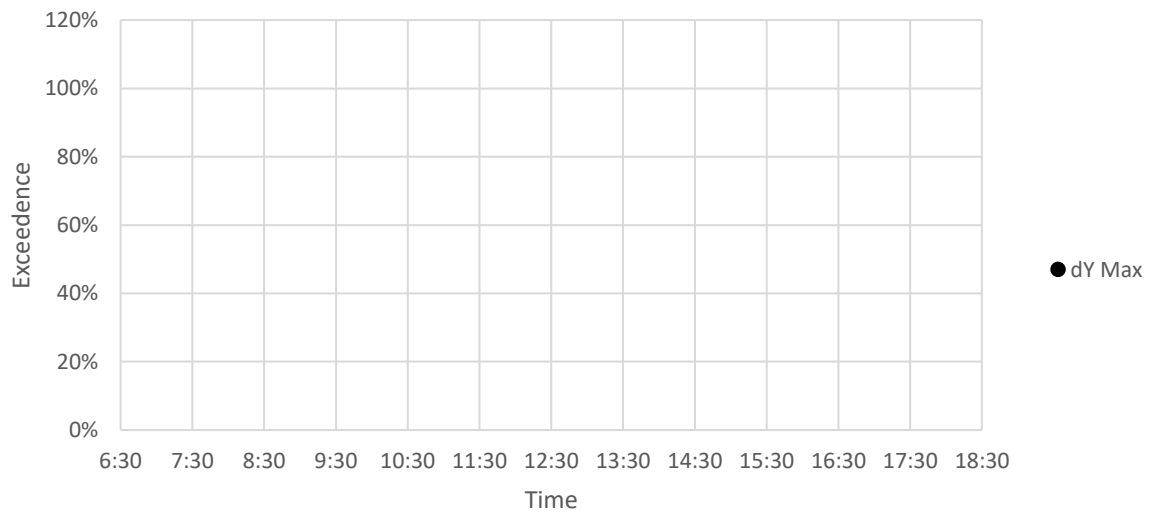
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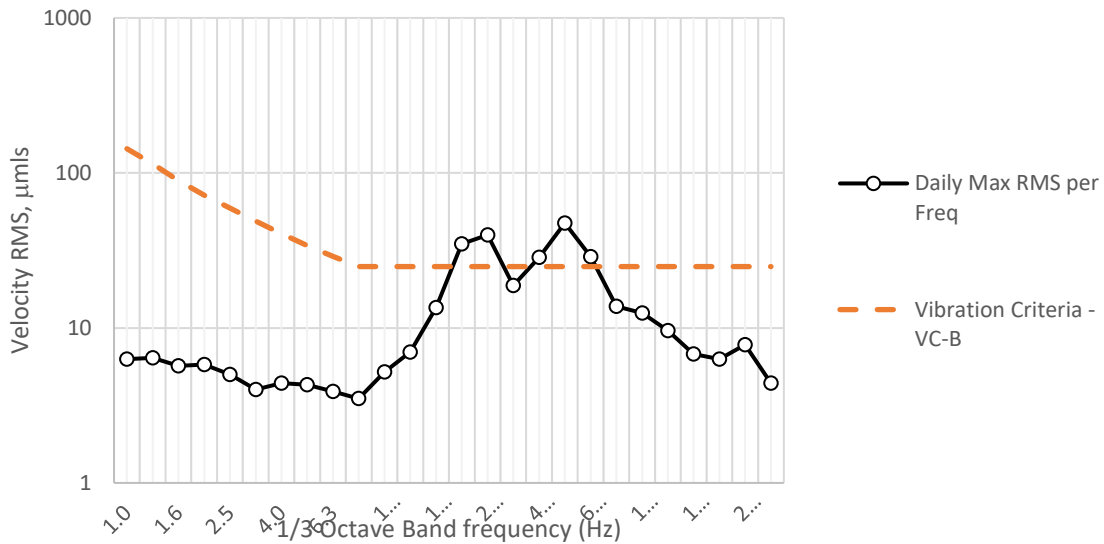
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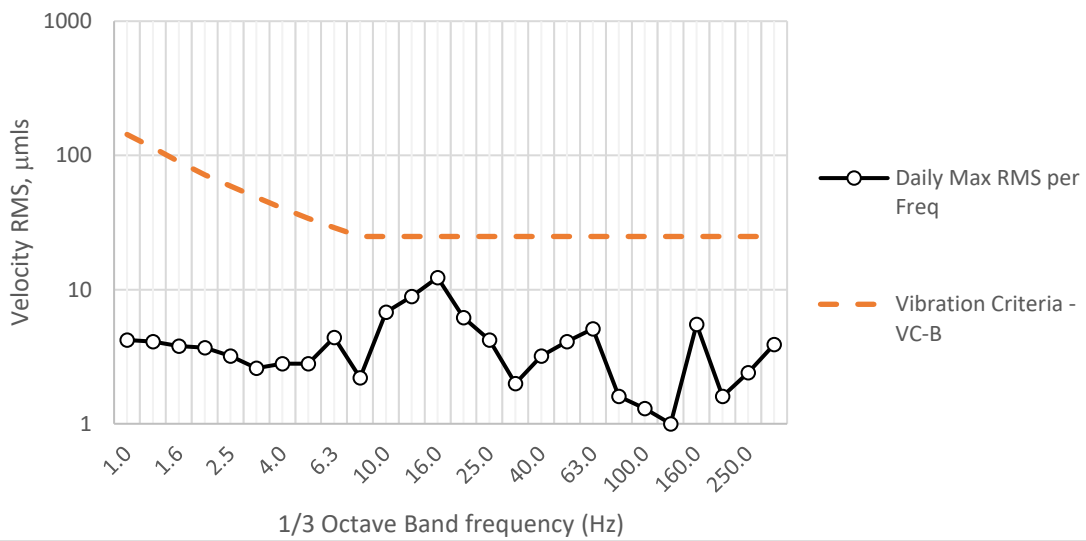
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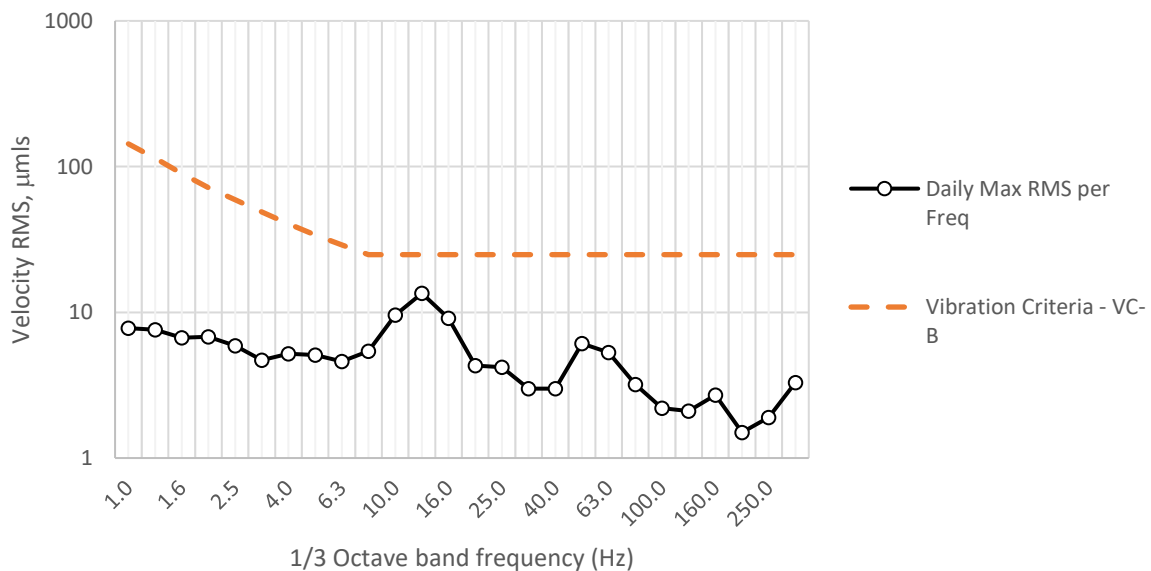
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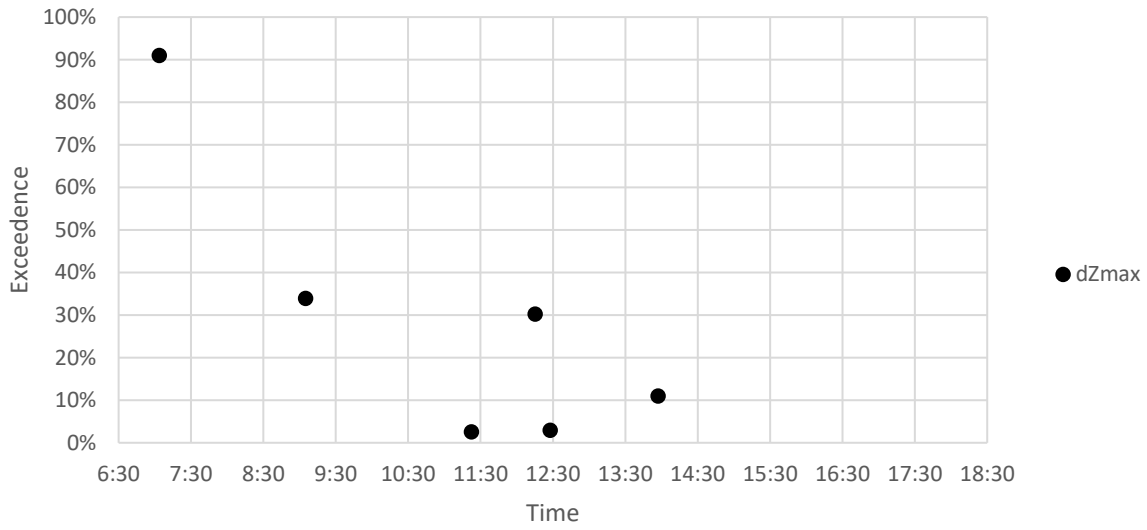
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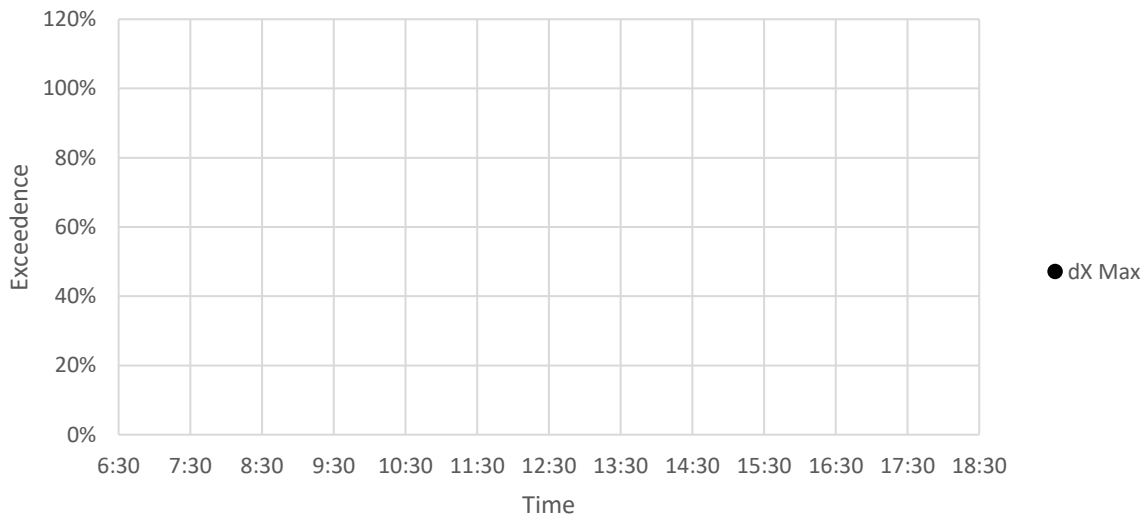
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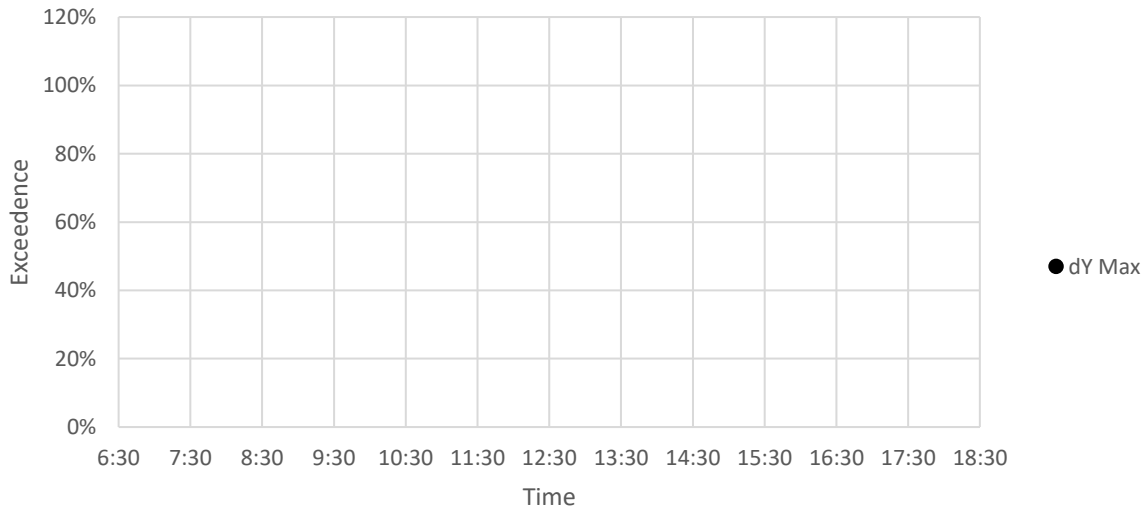
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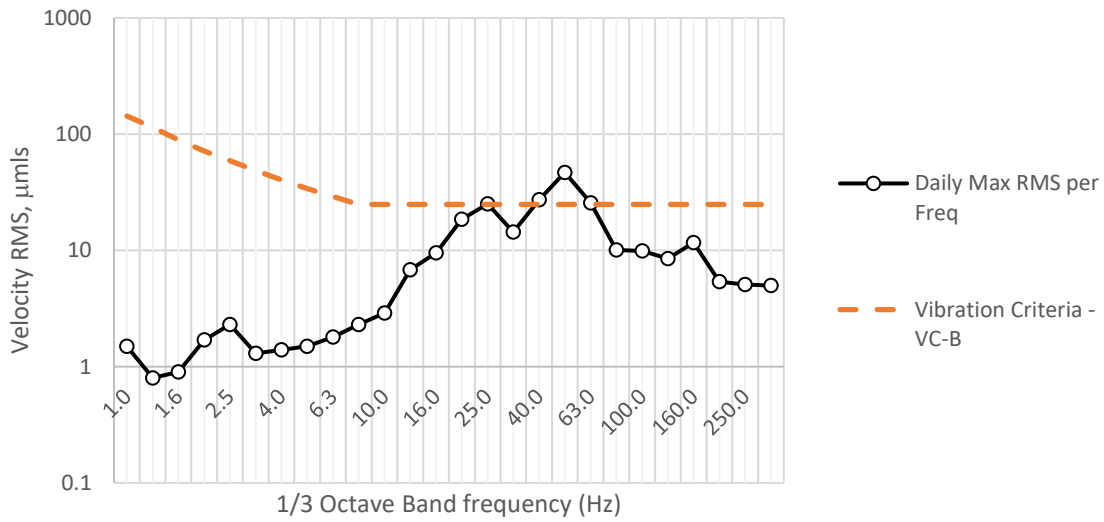
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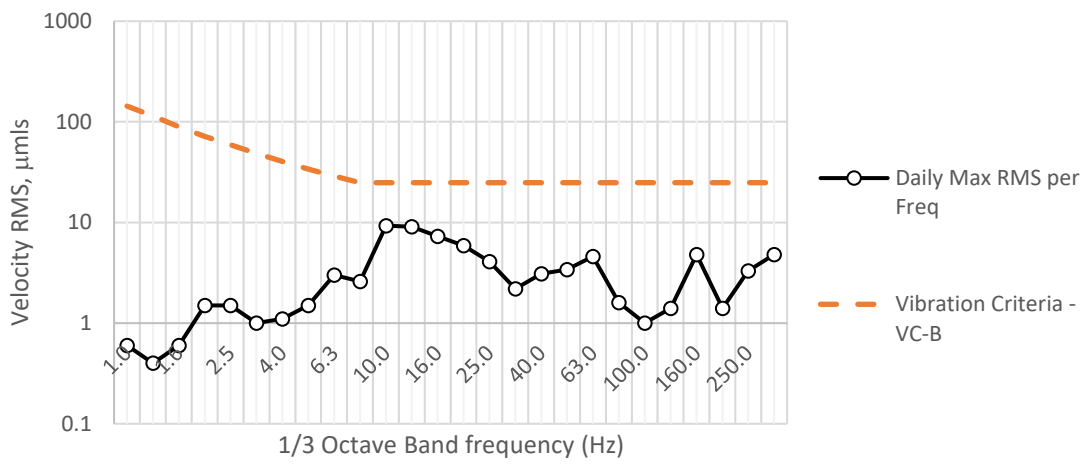
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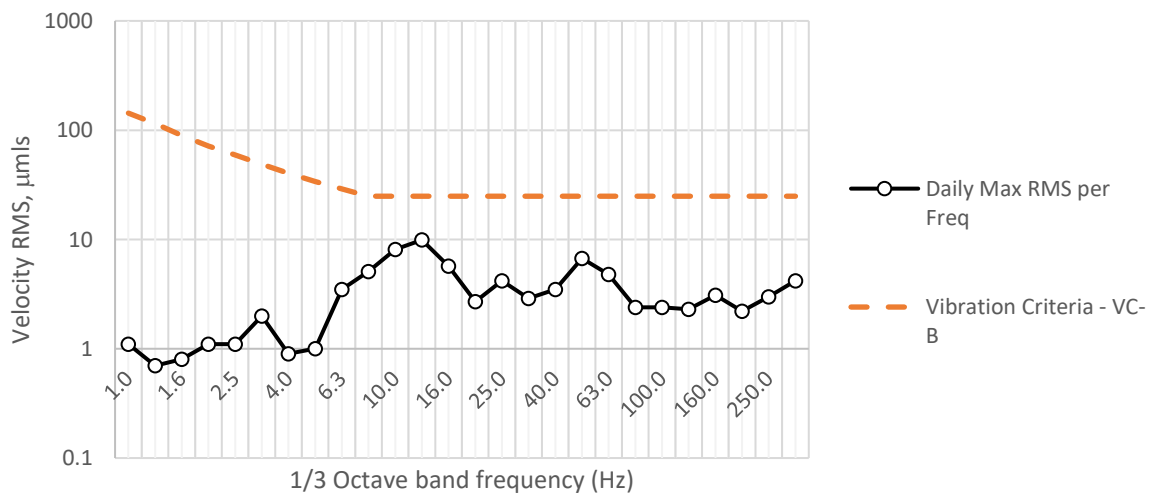
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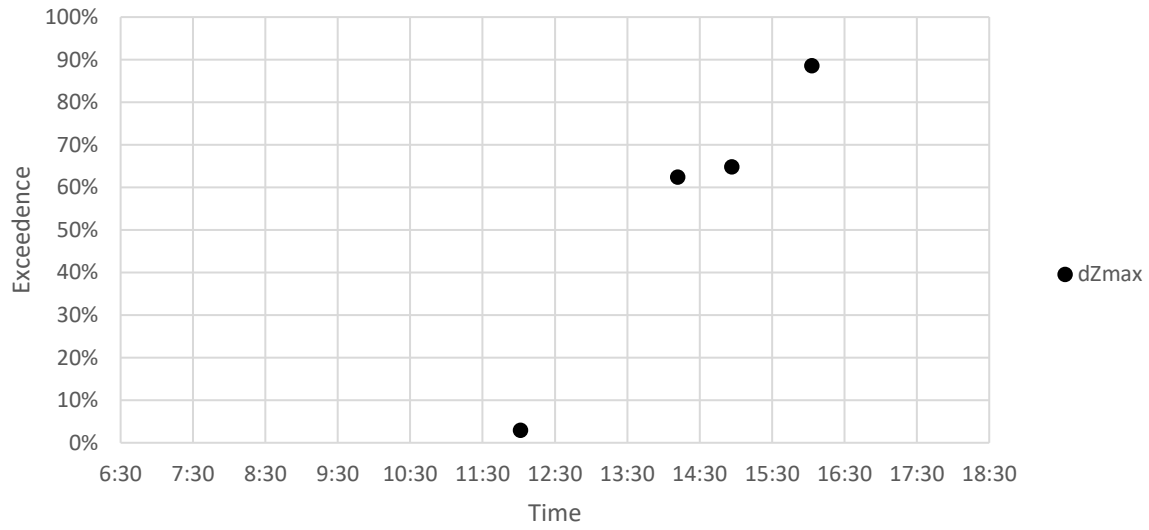
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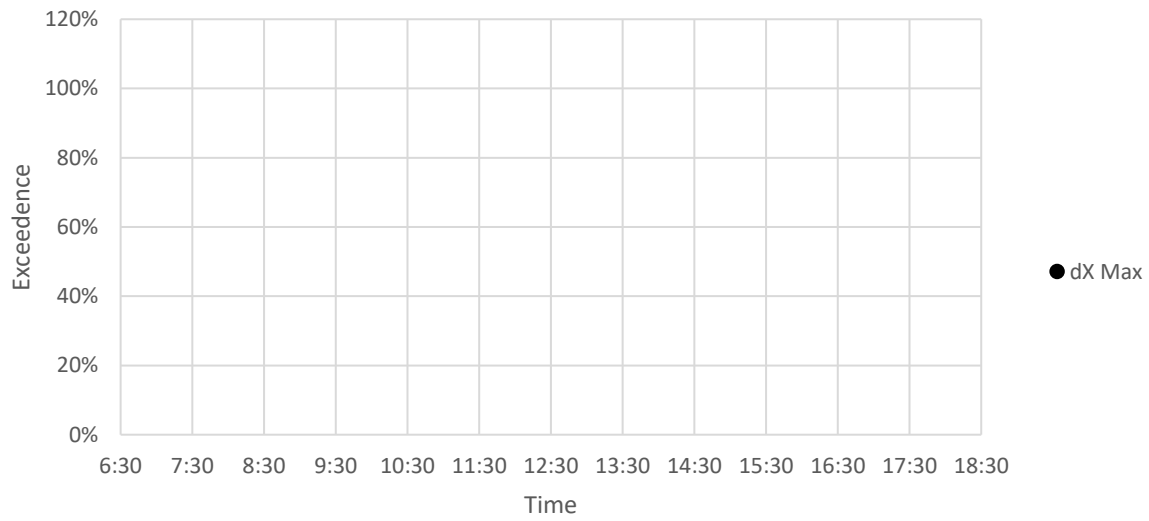
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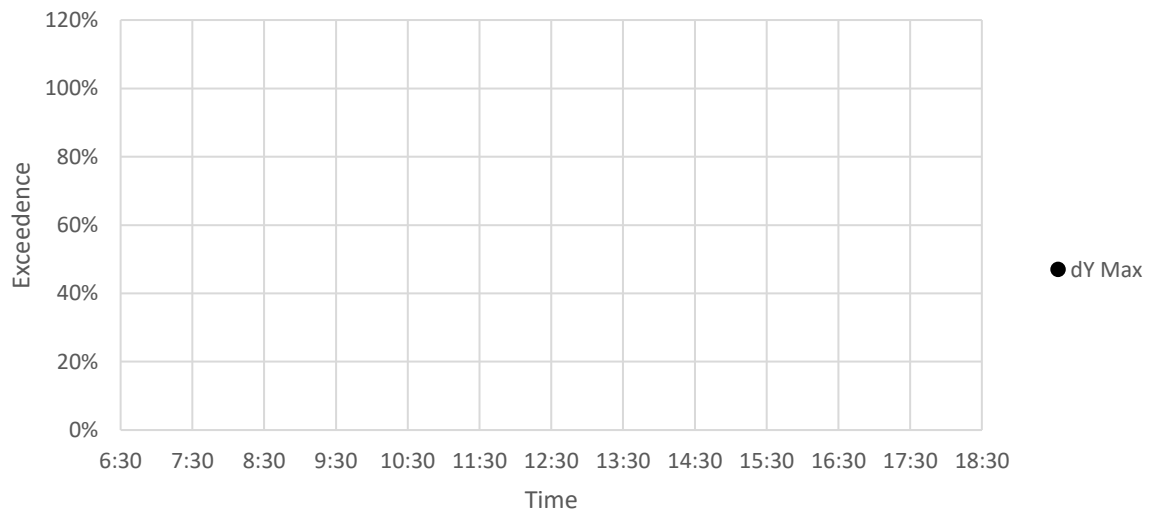
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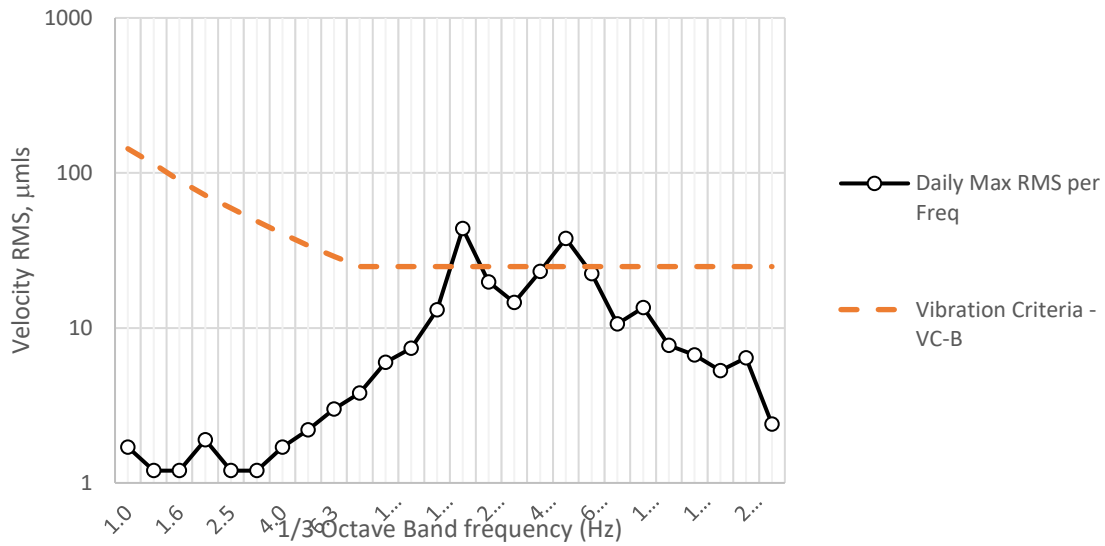
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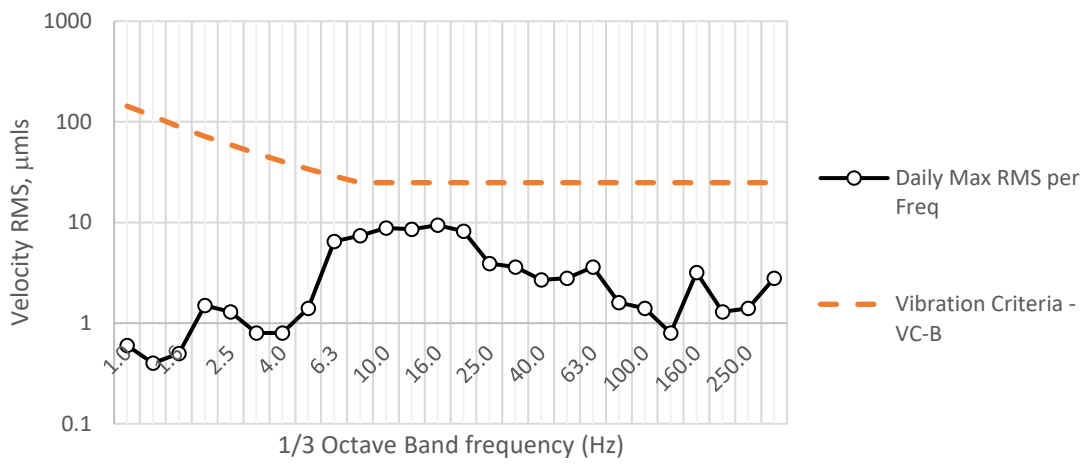
Sideways



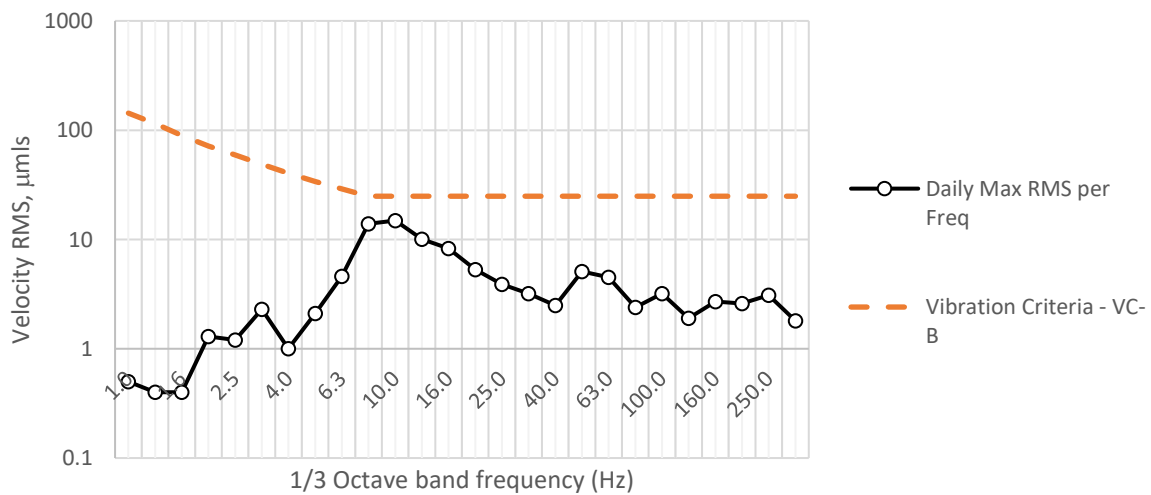
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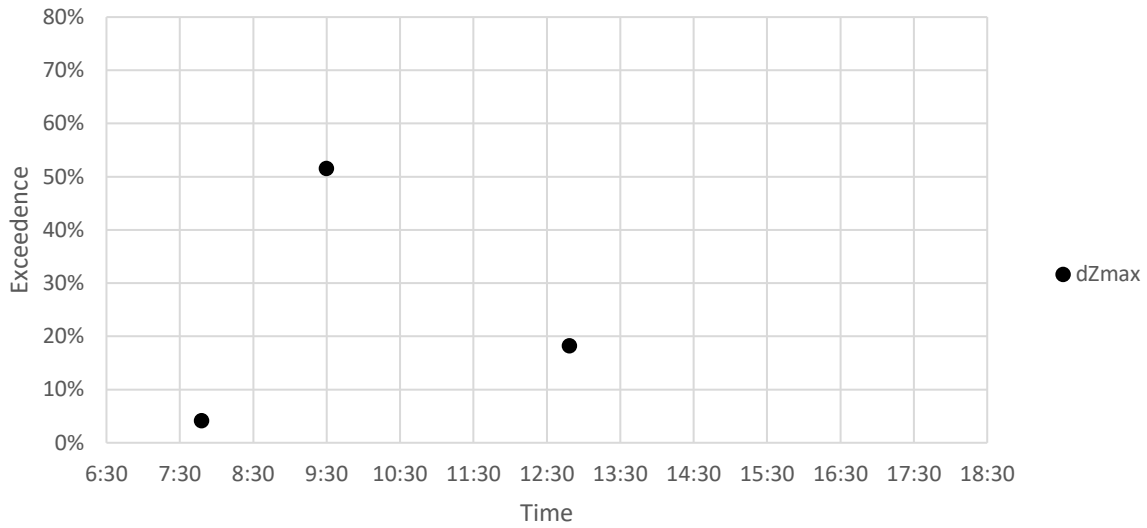
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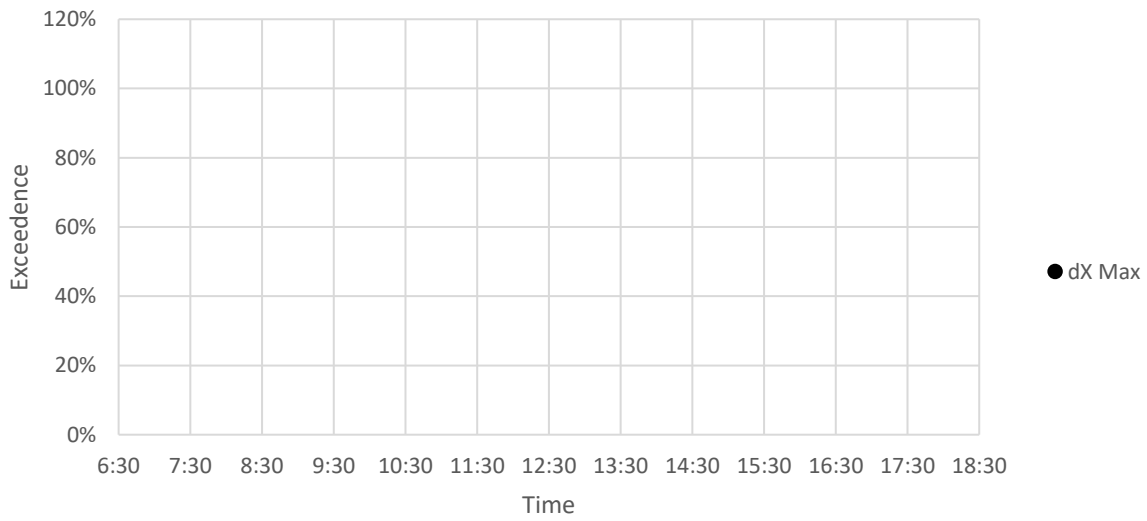
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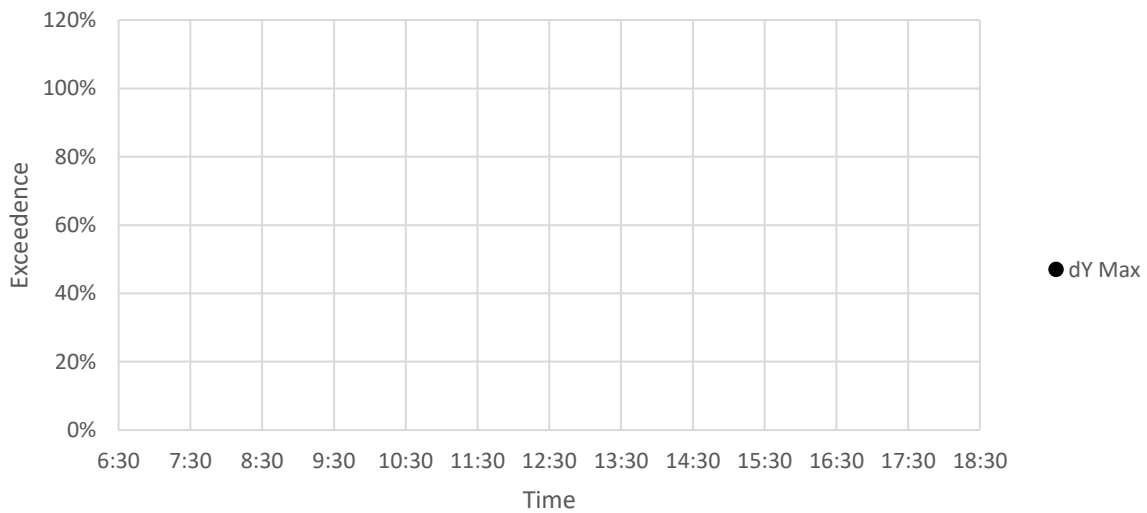
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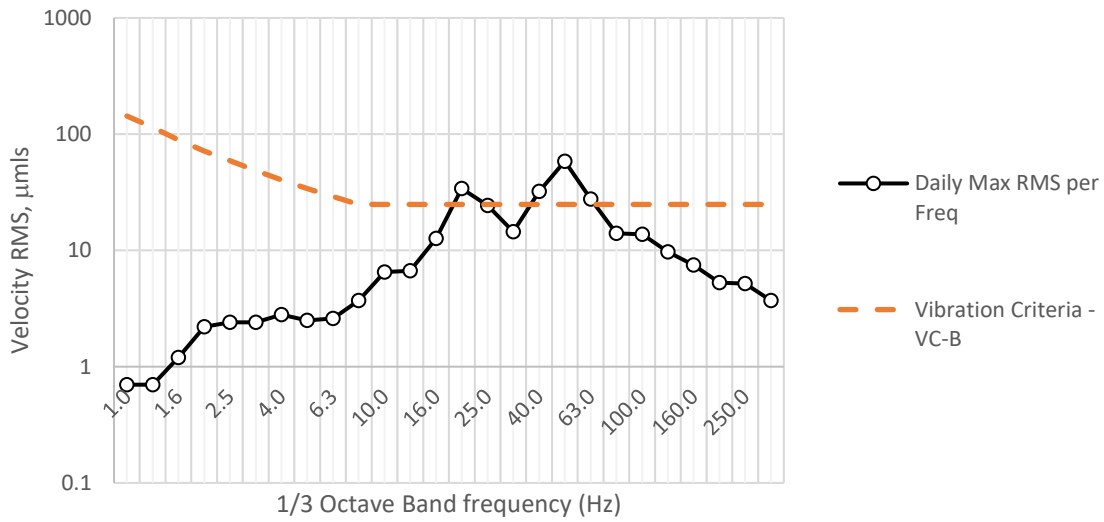
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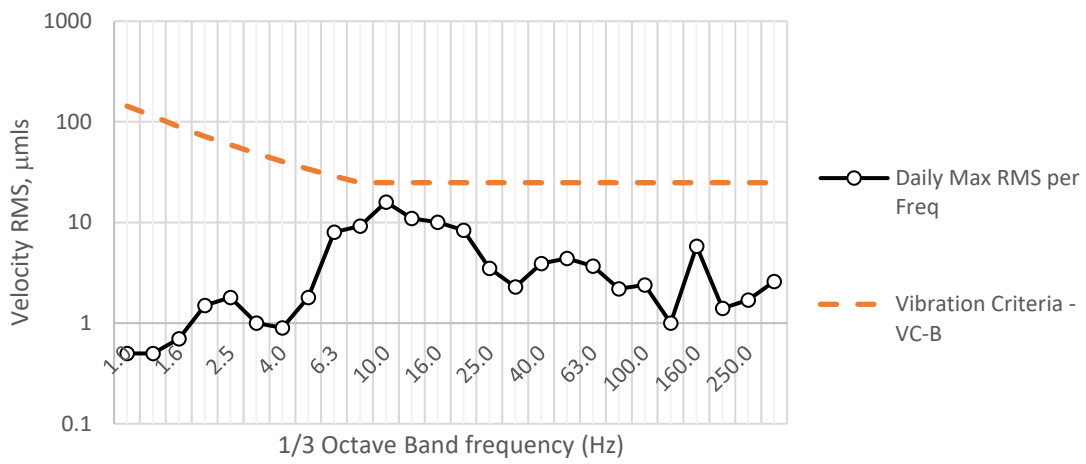
Sideways



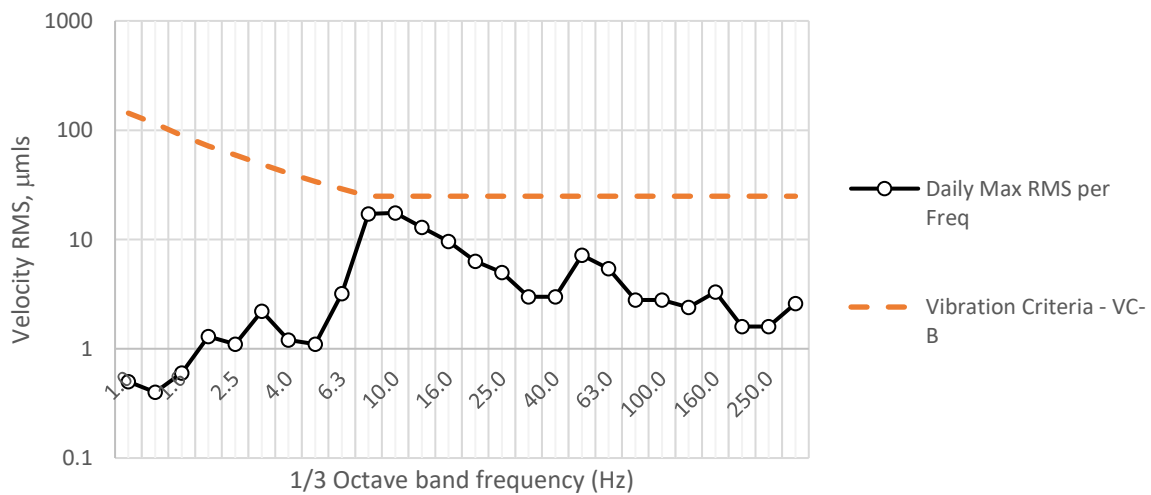
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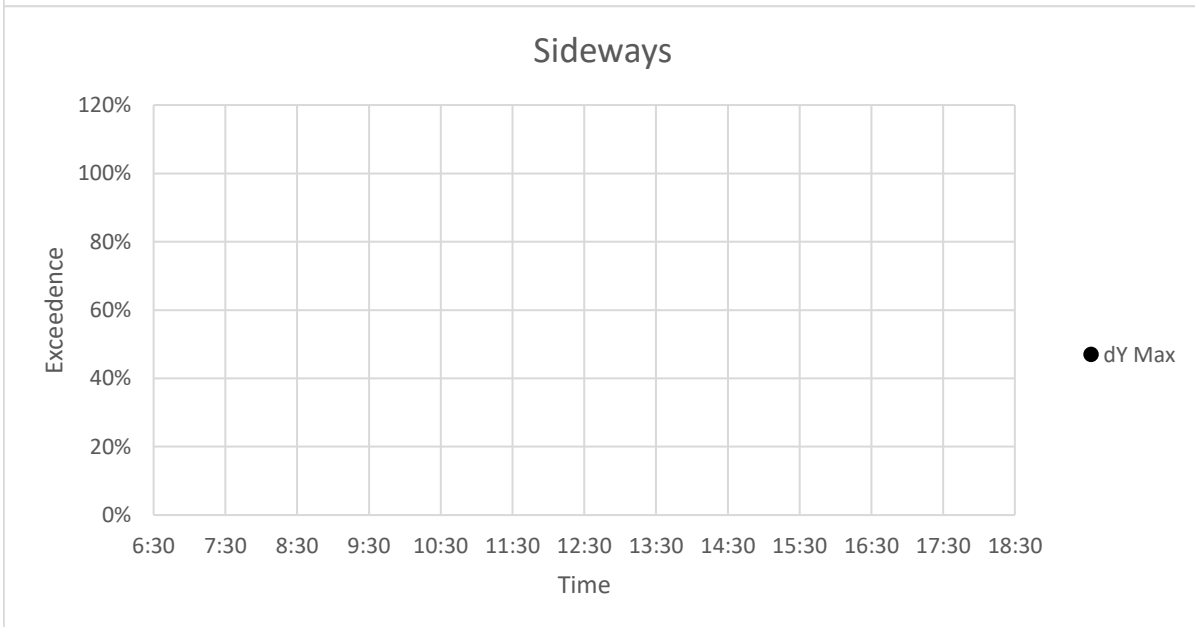
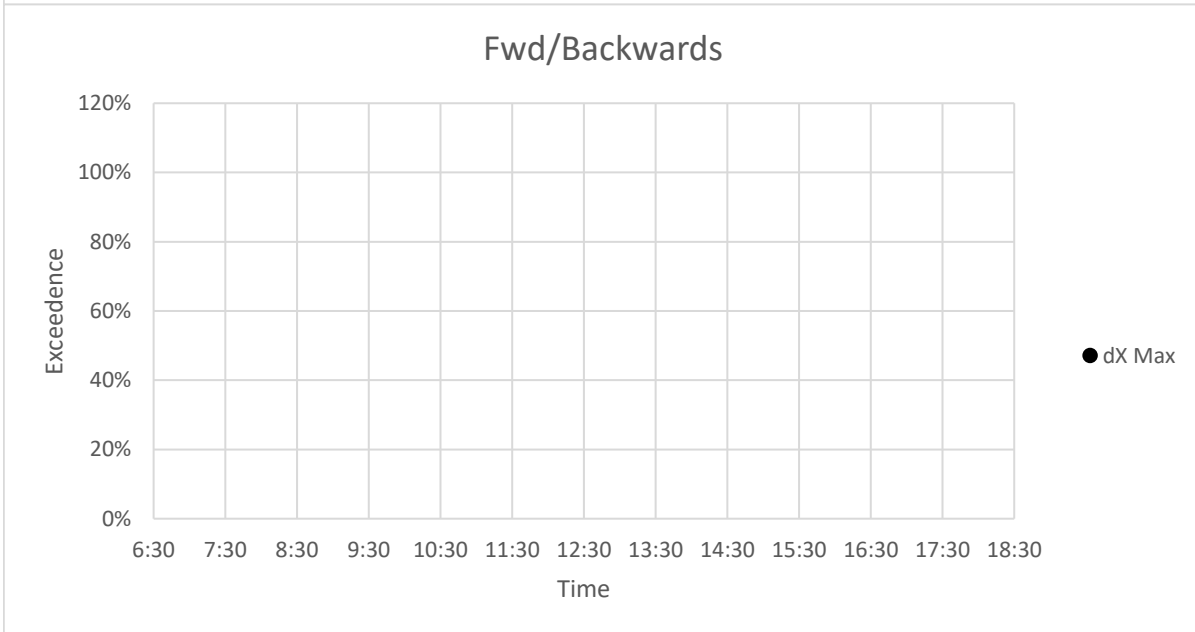
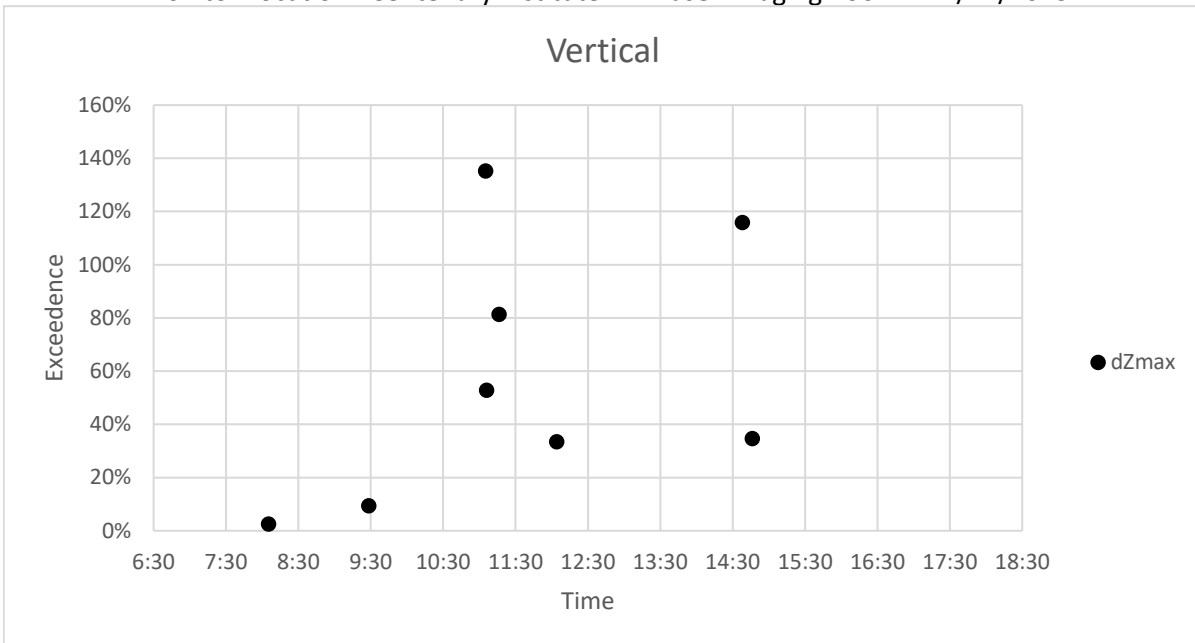


FwdBackwd Vibration

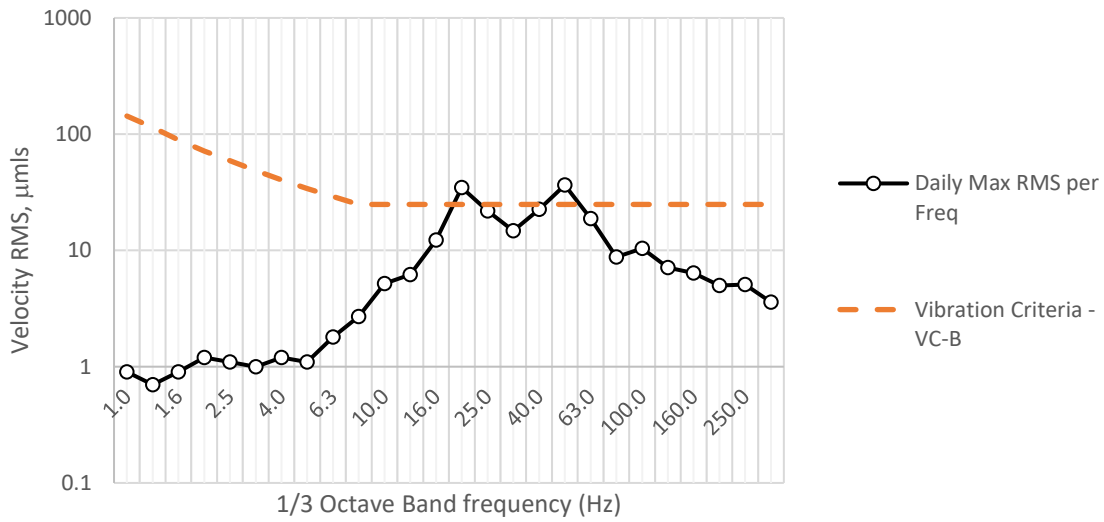


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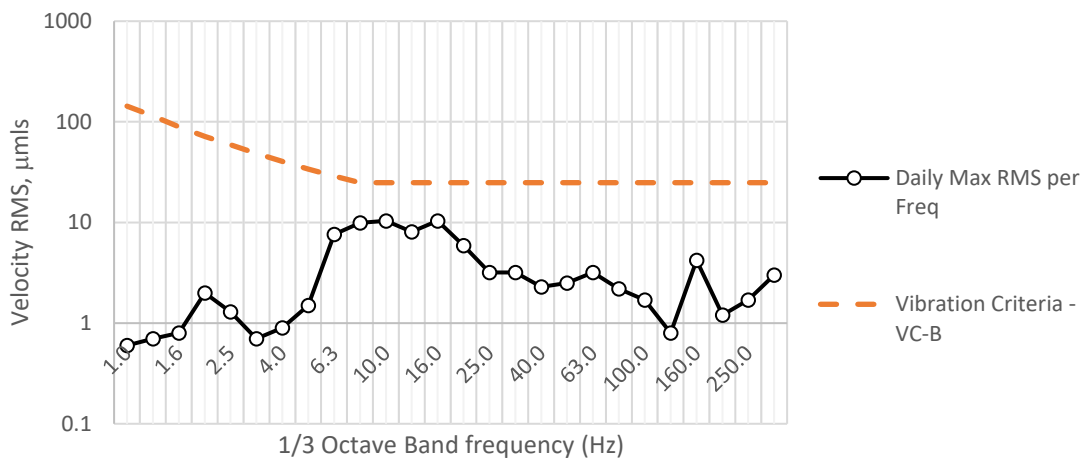




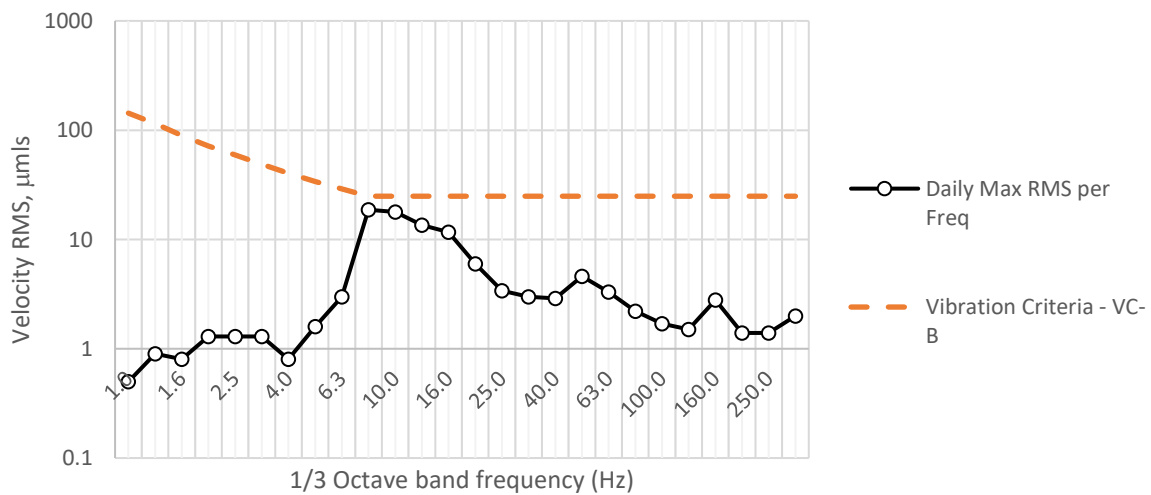
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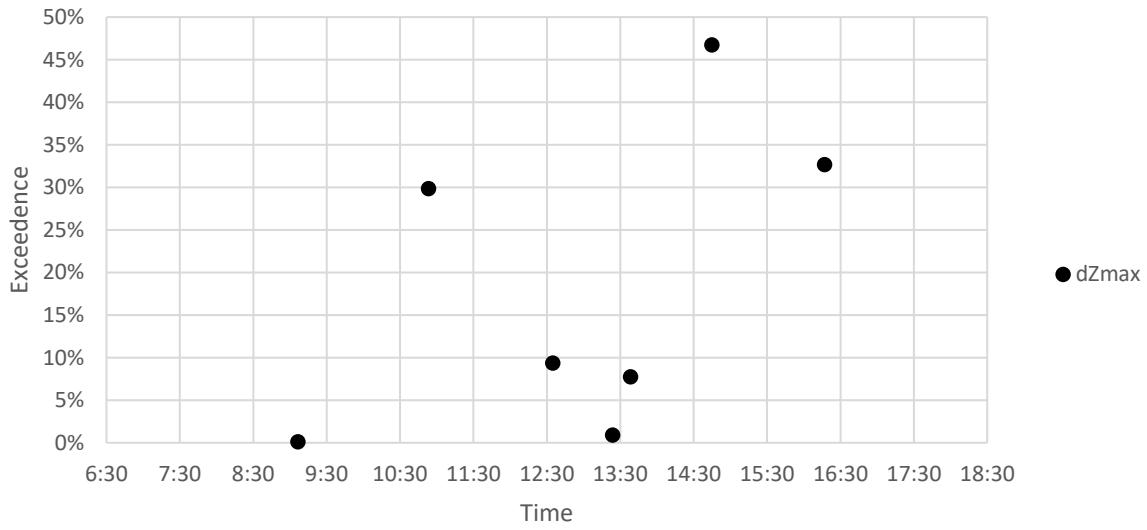
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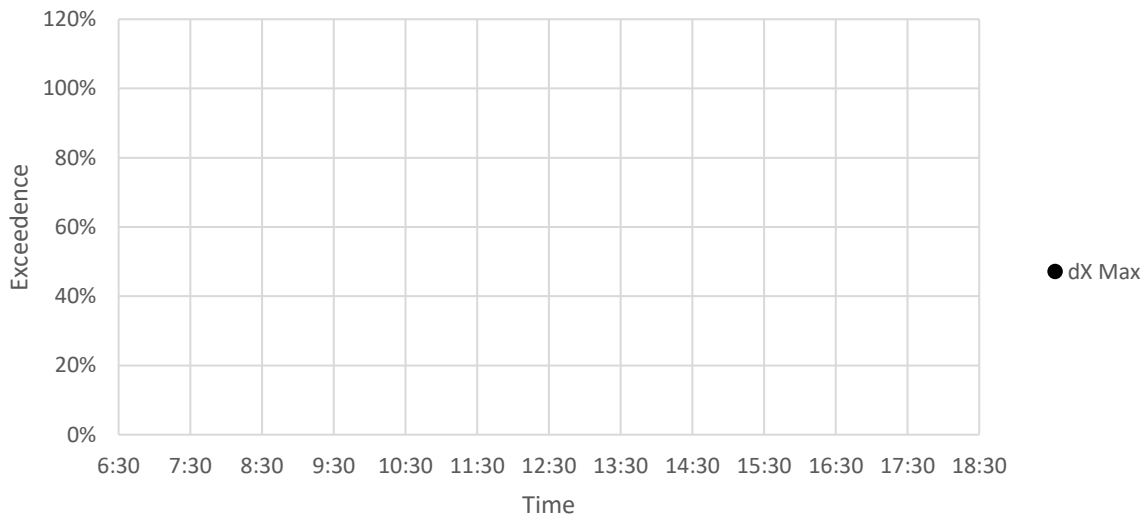
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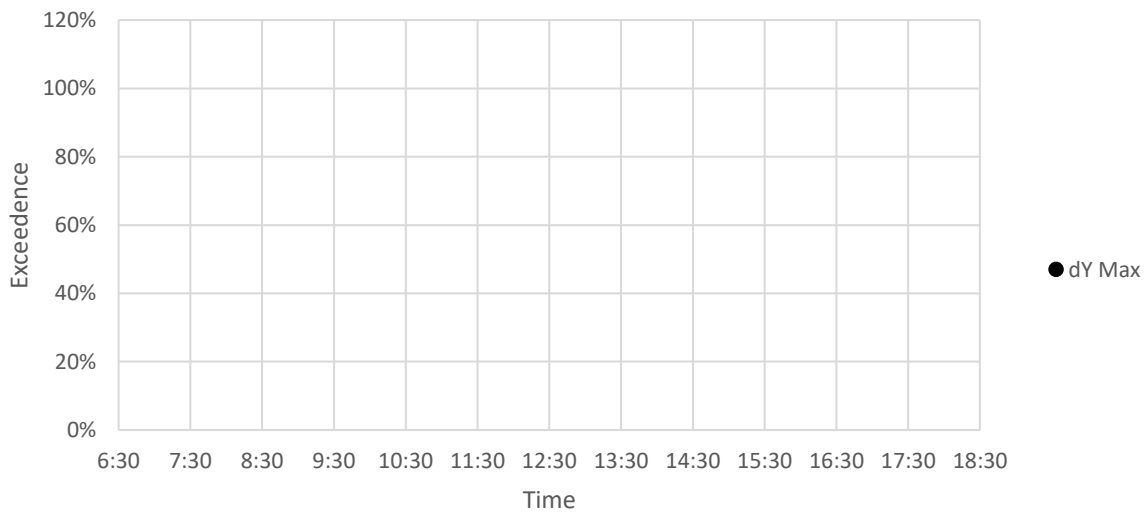
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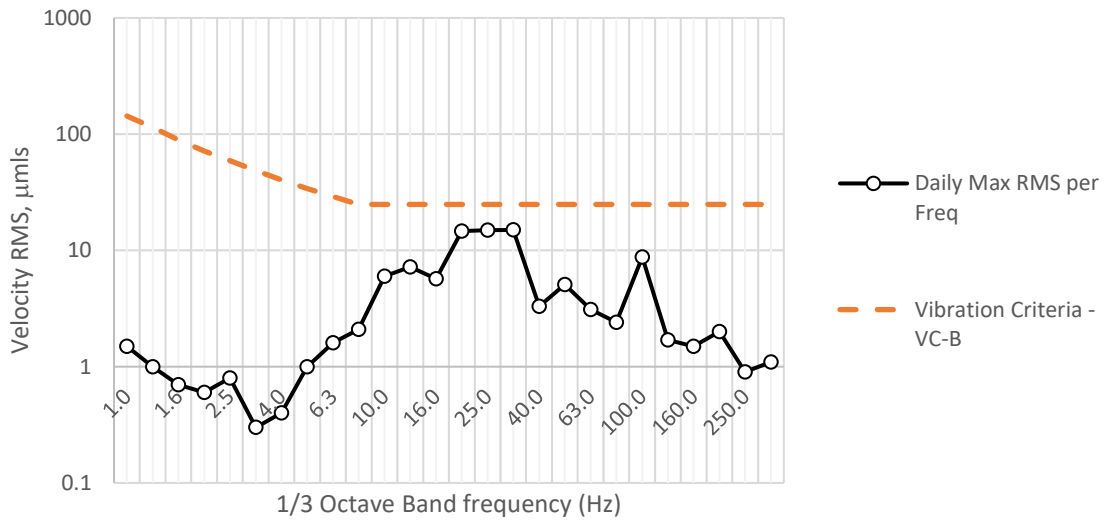
Fwd/Backwards



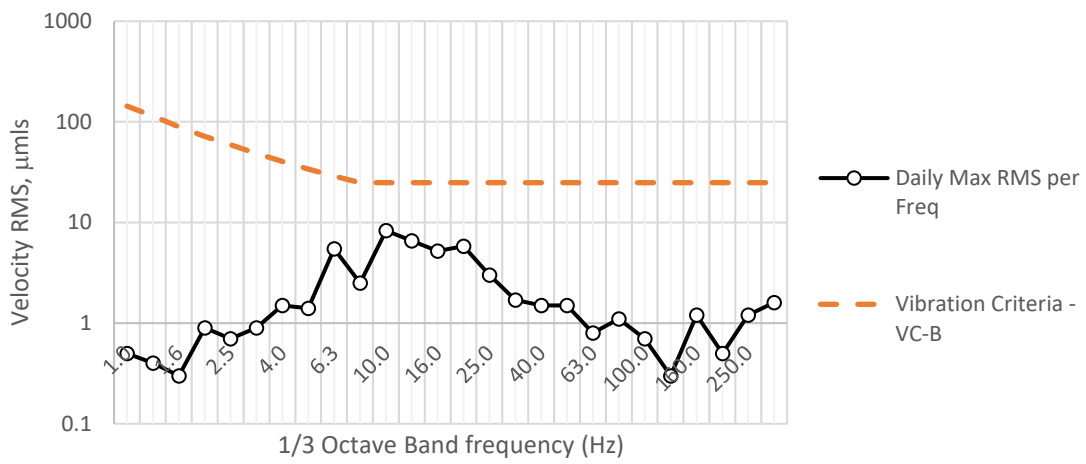
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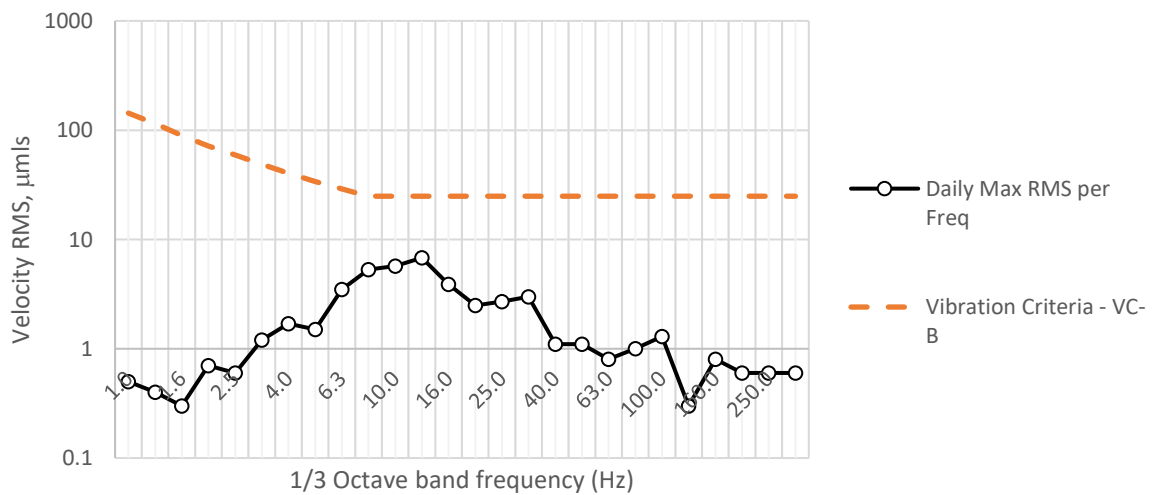
Vertical Vibration



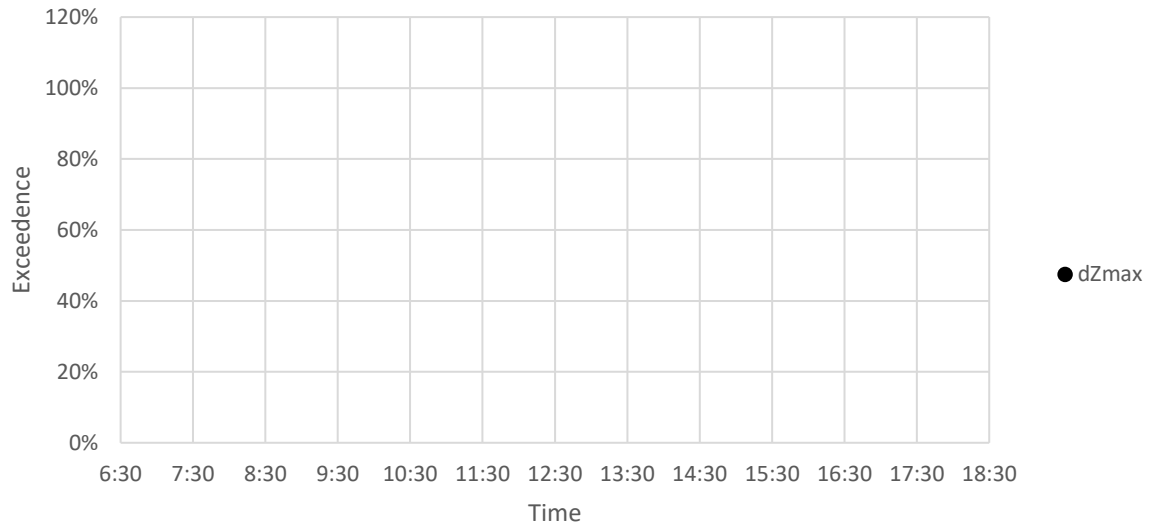
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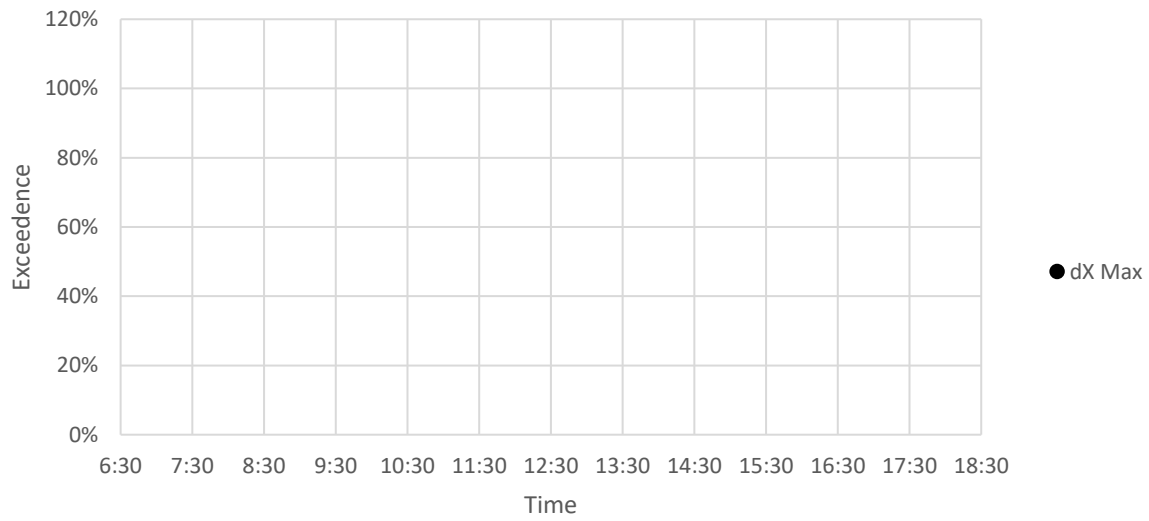
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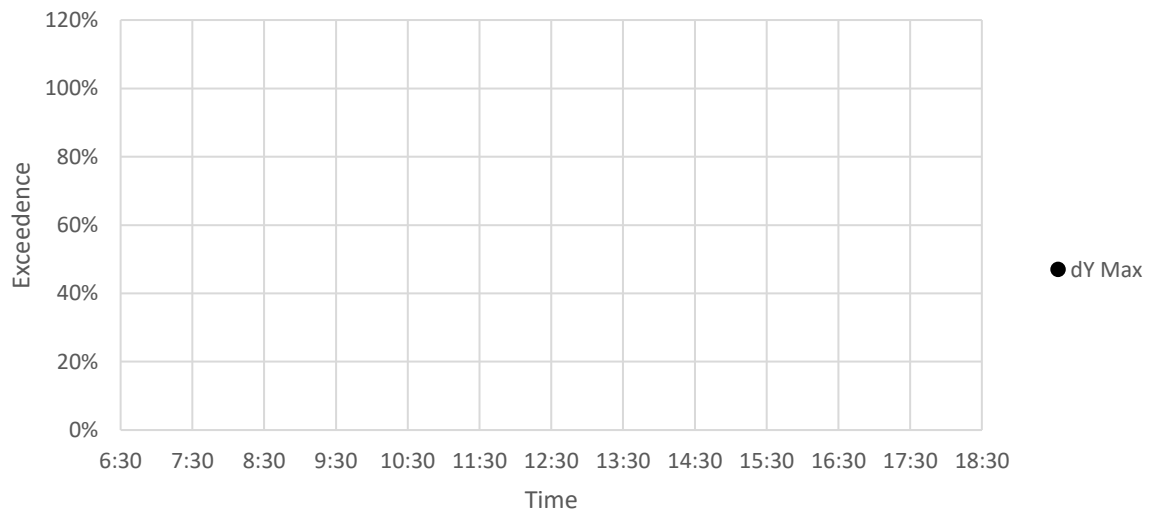
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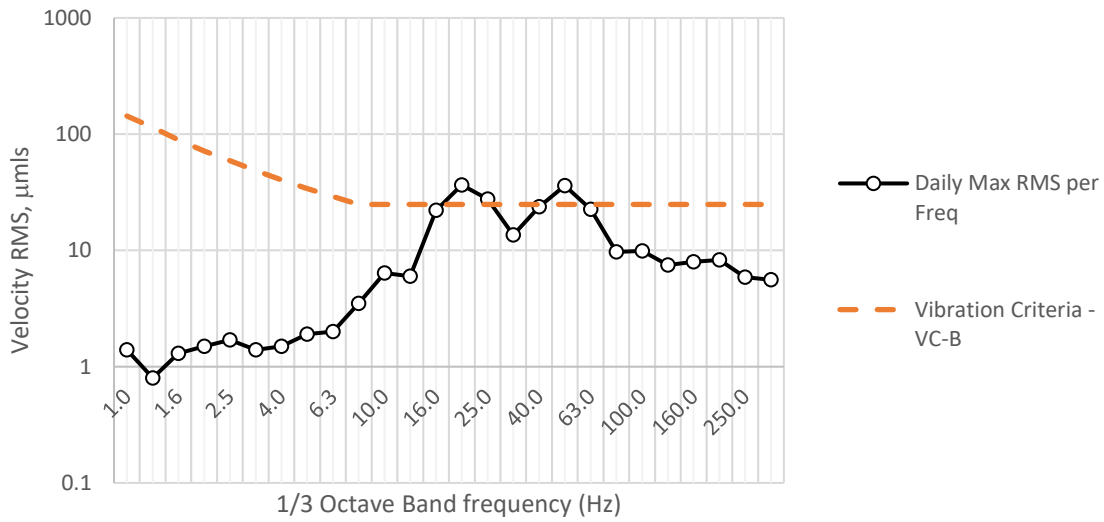
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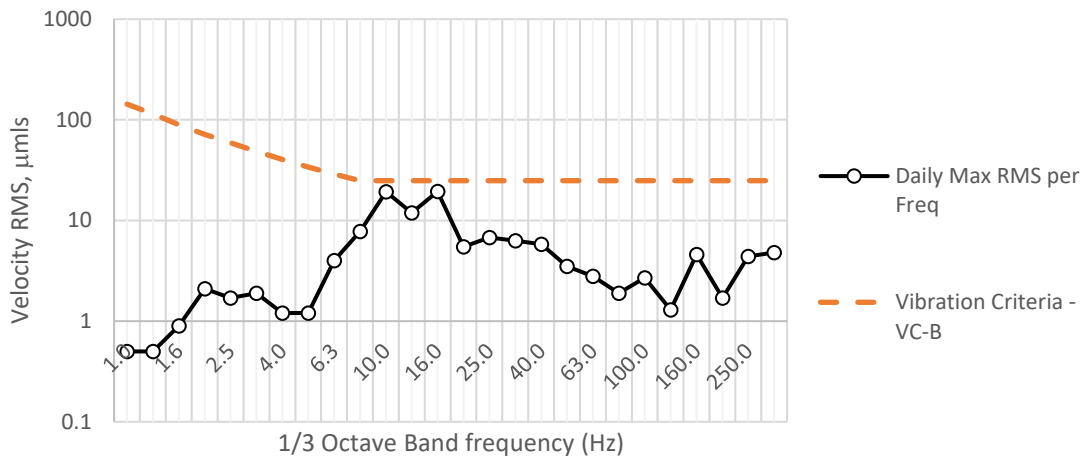
Sideways



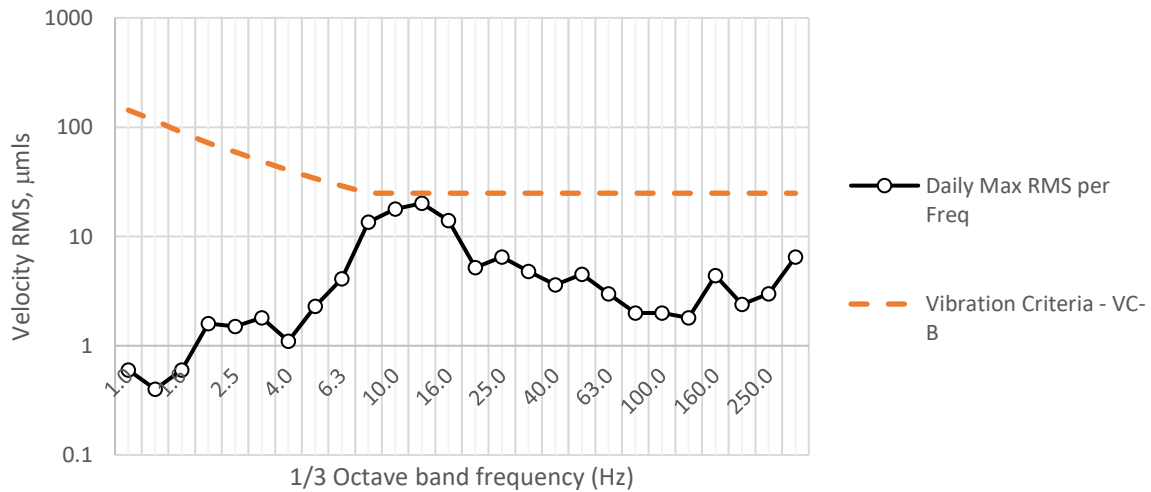
Vertical Vibration



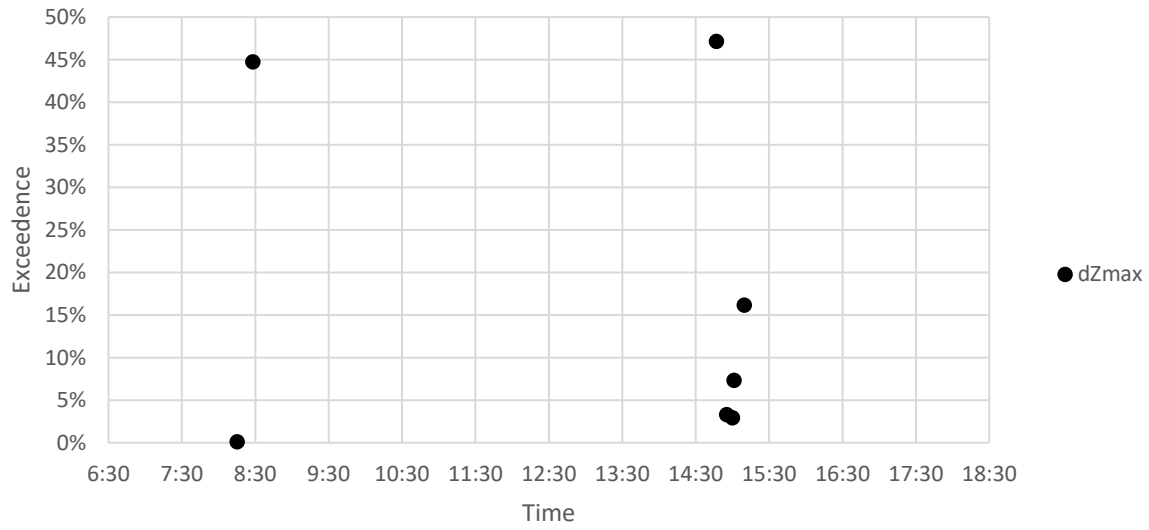
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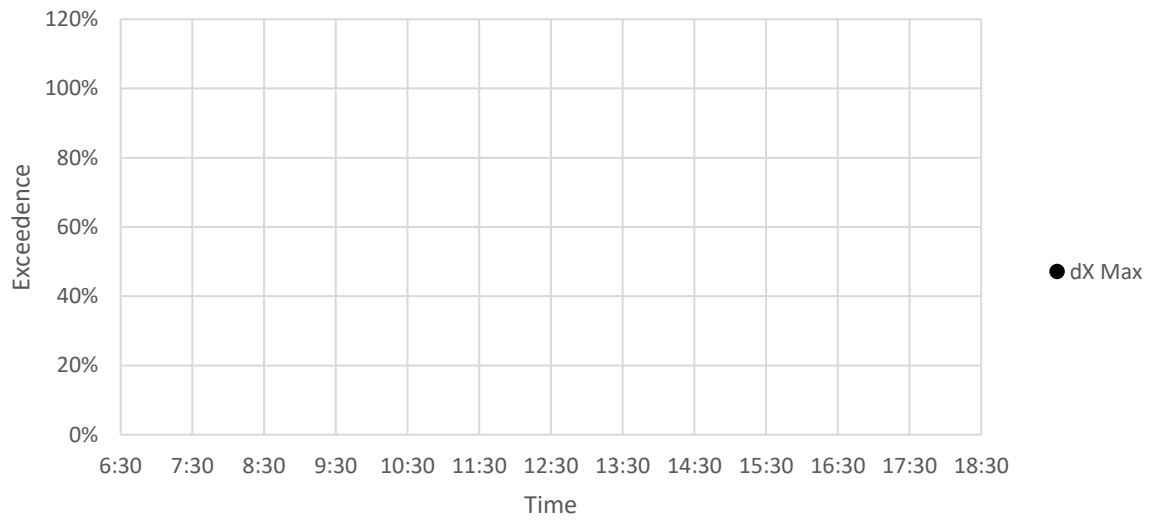
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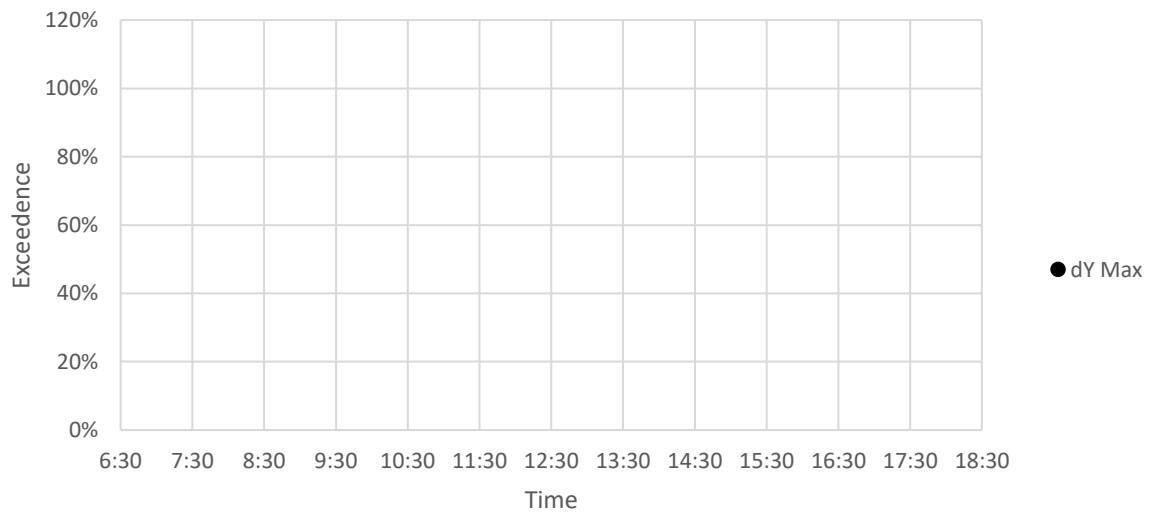
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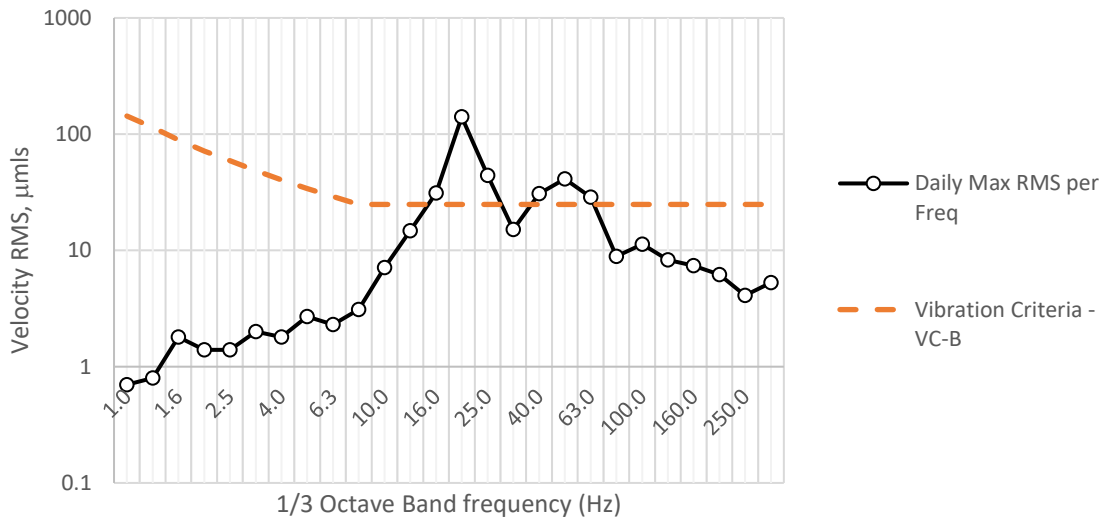
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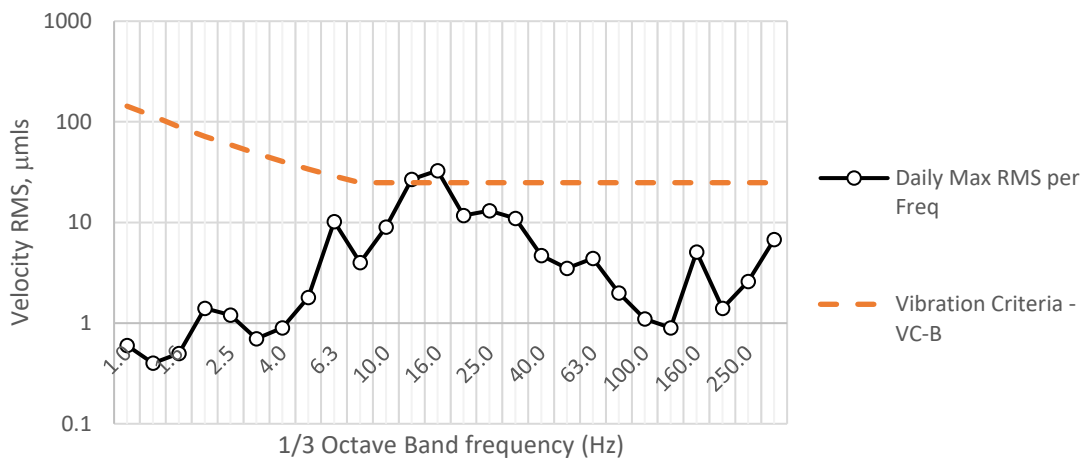
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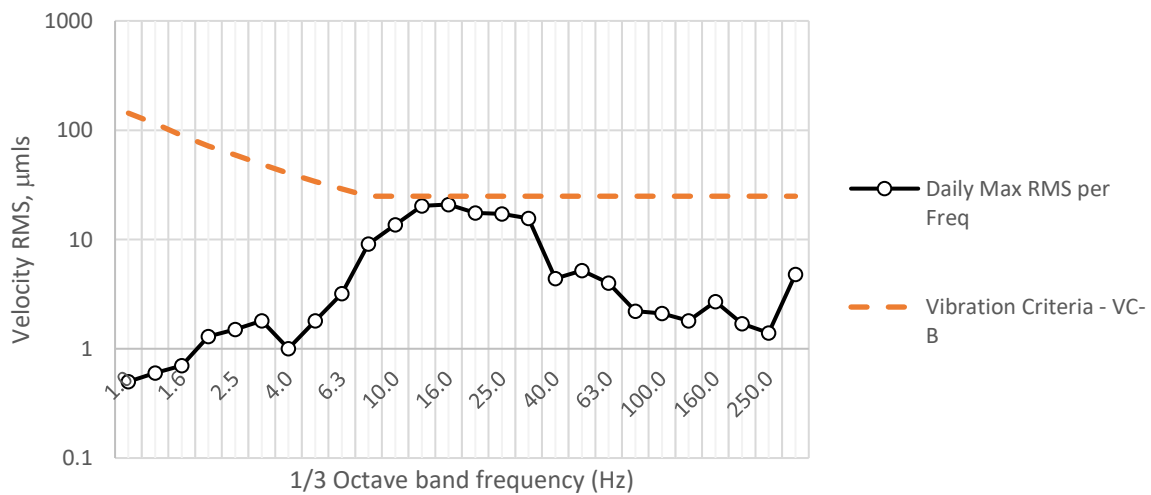
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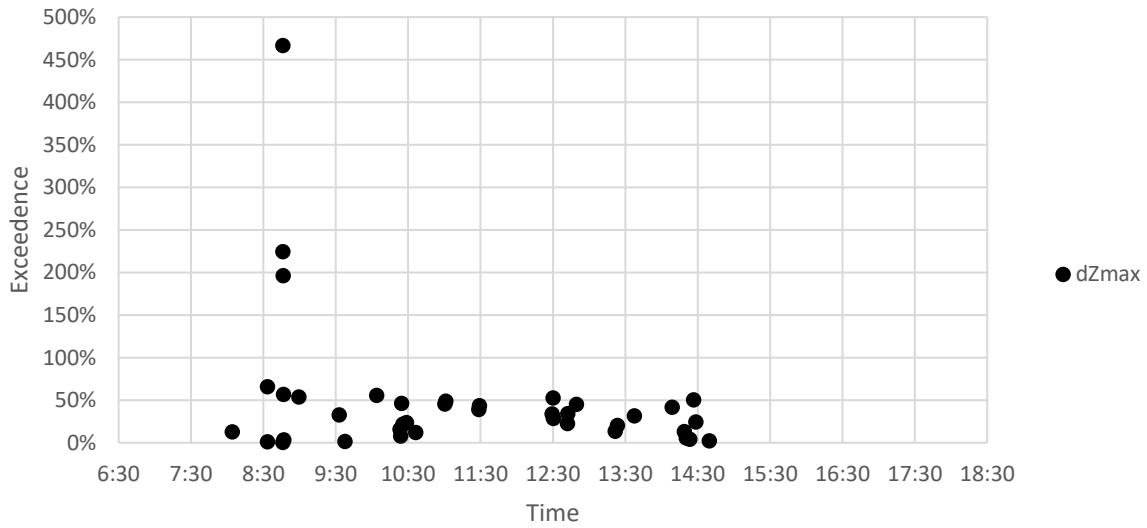
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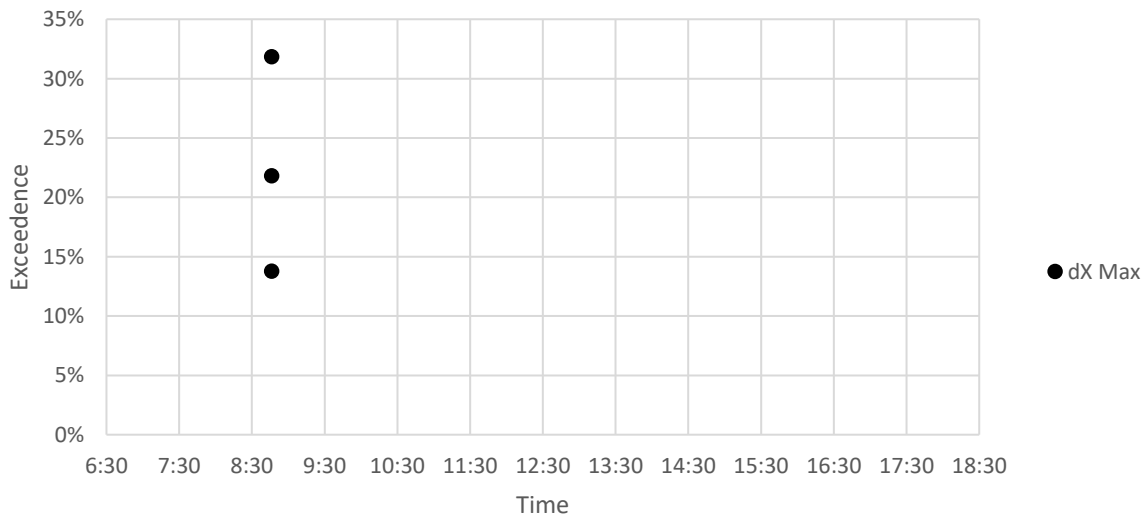
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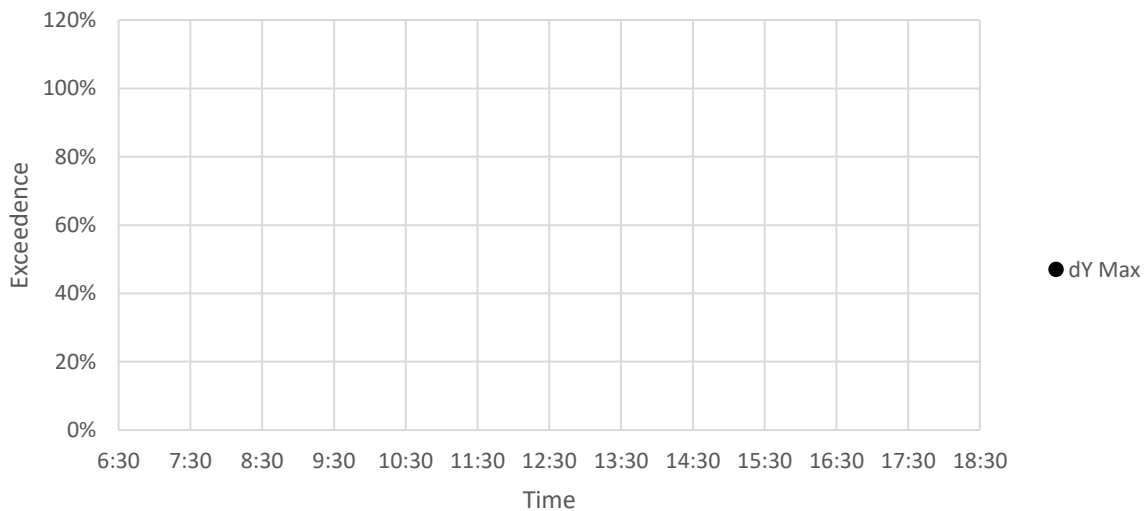
Vertical



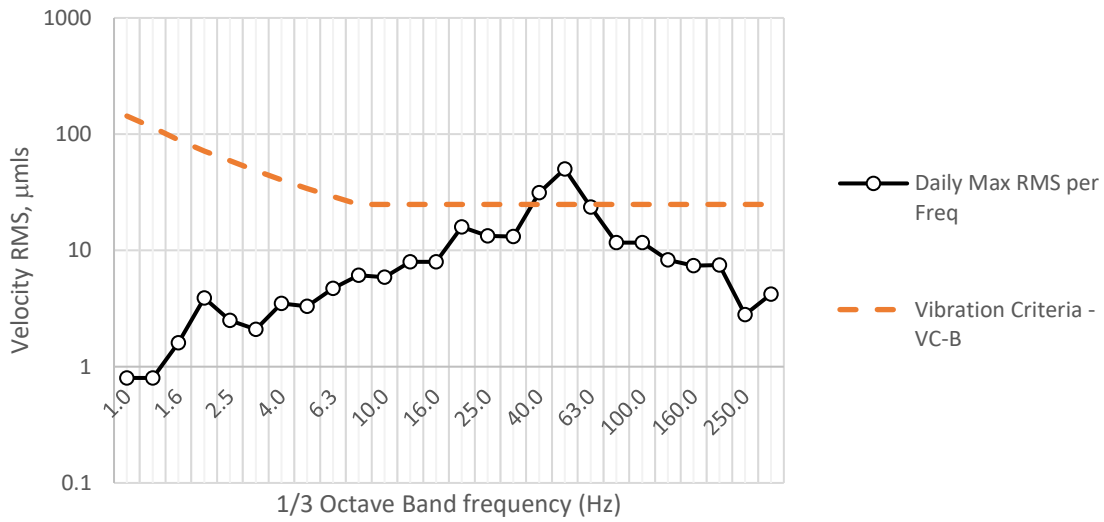
Fwd/Backwards



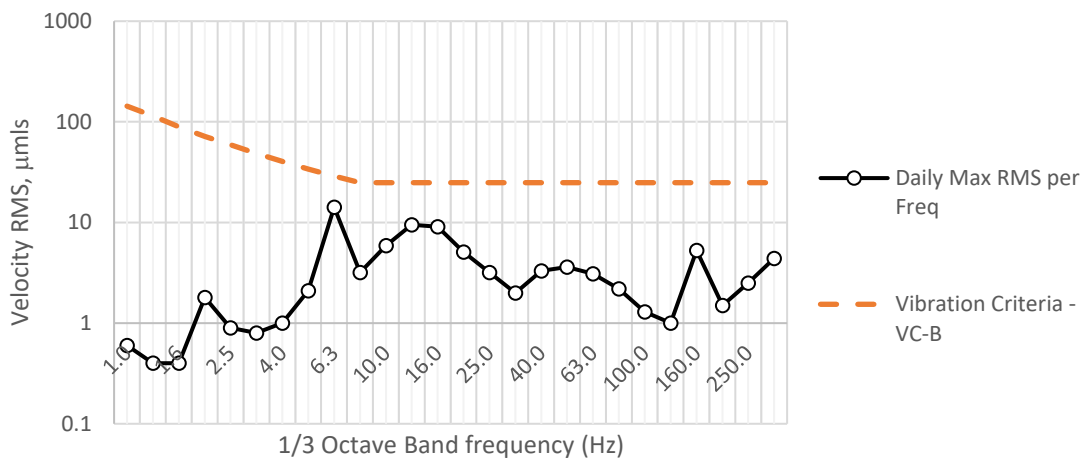
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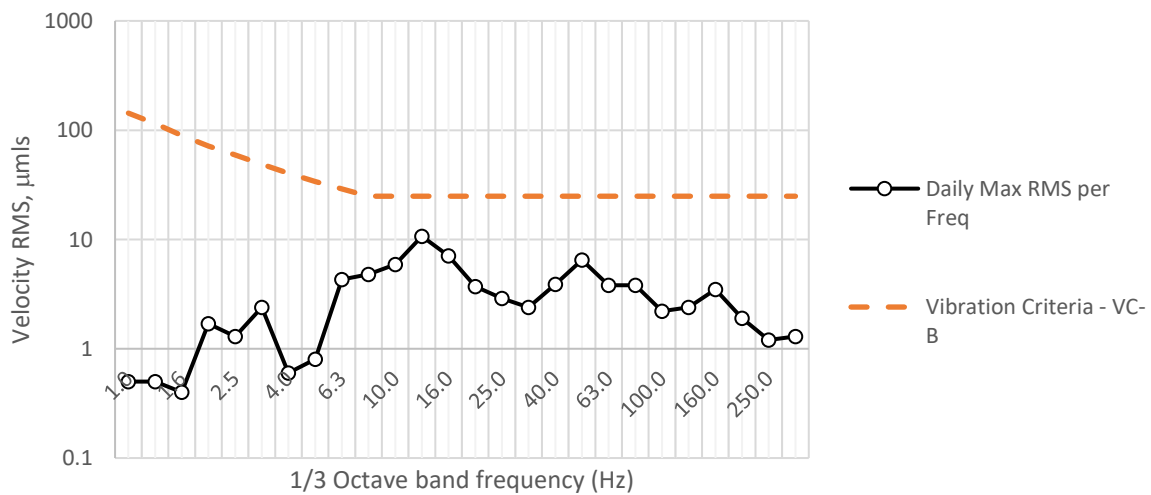
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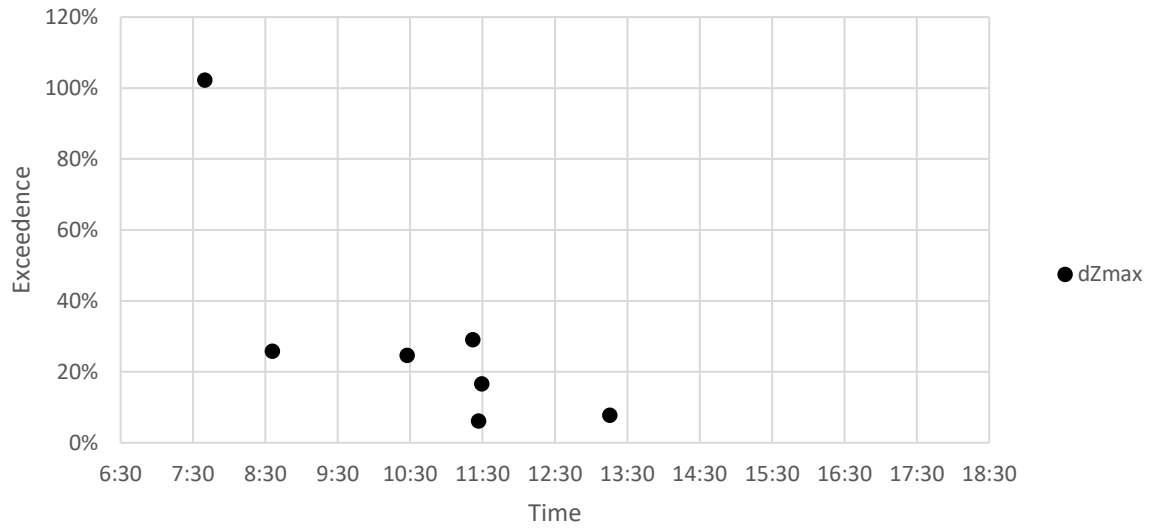
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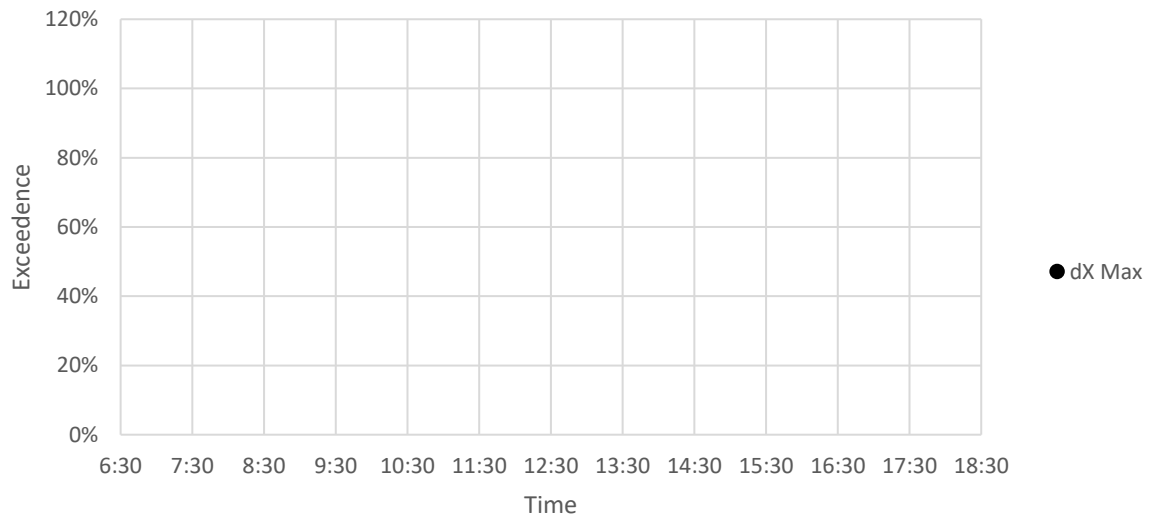
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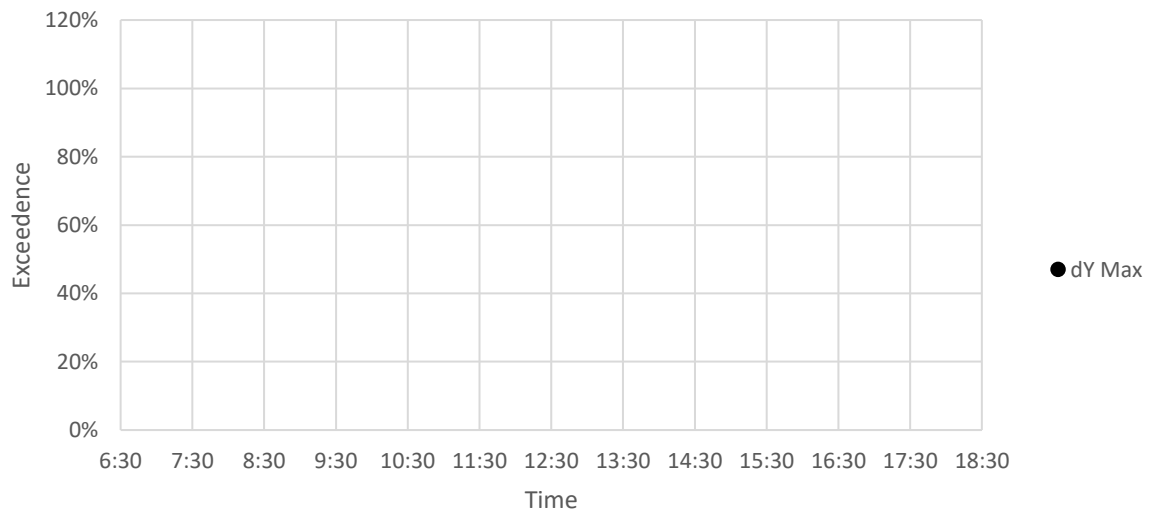
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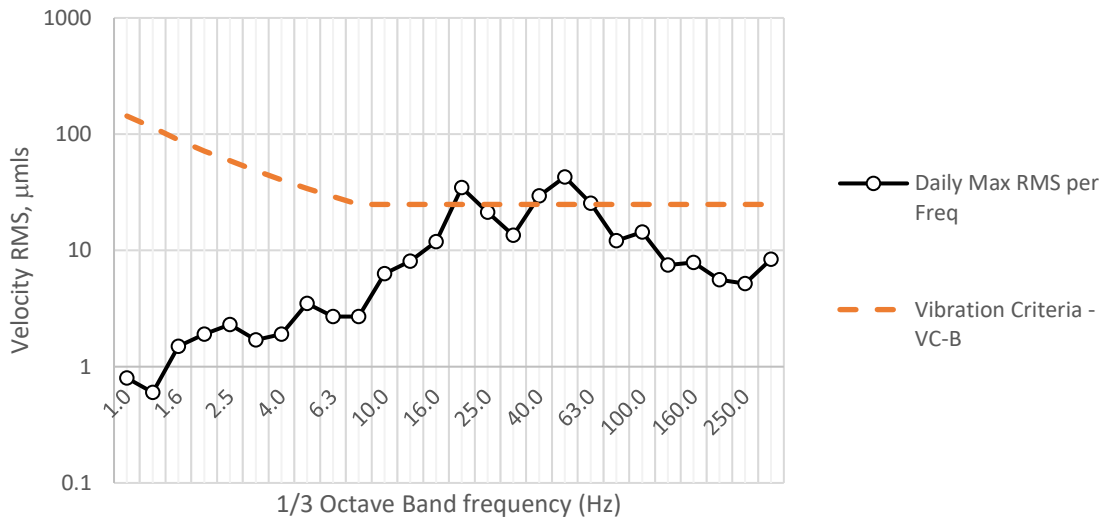
Fwd/Backwards



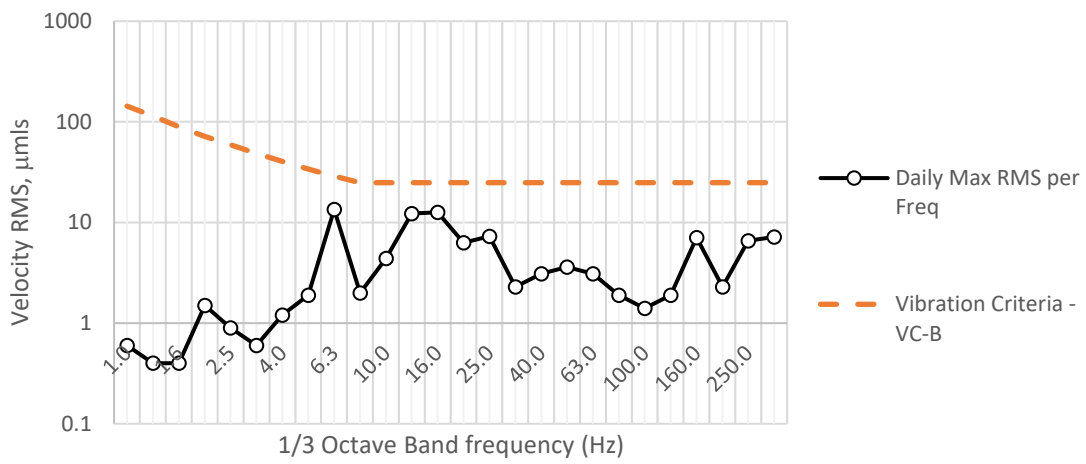
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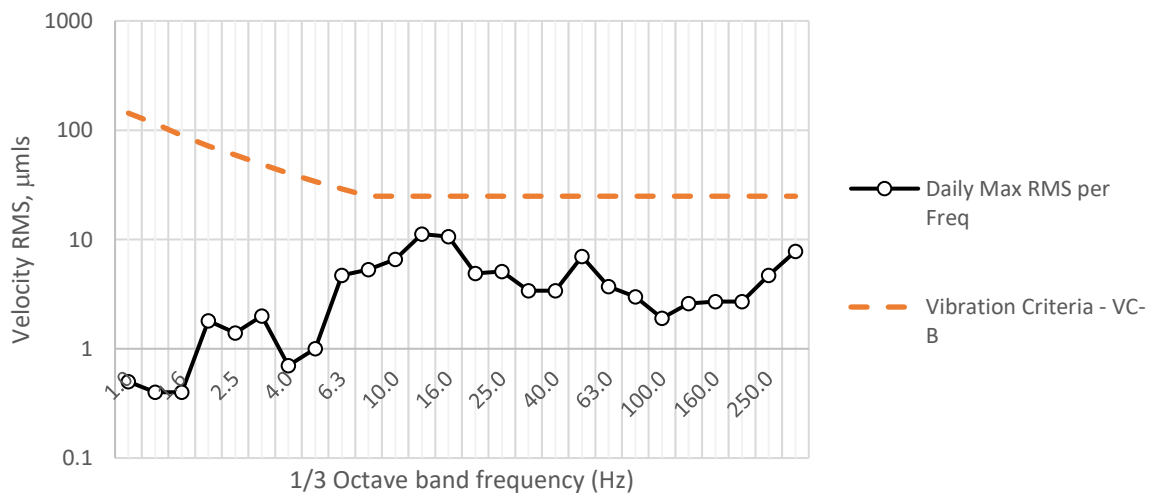
Vertical Vibration

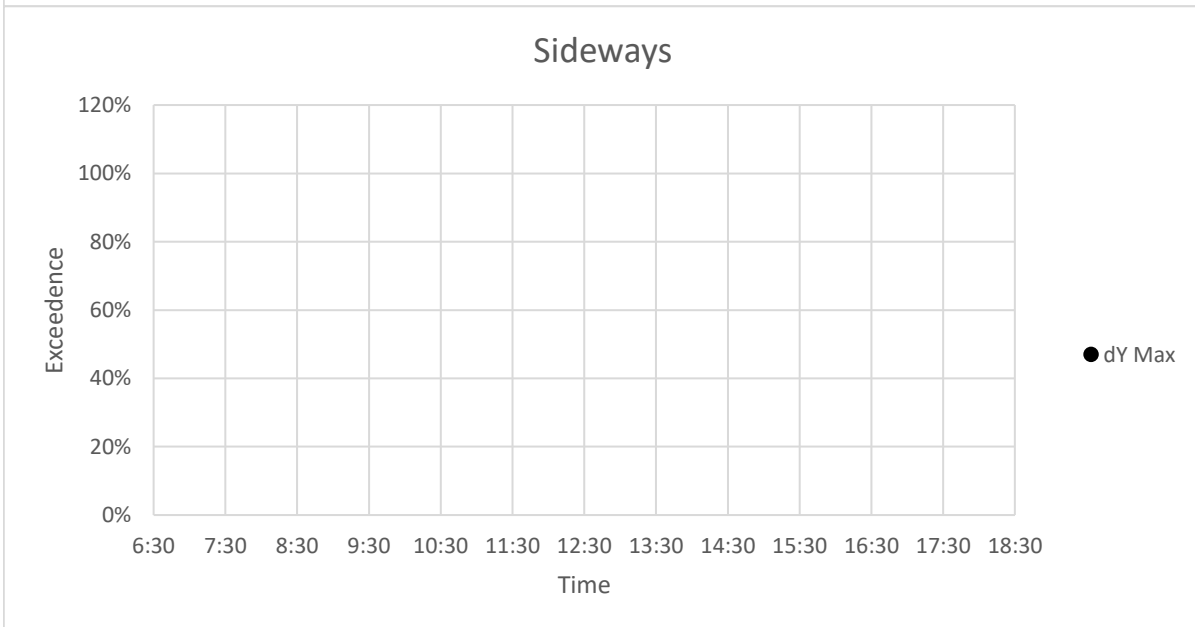
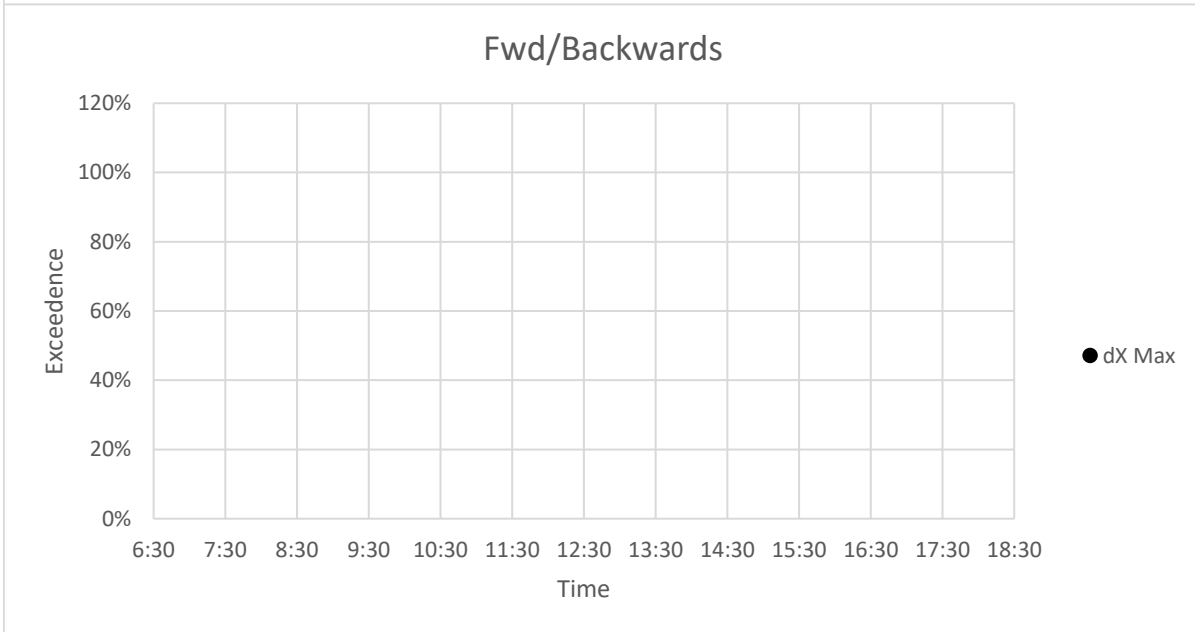
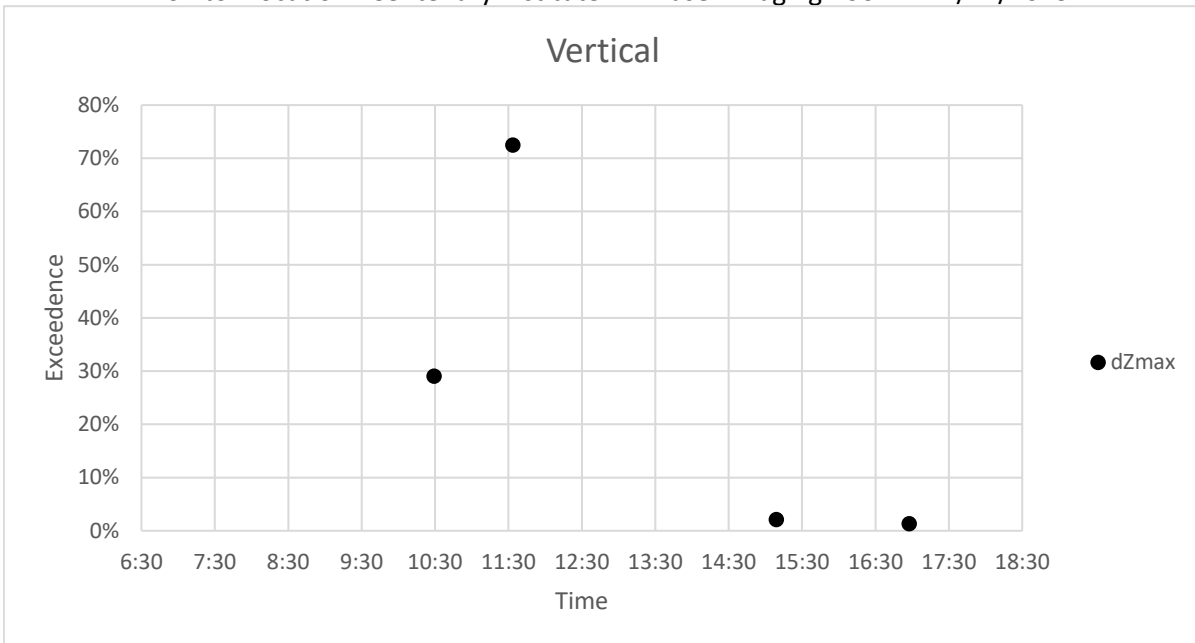


FwdBackwd Vibration

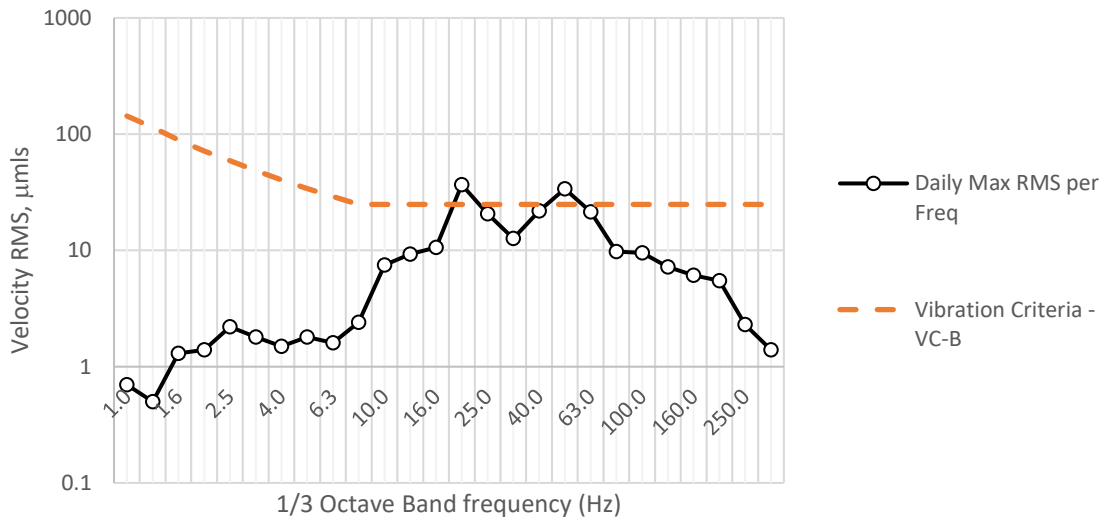


Sideways Vibration

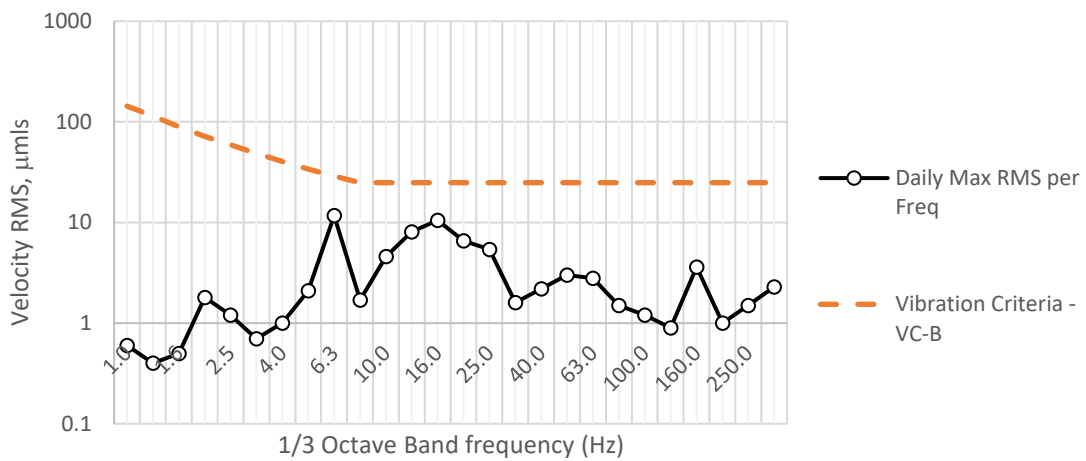




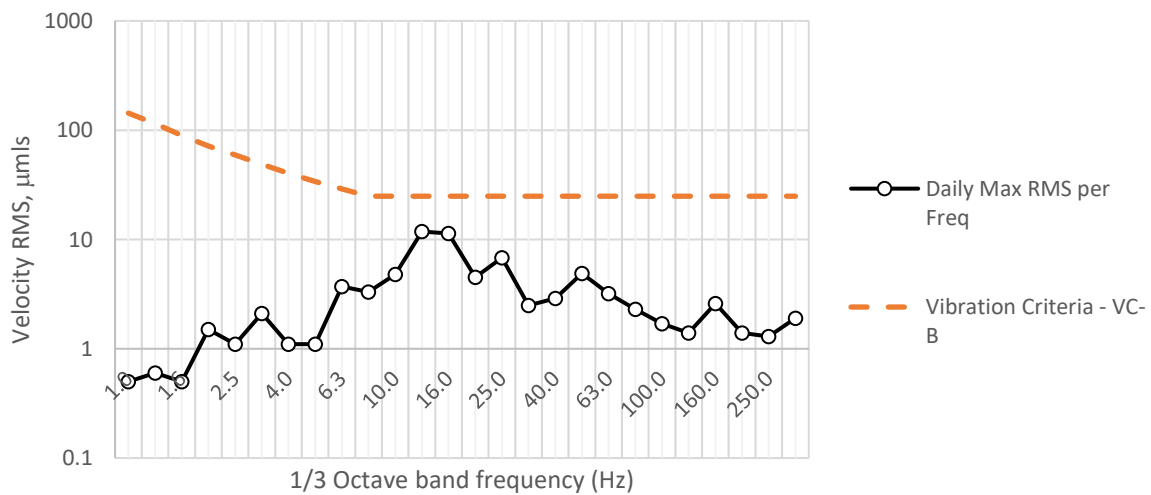
Vertical Vibration



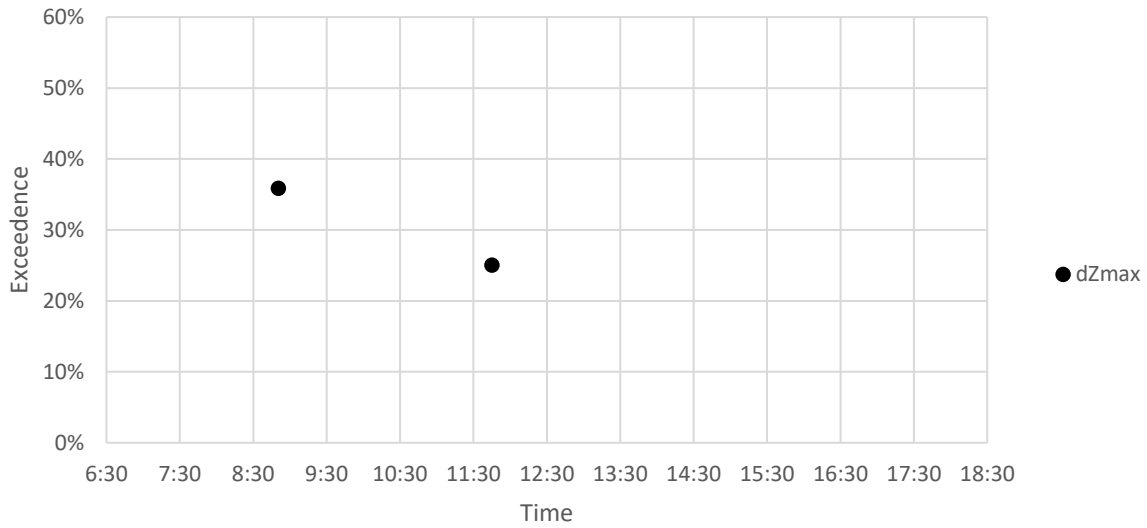
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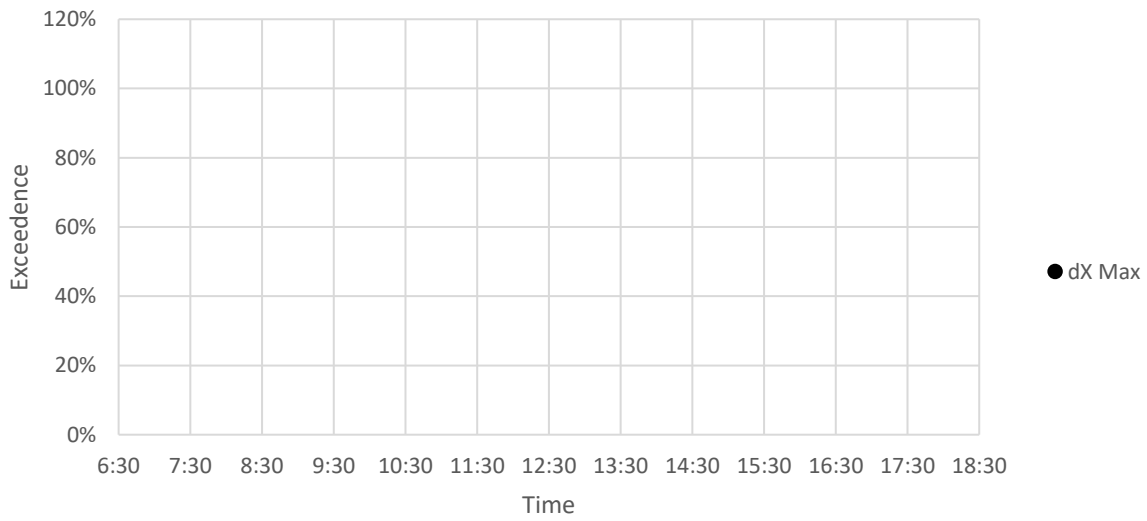
Sideways Vibration



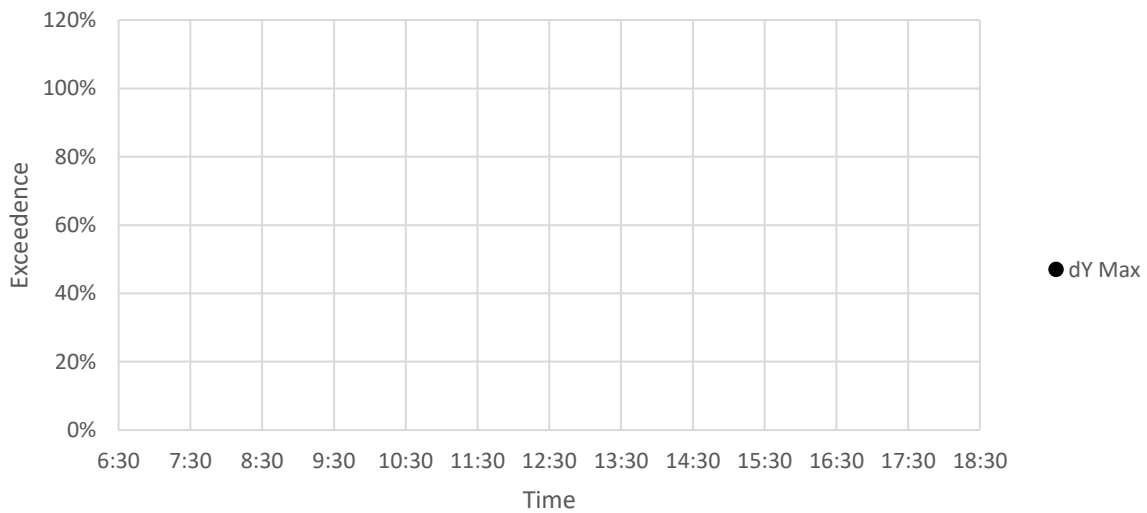
Vertical



Fwd/Backwards

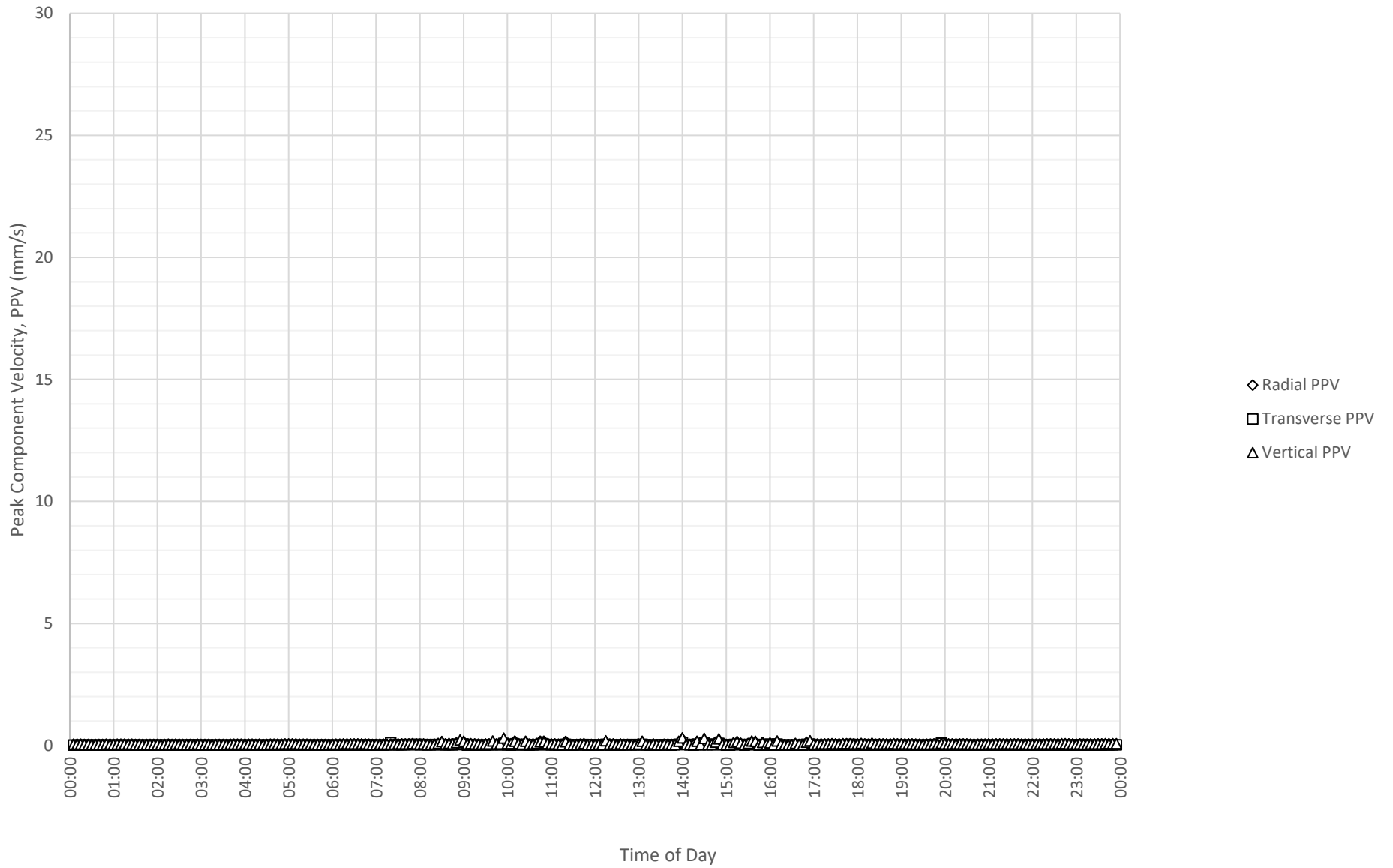


Sideways

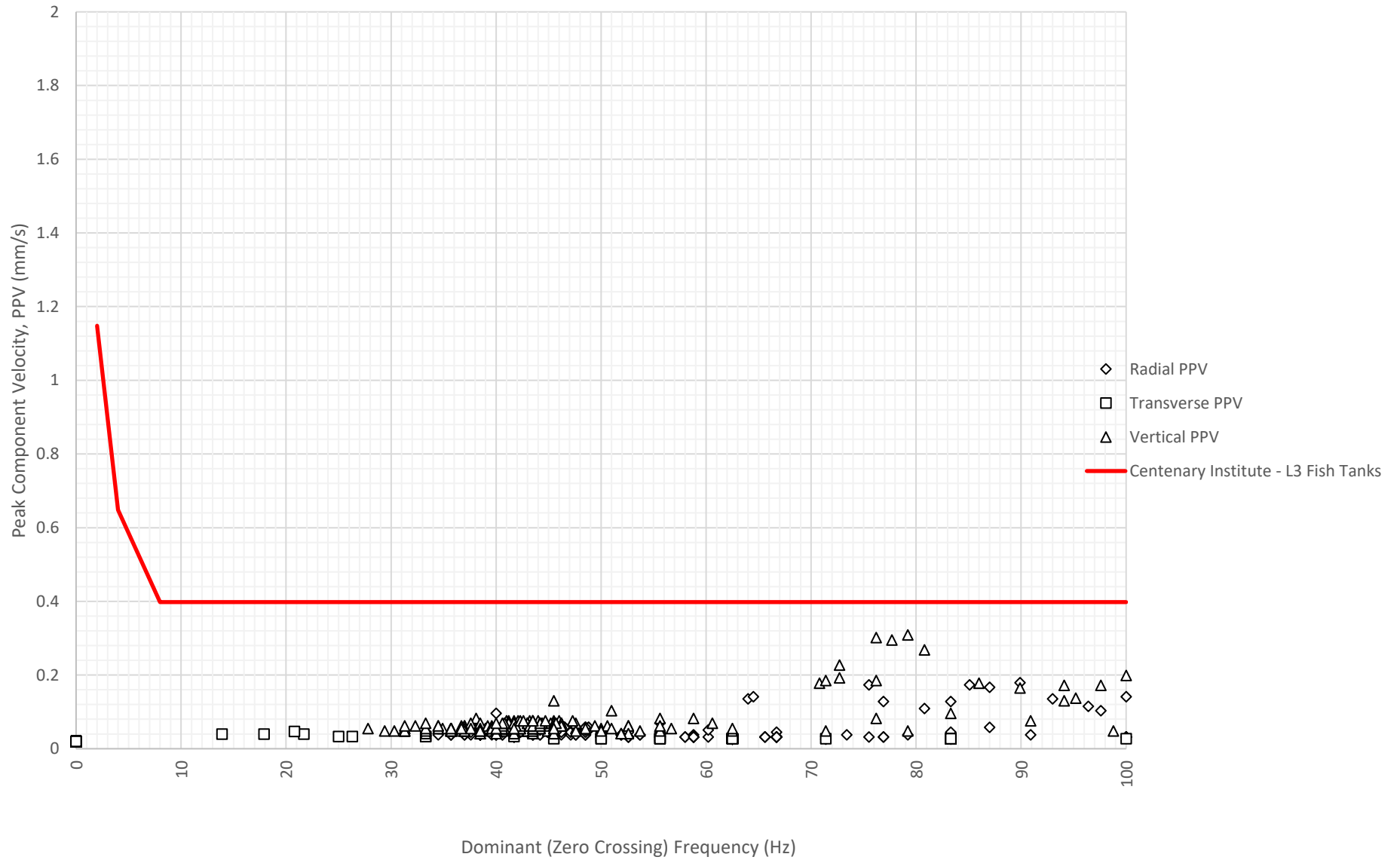


CENTENARY INSTITUTE – LEVEL 3 FISH TANKS

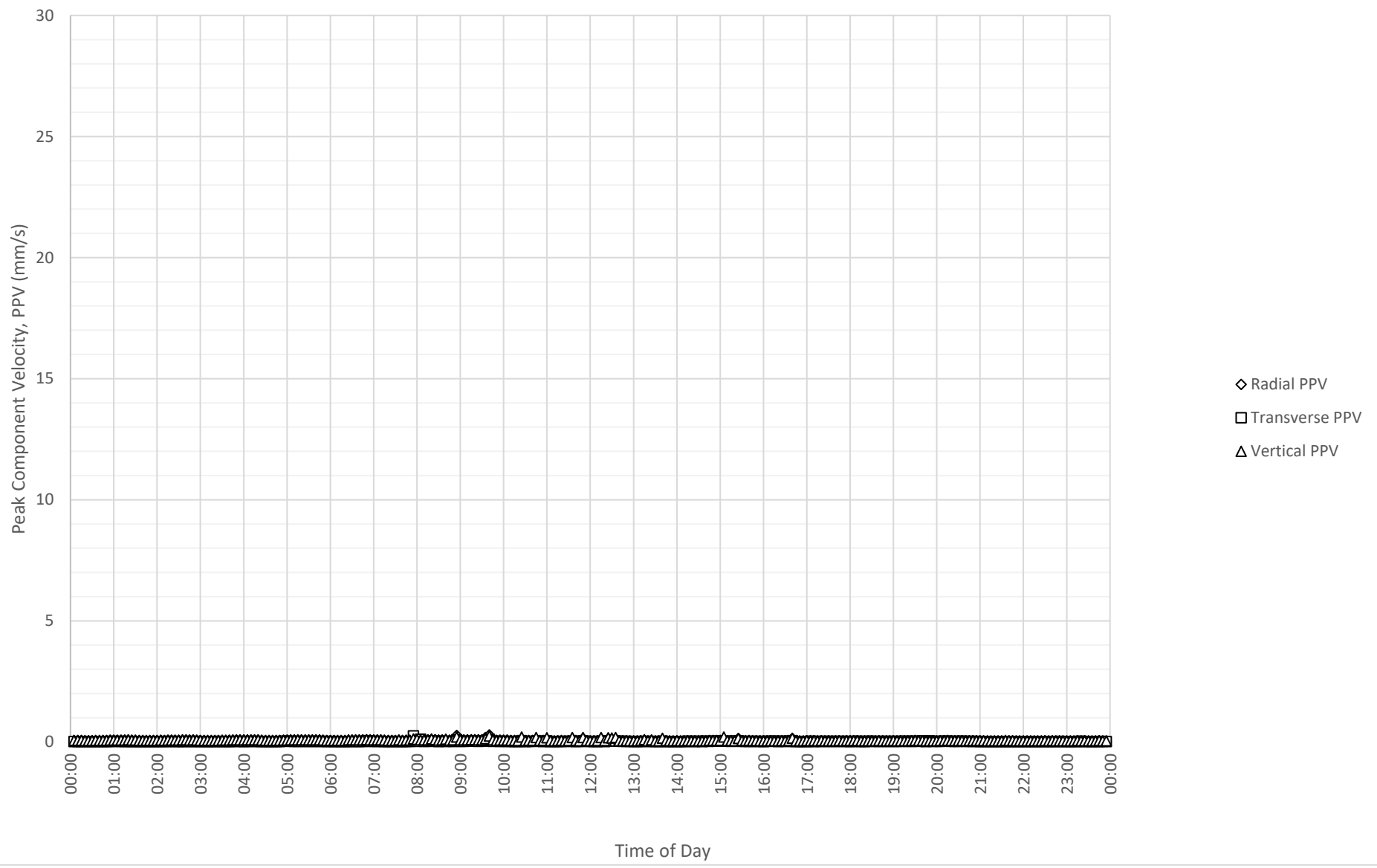
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 7-12-2023



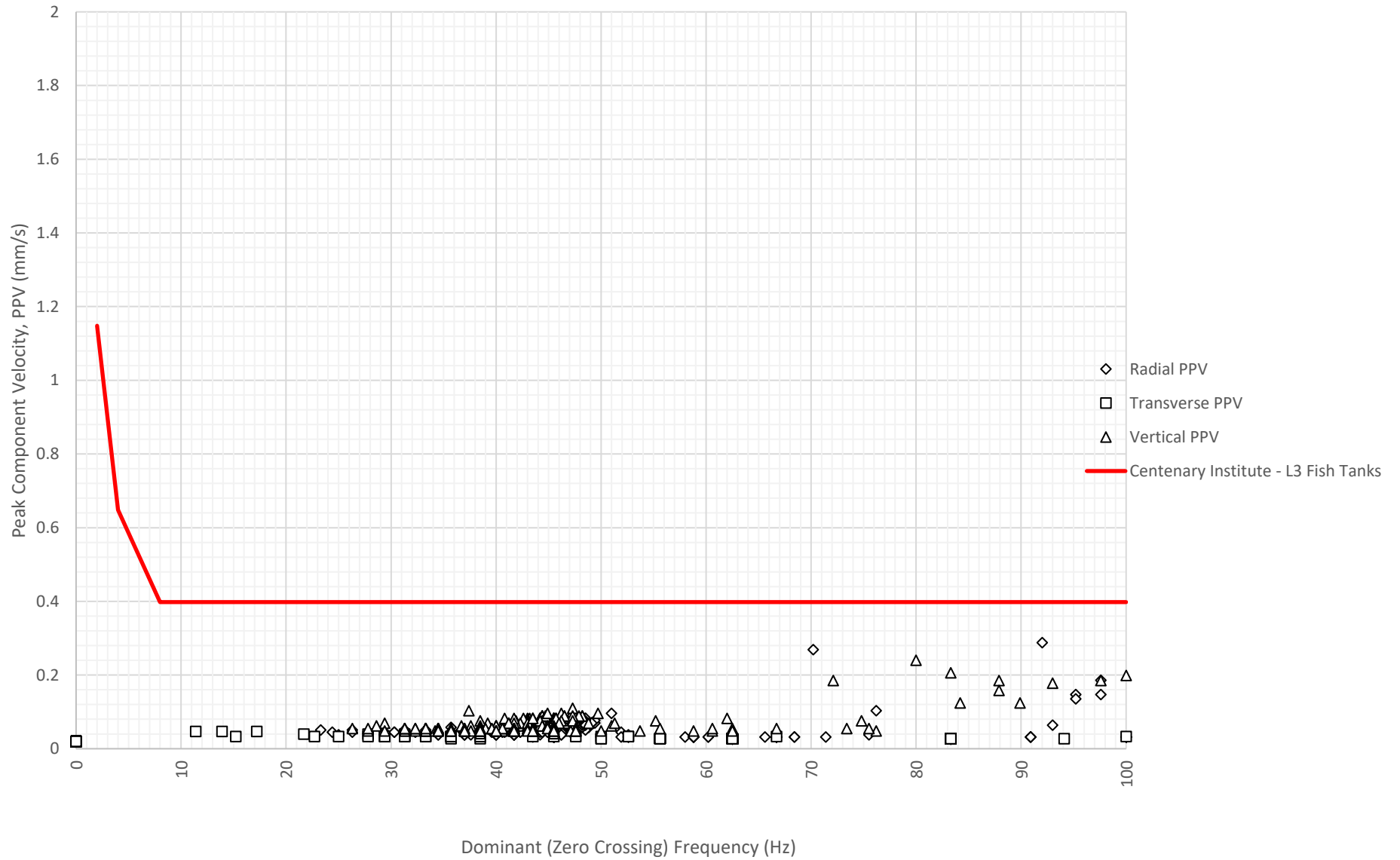
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 7-12-2023



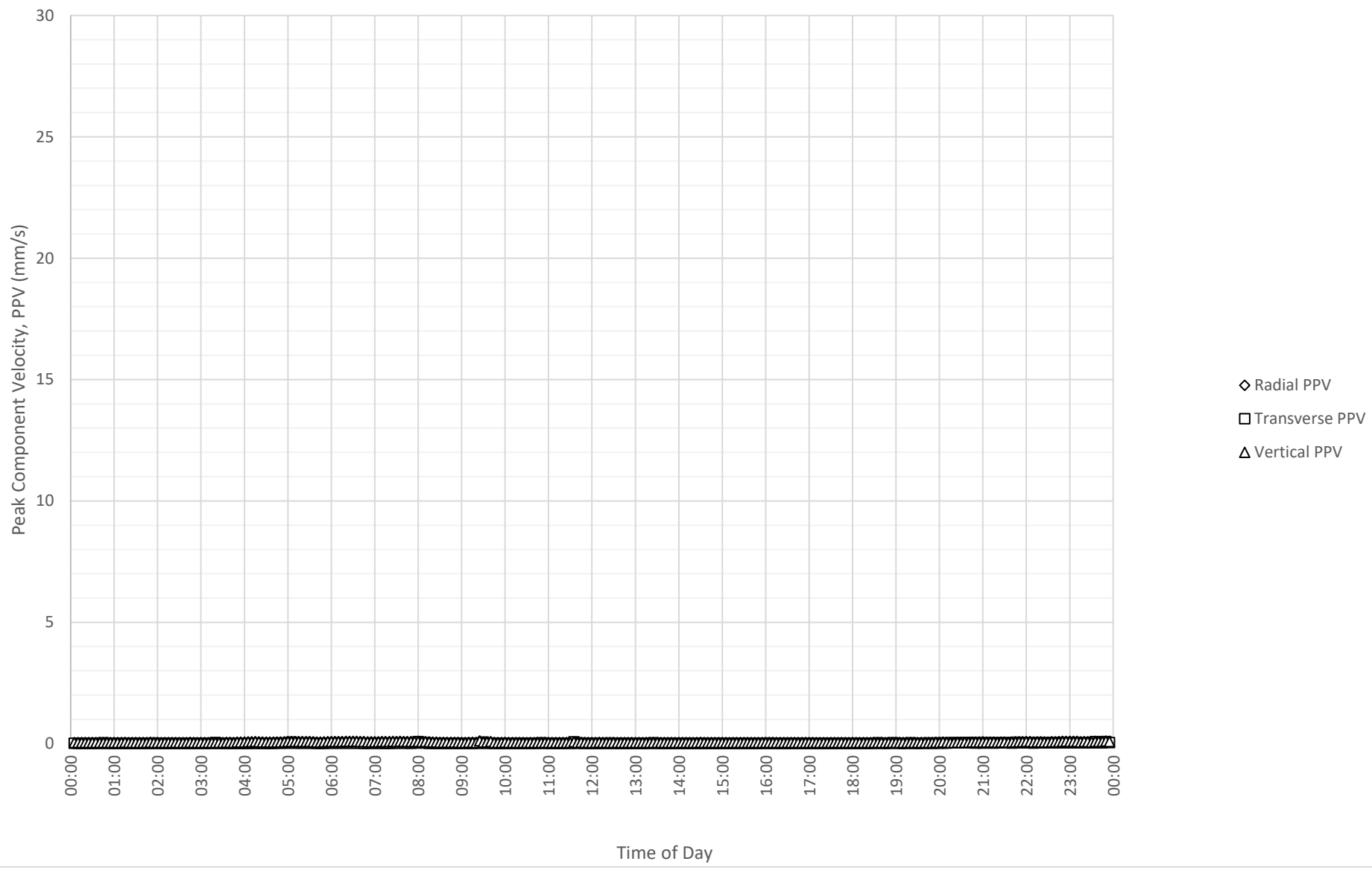
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 8-12-2023



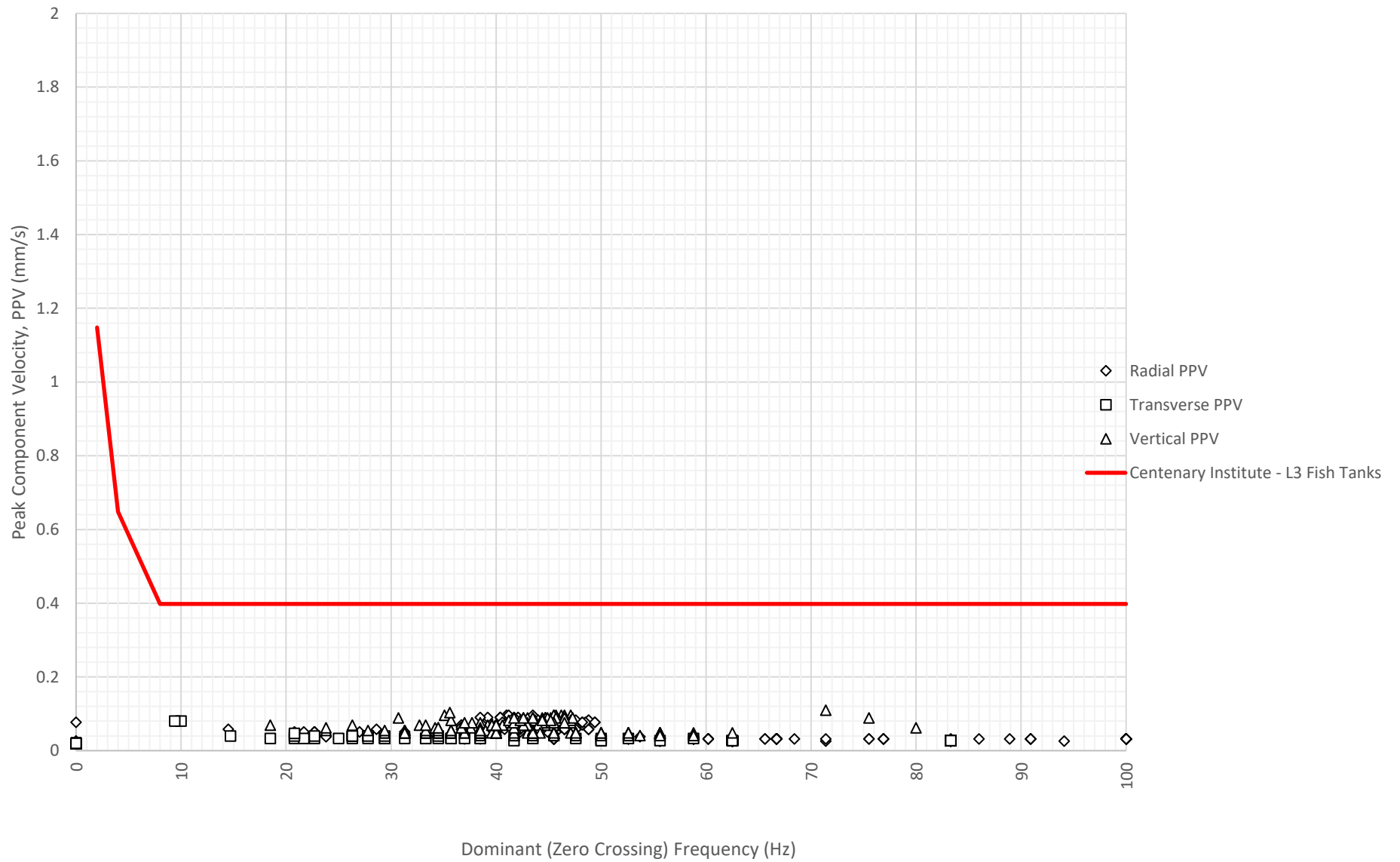
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 8-12-2023



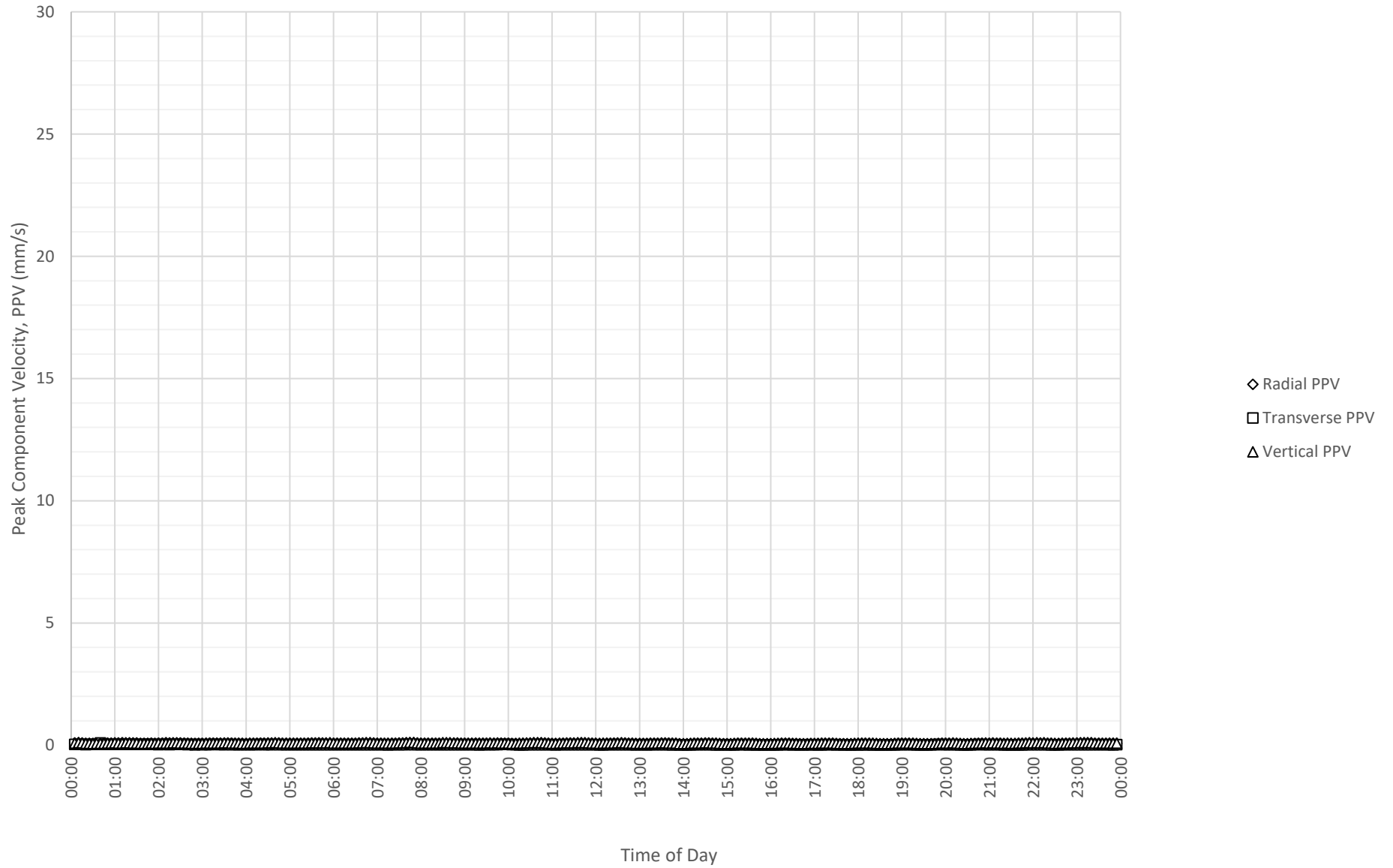
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 9-12-2023



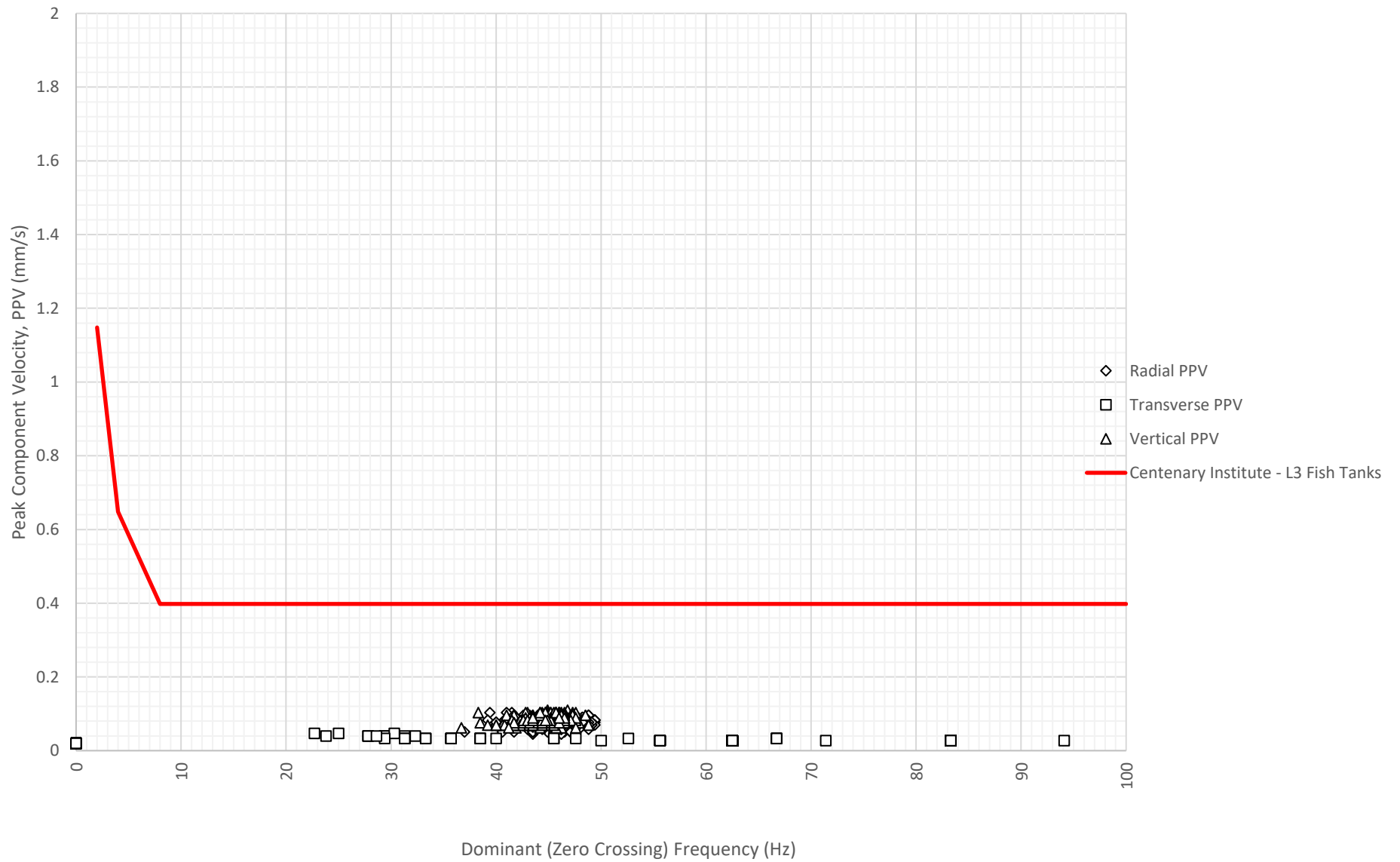
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 9-12-2023



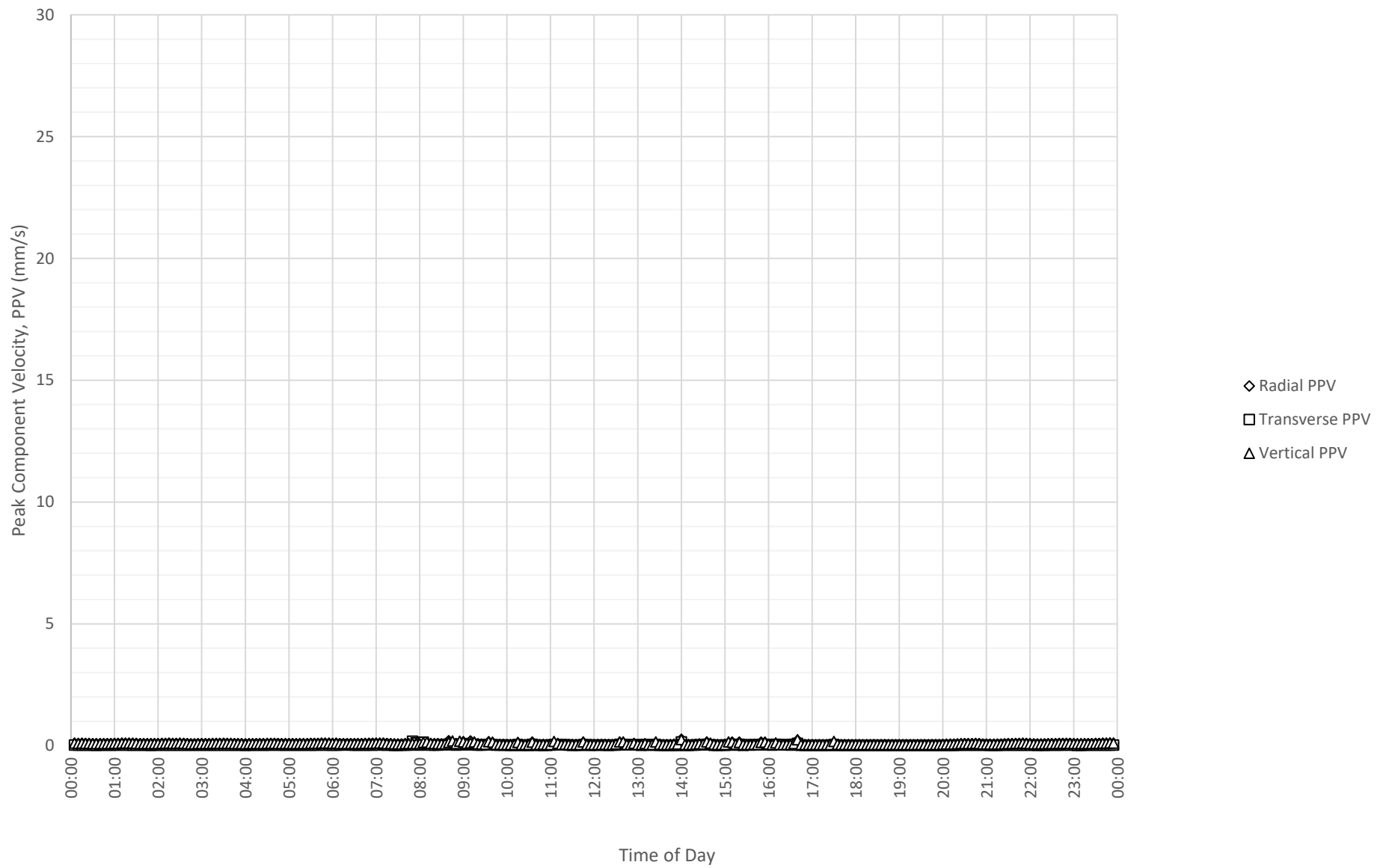
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 10-12-2023



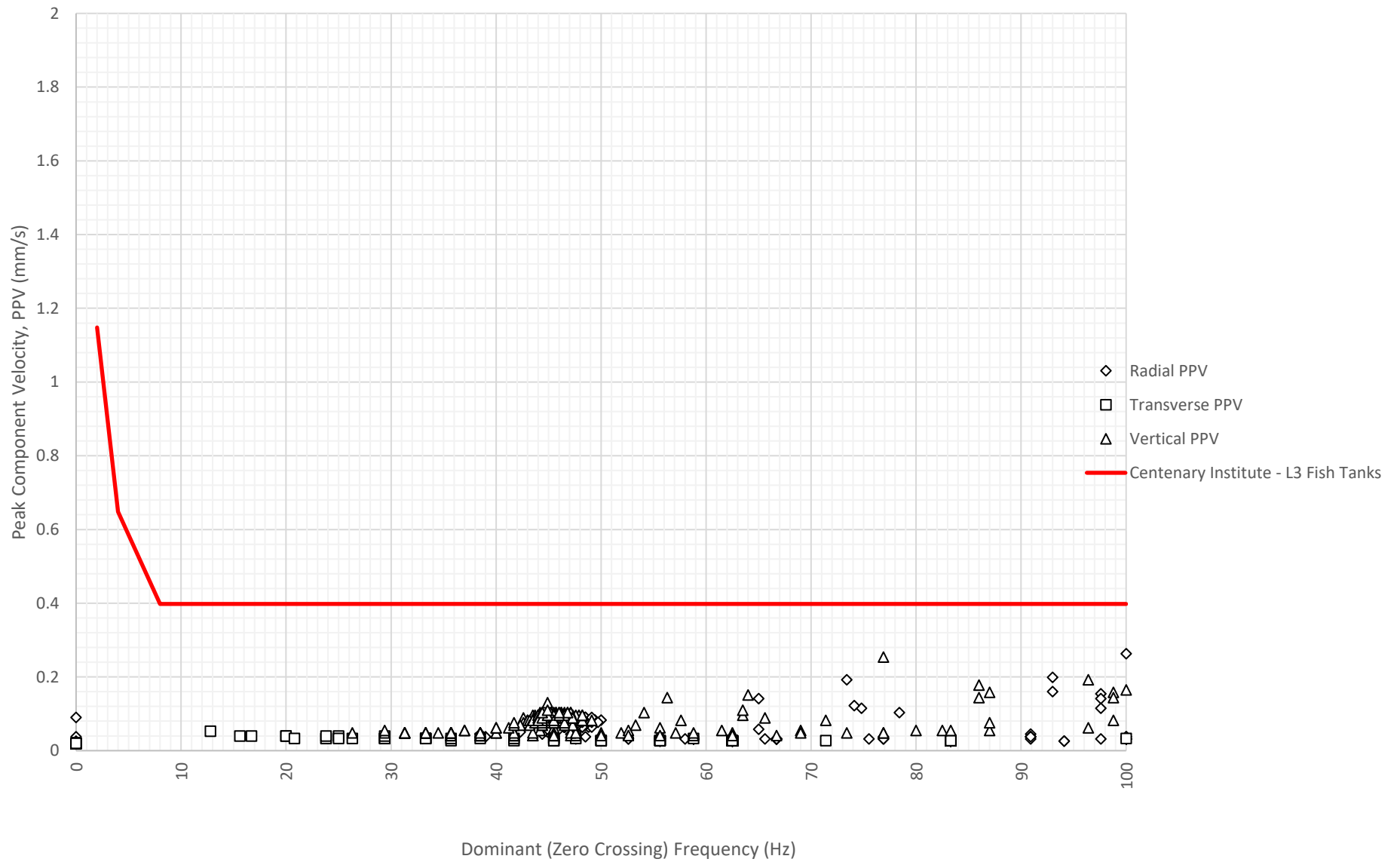
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 10-12-2023



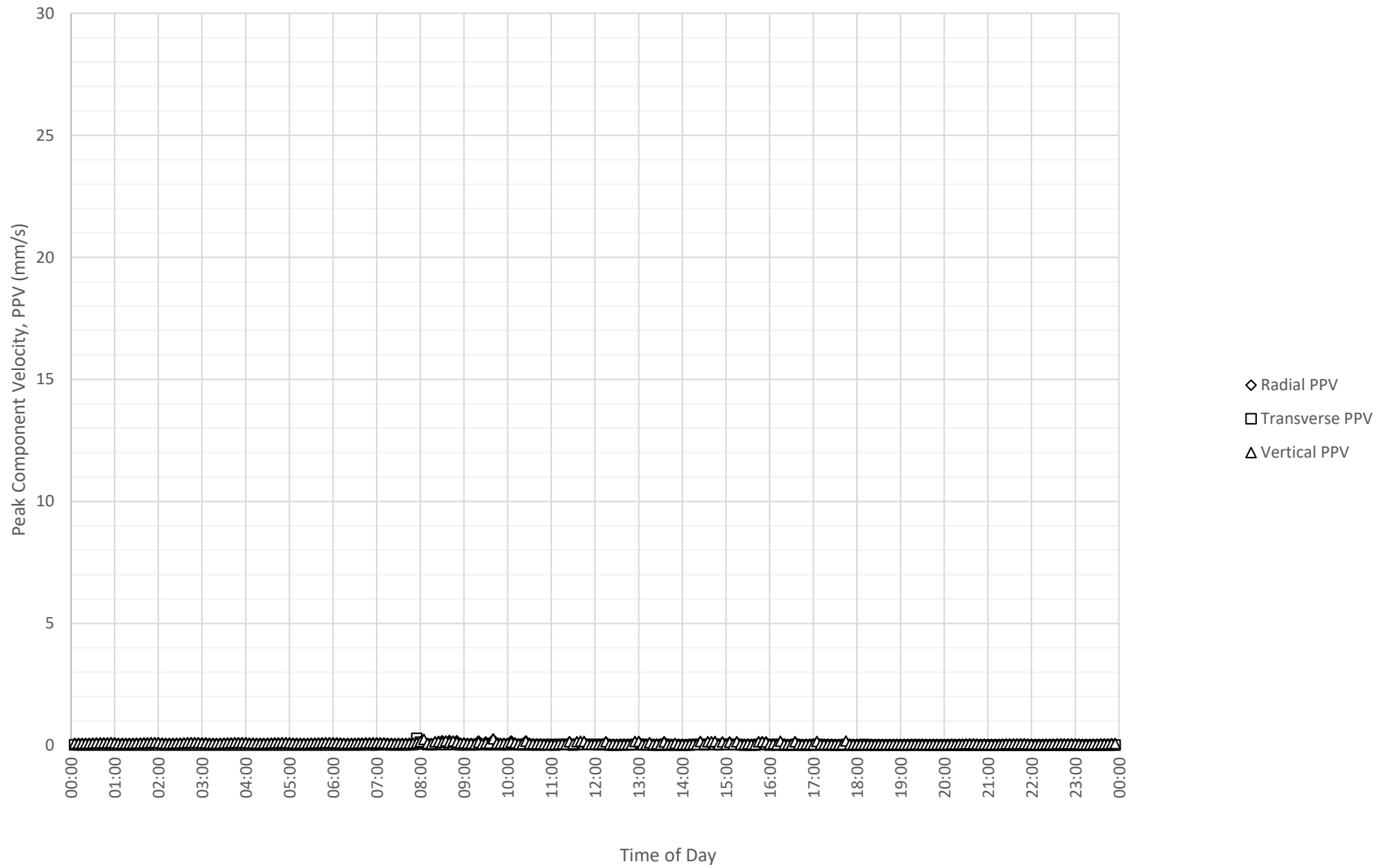
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 11-12-2023



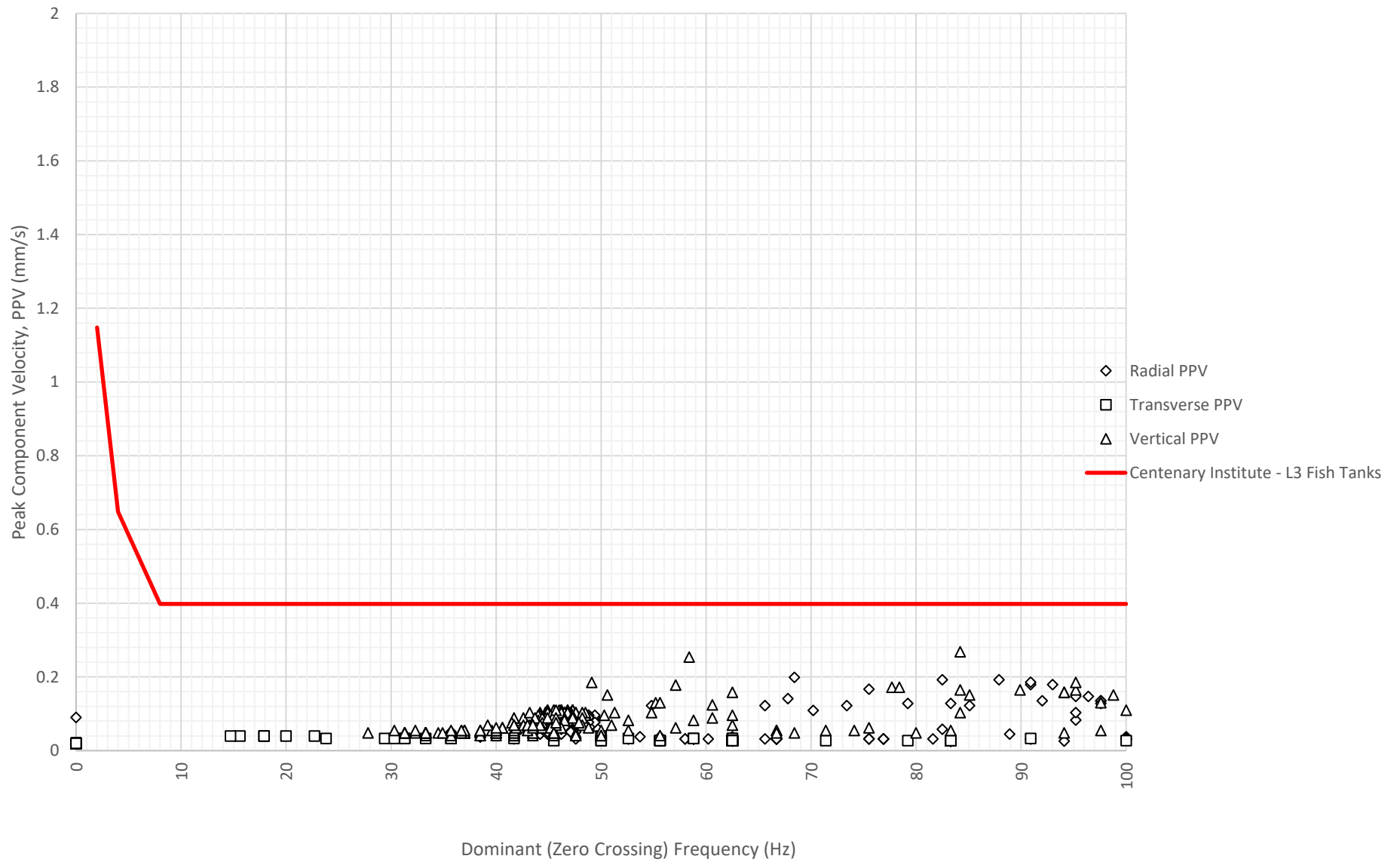
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 11-12-2023



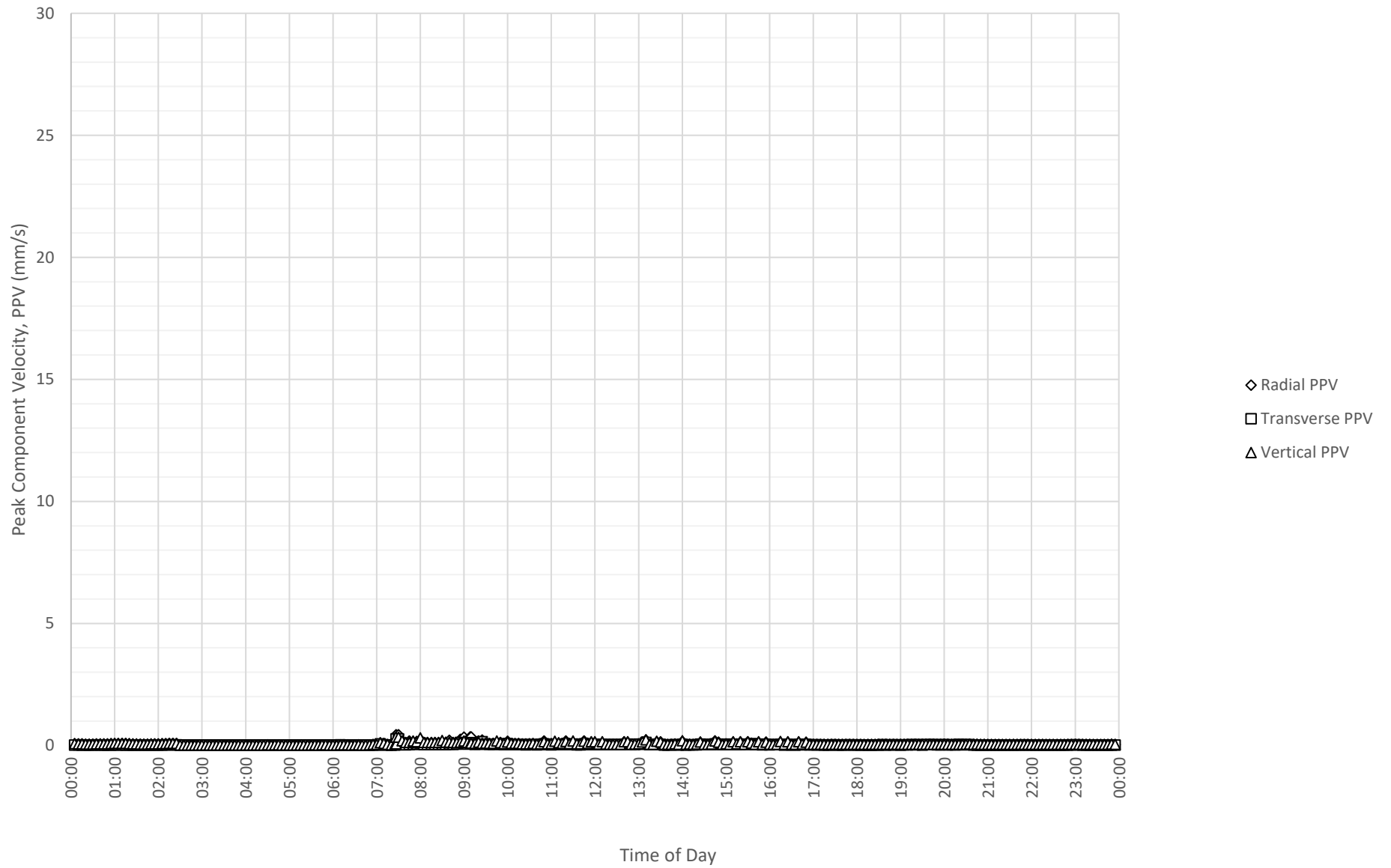
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 12-12-2023



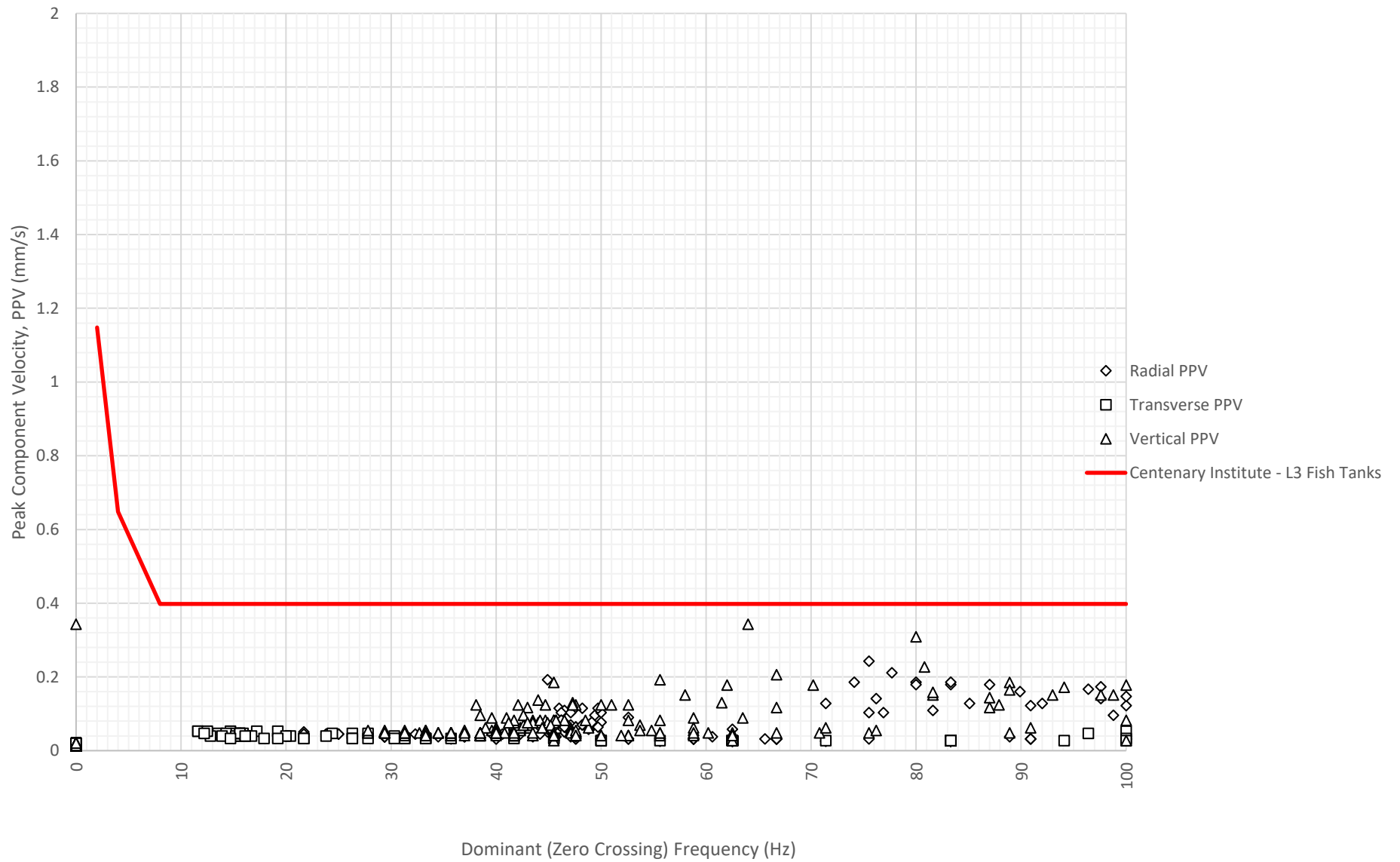
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 12-12-2023



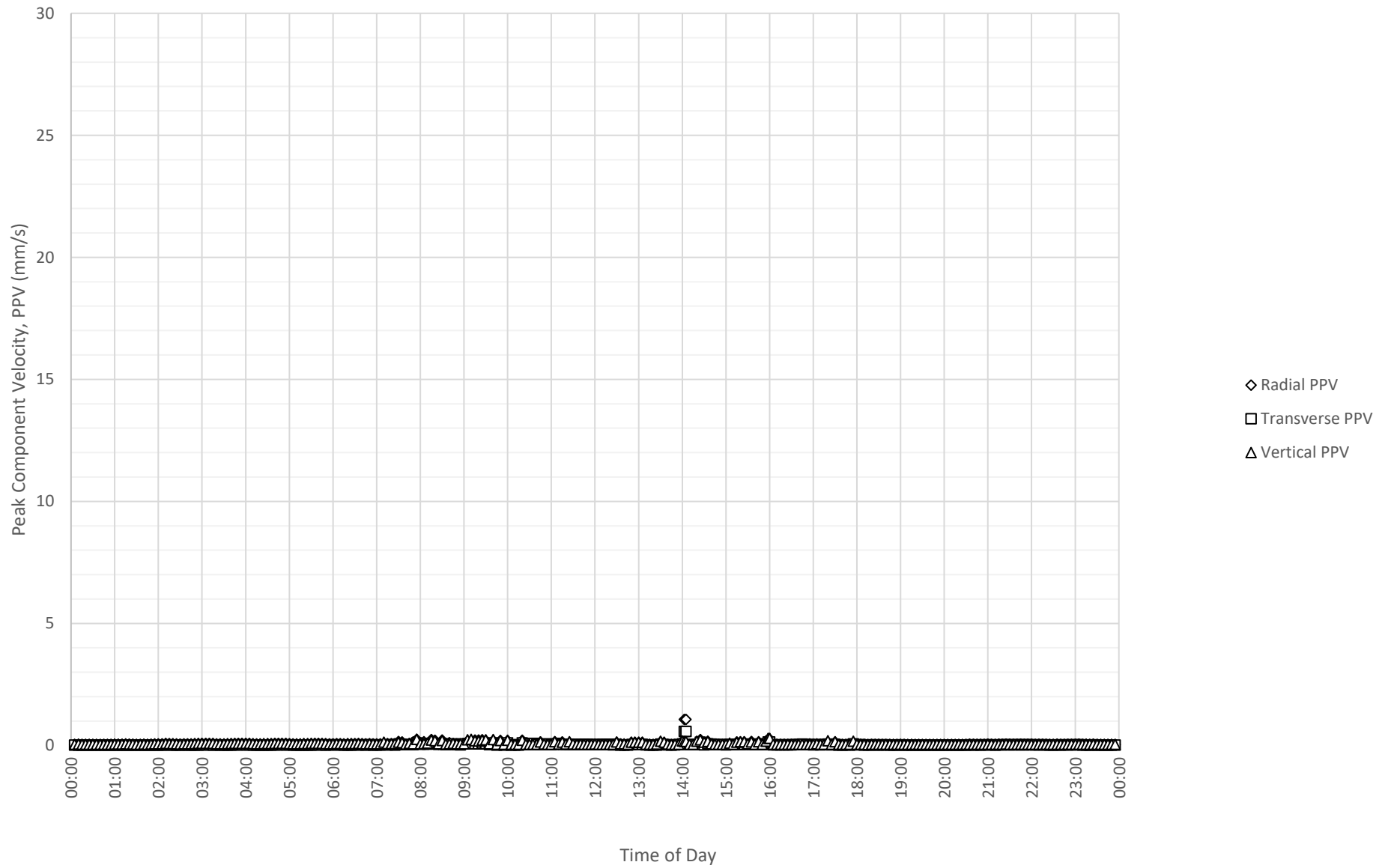
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 13-12-2023



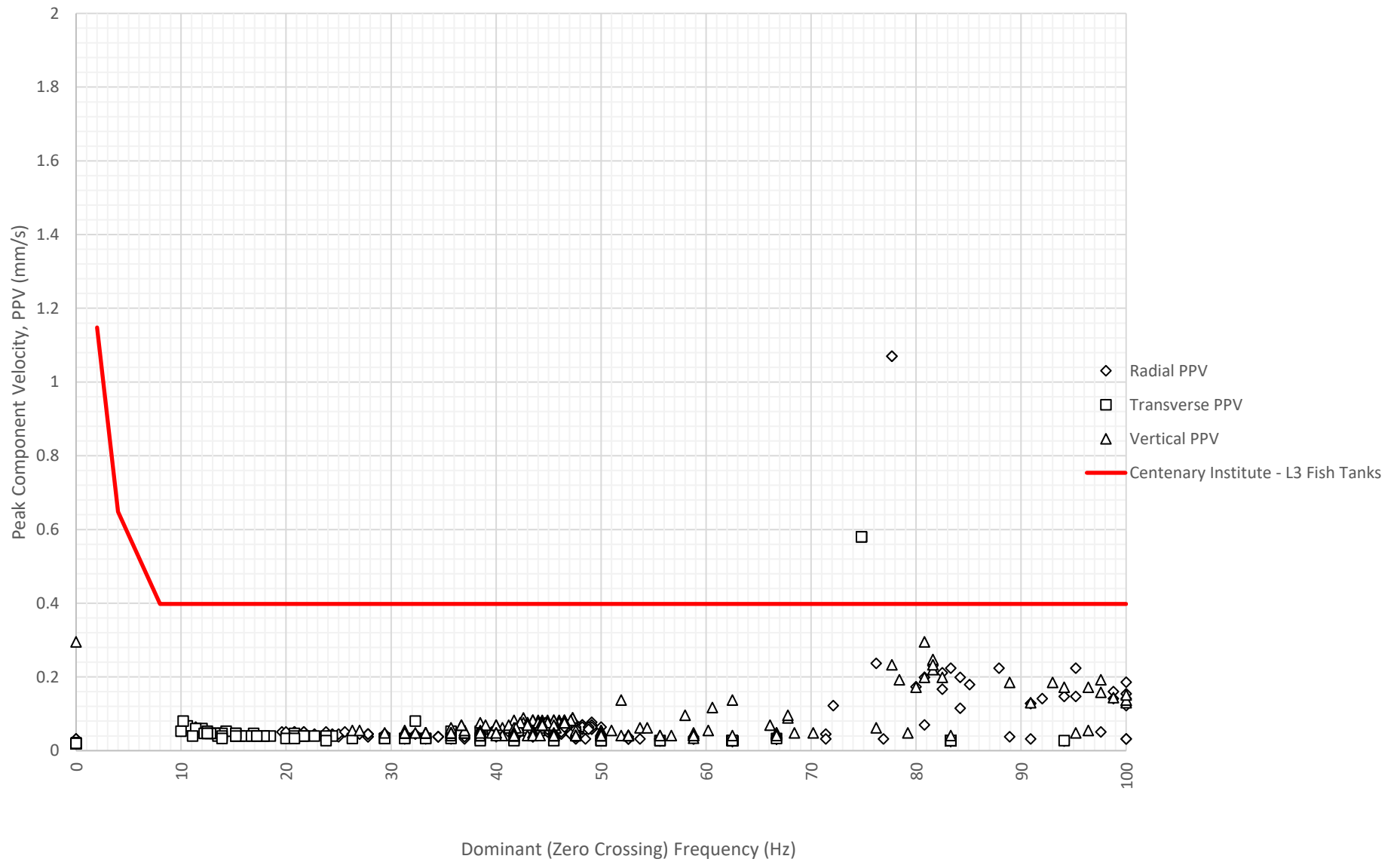
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 13-12-2023



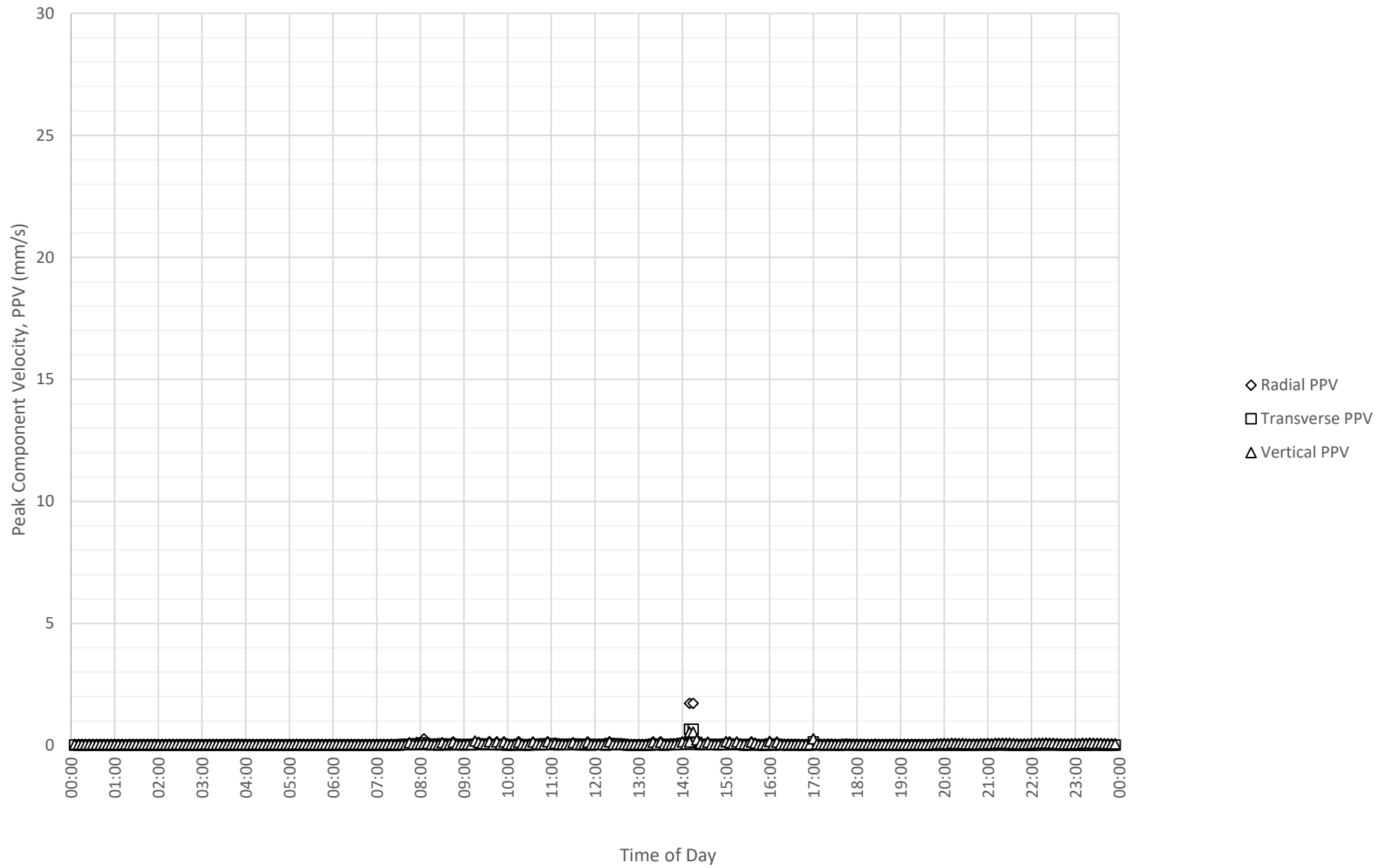
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 14-12-2023



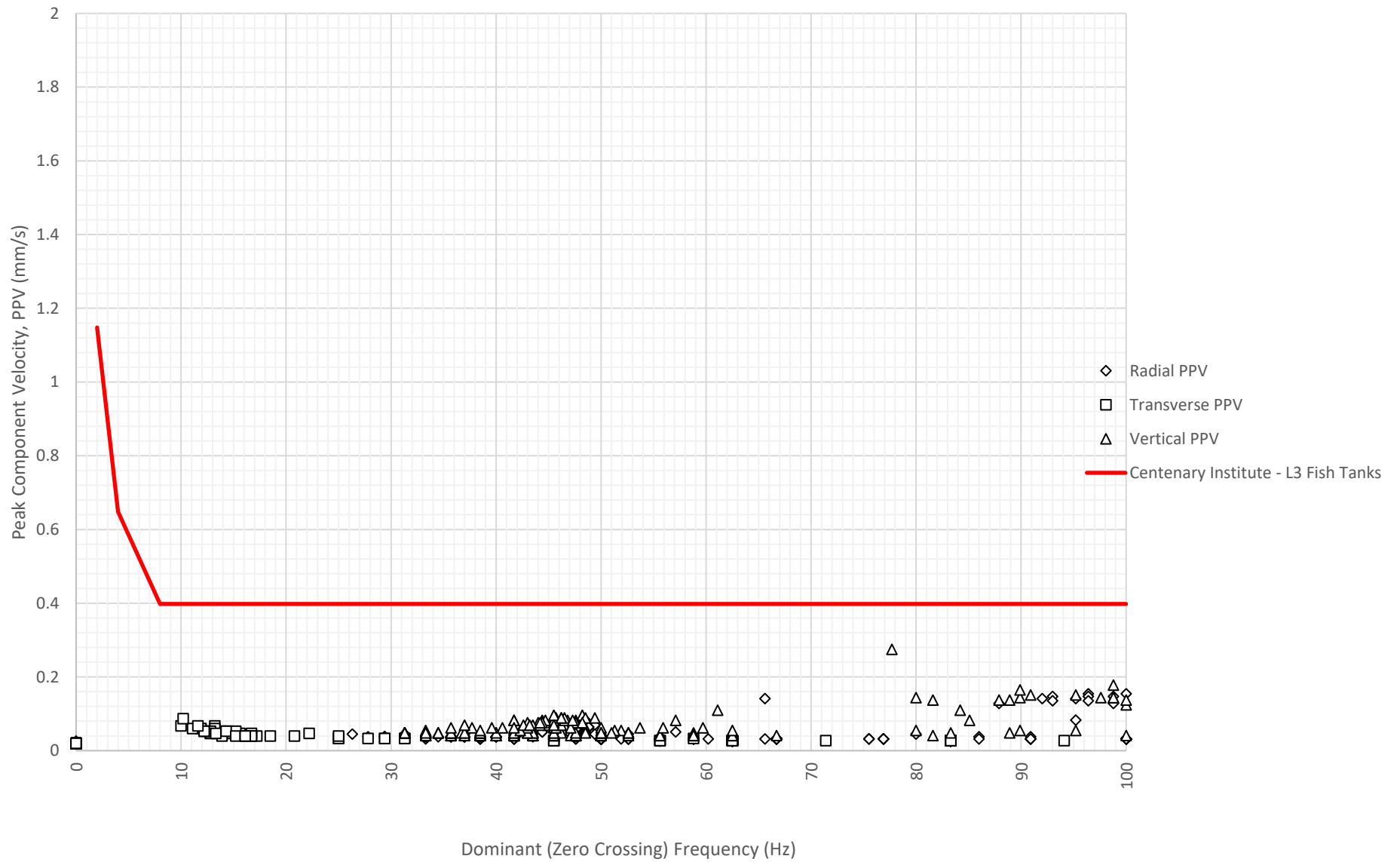
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 14-12-2023



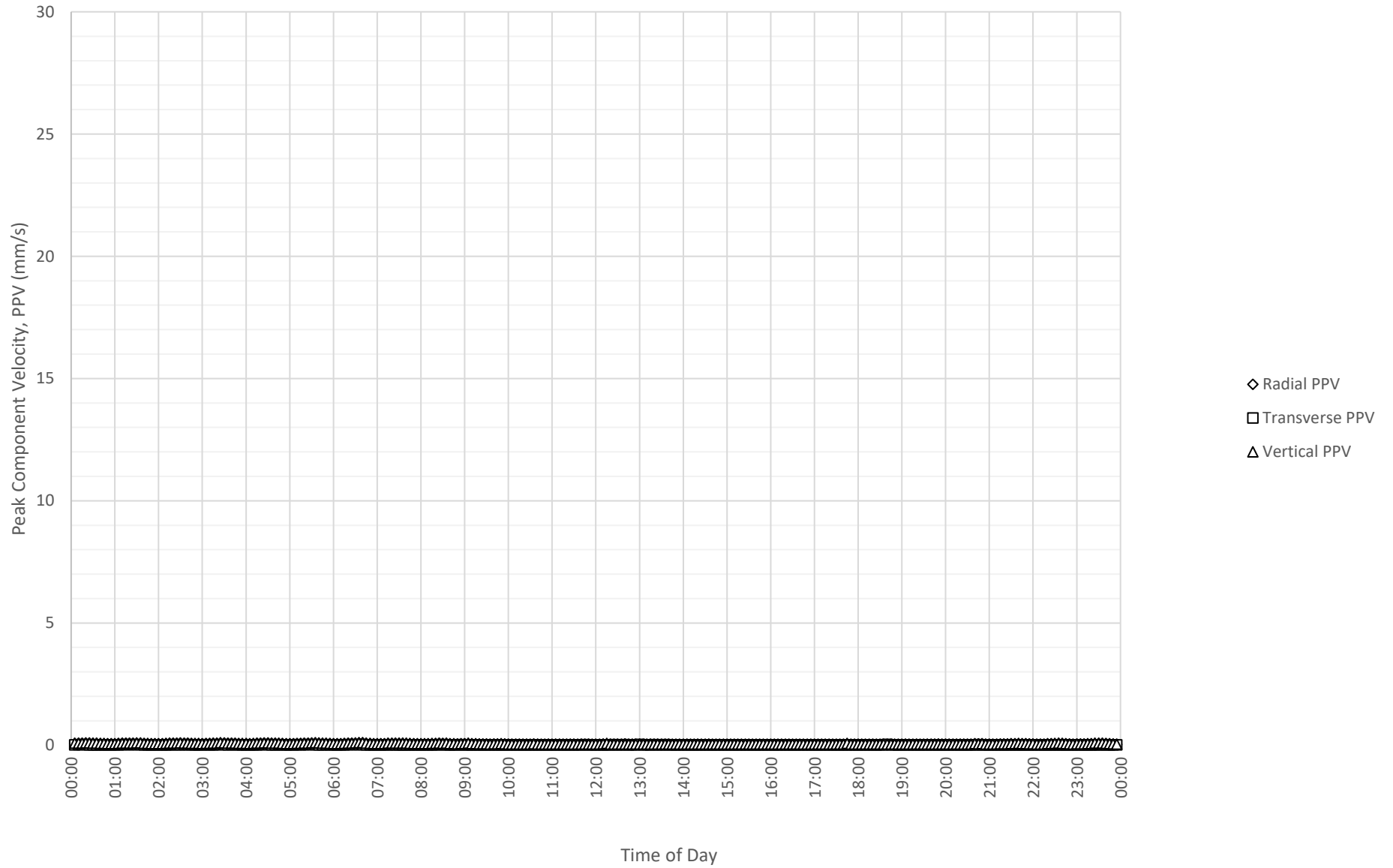
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 15-12-2023



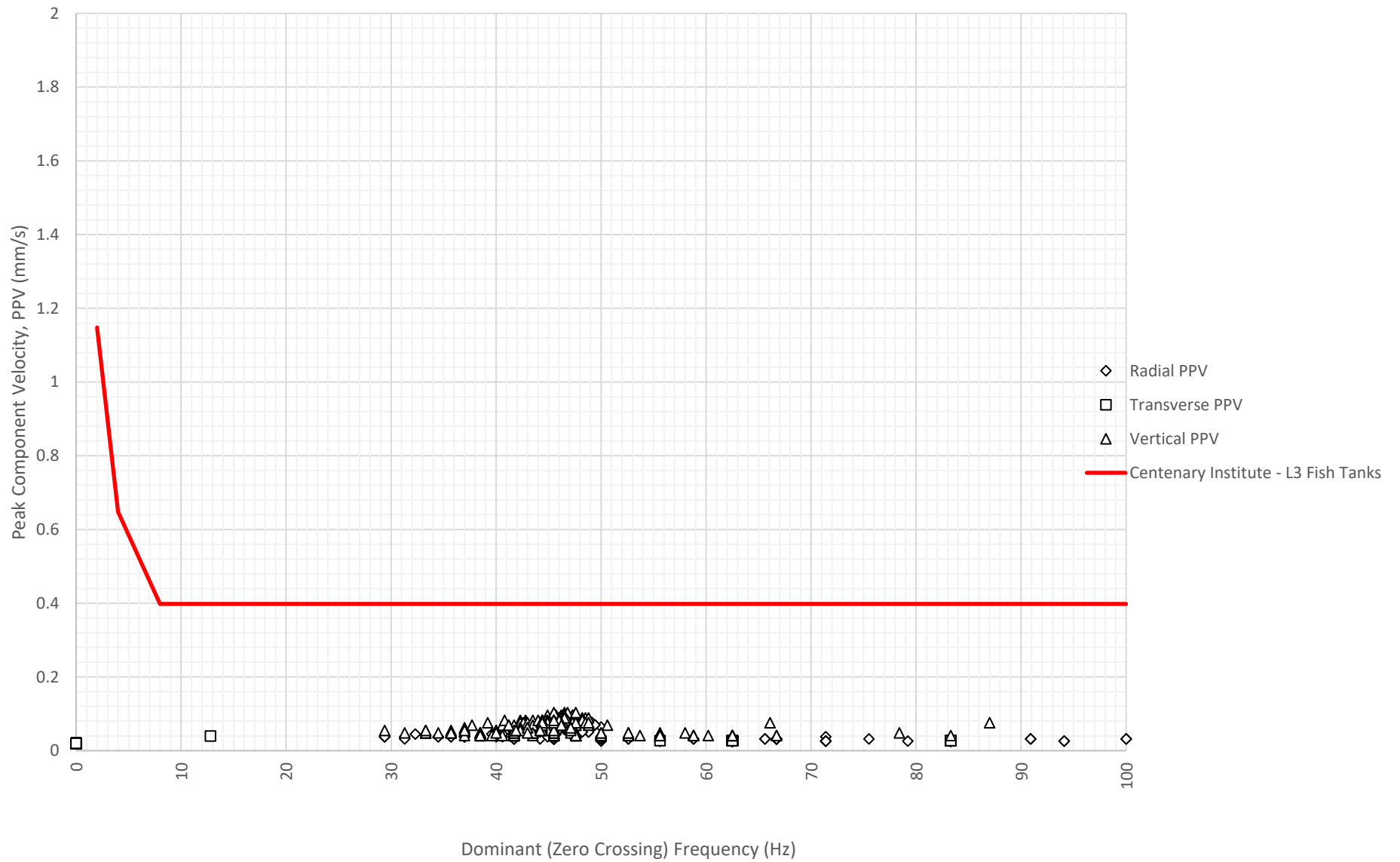
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 15-12-2023



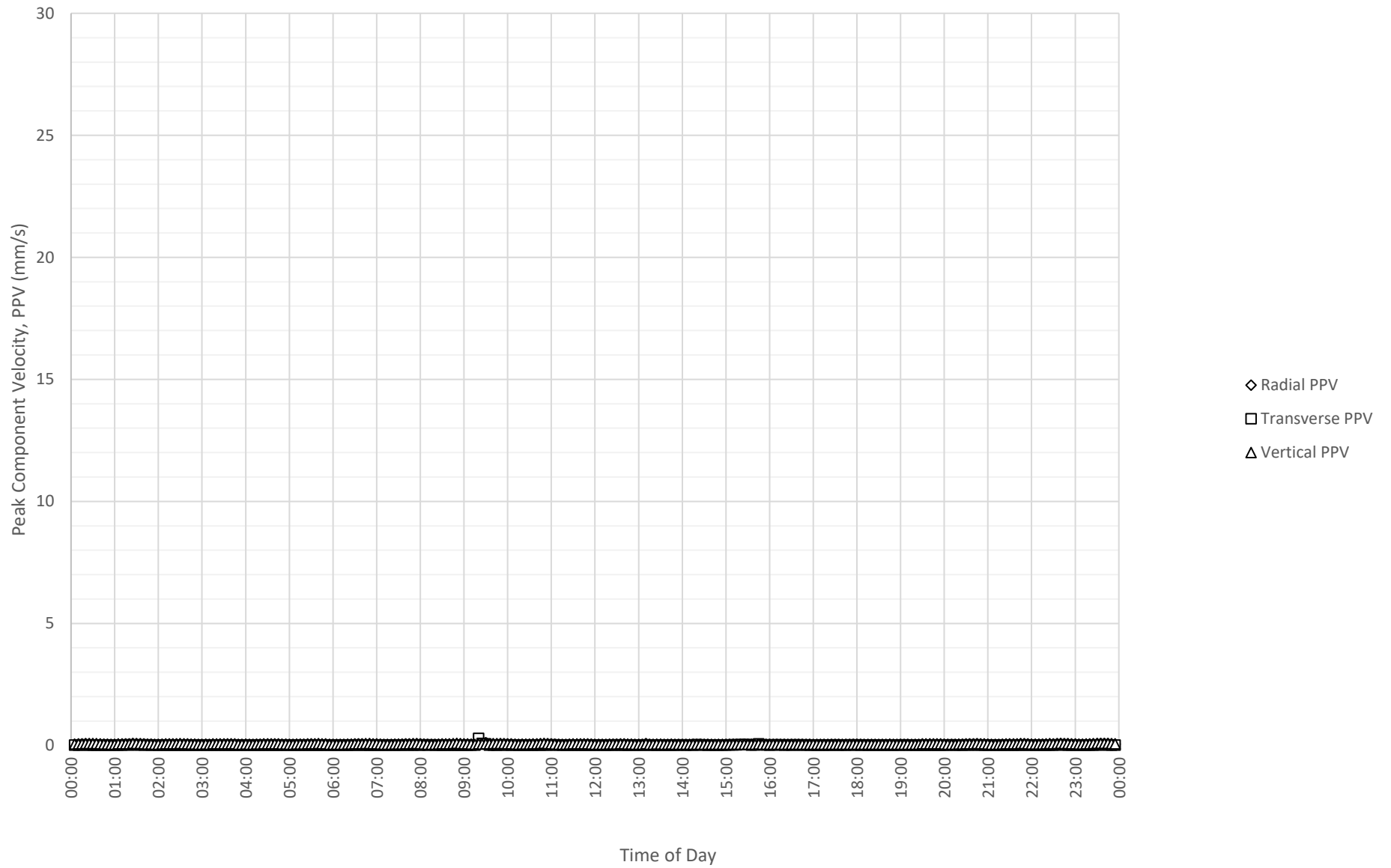
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 16-12-2023



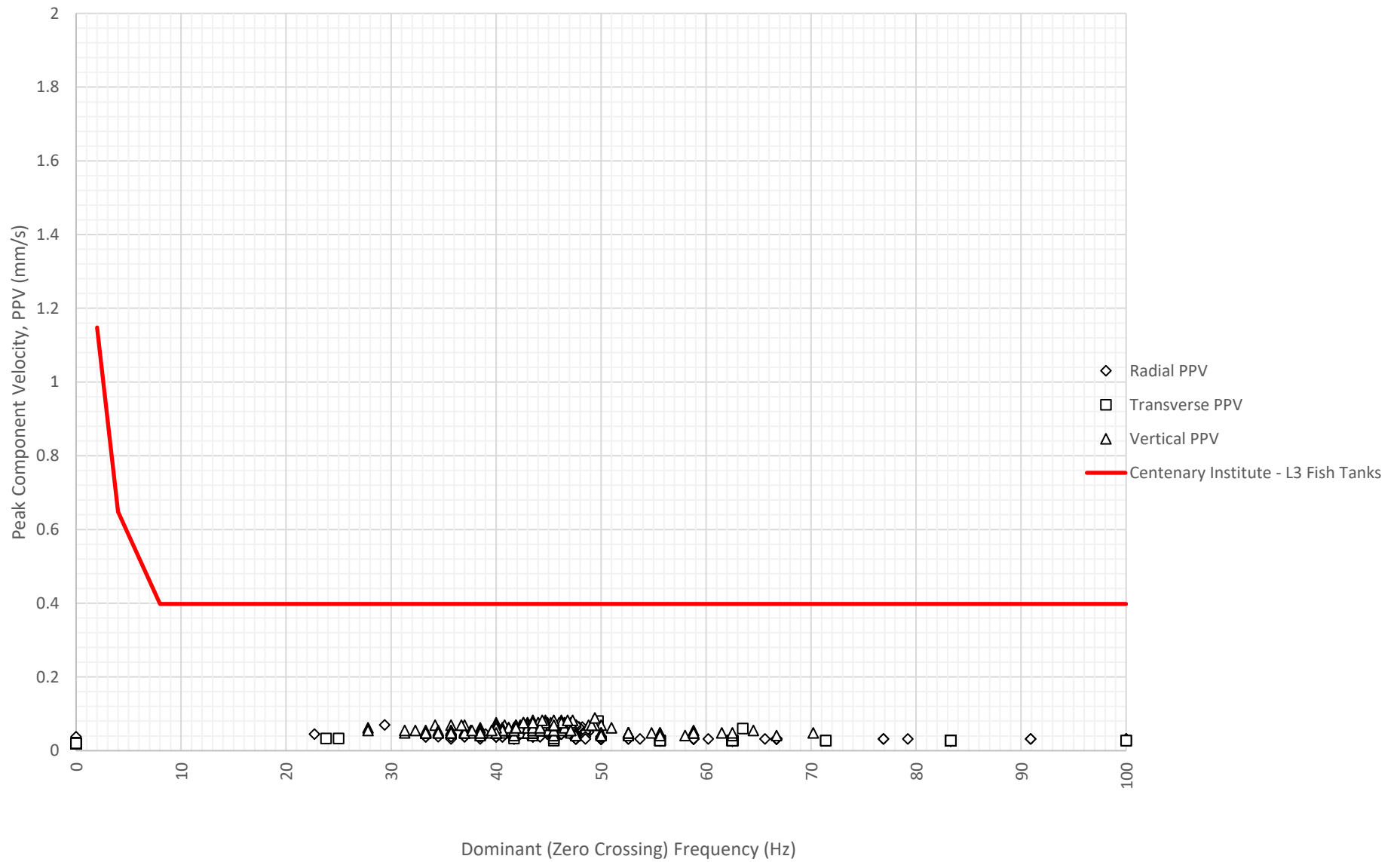
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 16-12-2023



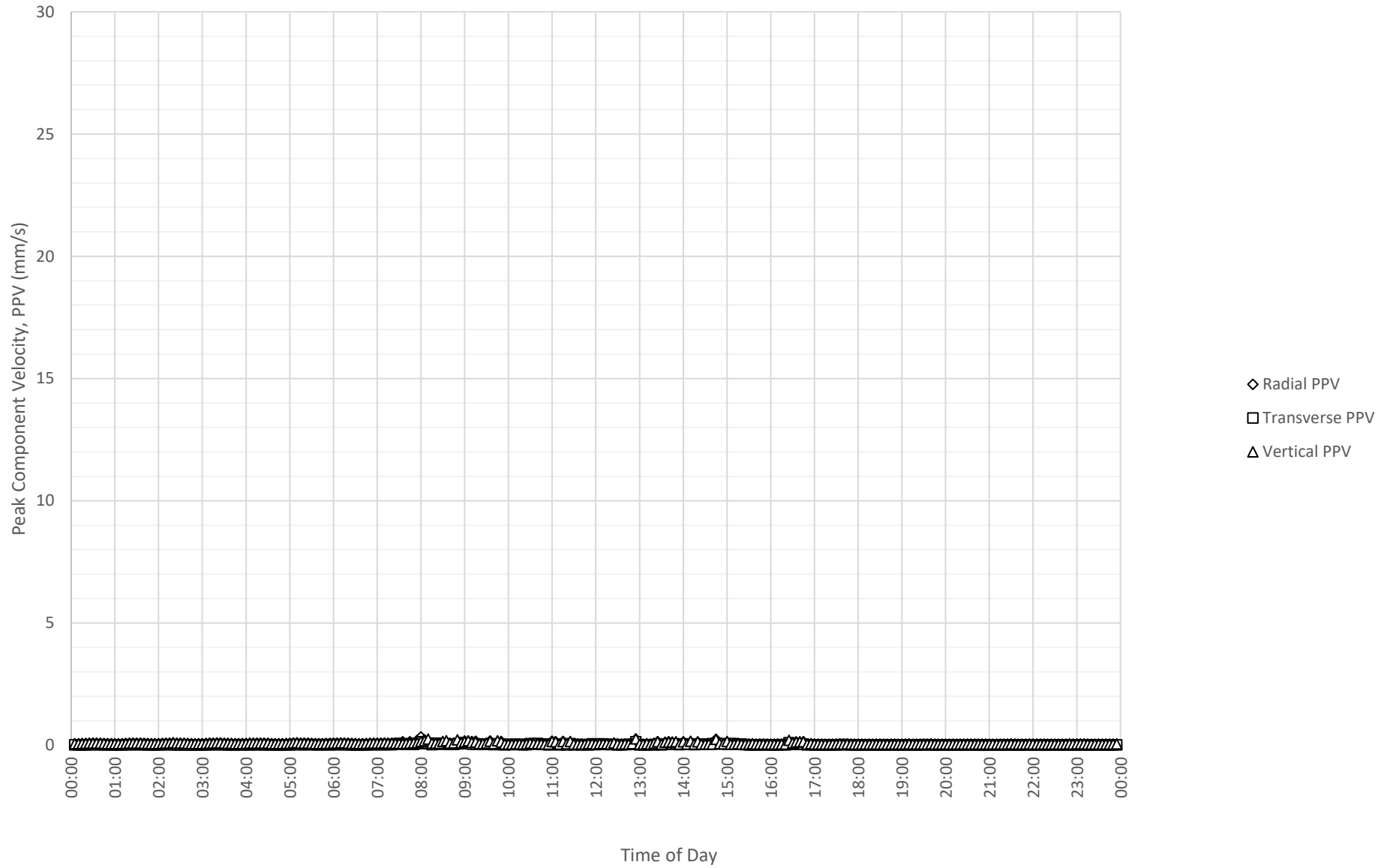
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 17-12-2023



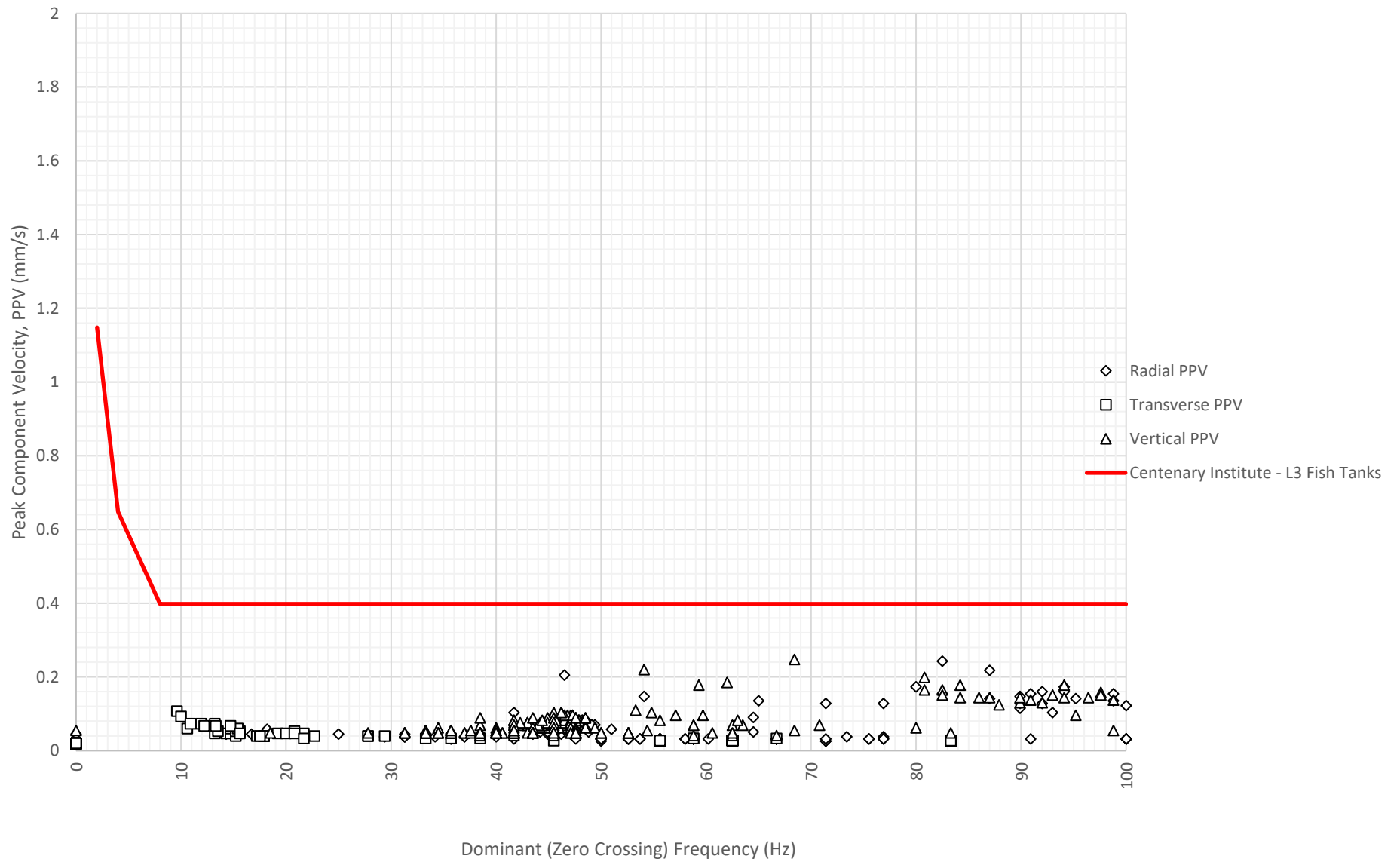
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 17-12-2023



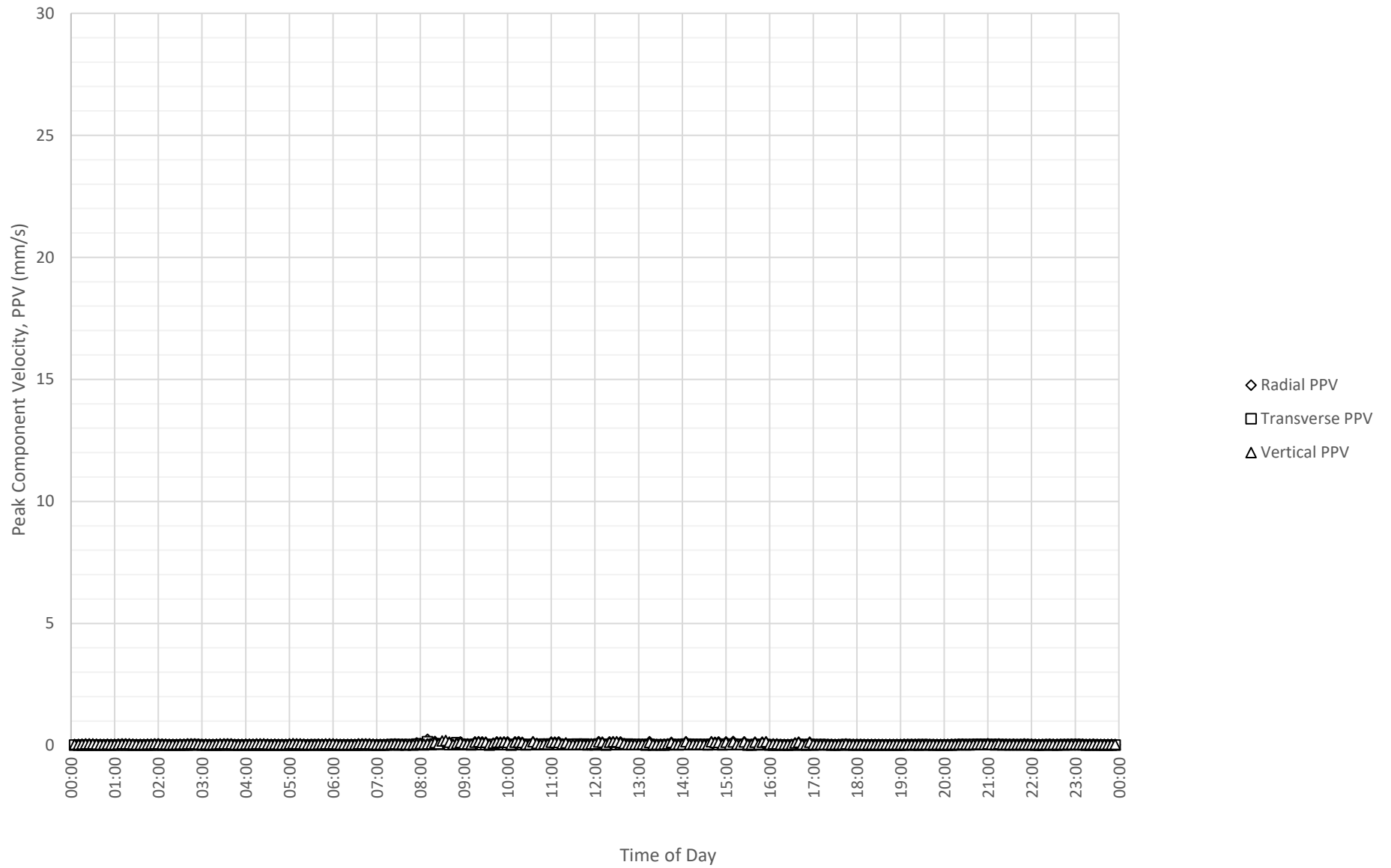
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 18-12-2023



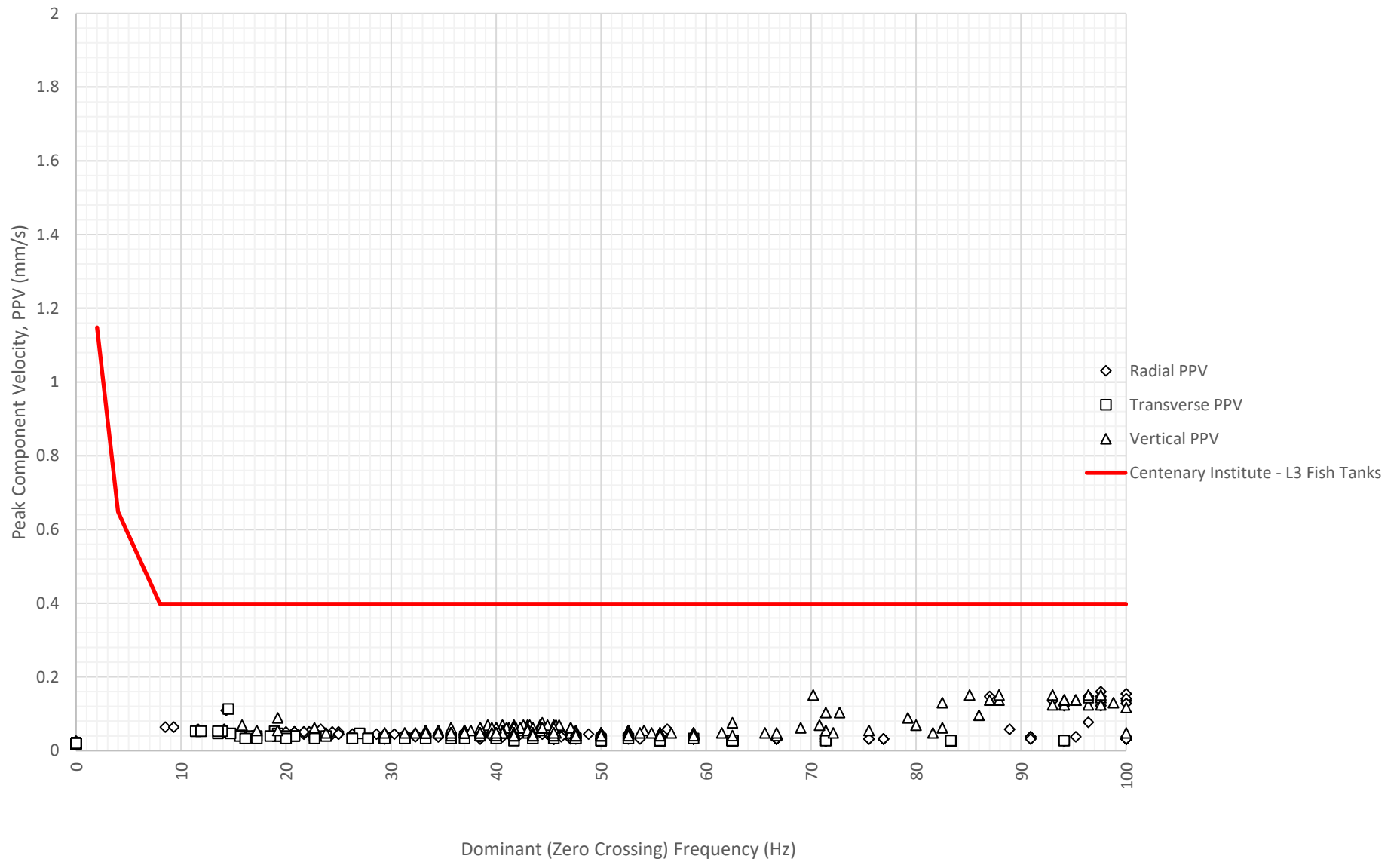
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 18-12-2023



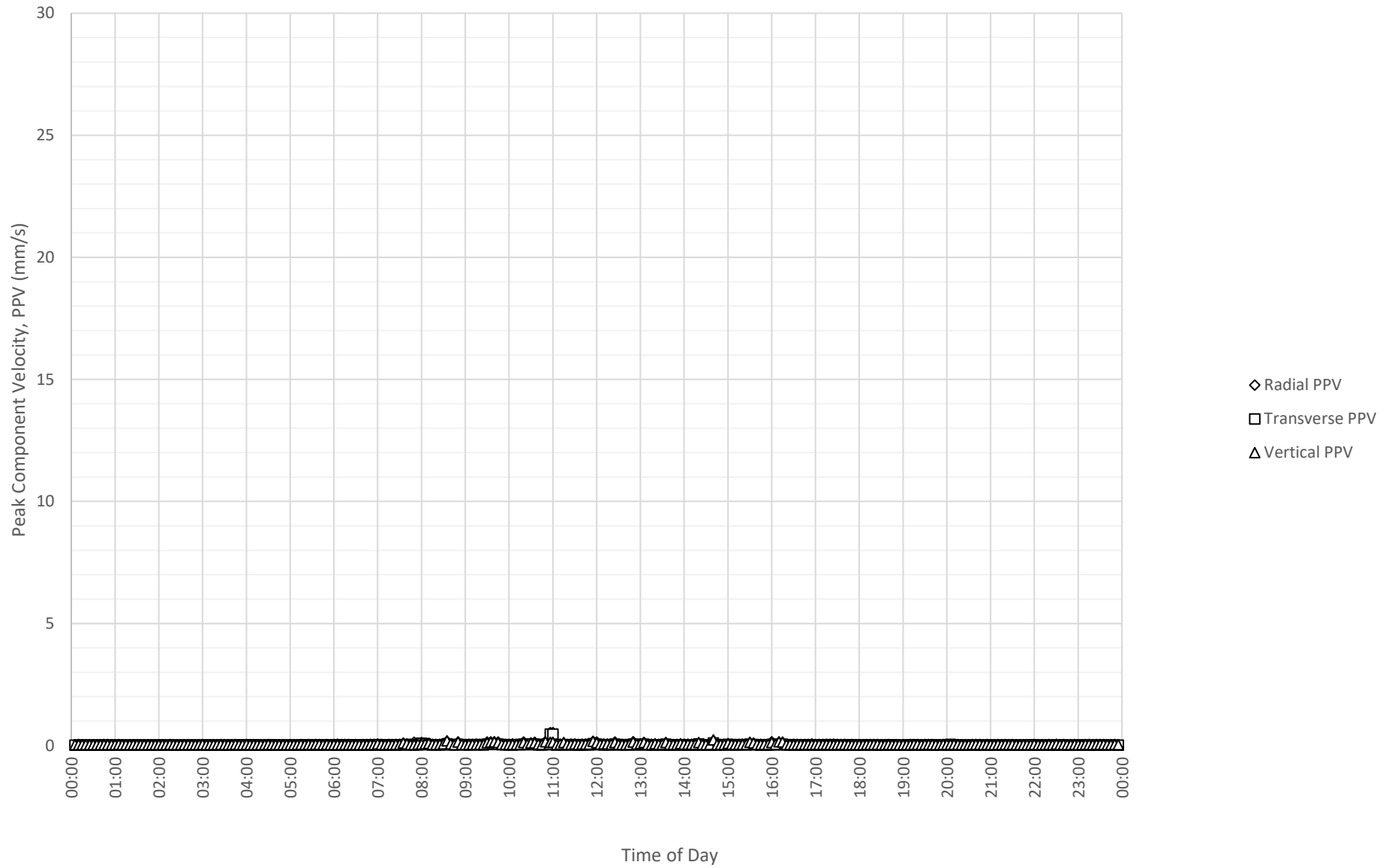
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 19-12-2023



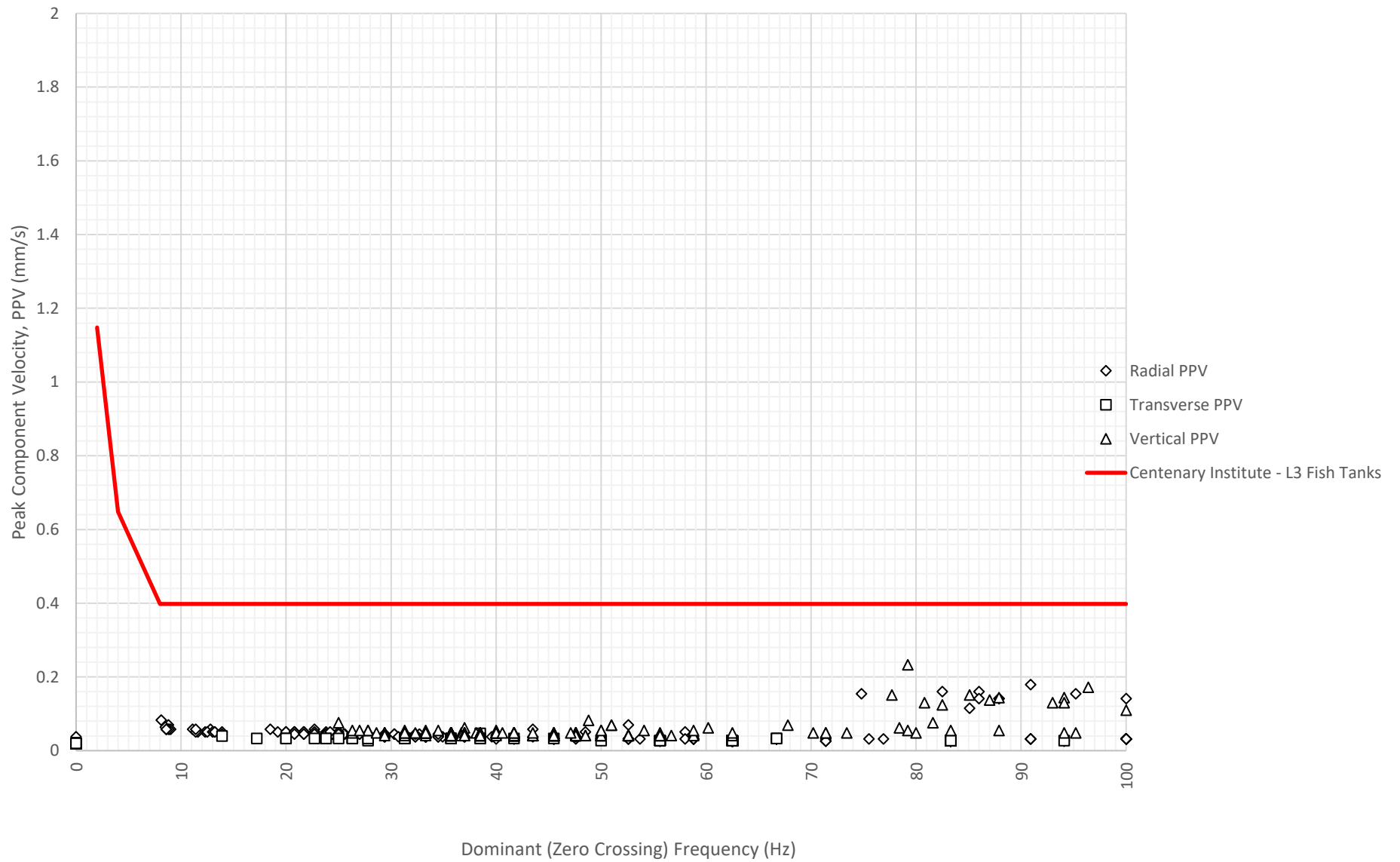
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 19-12-2023



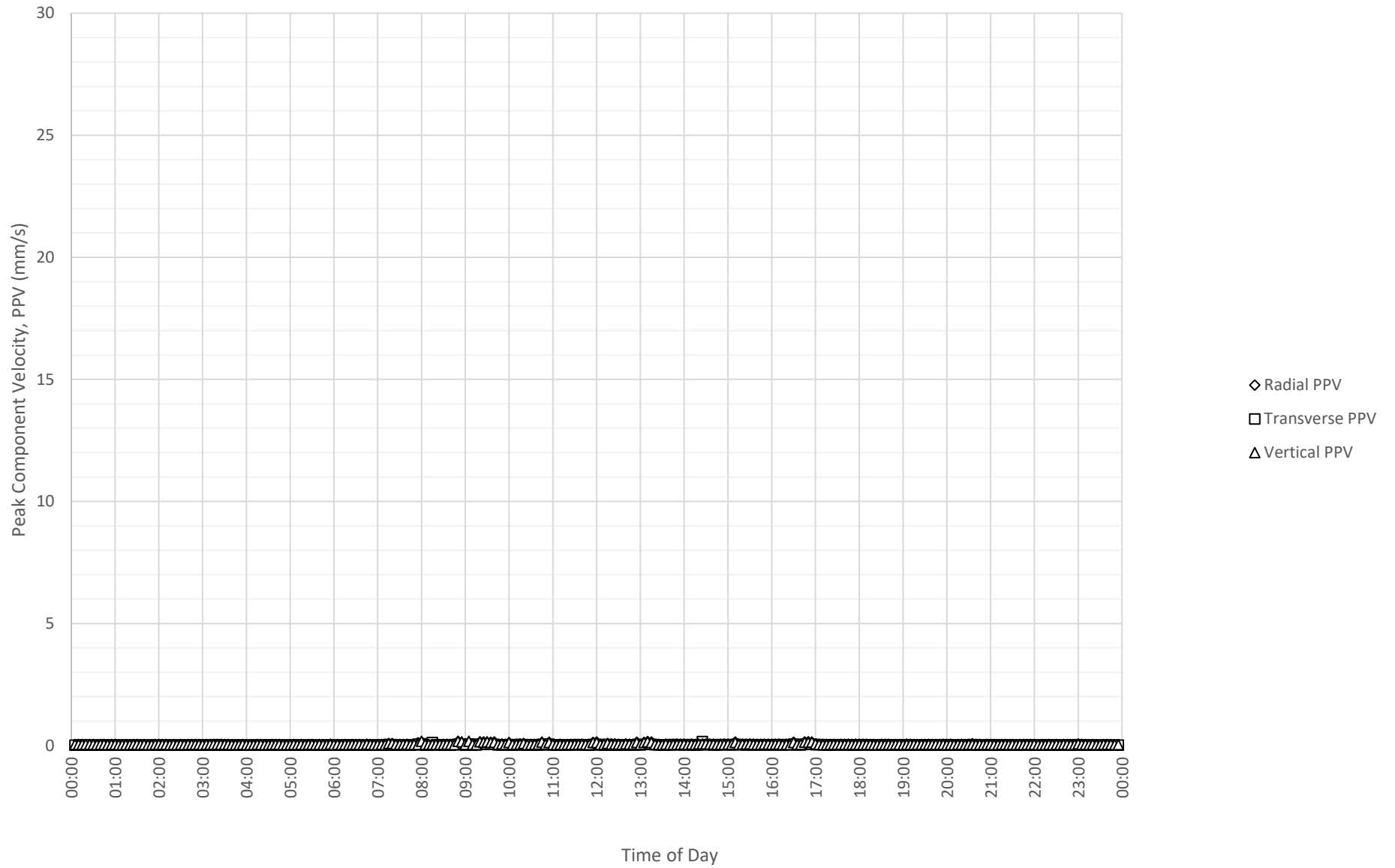
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 20-12-2023



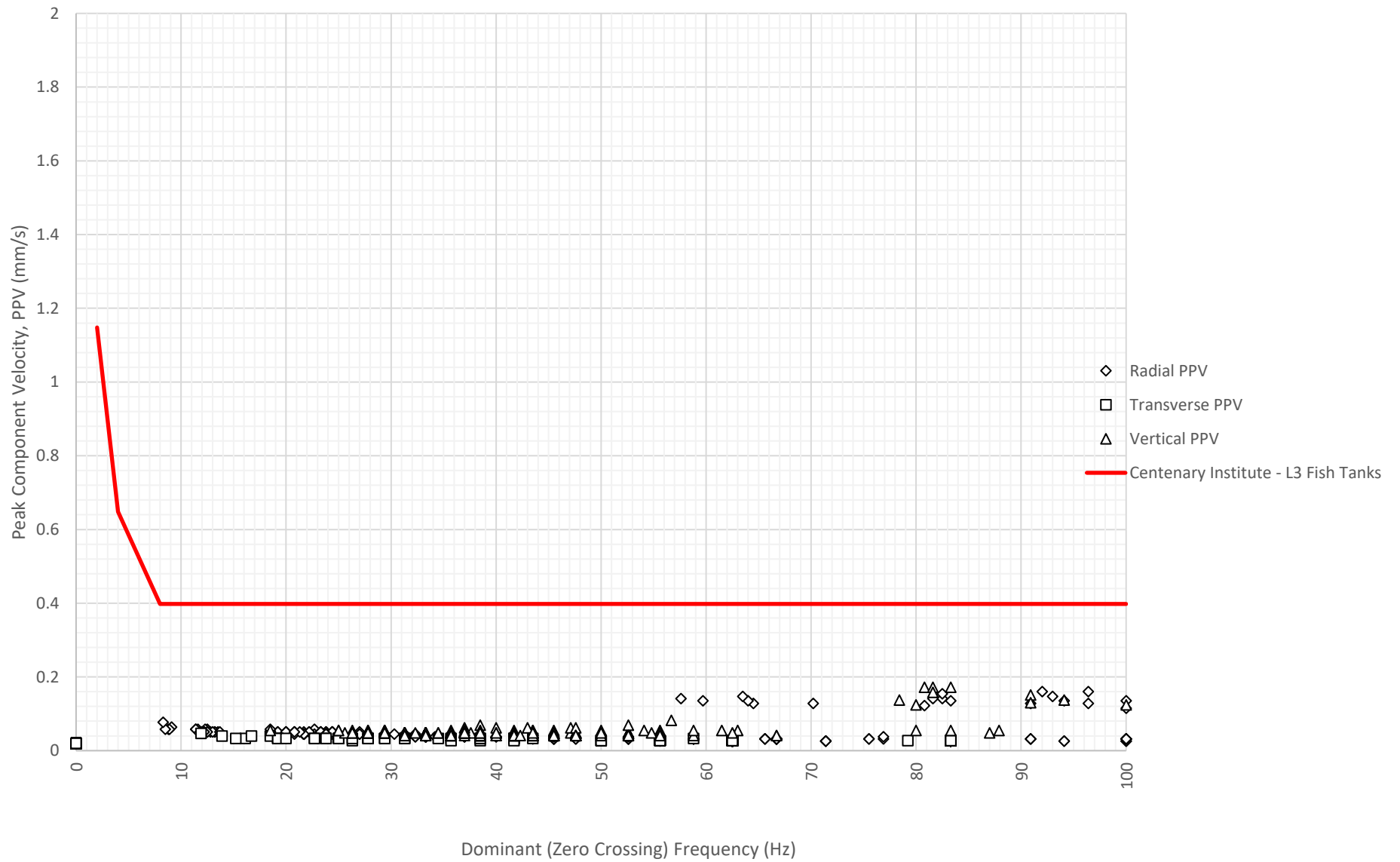
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 20-12-2023



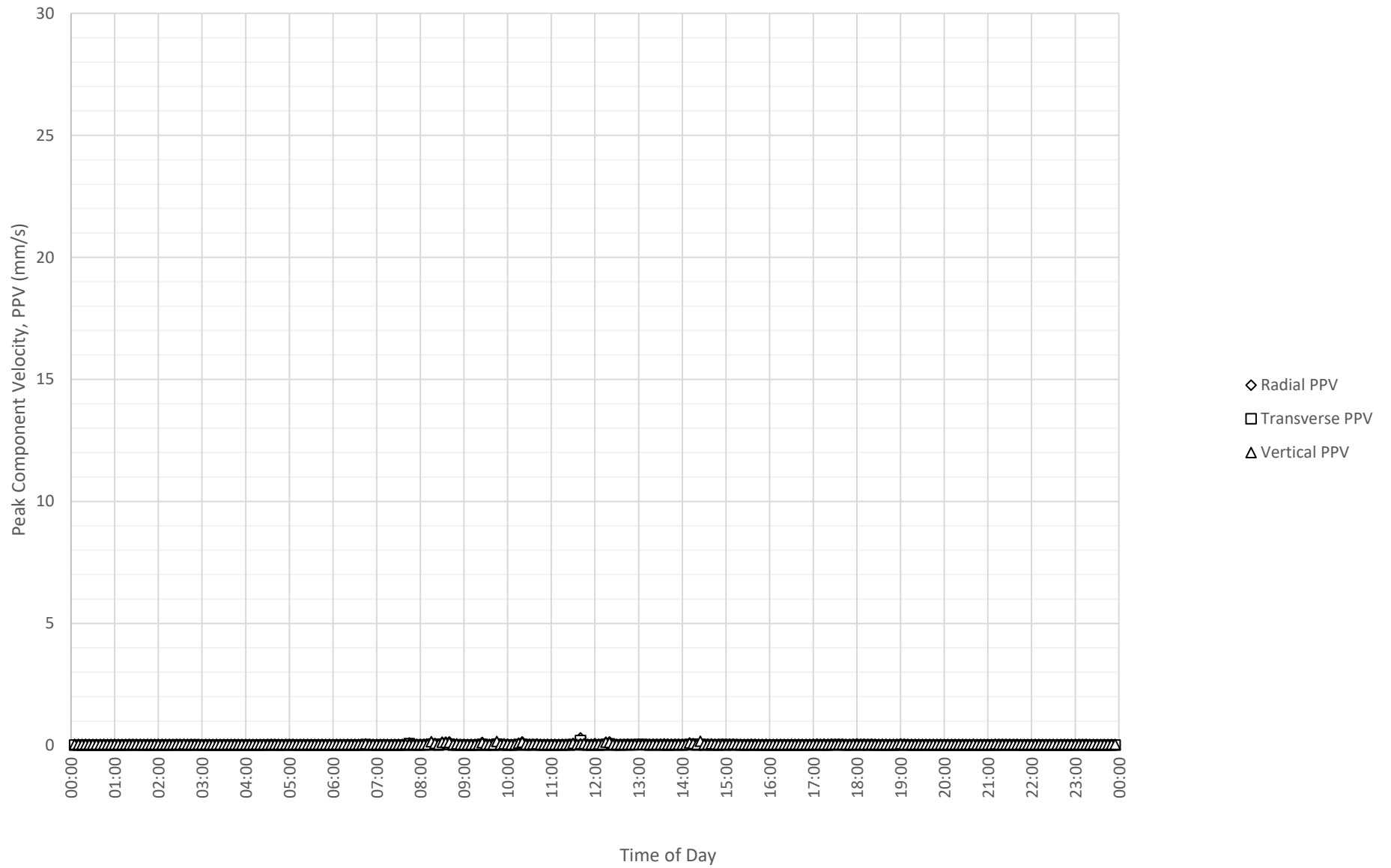
Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 21-12-2023



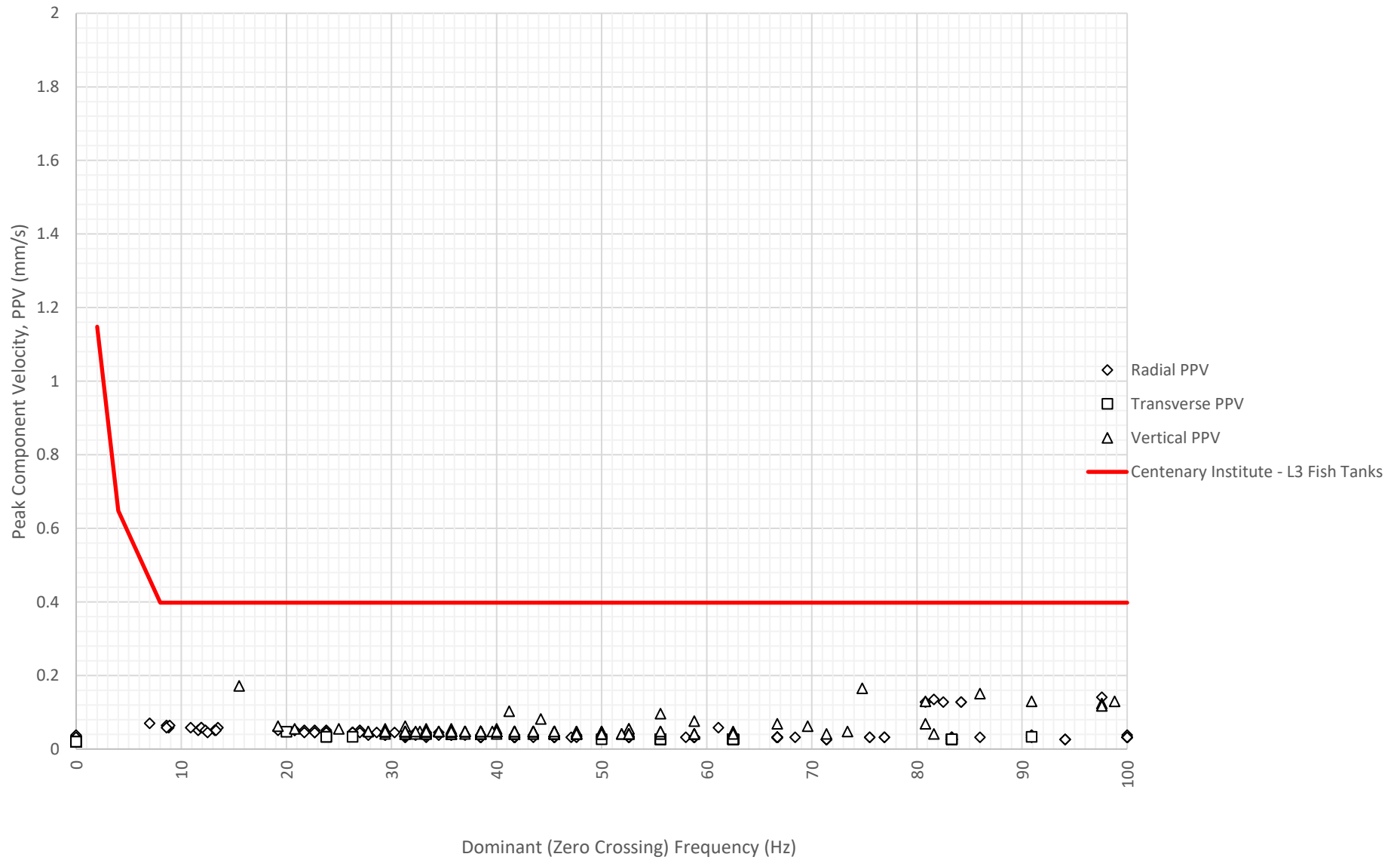
Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 21-12-2023



Daily Monitored Vibration Levels at Centenary Institute L3 Fish Tanks on 22-12-2023

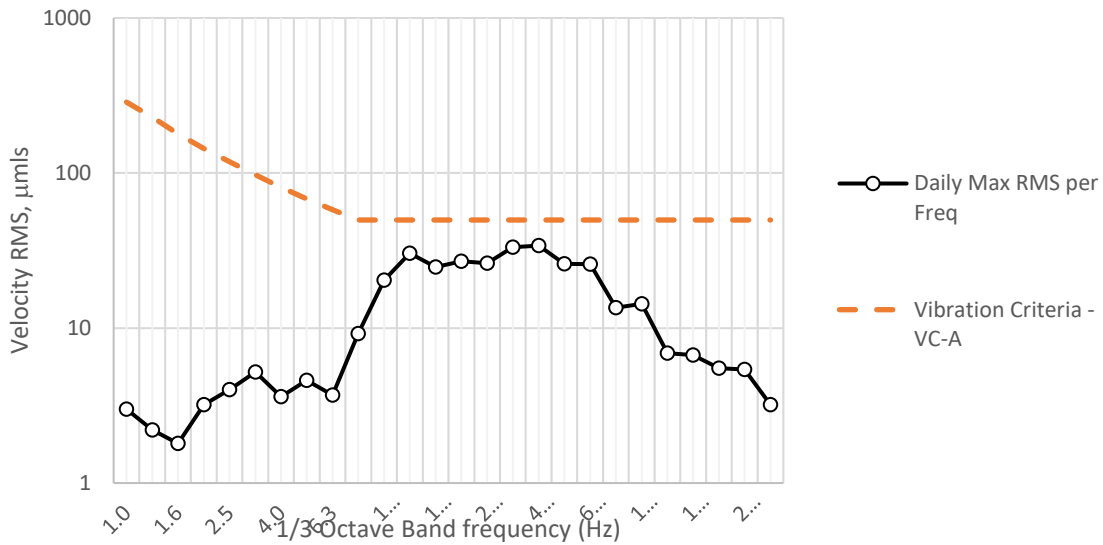


Frequency Content of Vibration Levels at Centenary Institute L3 Fish Tanks on 22-12-2023

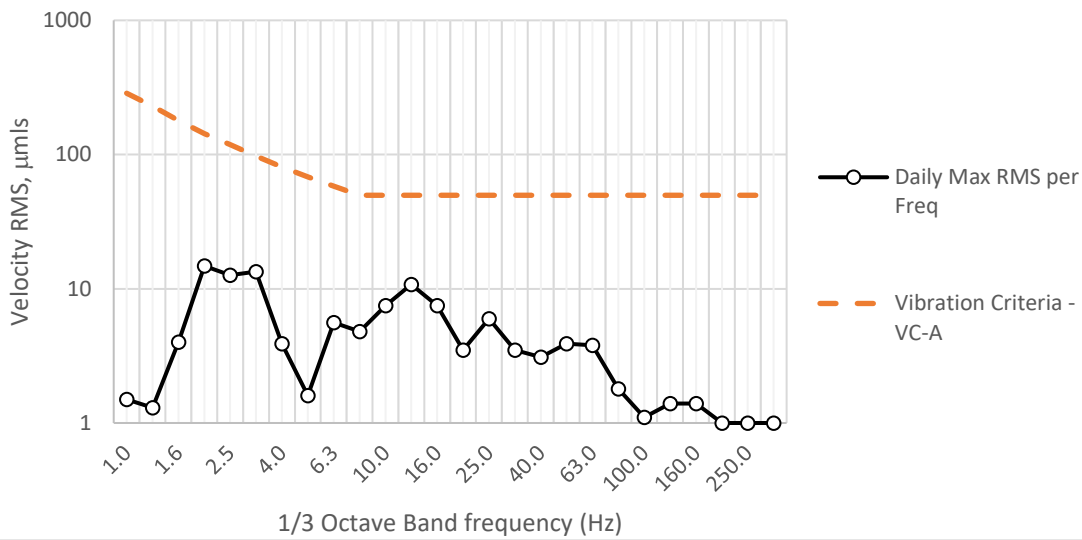


CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE)

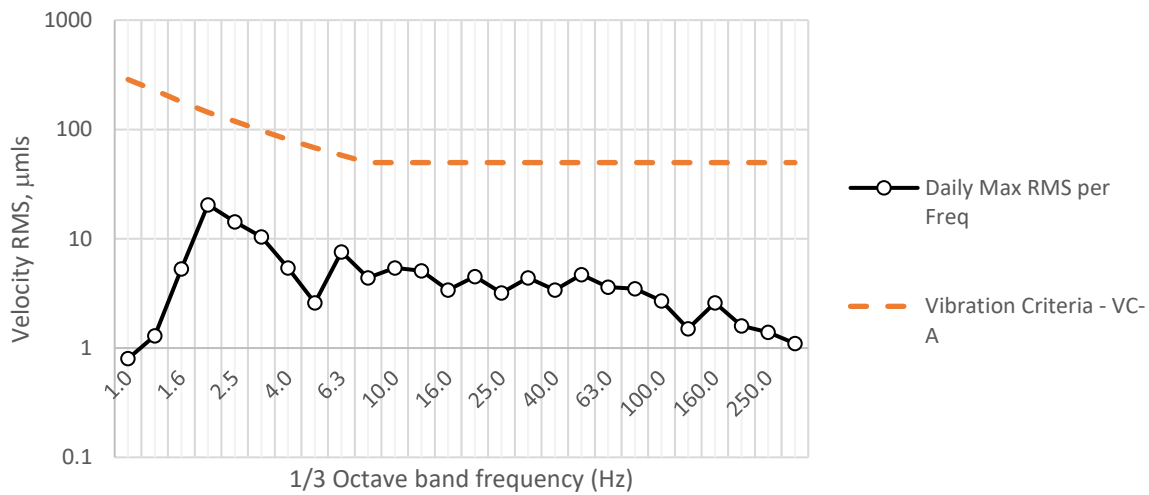
Vertical Vibration



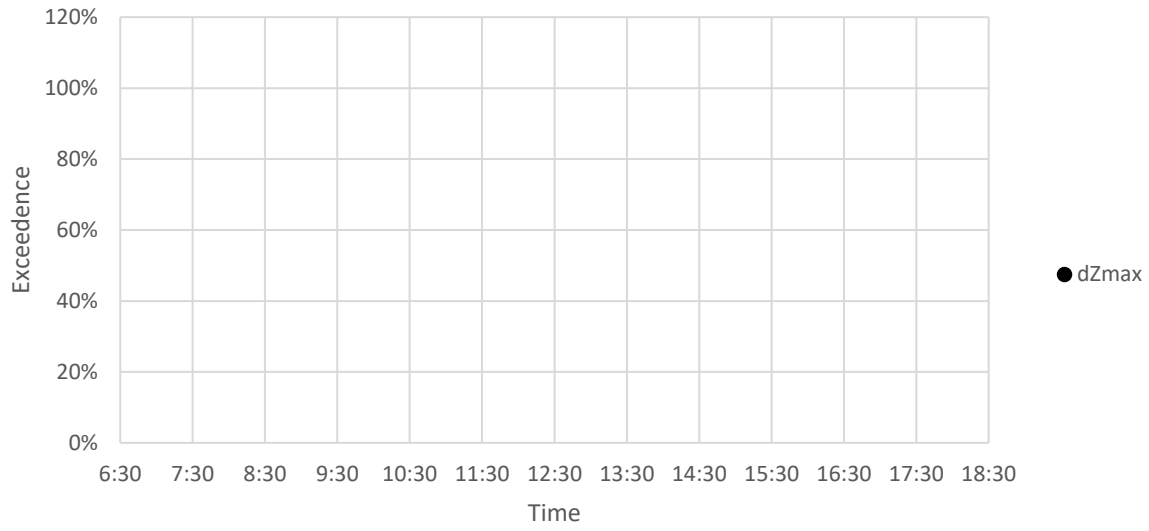
FwdBackwd Vibration



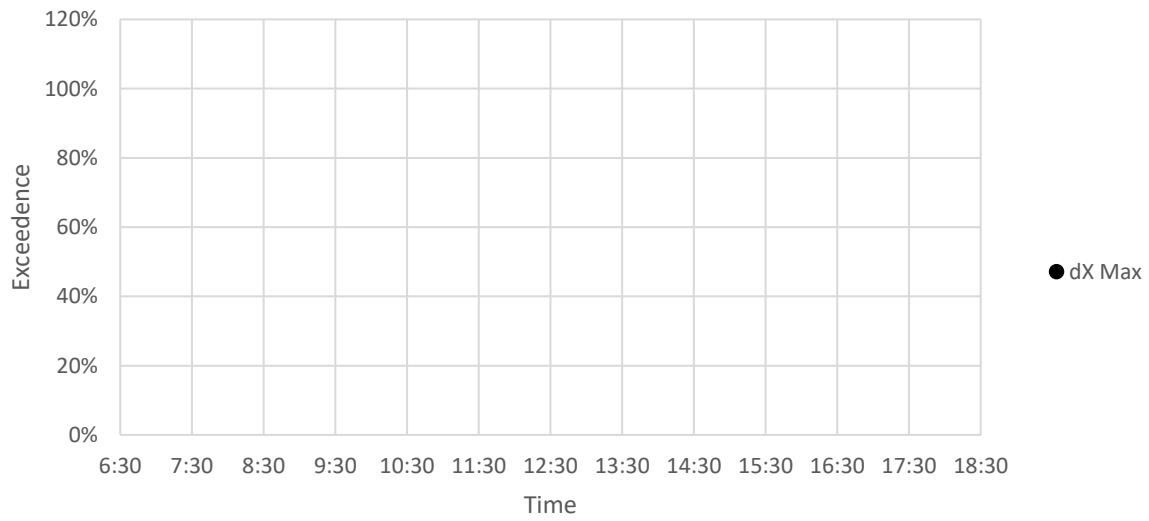
Sideways Vibration



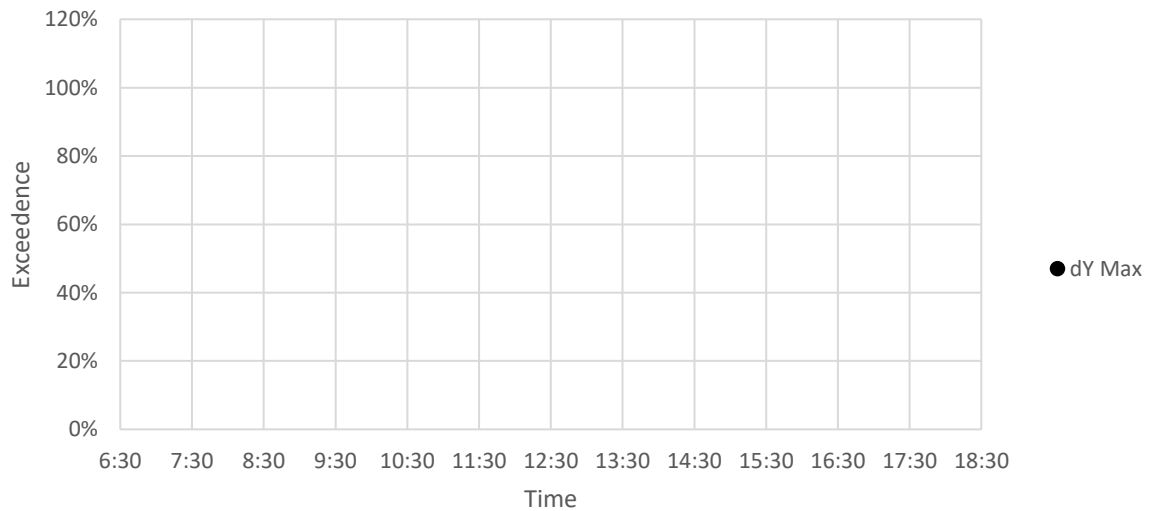
Vertical

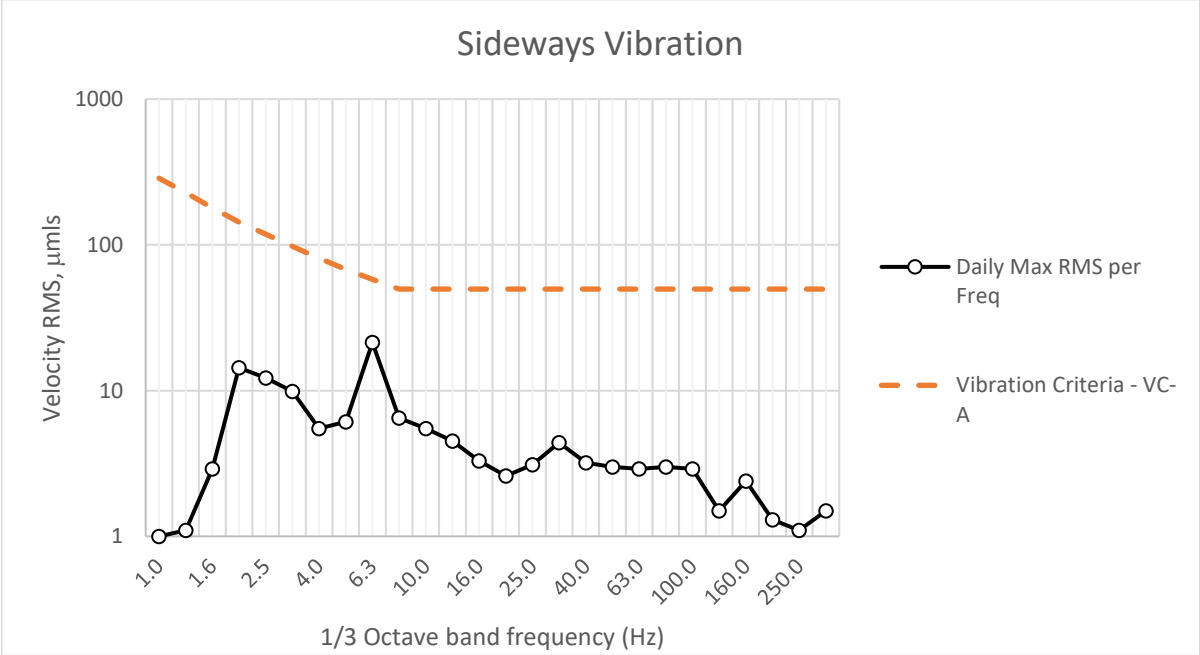
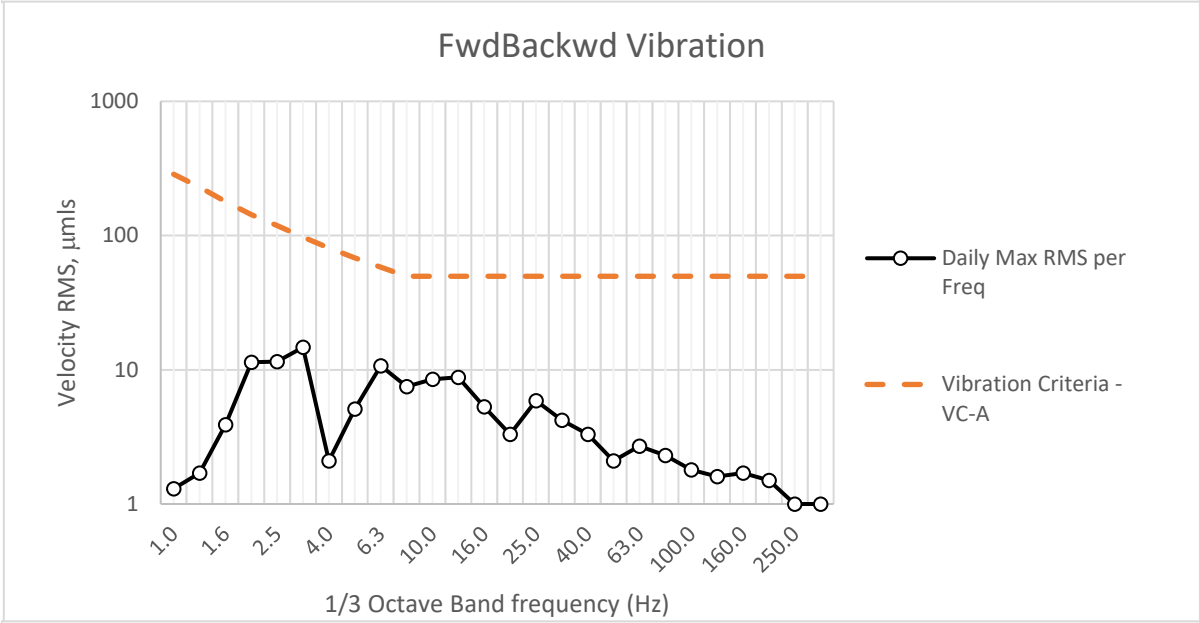
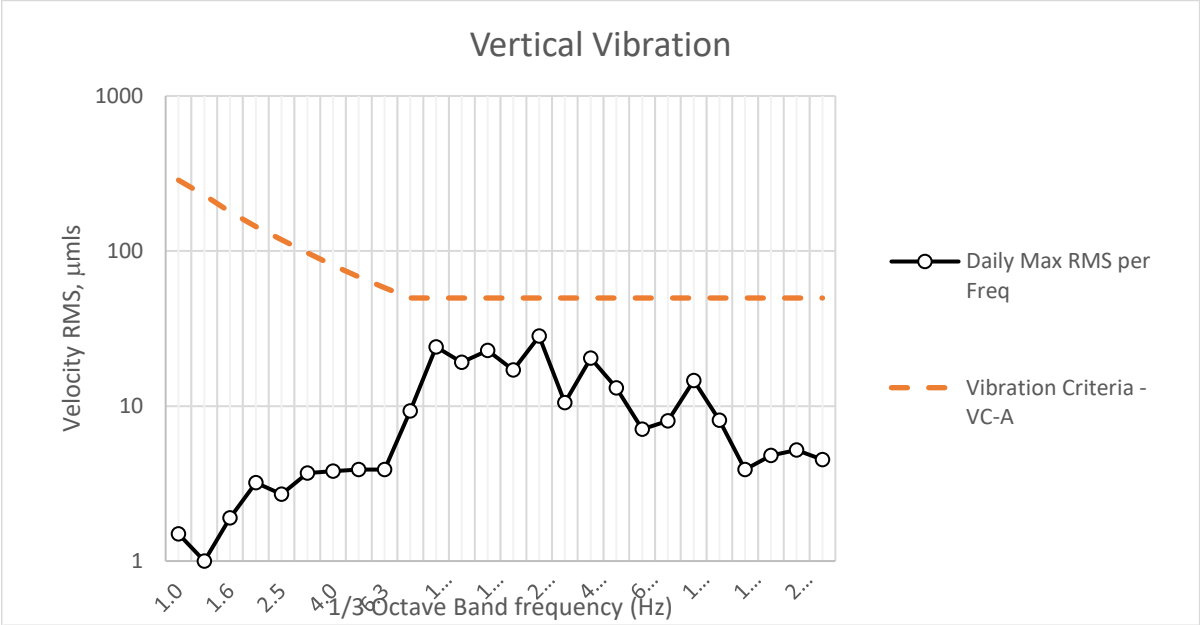


Fwd/Backwards

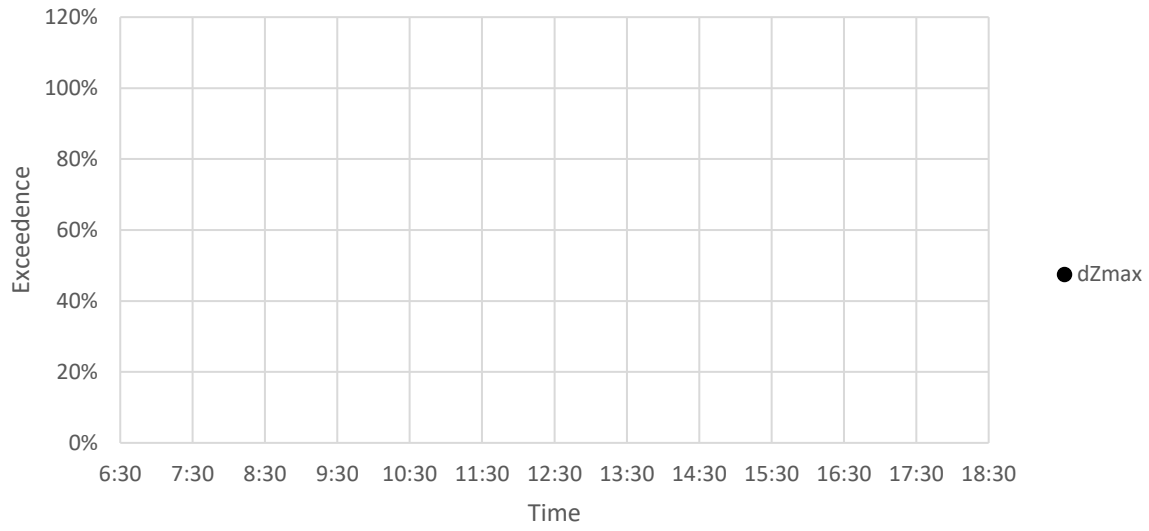


Sideways

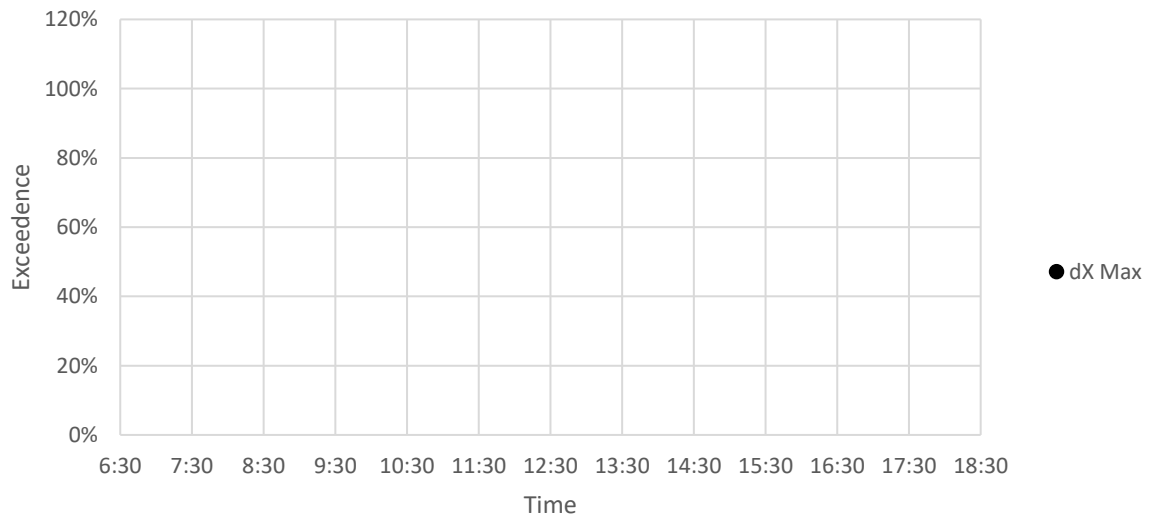




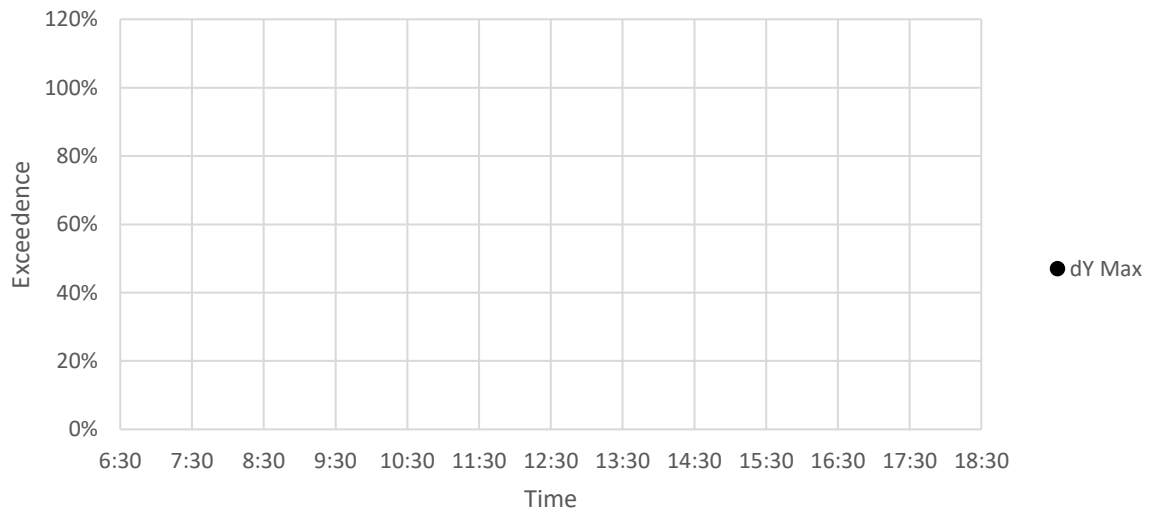
Vertical

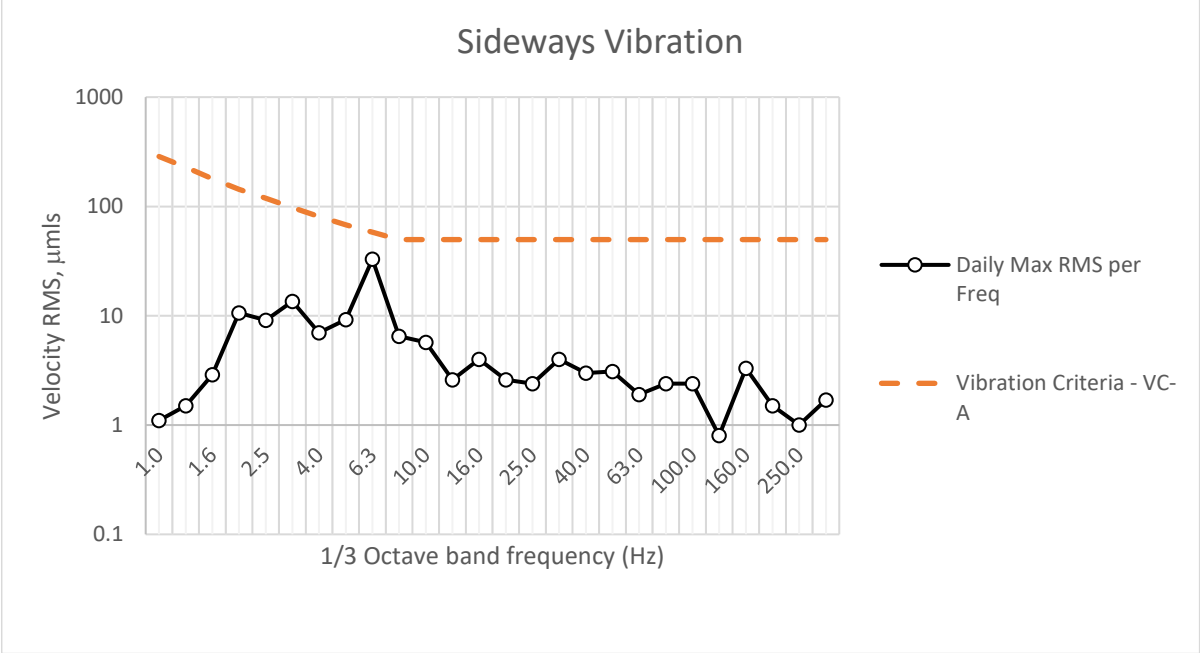
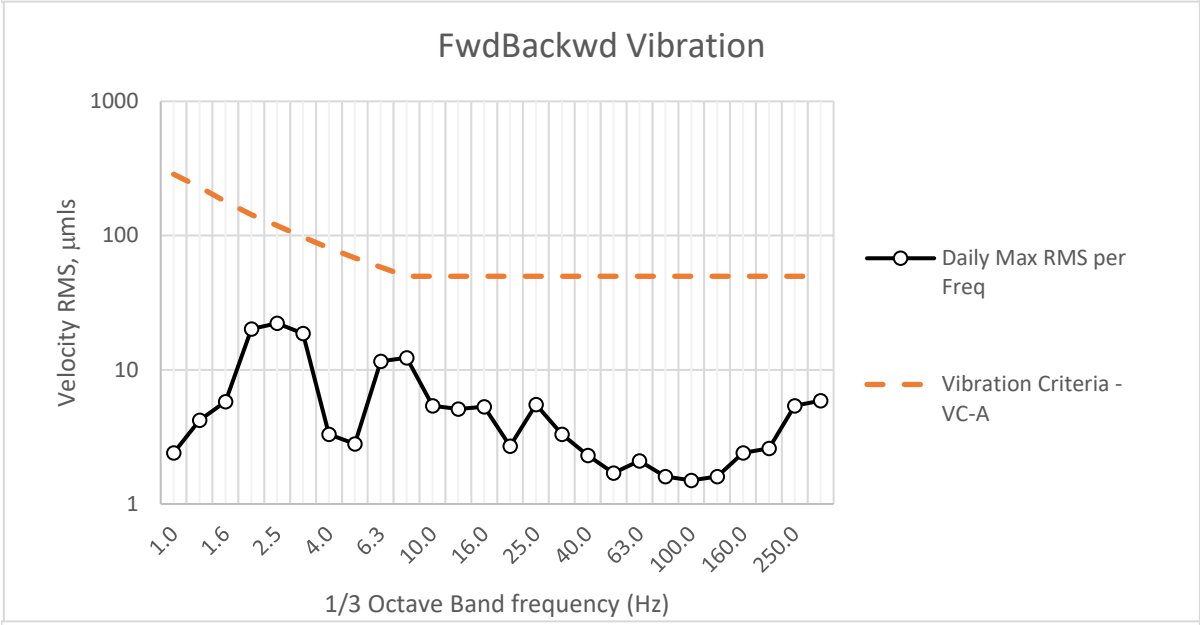
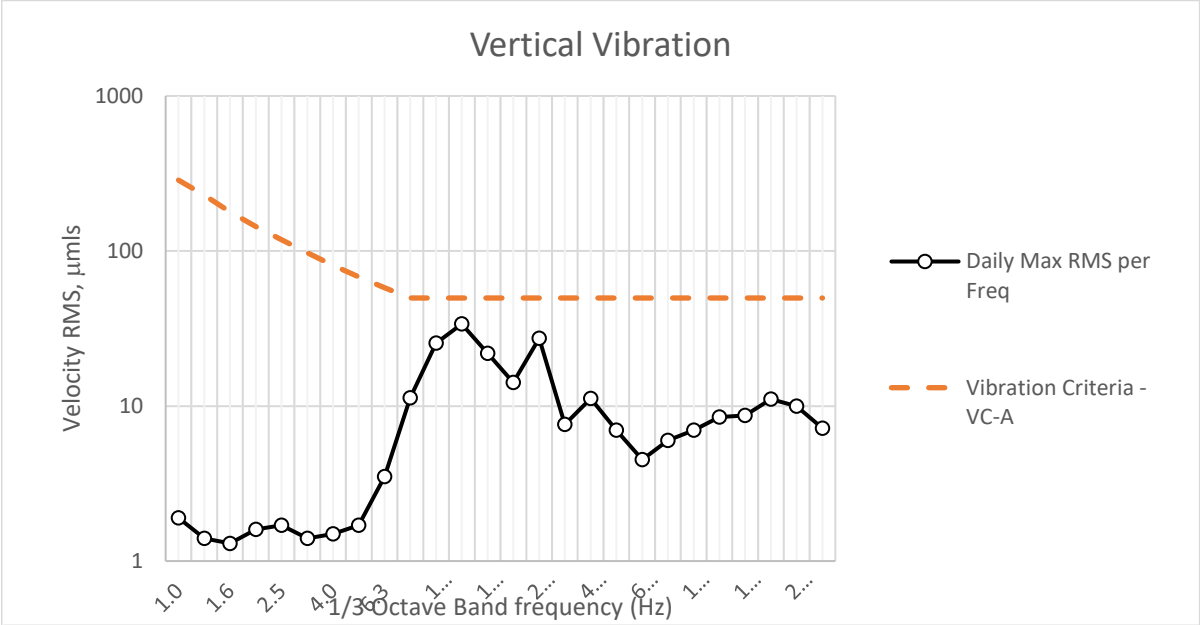


Fwd/Backwards

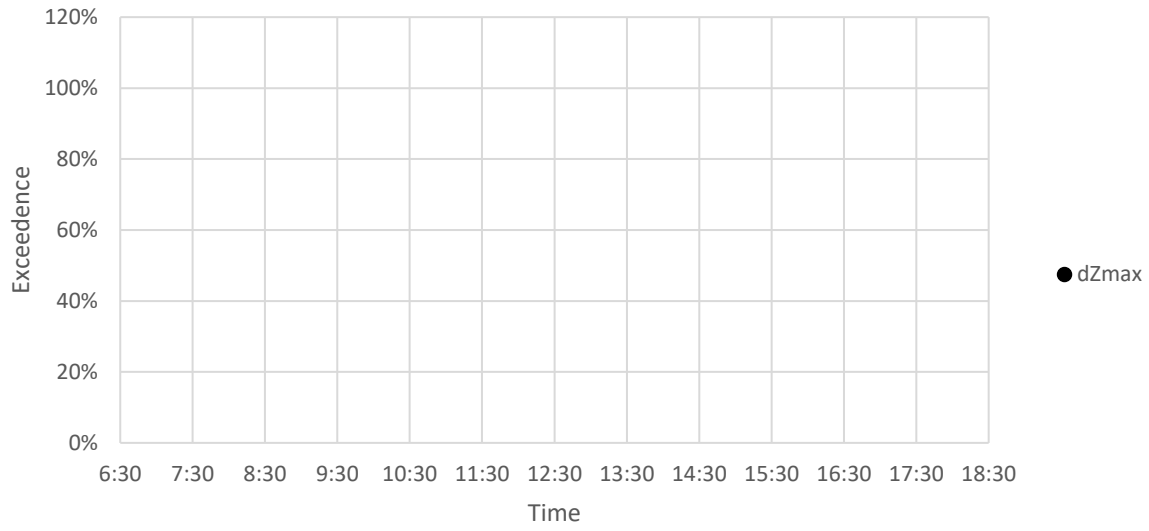


Sideways

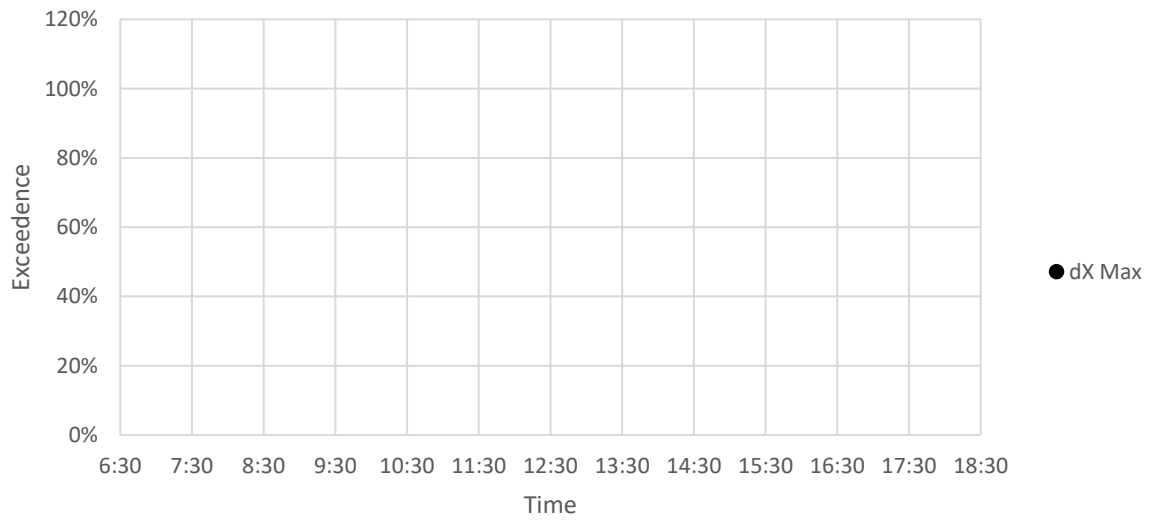




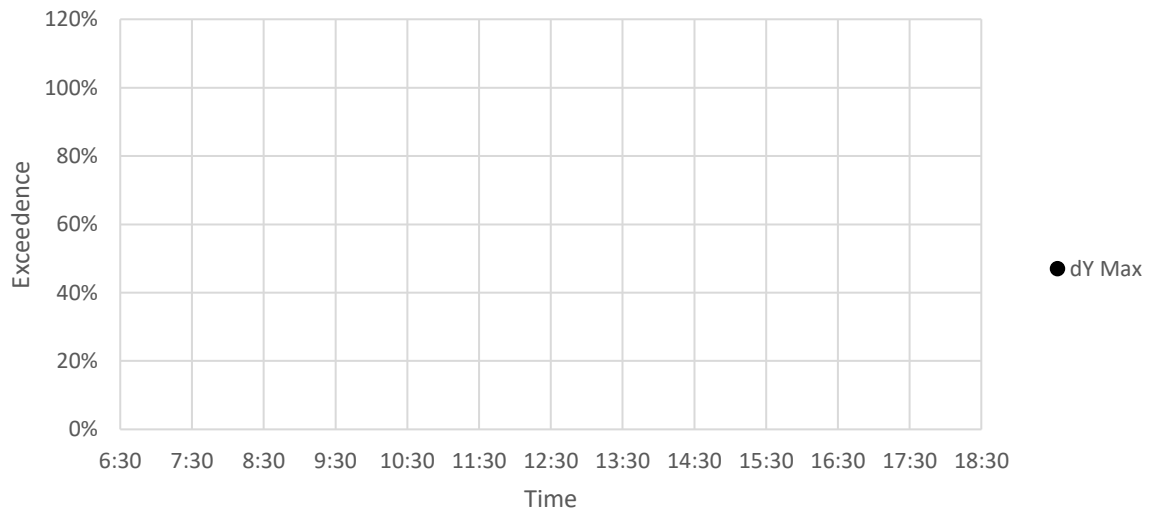
Vertical



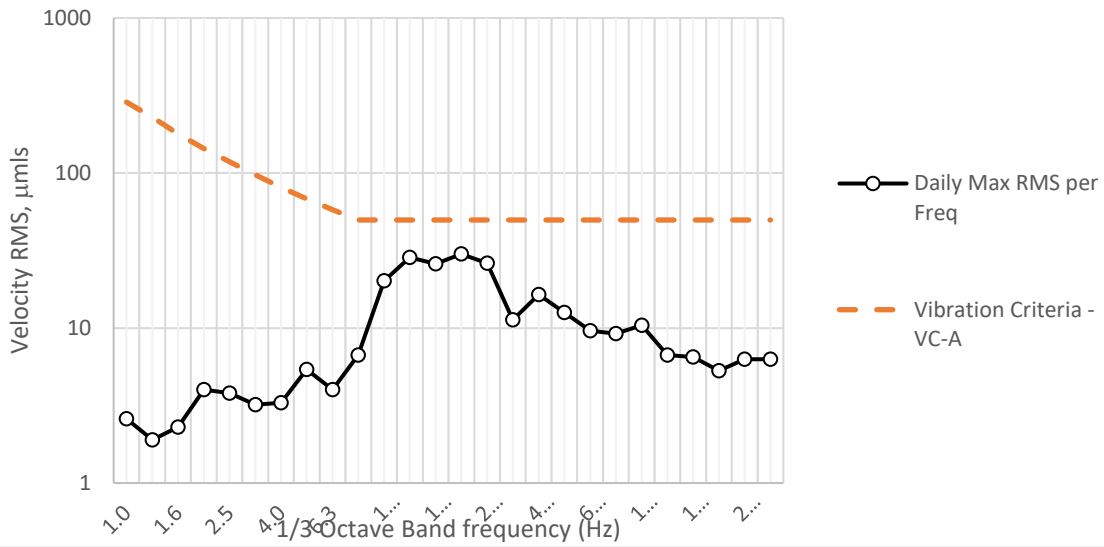
Fwd/Backwards



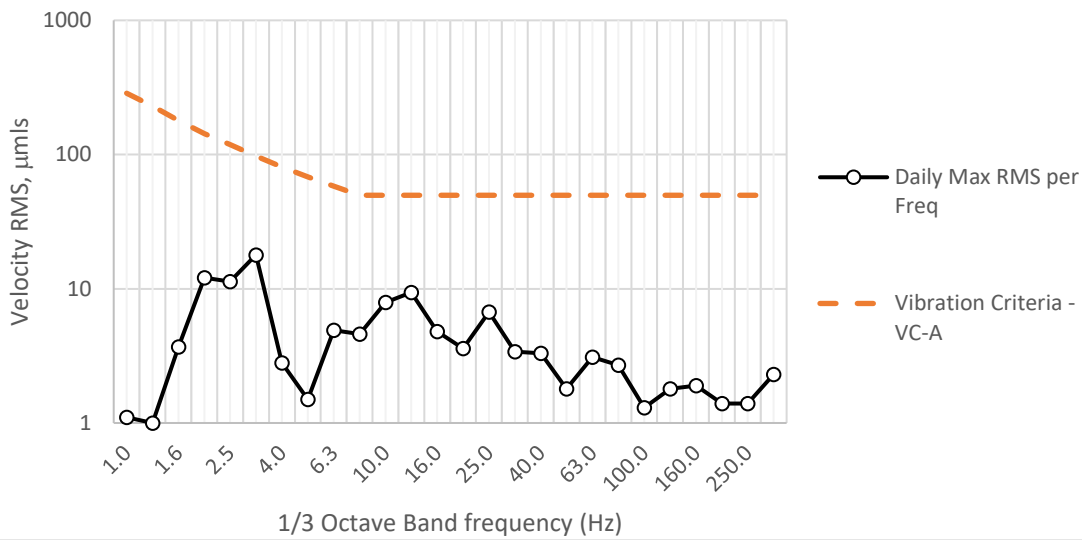
Sideways



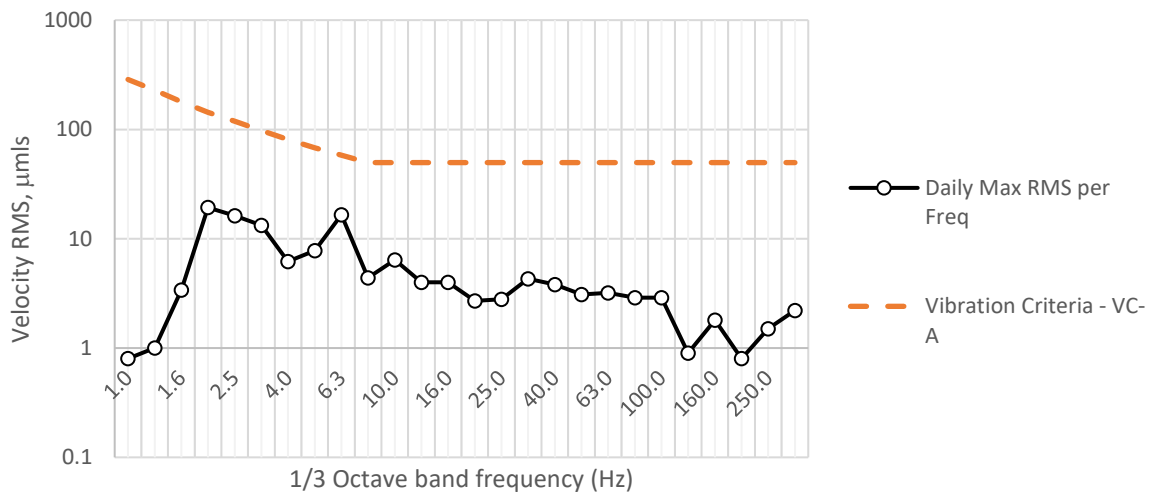
Vertical Vibration



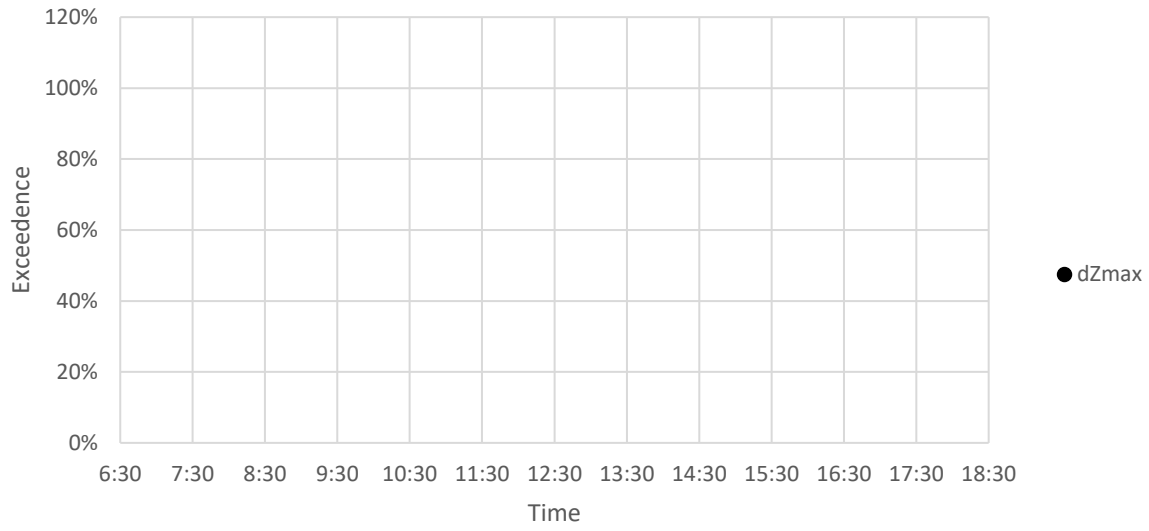
FwdBackwd Vibration



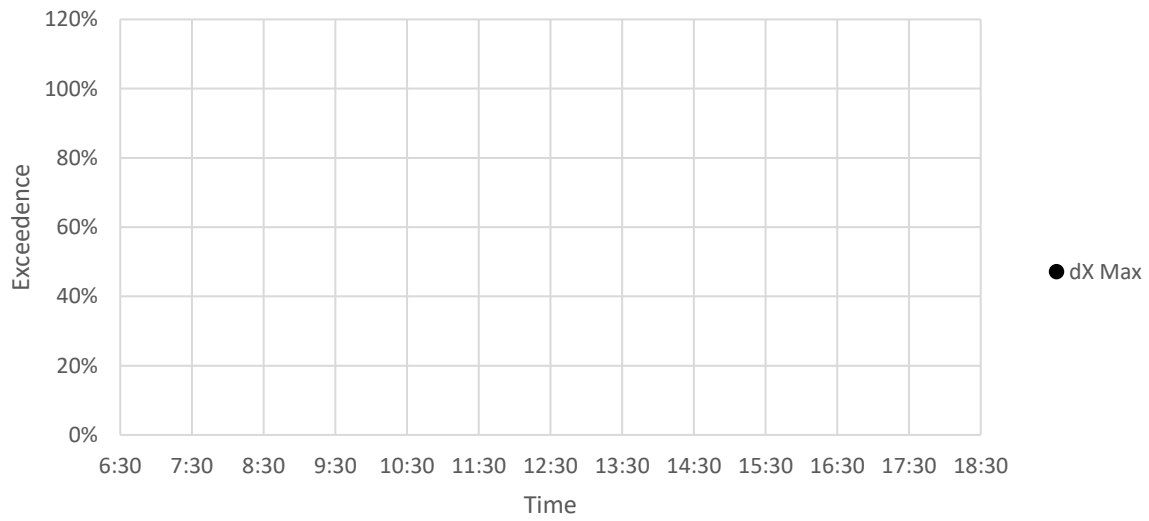
Sideways Vibration



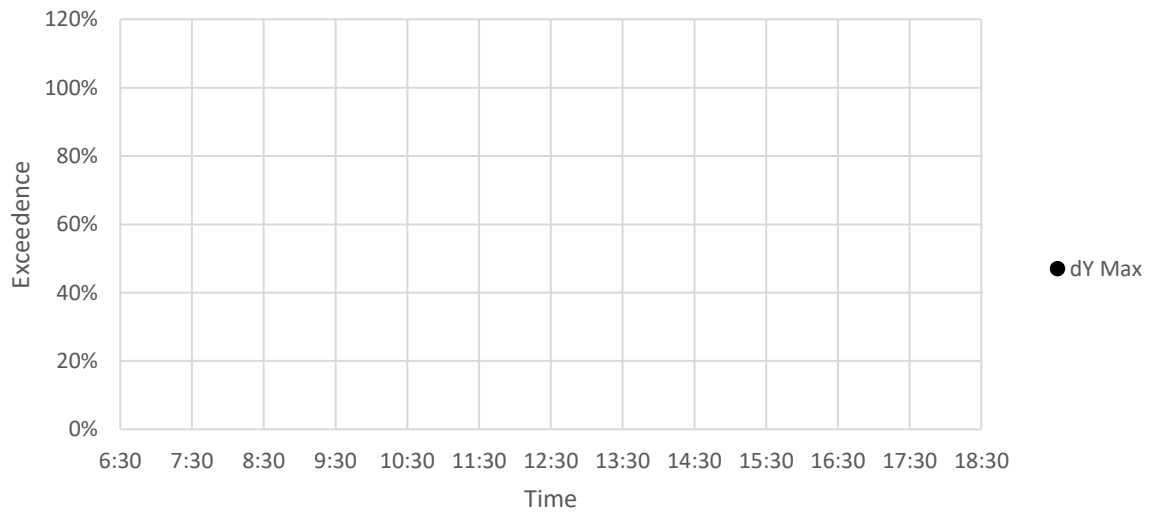
Vertical



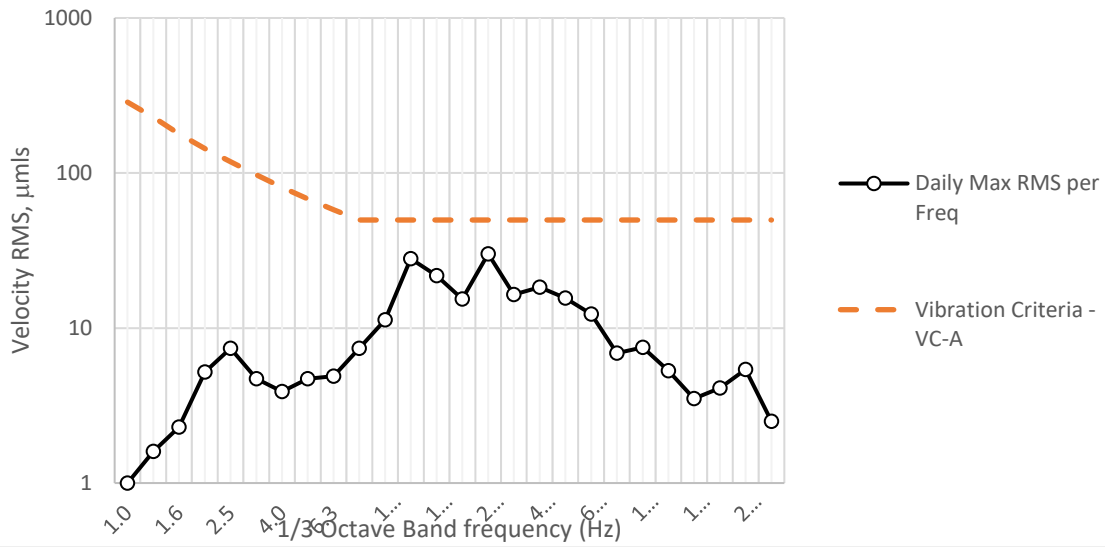
Fwd/Backwards



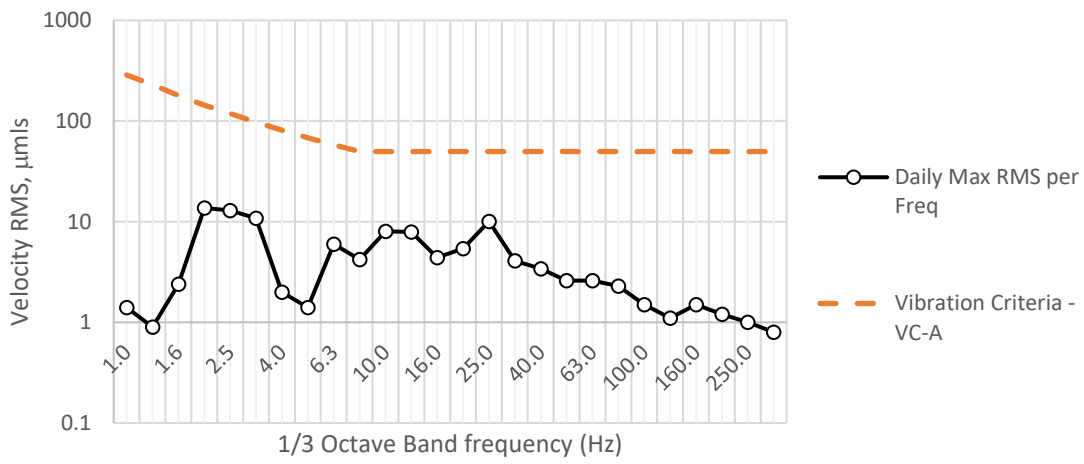
Sideways



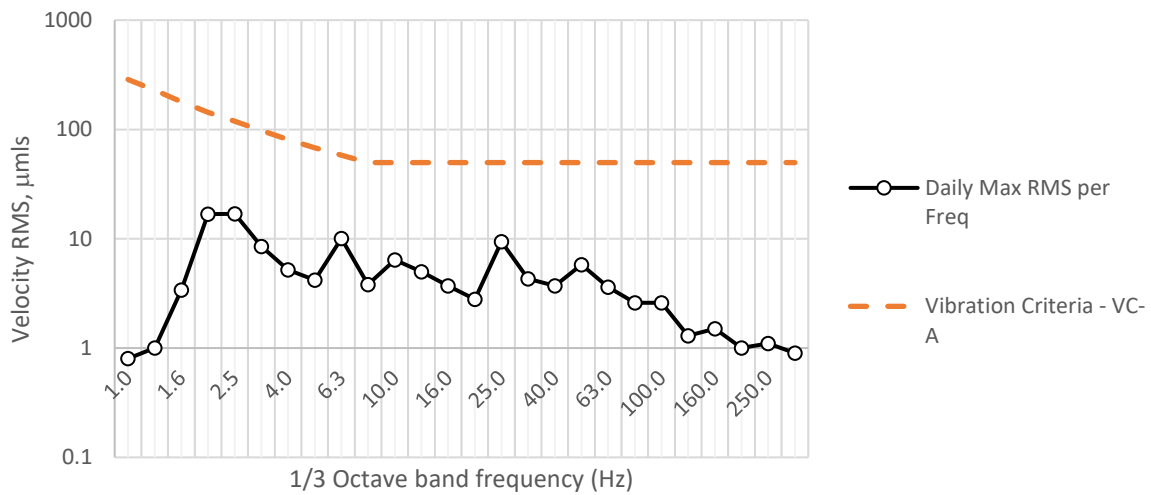
Vertical Vibration



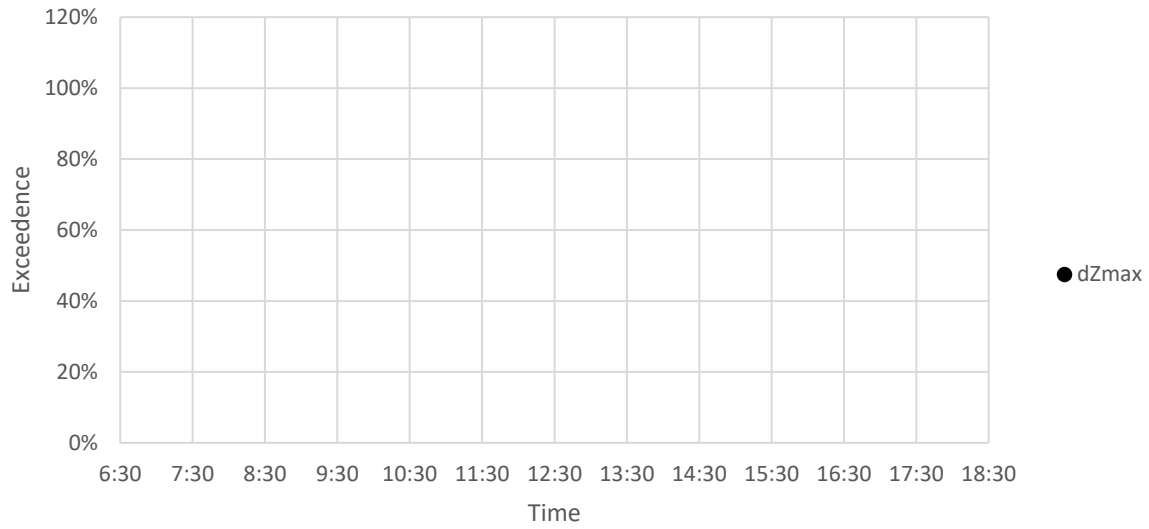
FwdBackwd Vibration



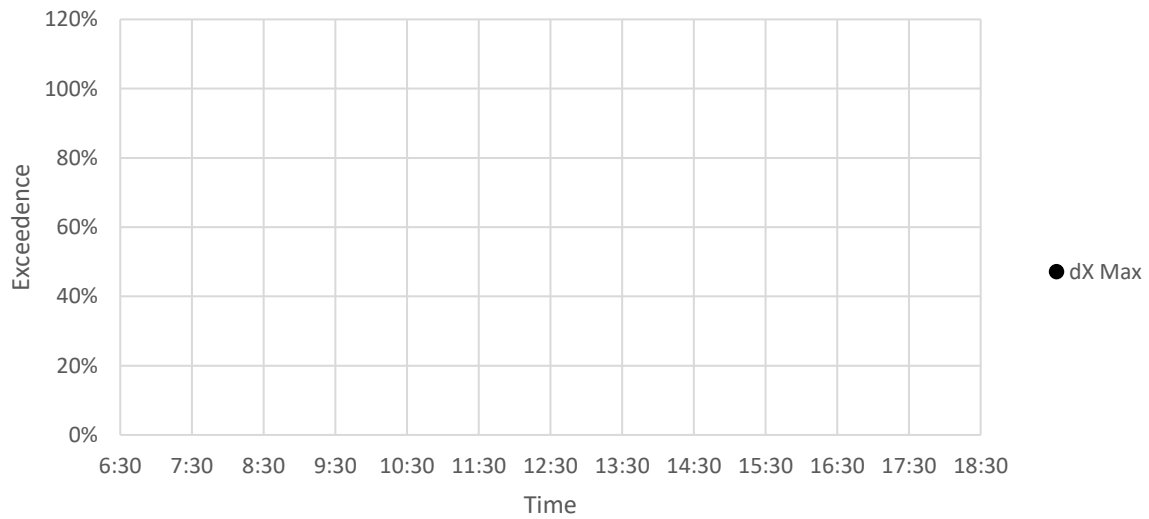
Sideways Vibration



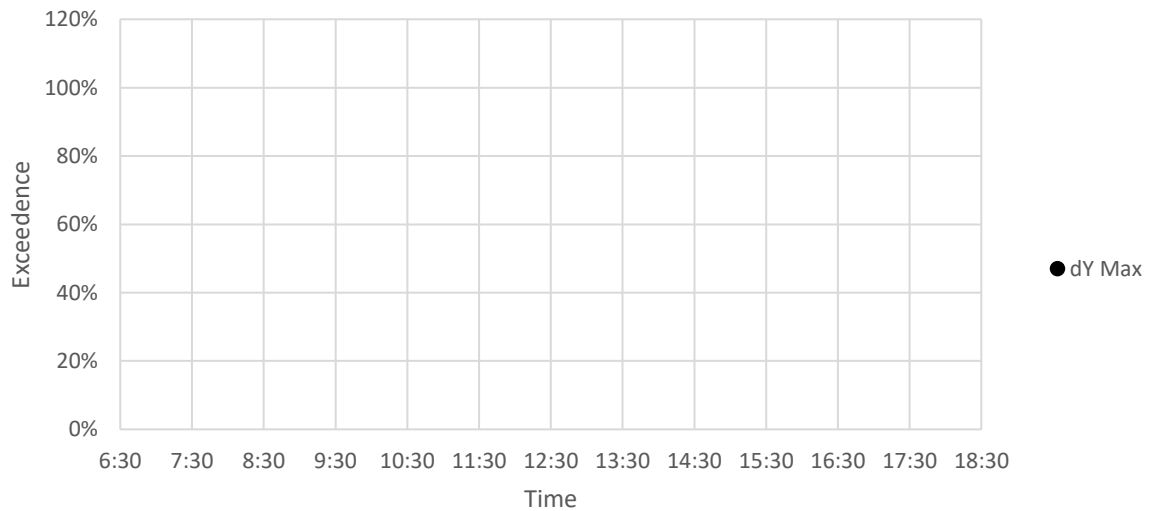
Vertical



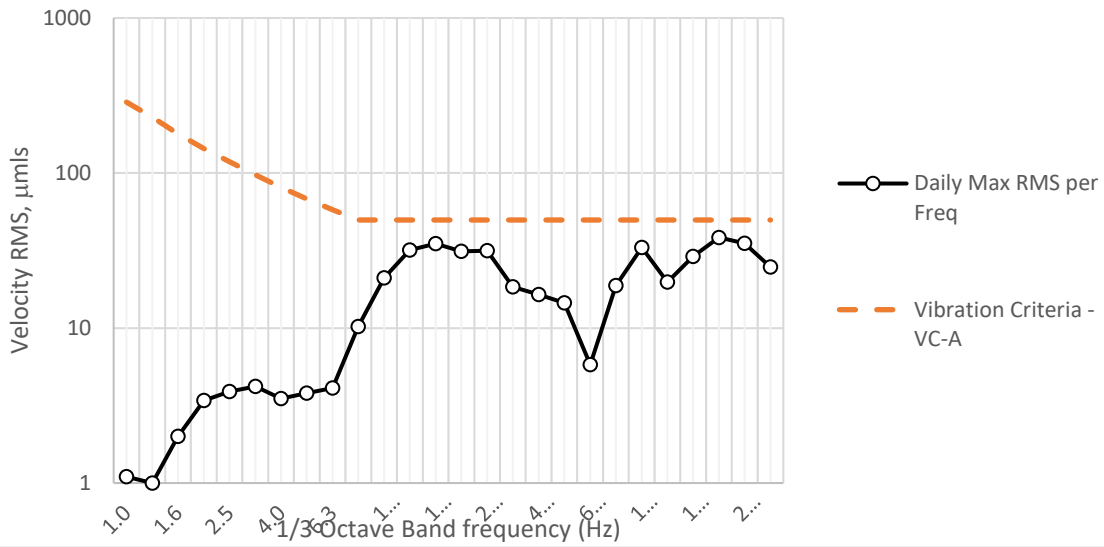
Fwd/Backwards



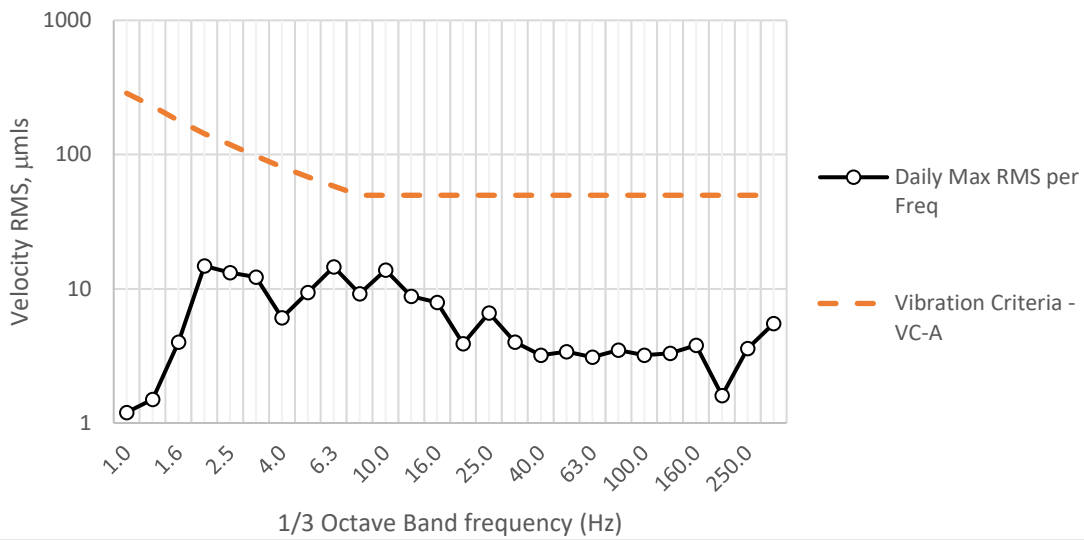
Sideways



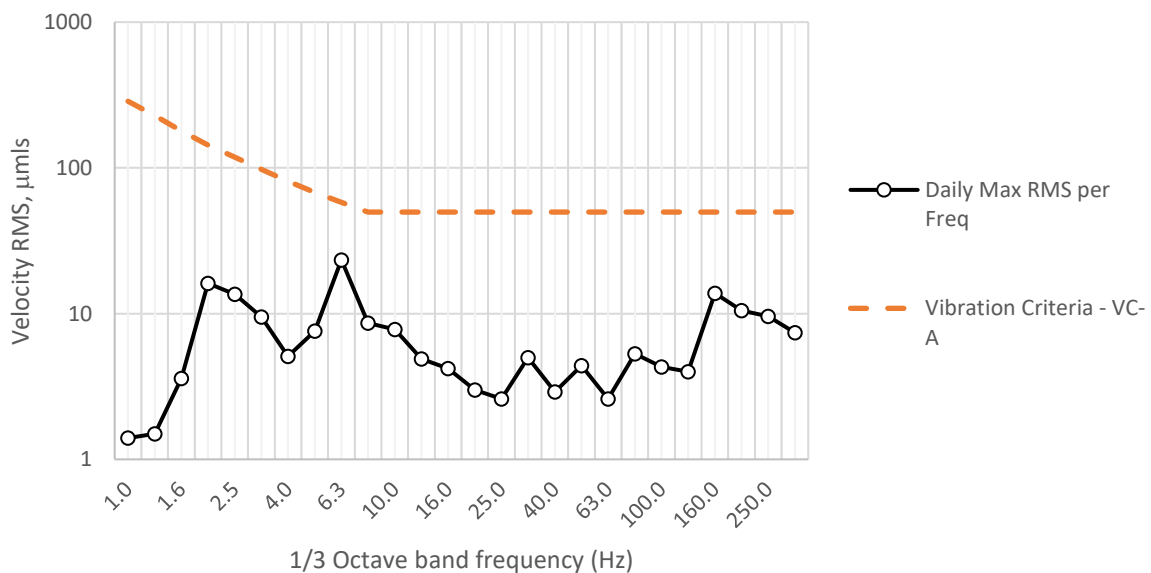
Vertical Vibration



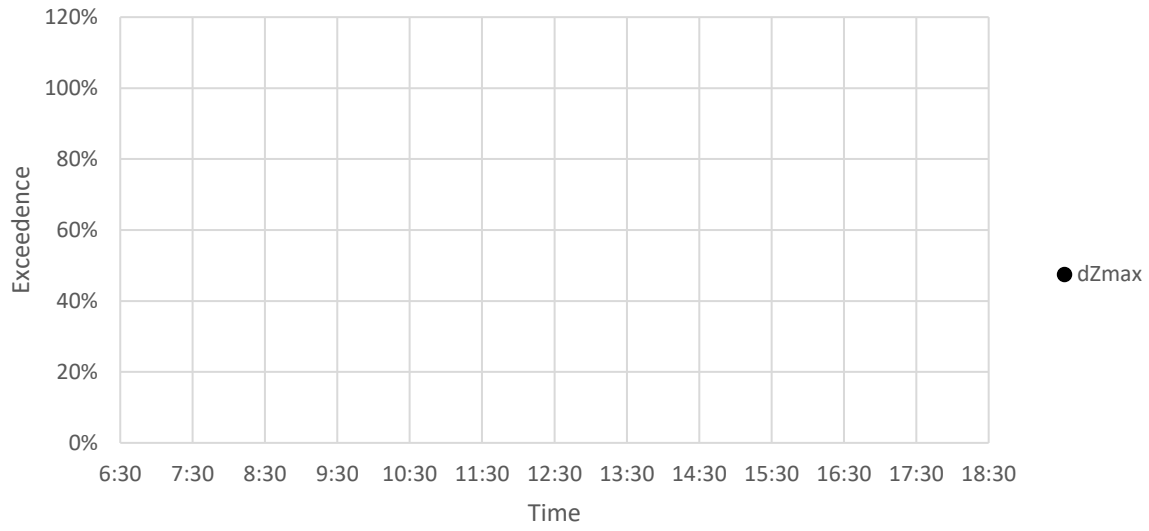
FwdBackwd Vibration



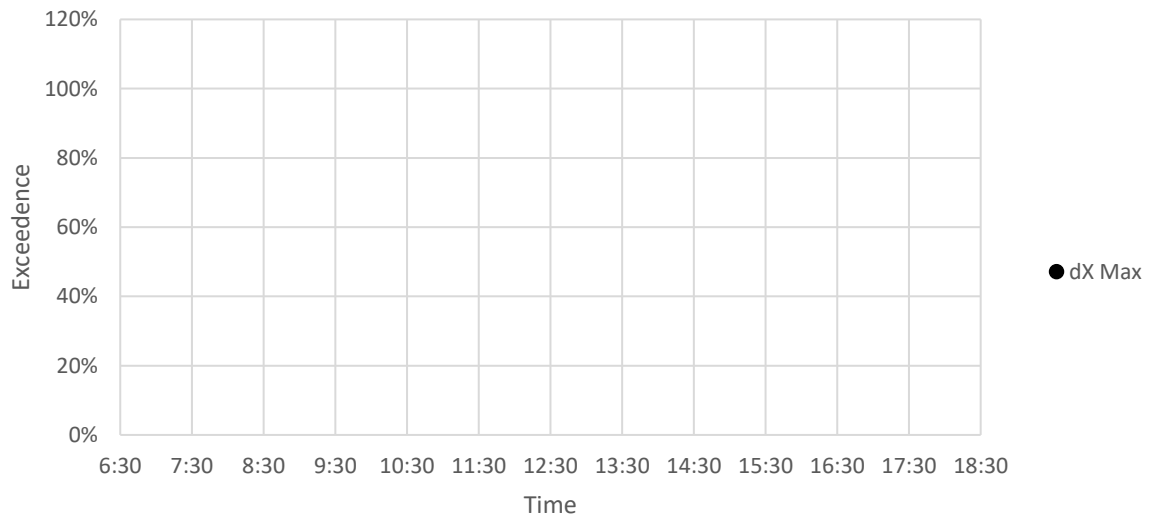
Sideways Vibration



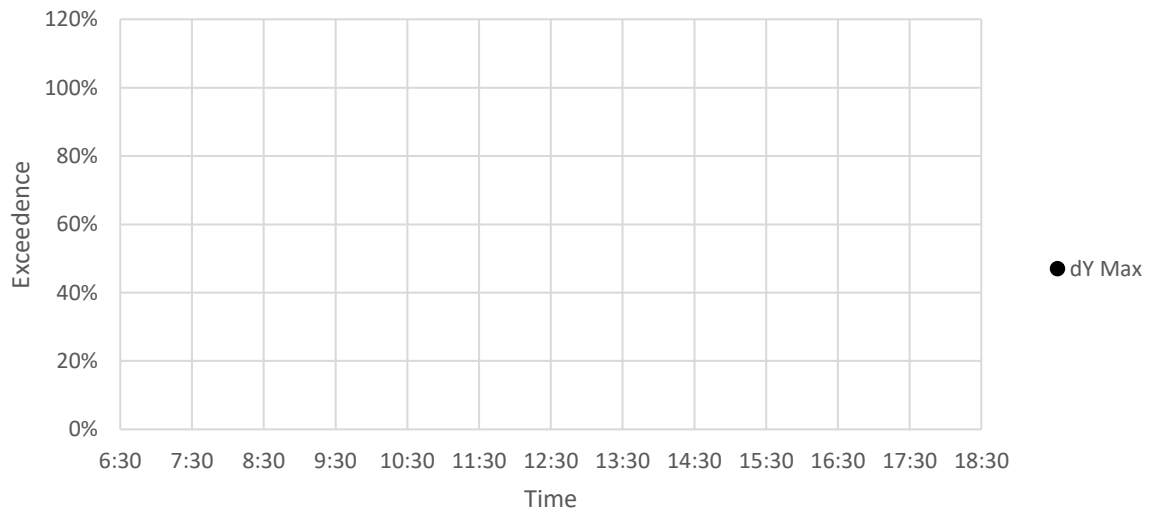
Vertical

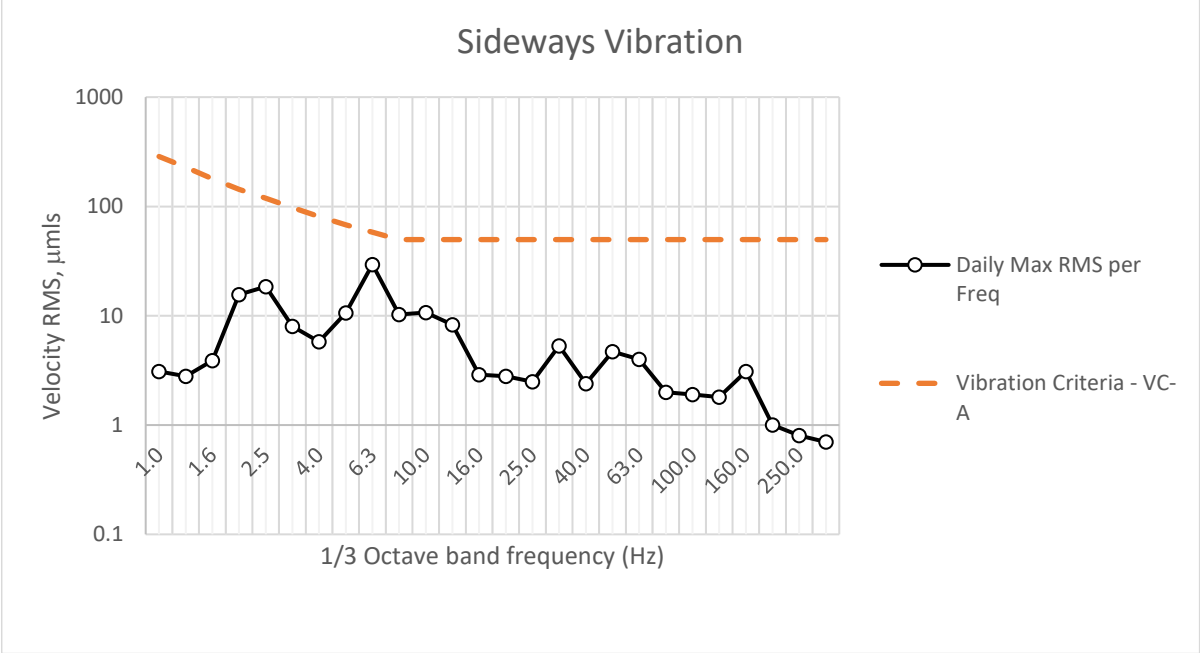
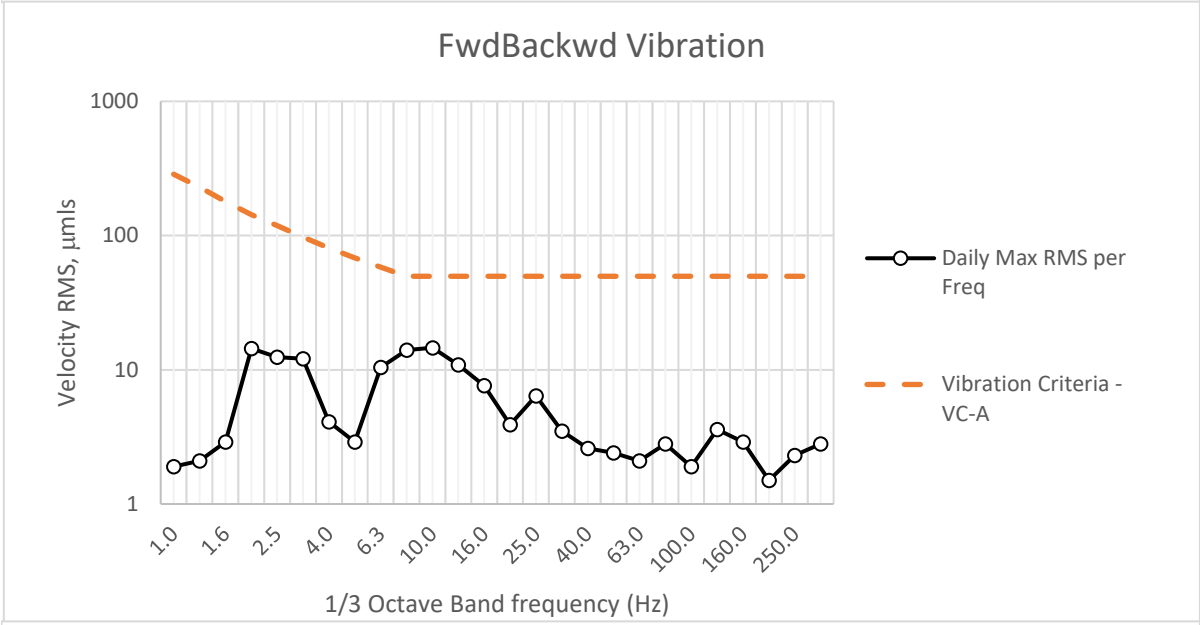
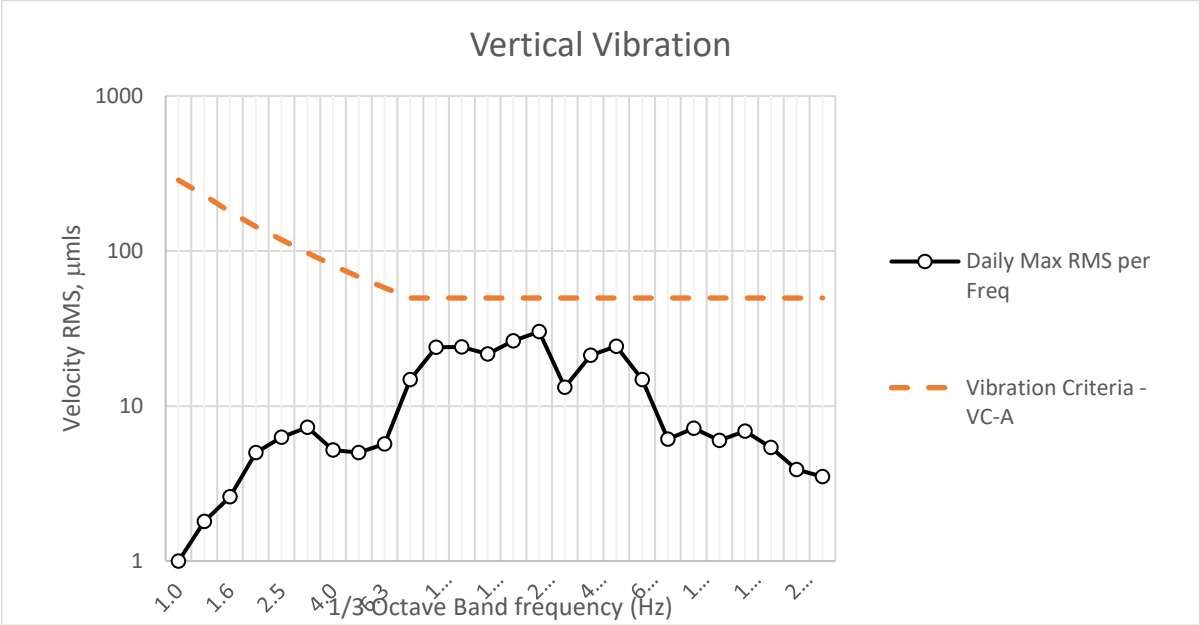


Fwd/Backwards

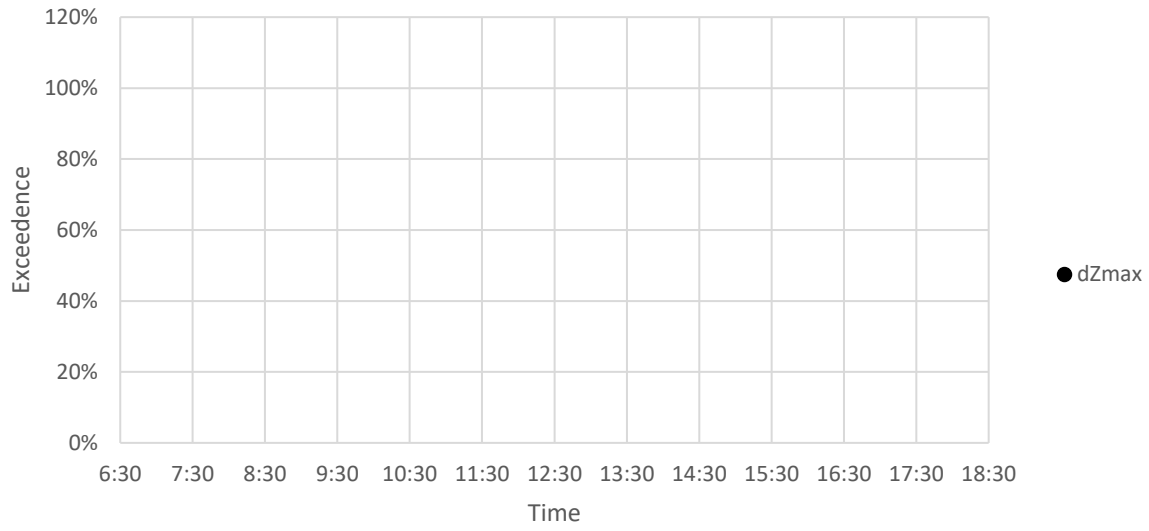


Sideways

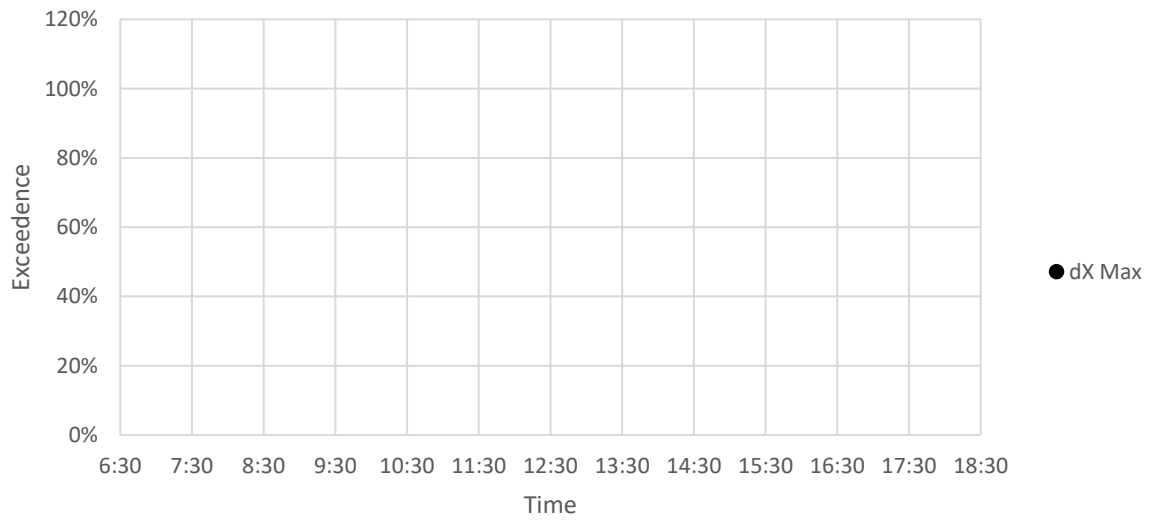




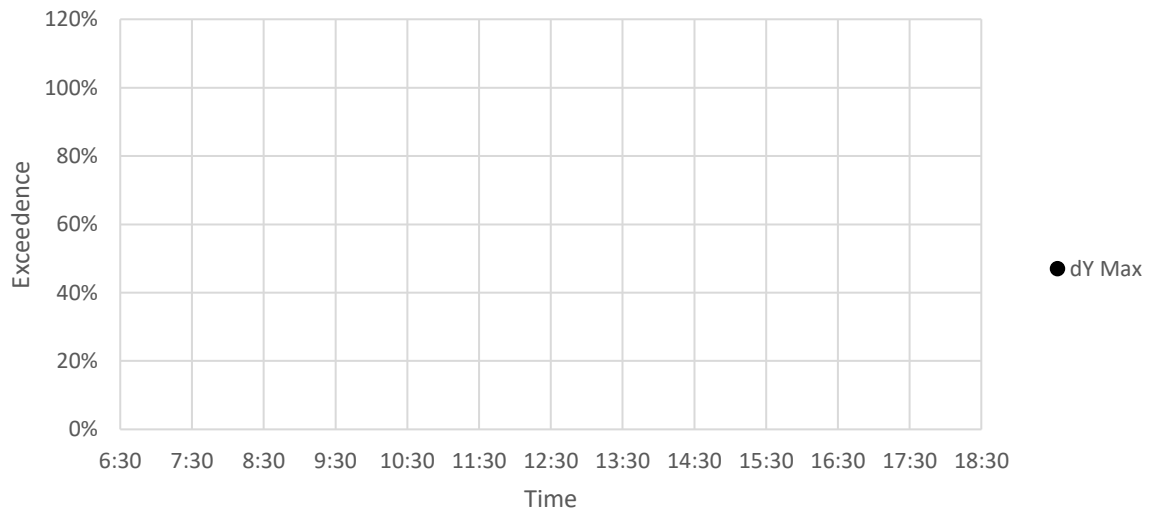
Vertical



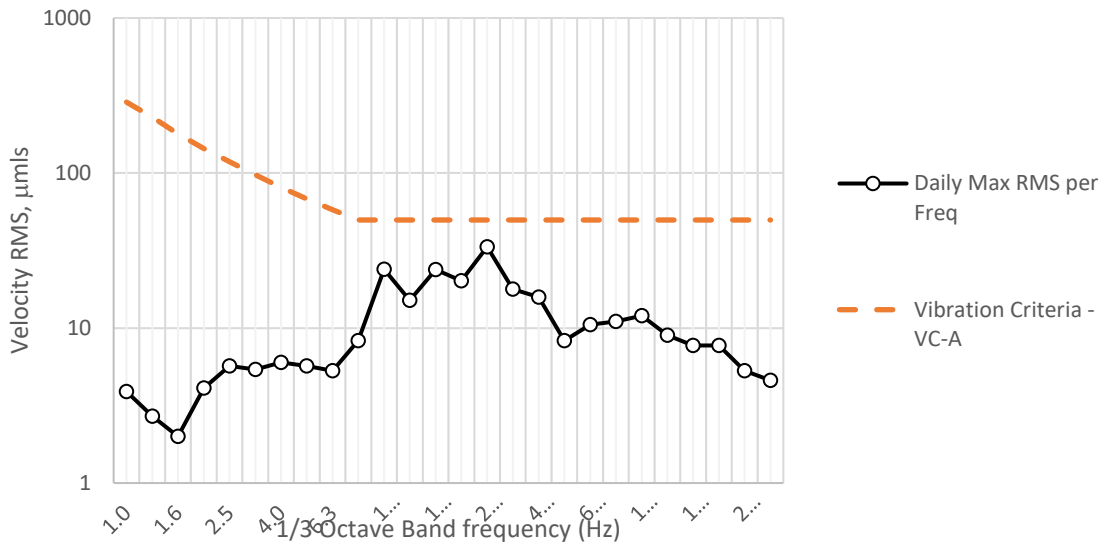
Fwd/Backwards



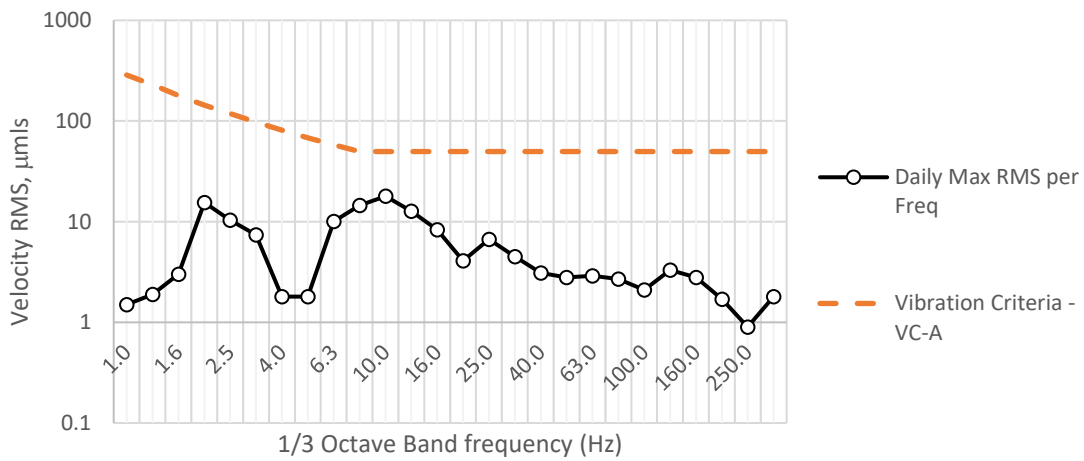
Sideways



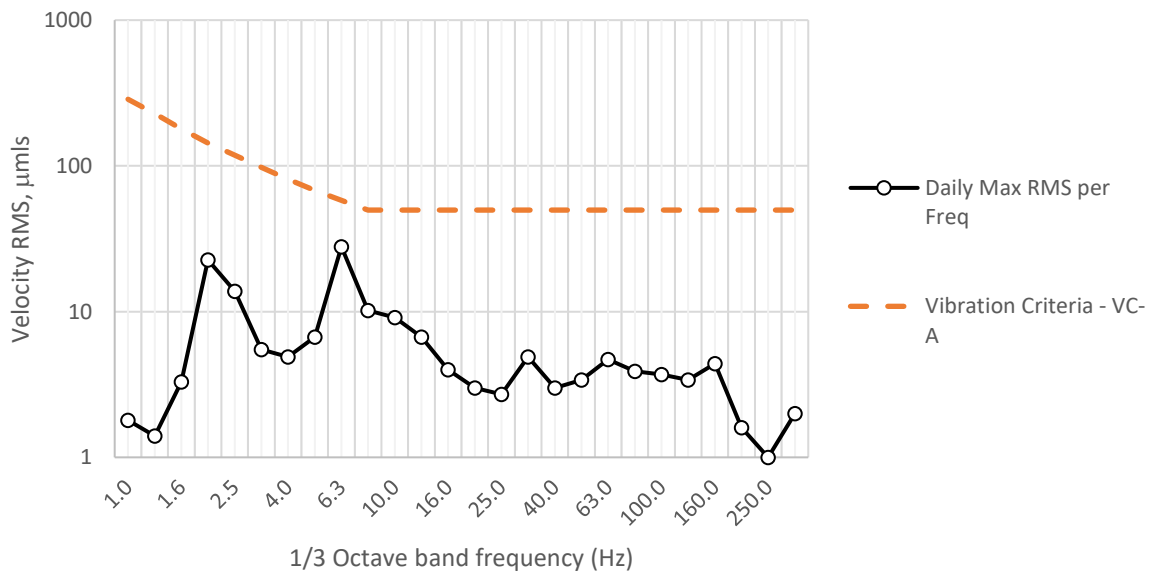
Vertical Vibration



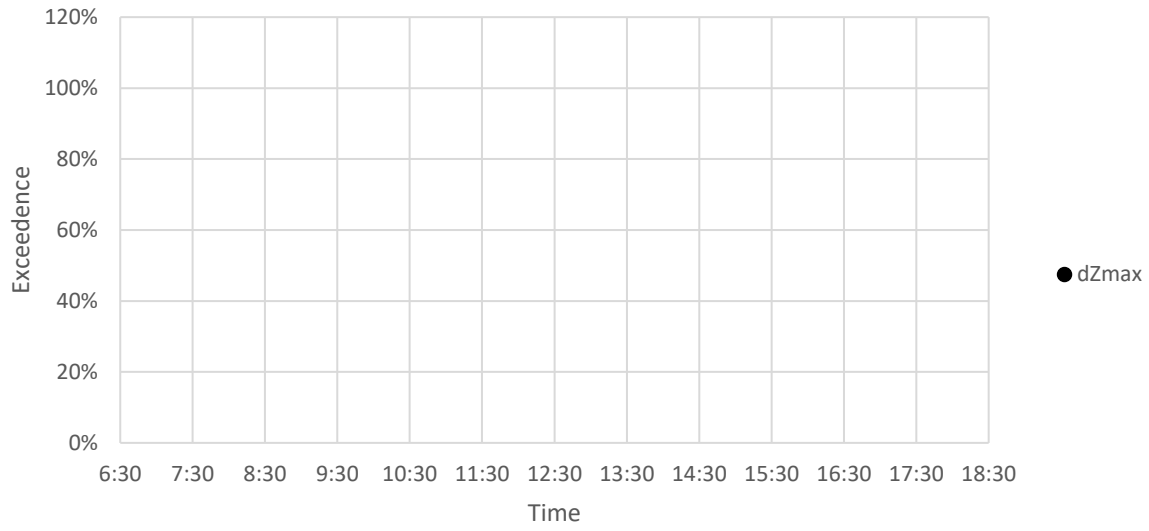
FwdBackwd Vibration



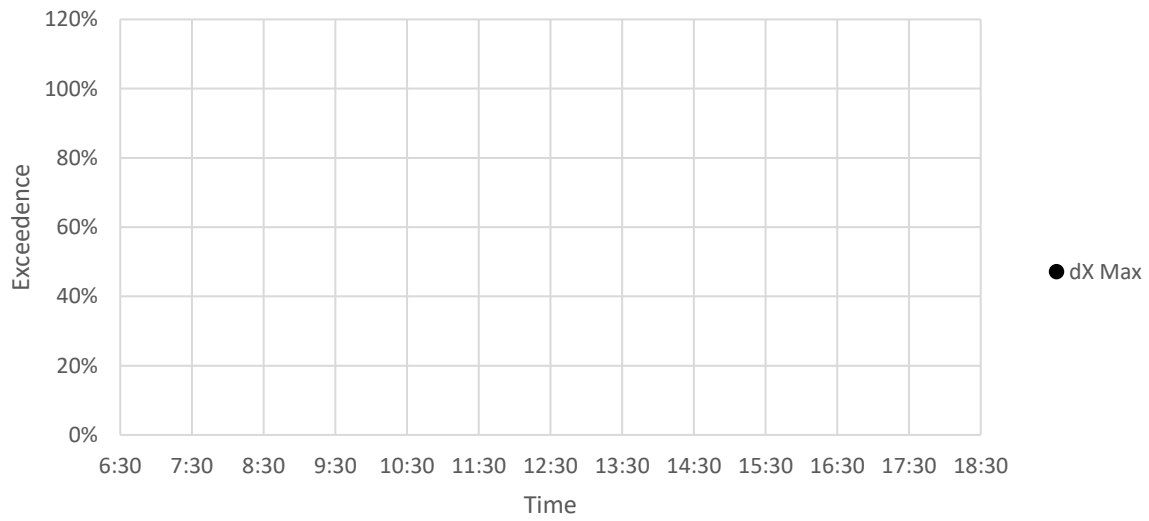
Sideways Vibration



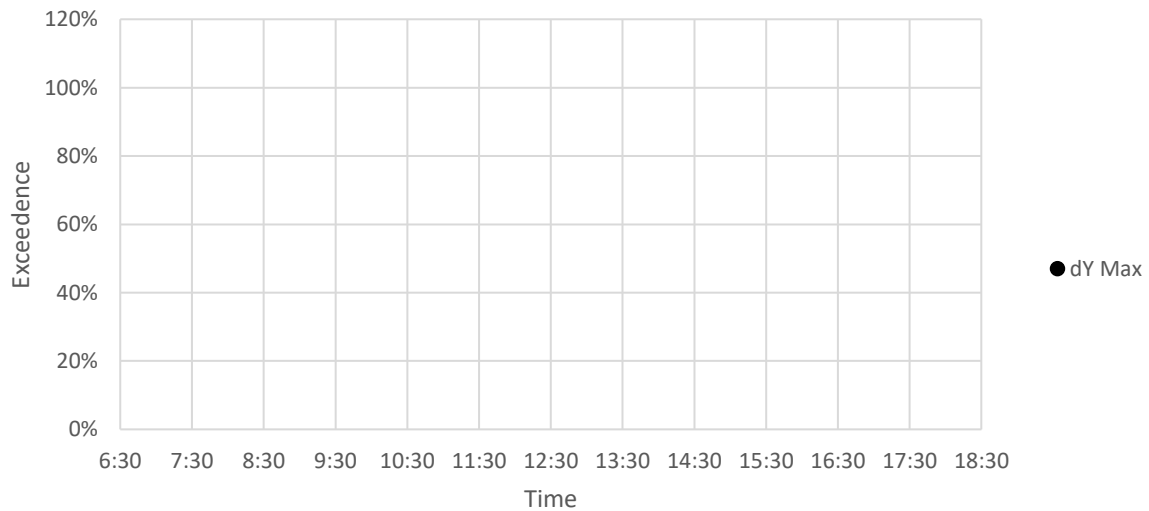
Vertical



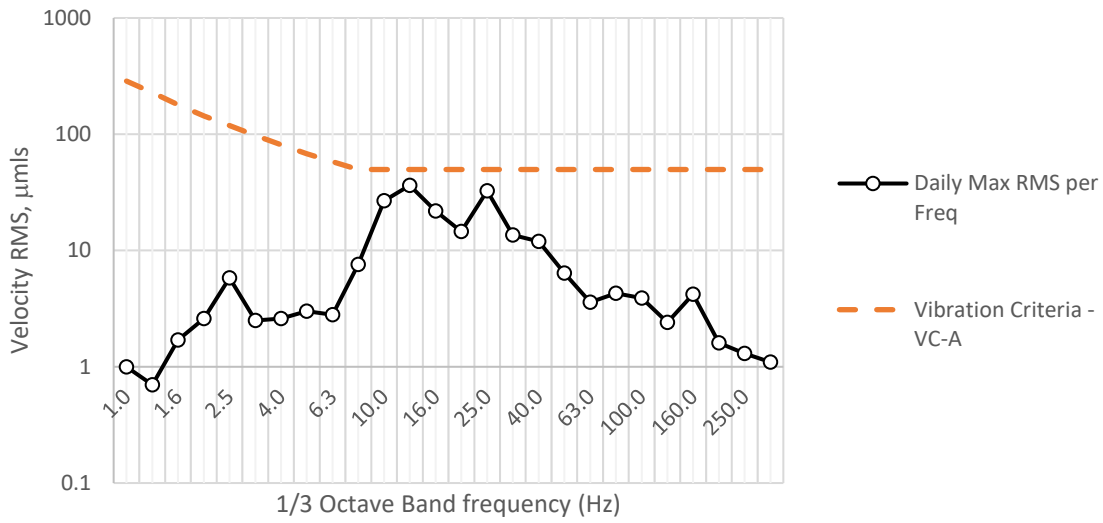
Fwd/Backwards



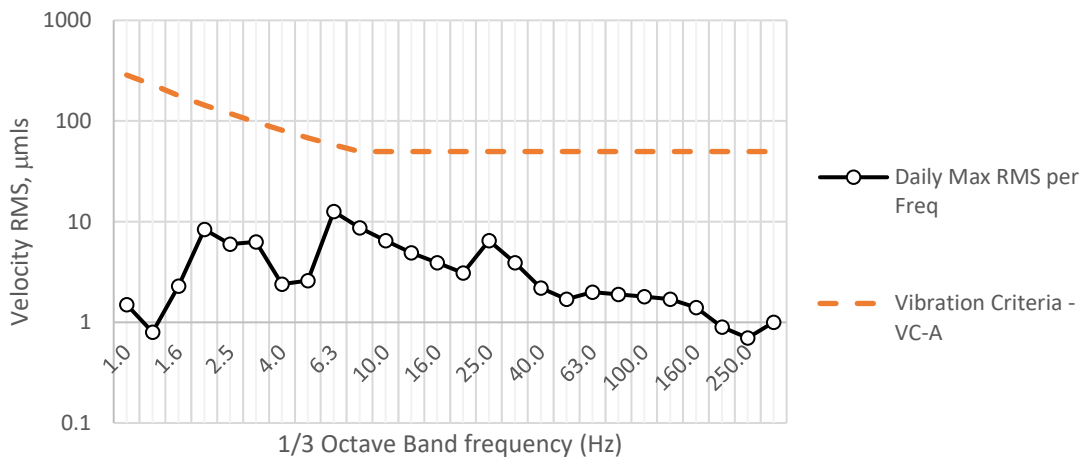
Sideways



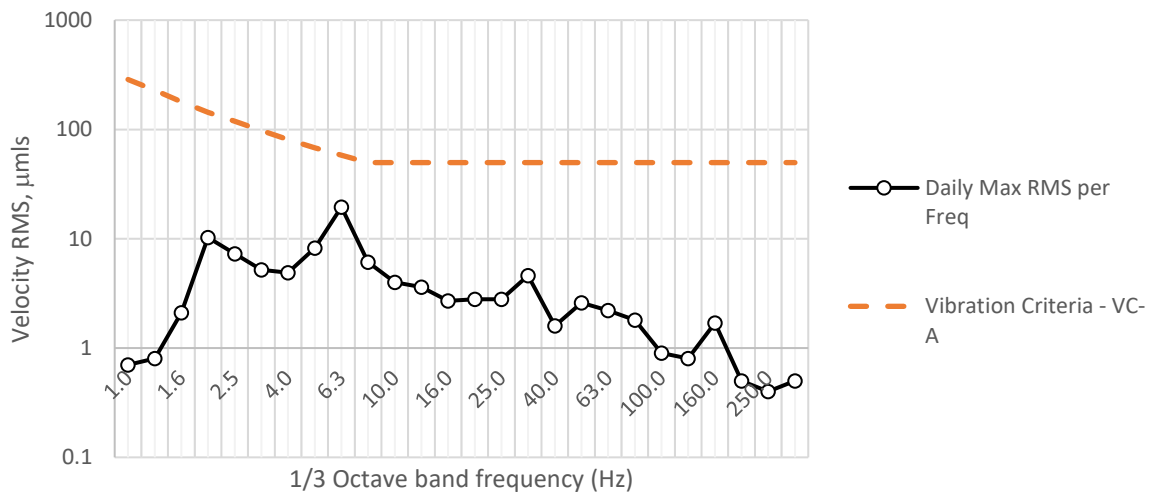
Vertical Vibration



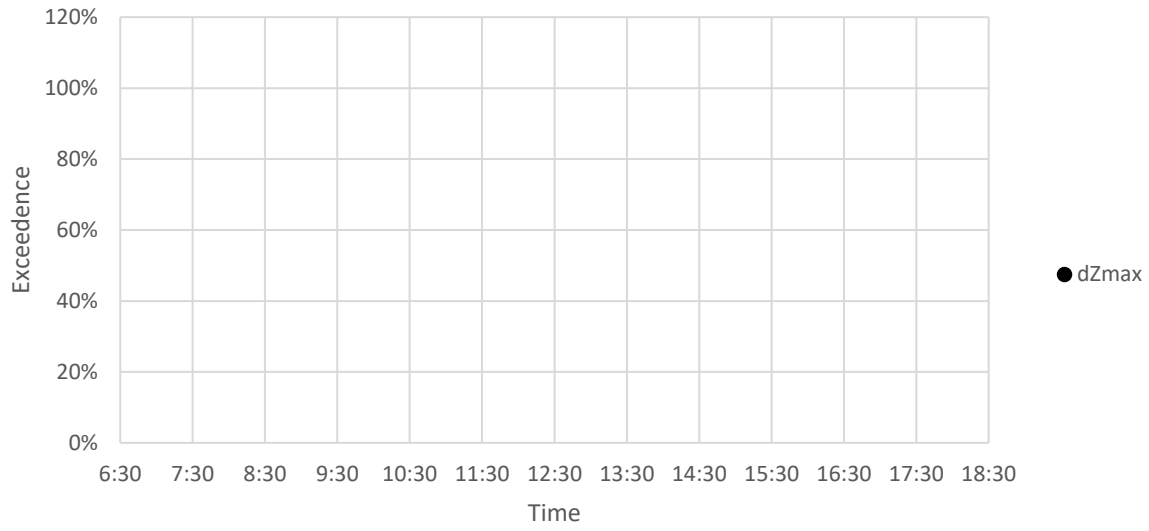
FwdBackwd Vibration



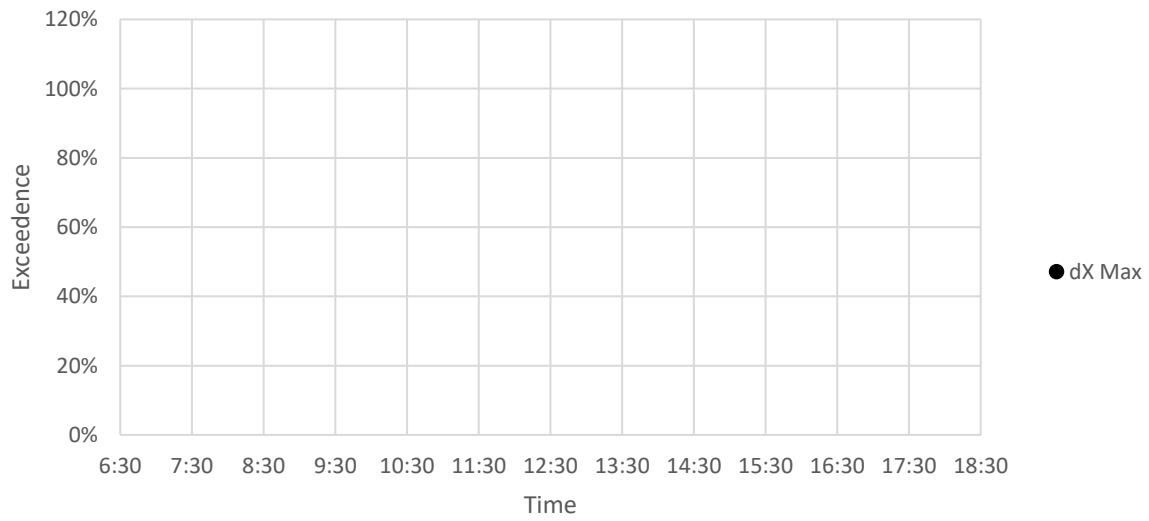
Sideways Vibration



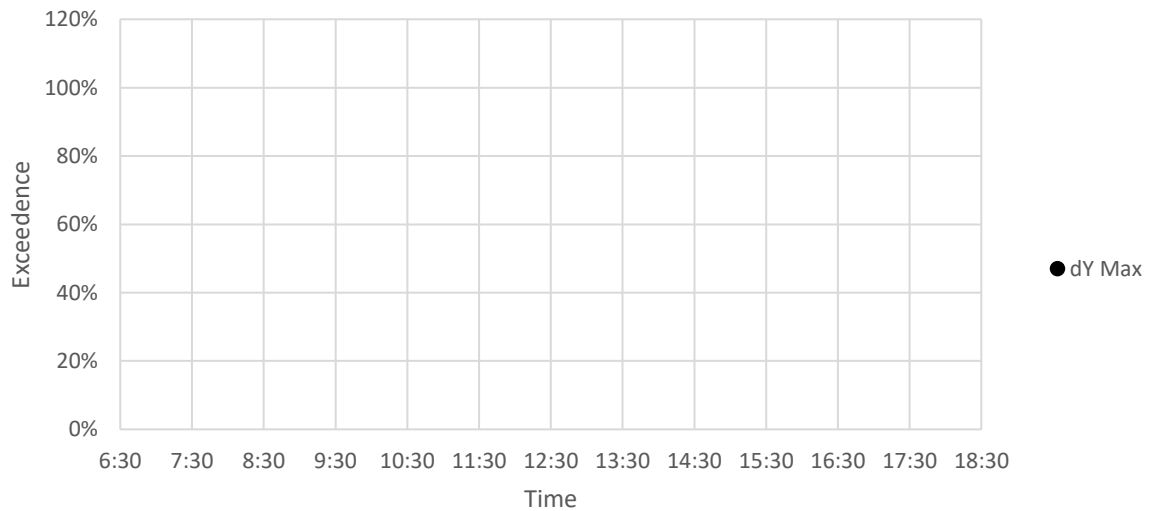
Vertical



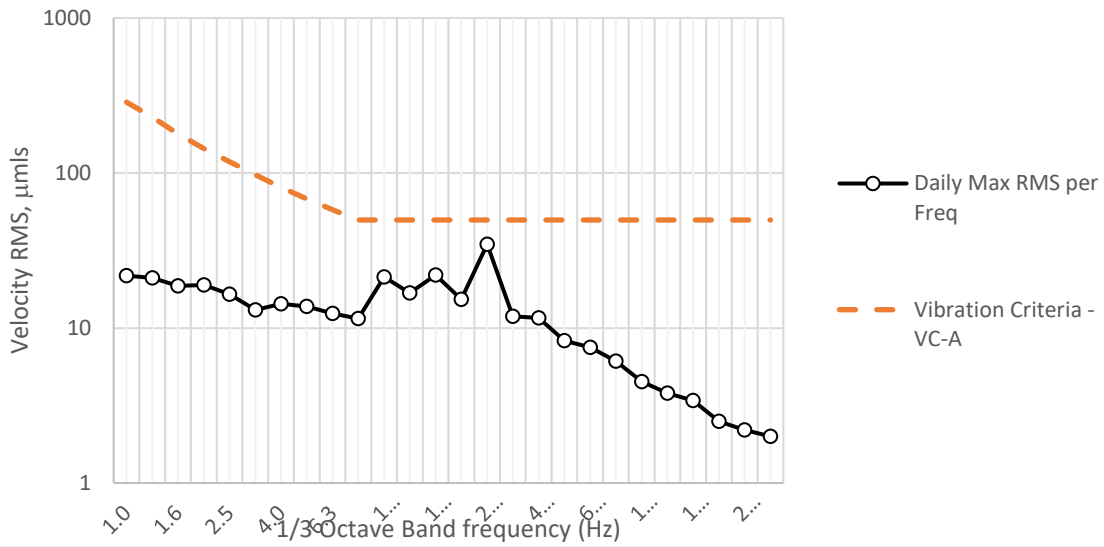
Fwd/Backwards



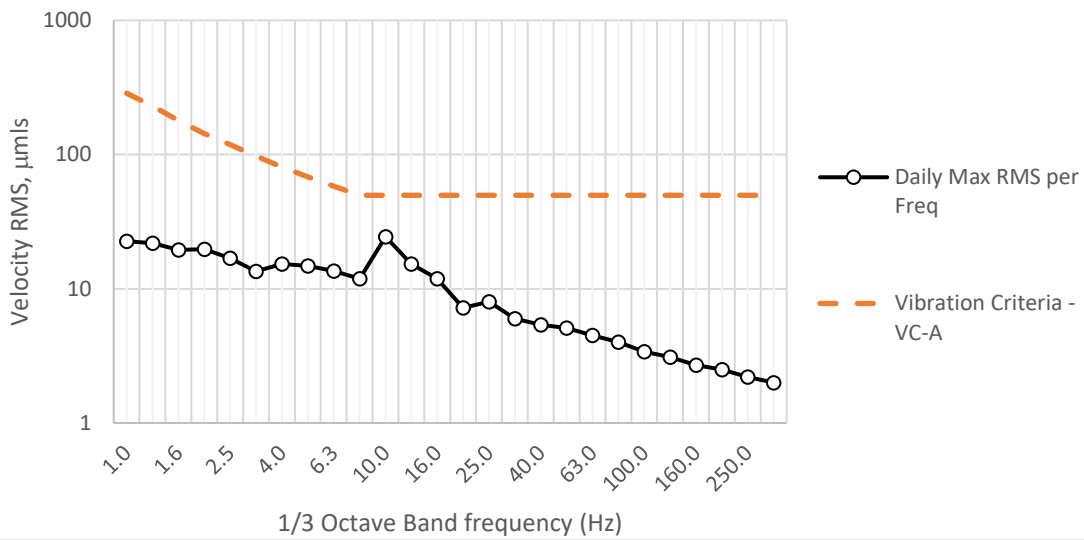
Sideways



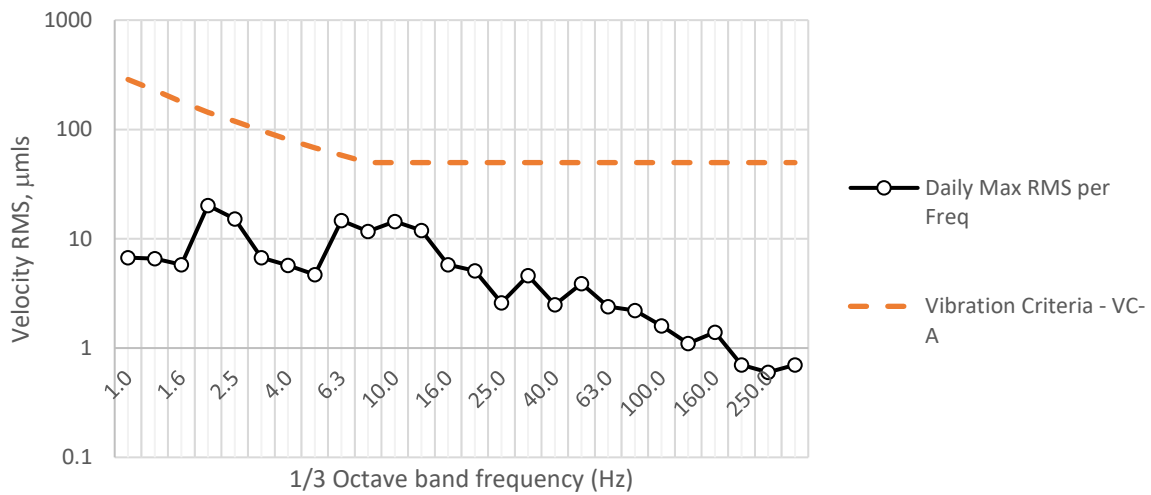
Vertical Vibration



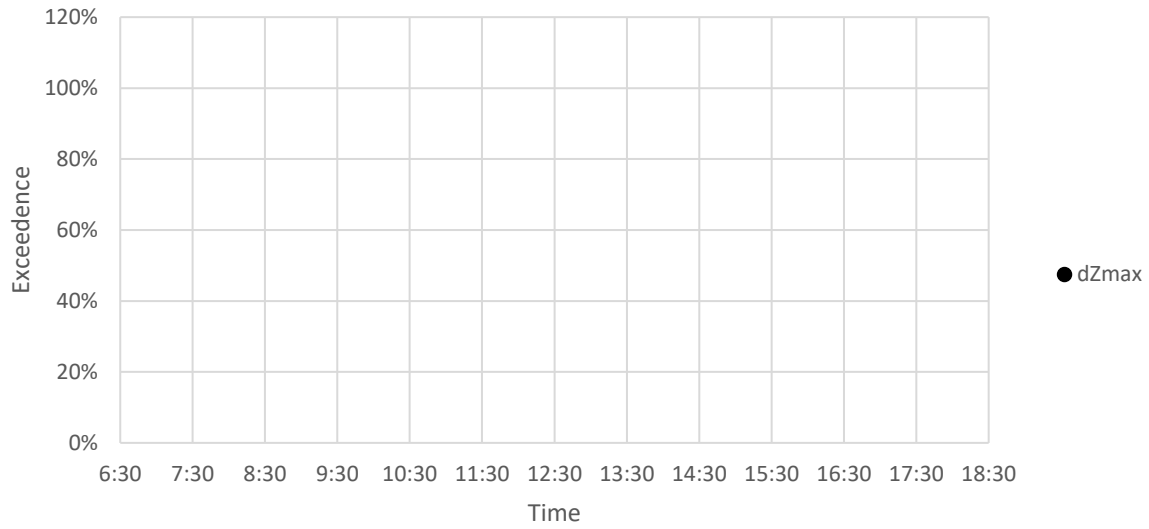
FwdBackwd Vibration



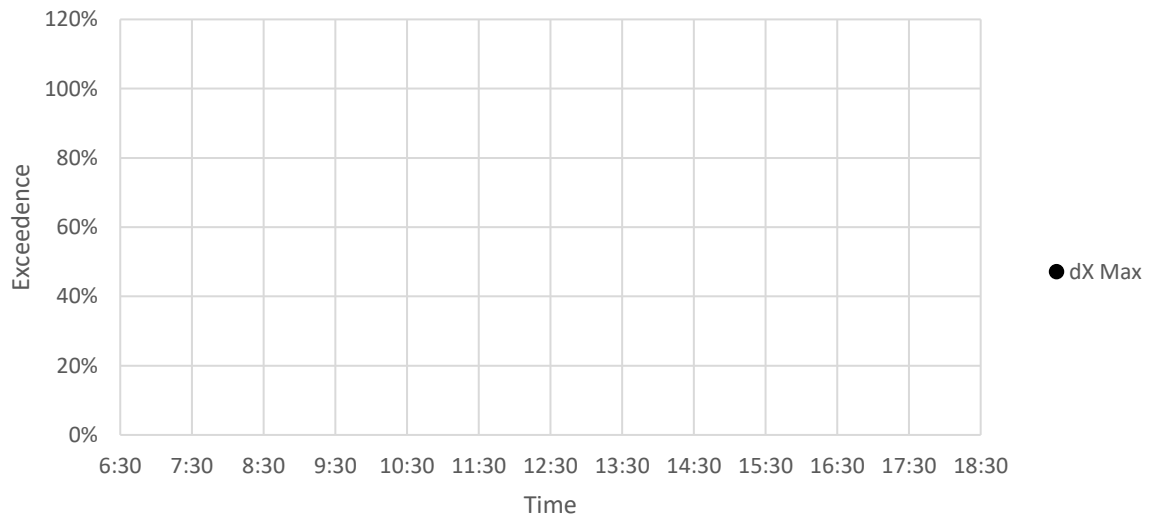
Sideways Vibration



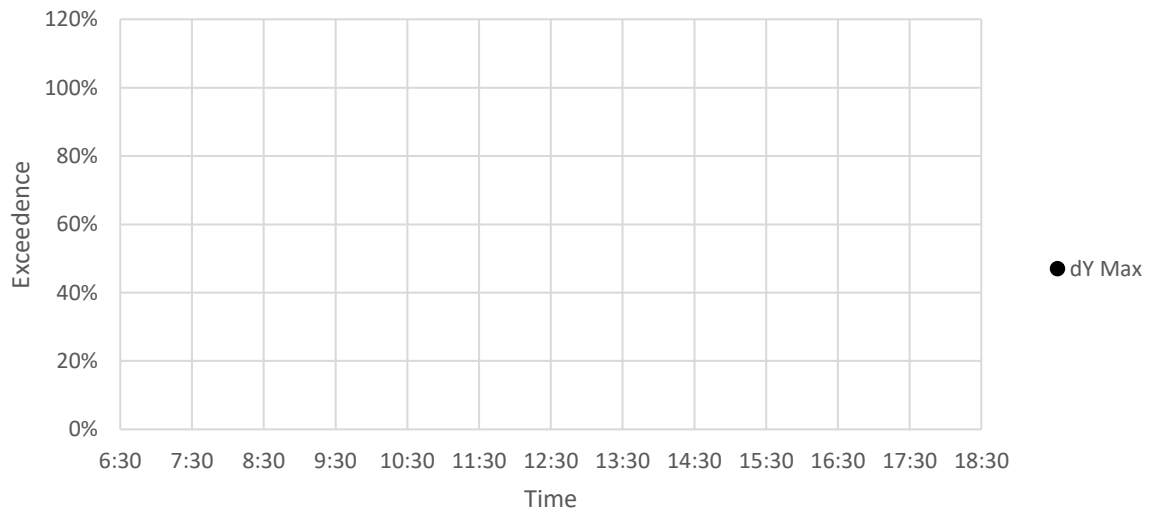
Vertical



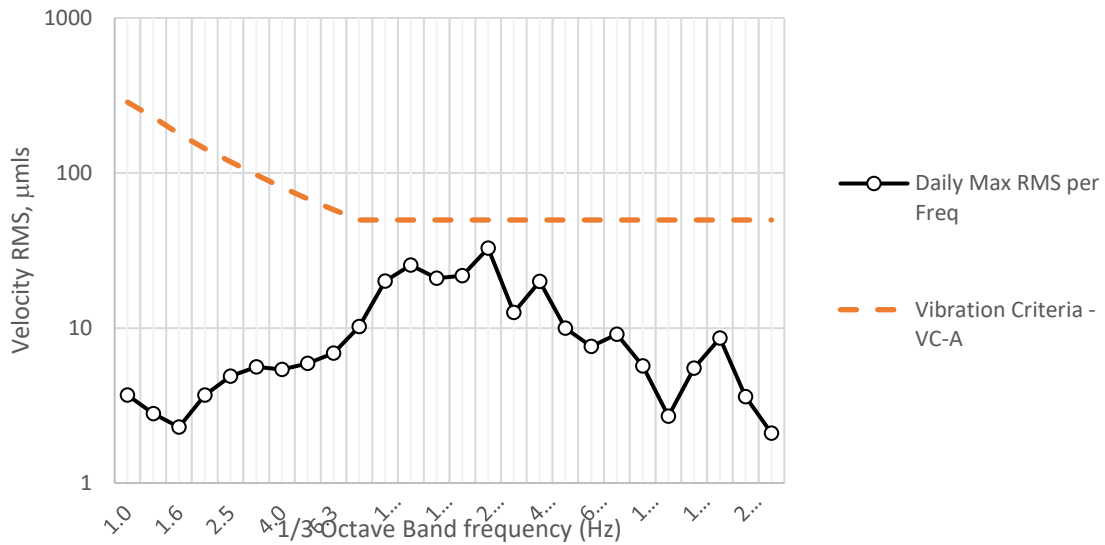
Fwd/Backwards



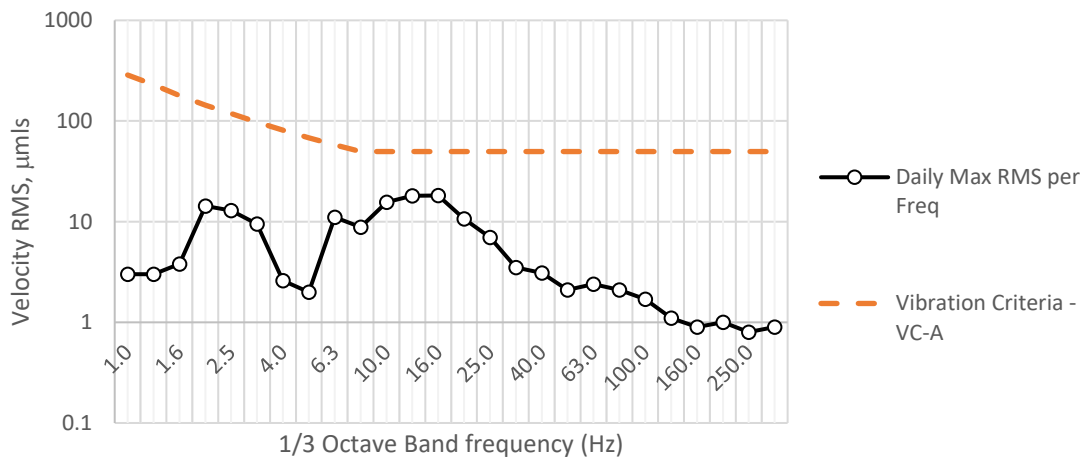
Sideways



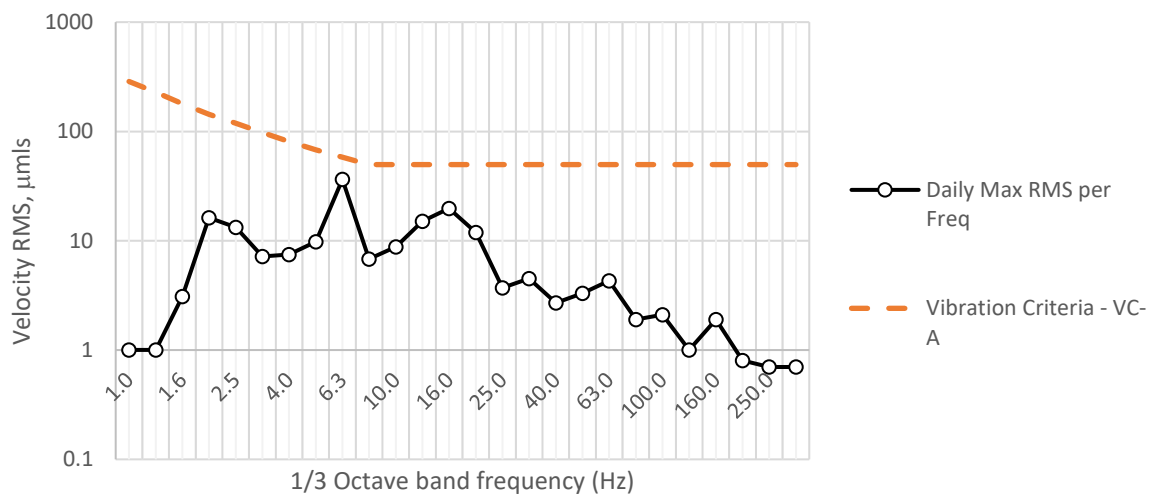
Vertical Vibration



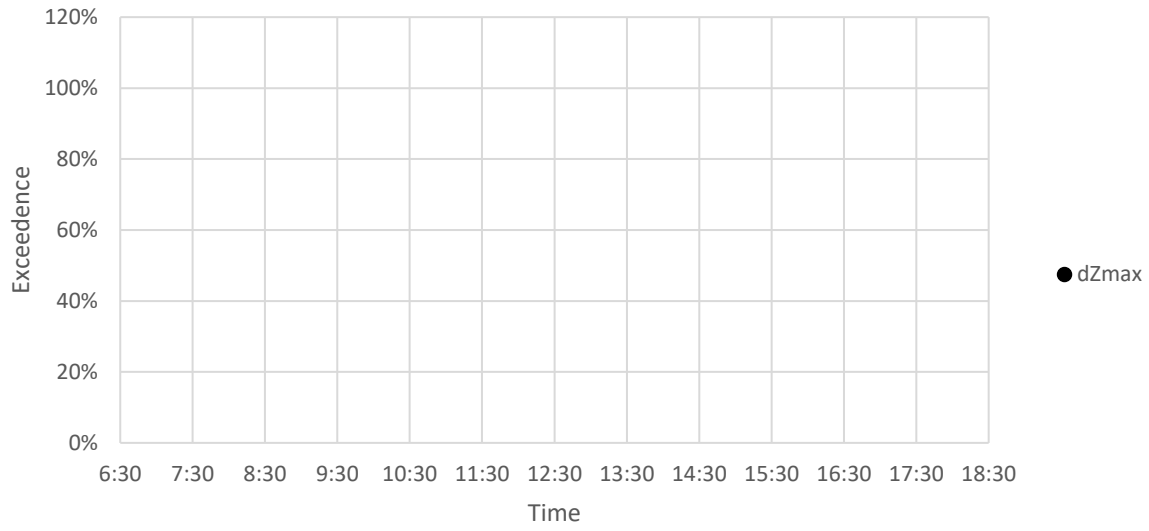
FwdBackwd Vibration



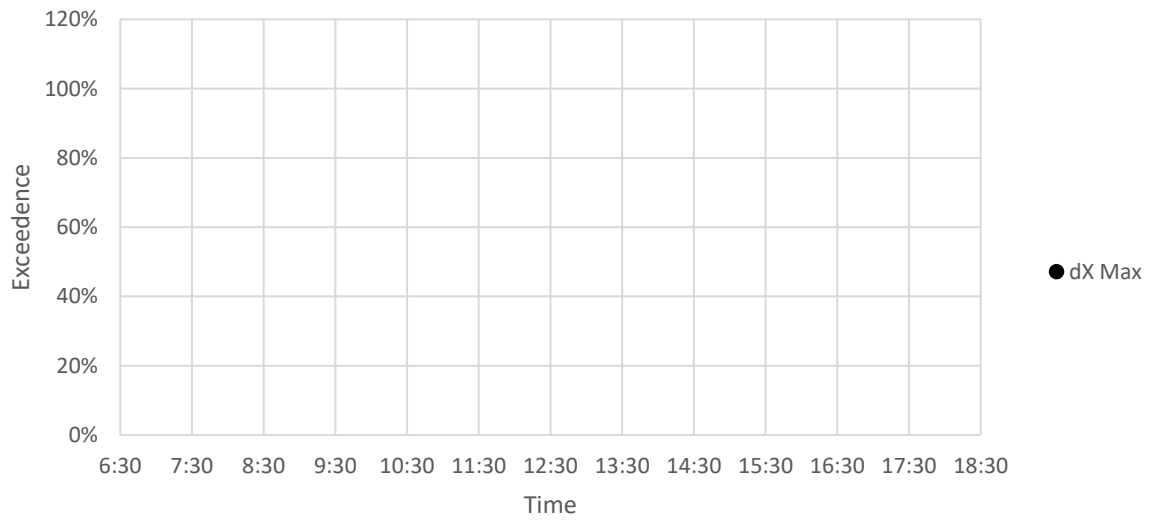
Sideways Vibration



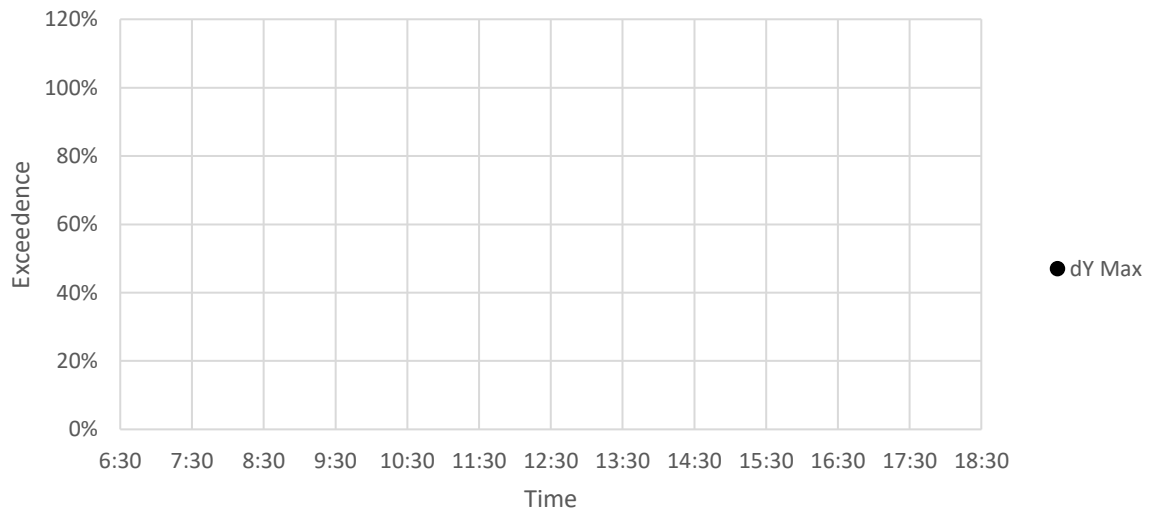
Vertical



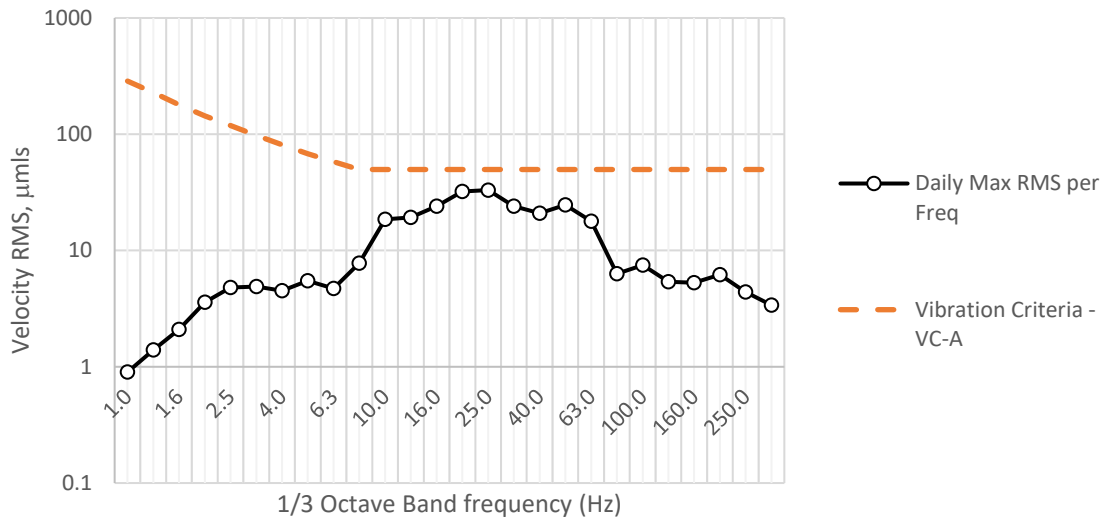
Fwd/Backwards



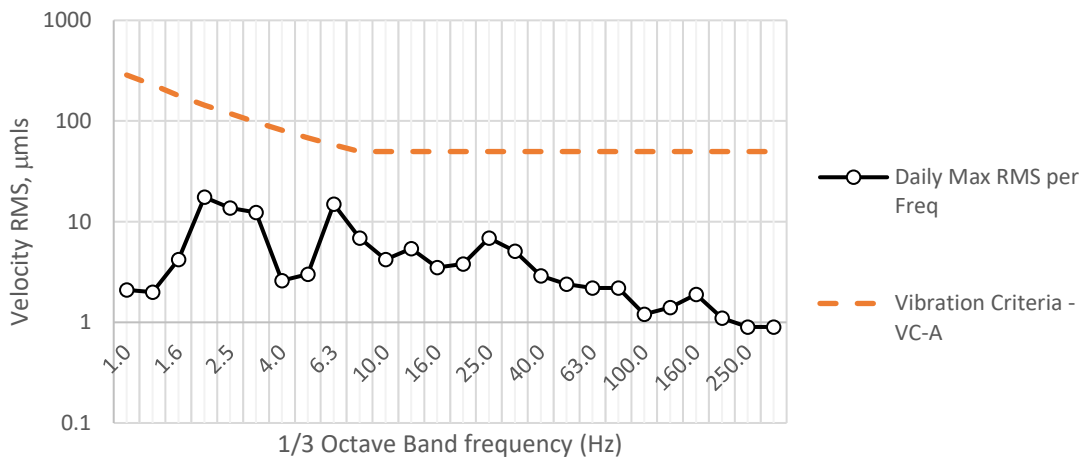
Sideways



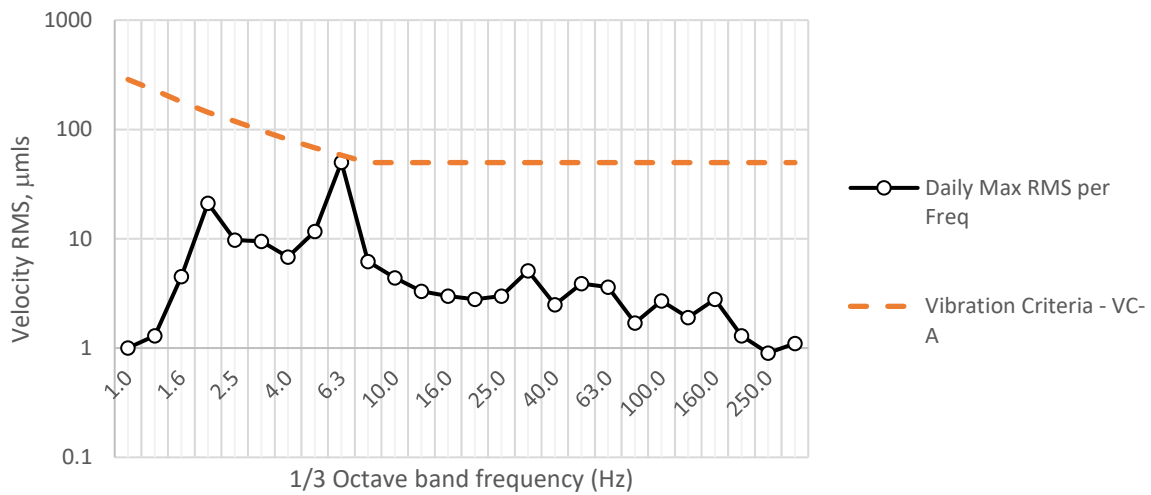
Vertical Vibration



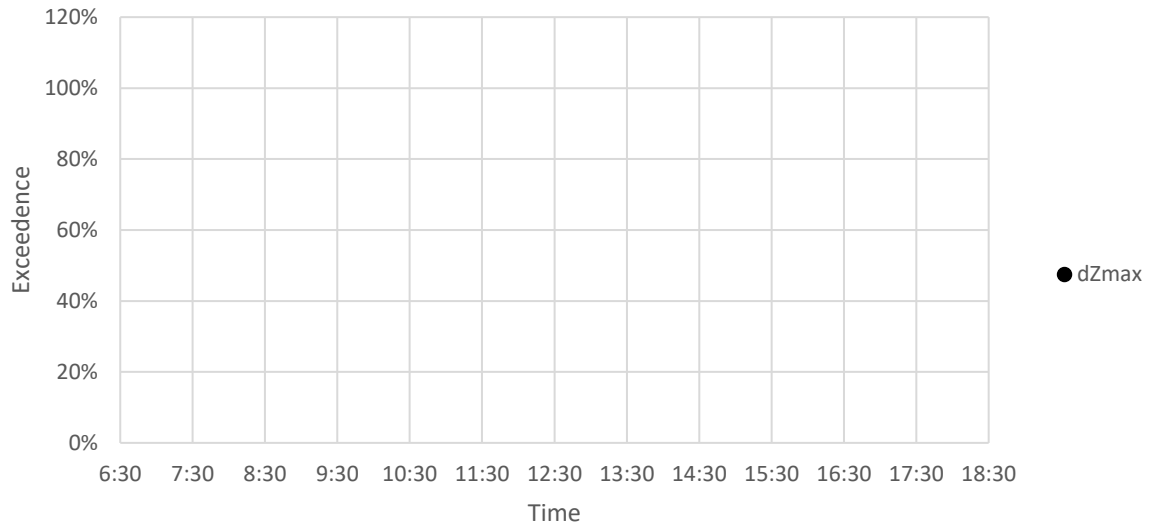
FwdBackwd Vibration



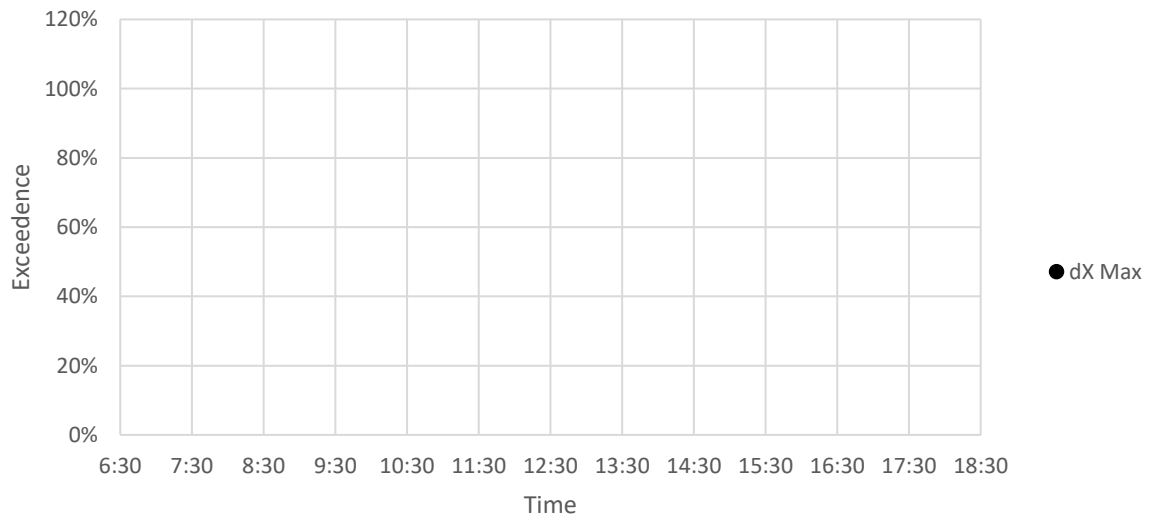
Sideways Vibration



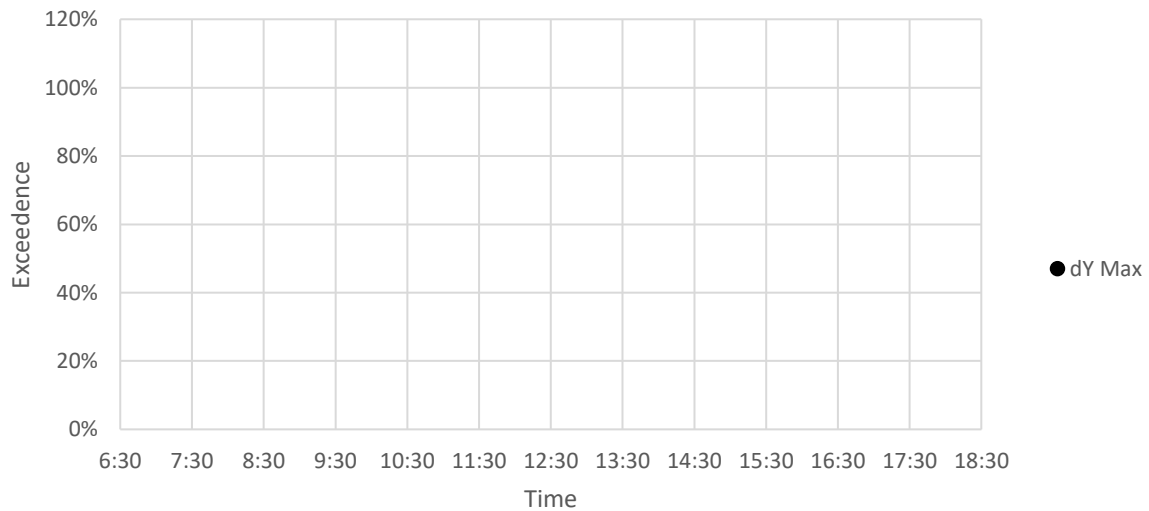
Vertical

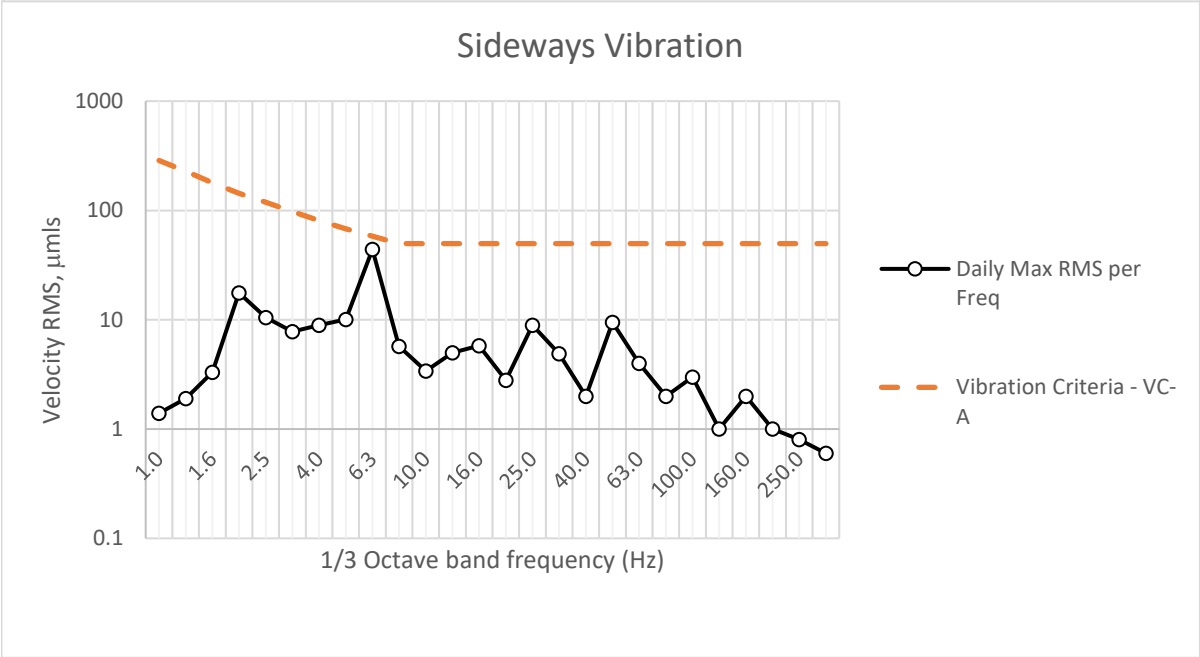
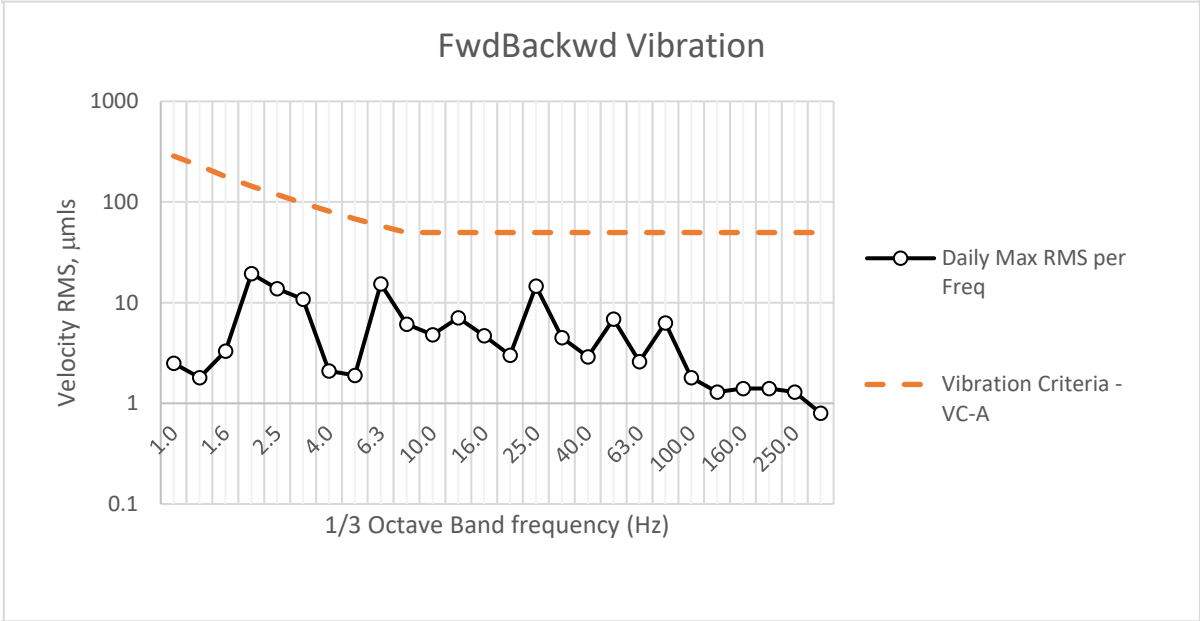
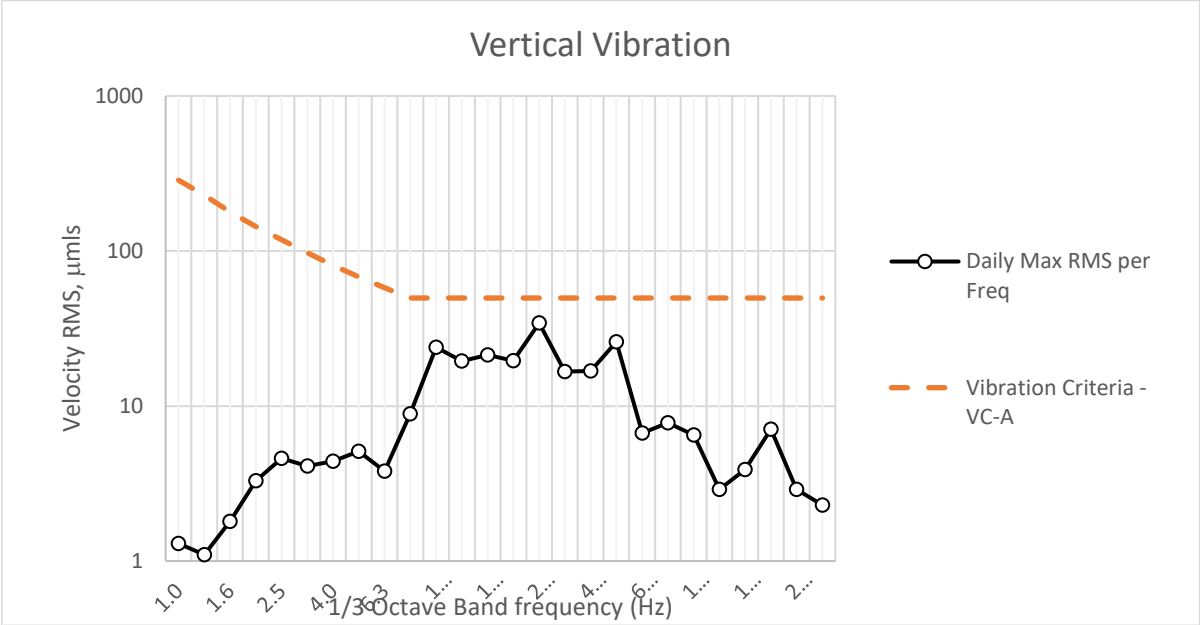


Fwd/Backwards

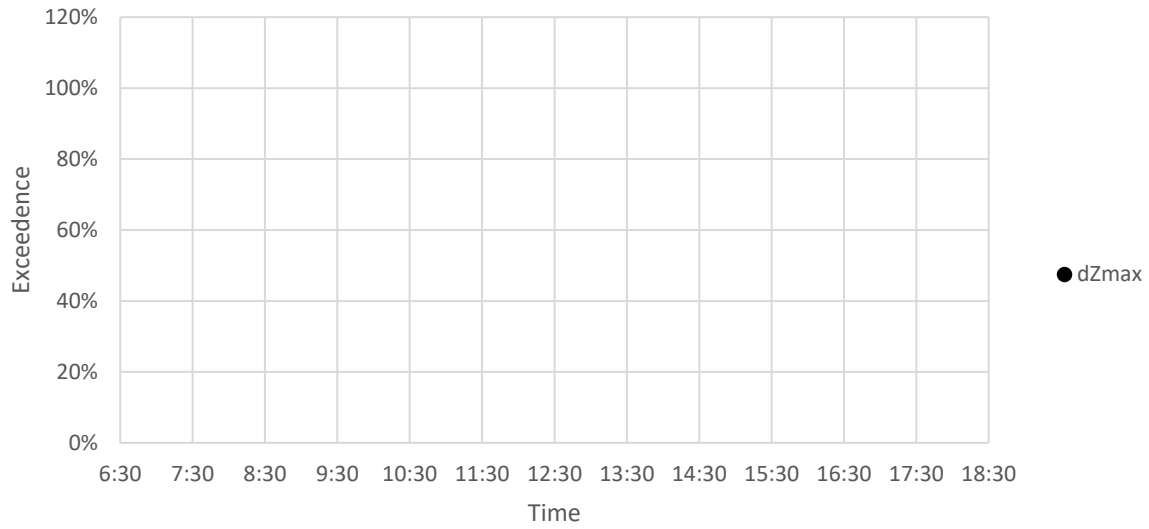


Sideways

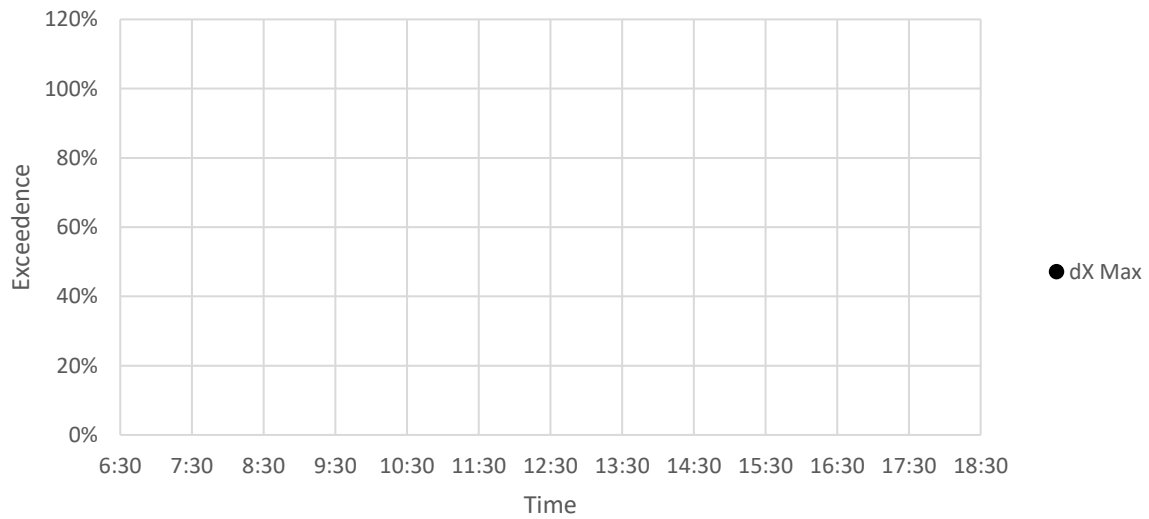




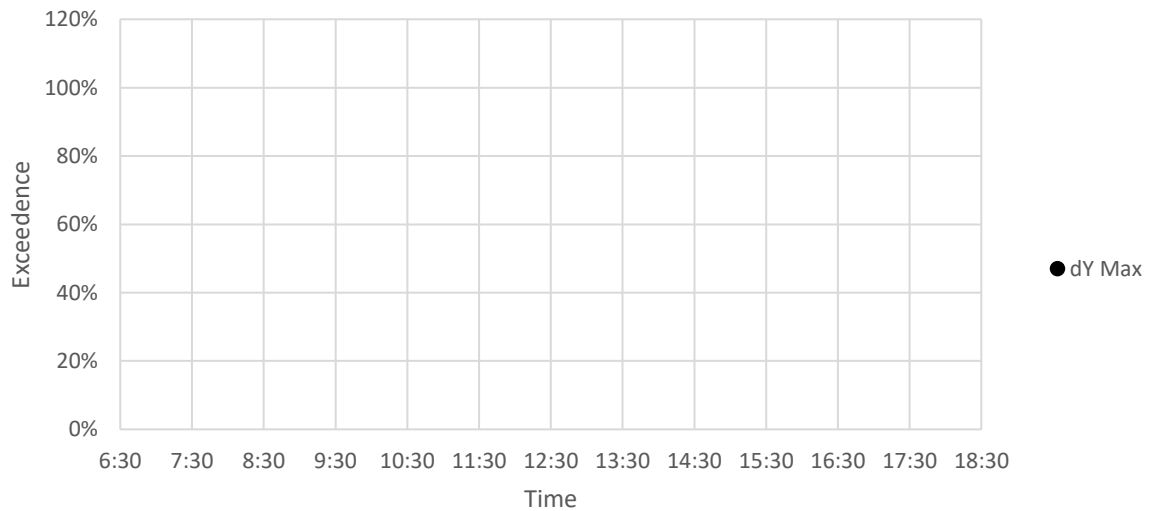
Vertical



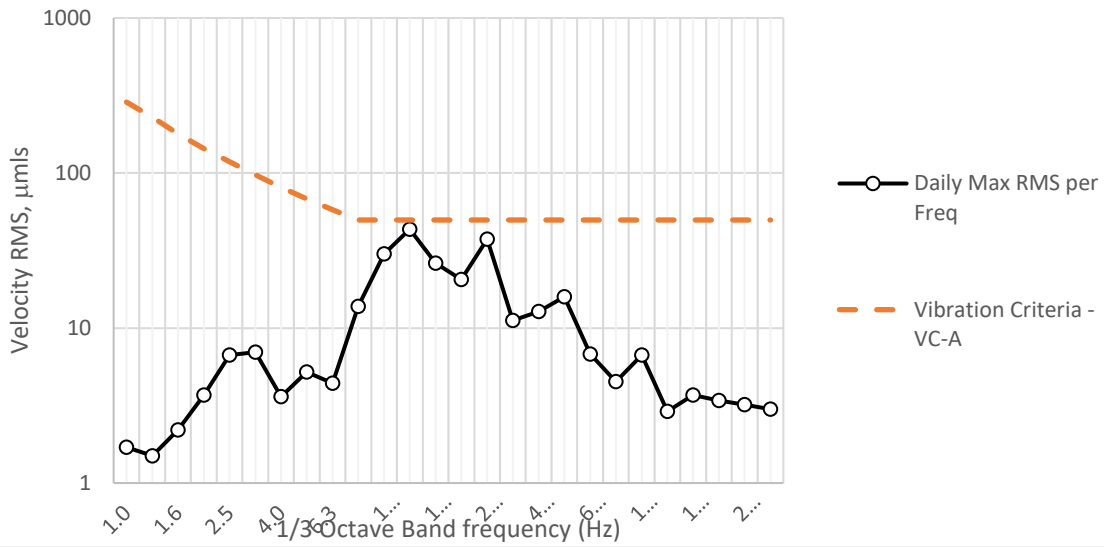
Fwd/Backwards



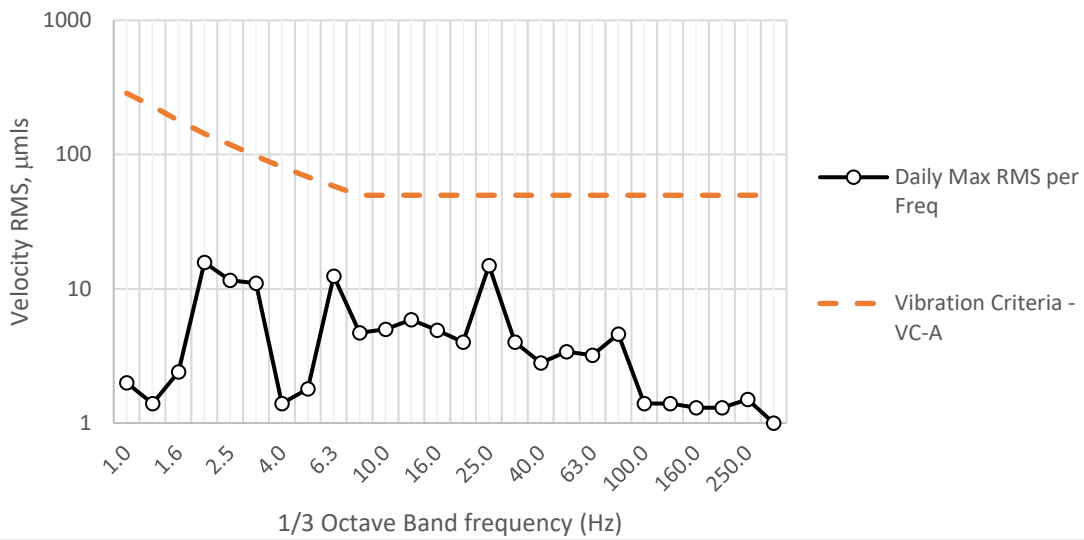
Sideways



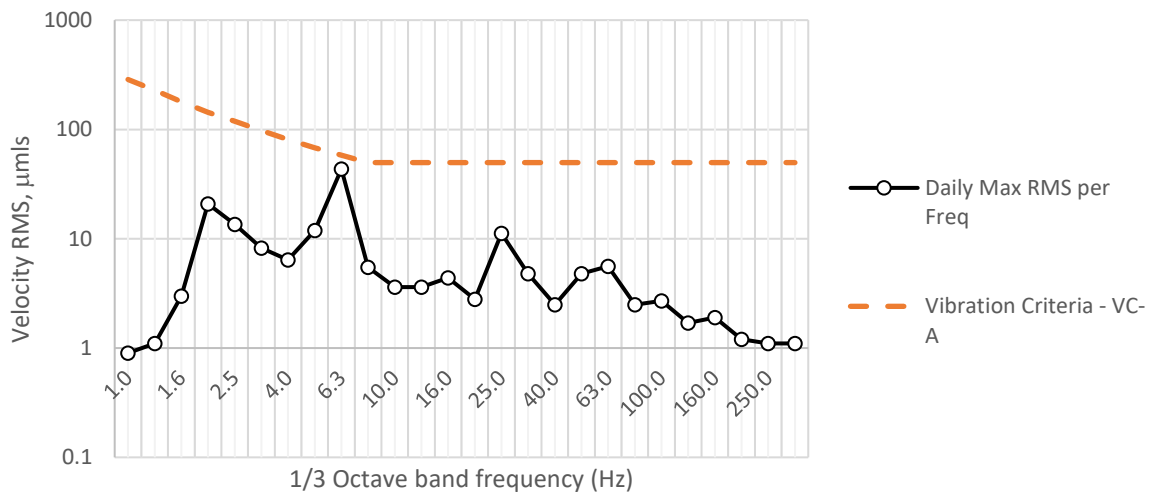
Vertical Vibration



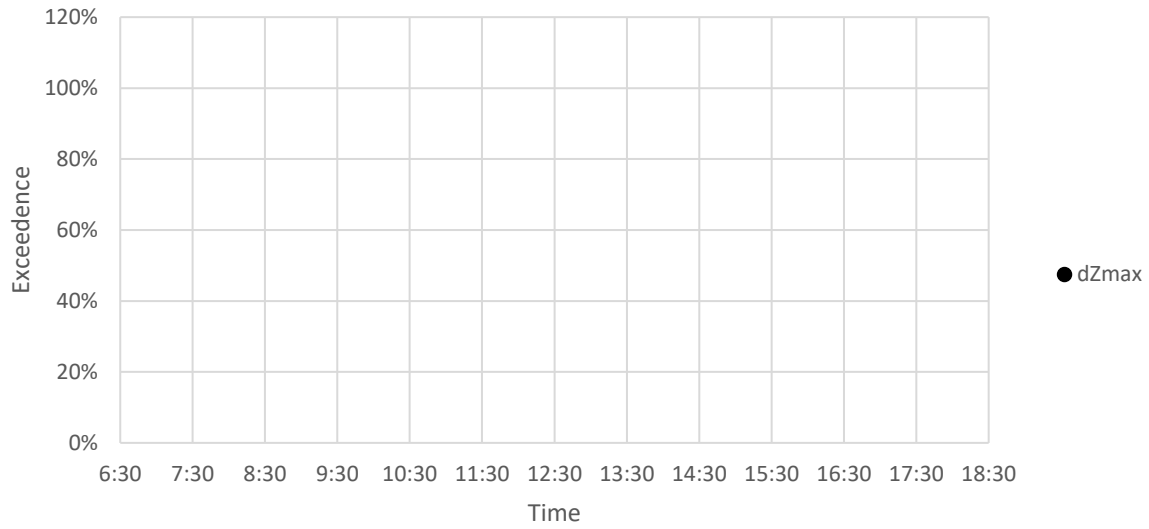
FwdBackwd Vibration



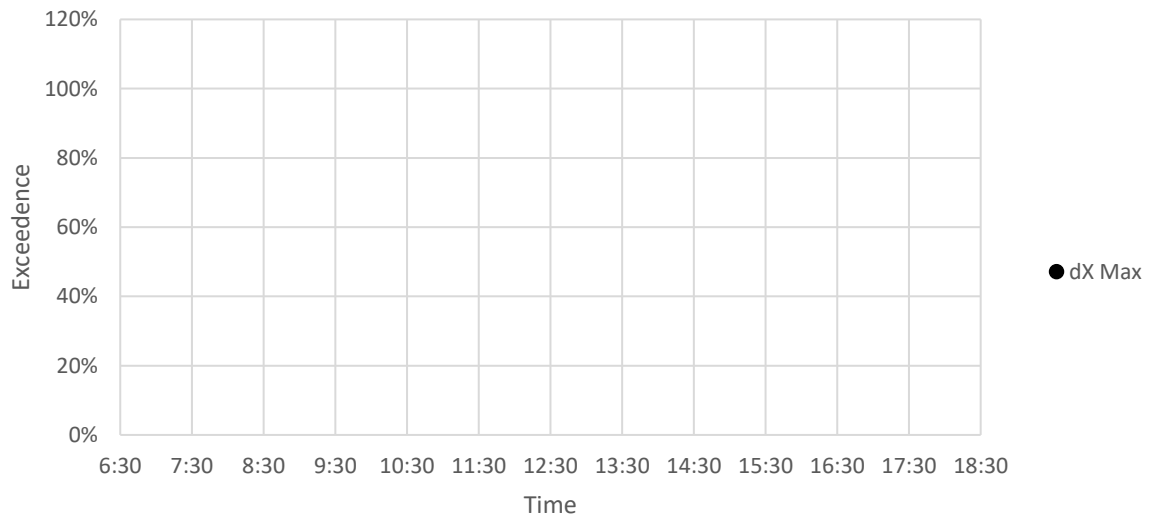
Sideways Vibration



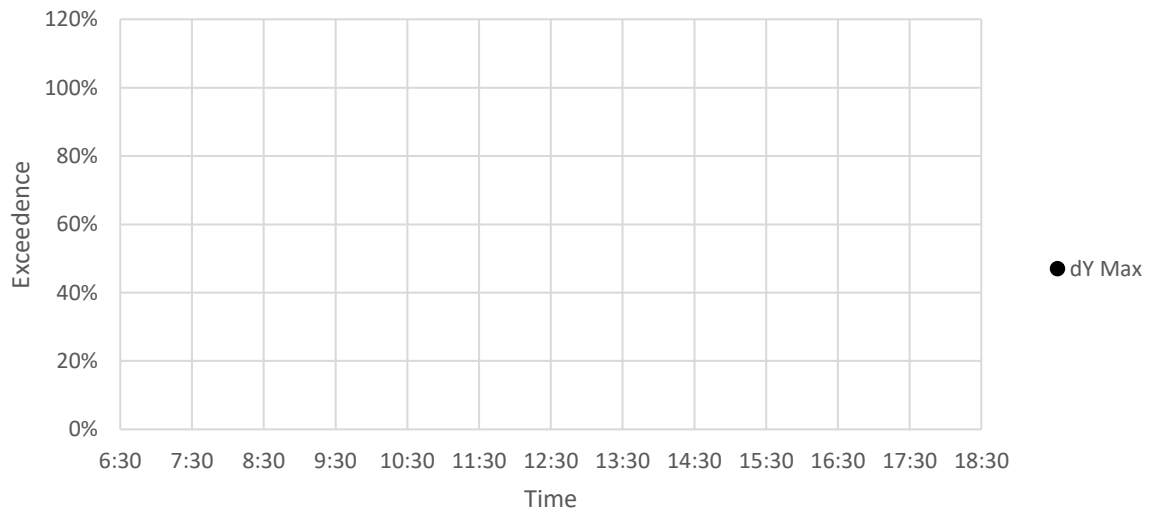
Vertical



Fwd/Backwards

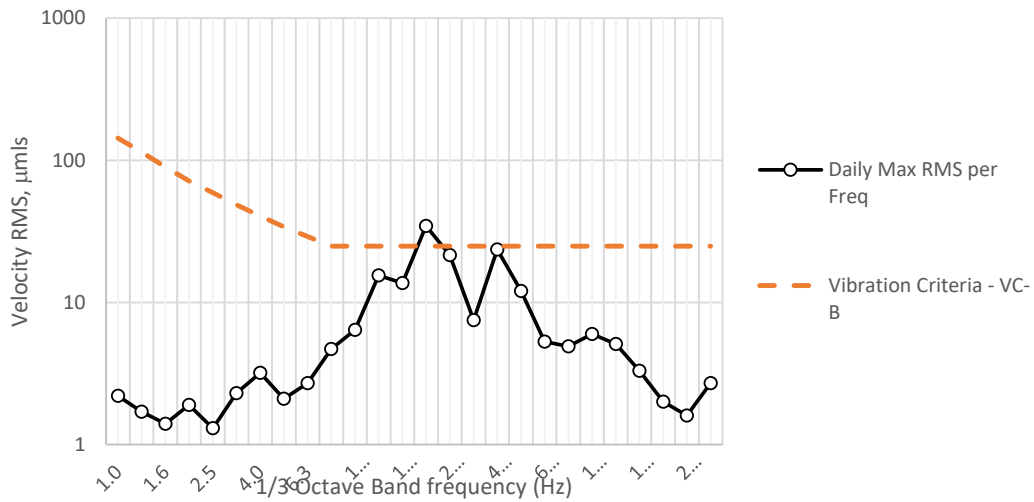


Sideways

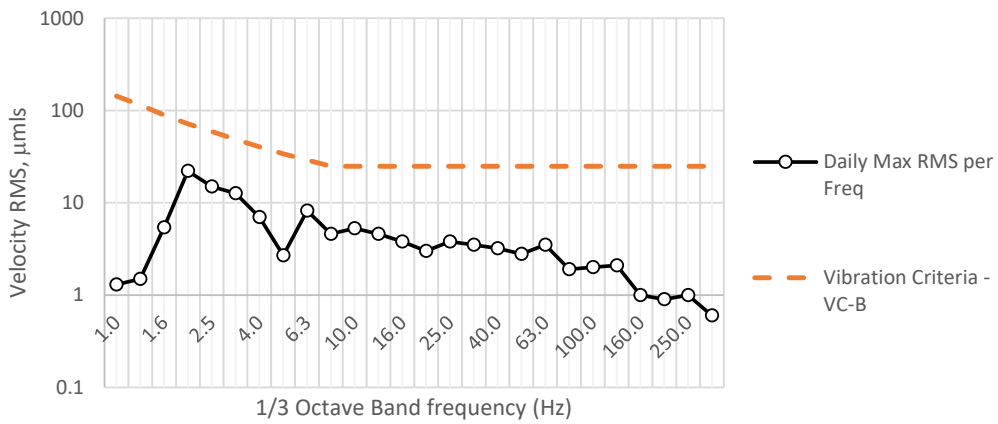


CENTENARY INSTITUTE – LEVEL 4 BATHROOM (NORTHERN FAÇADE)

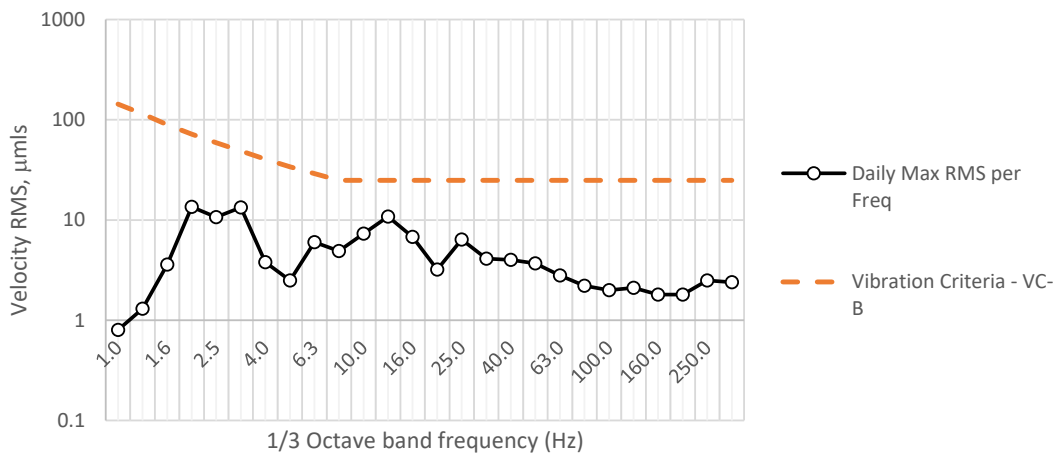
Vertical Vibration



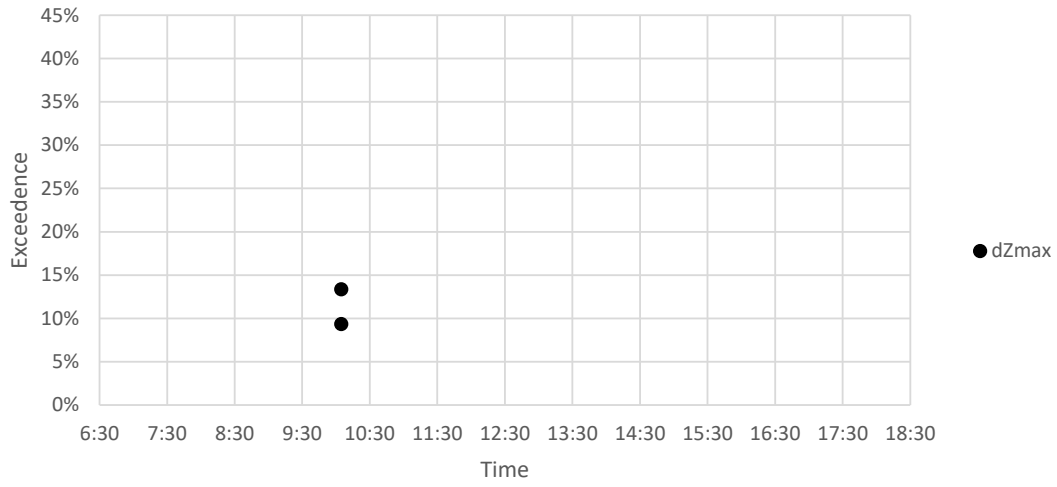
FwdBackwd Vibration



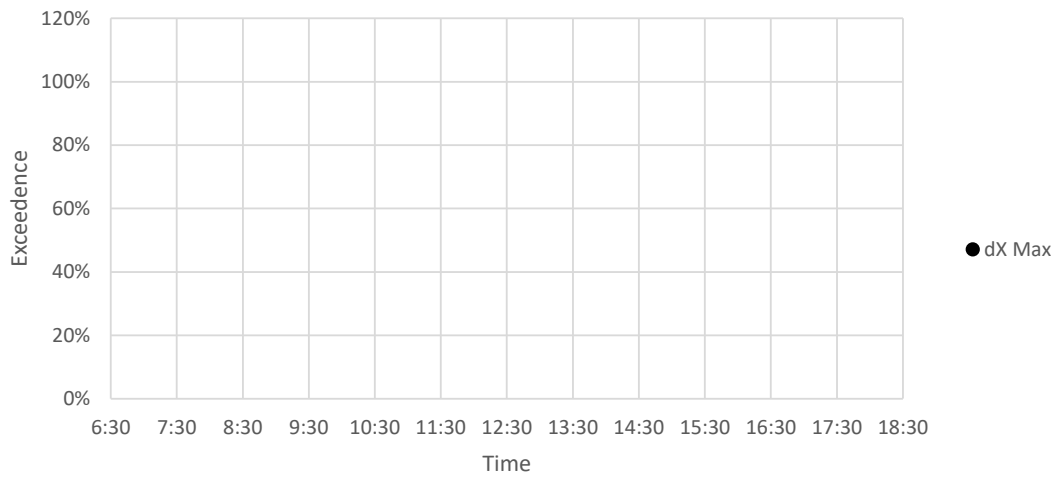
Sideways Vibration



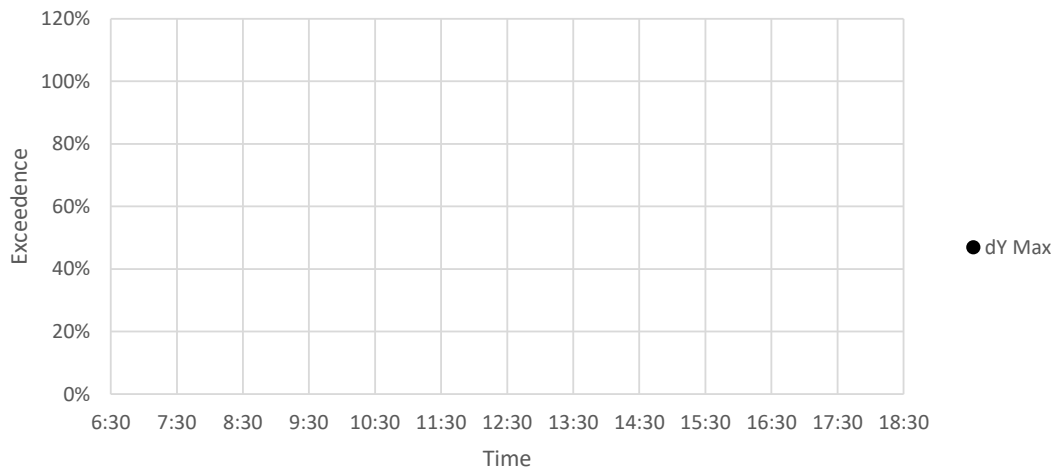
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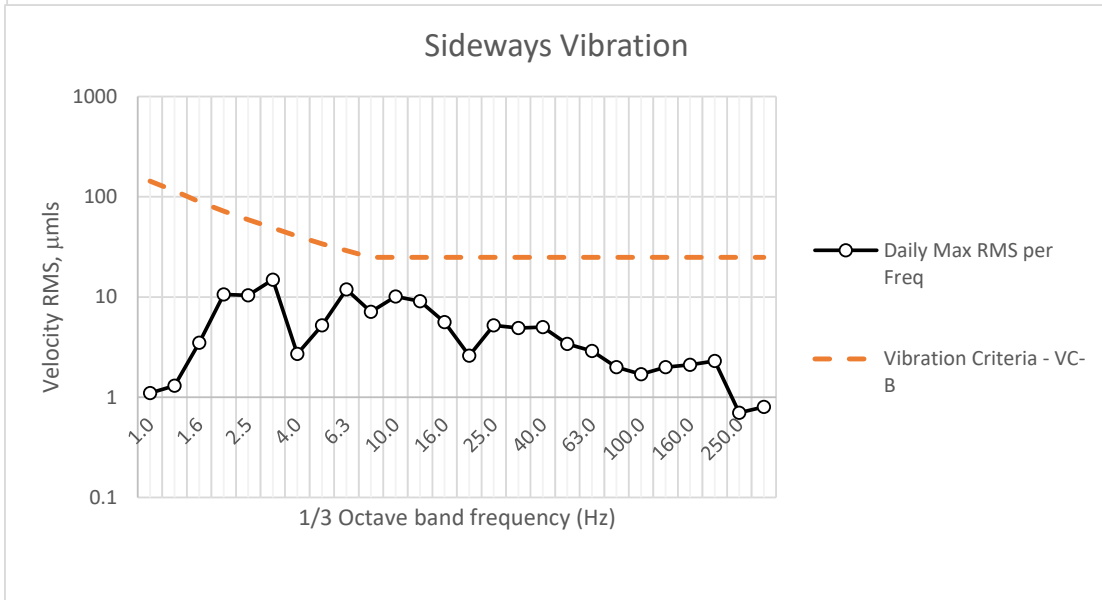
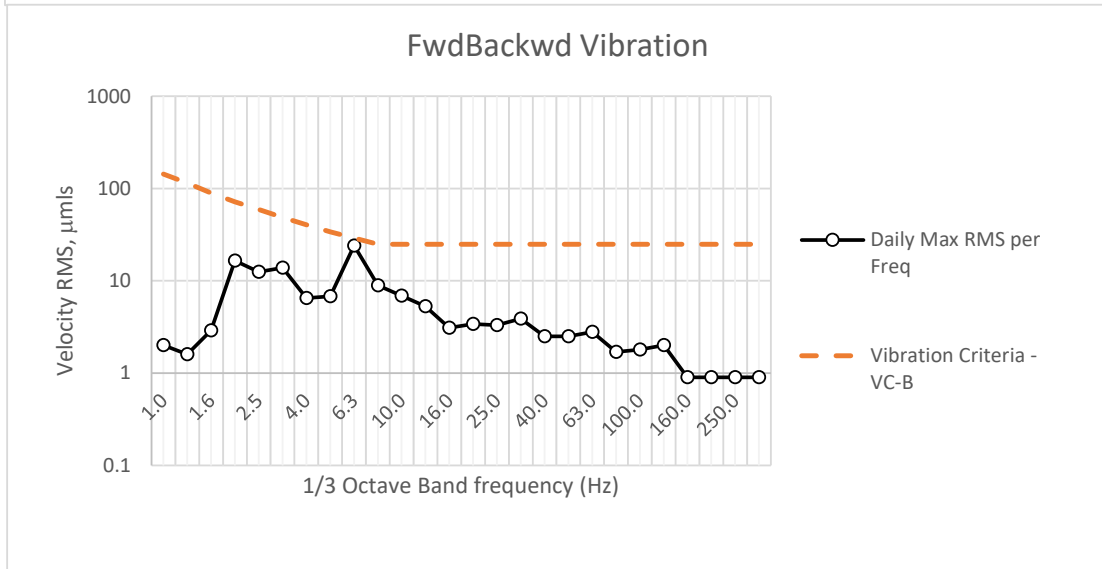
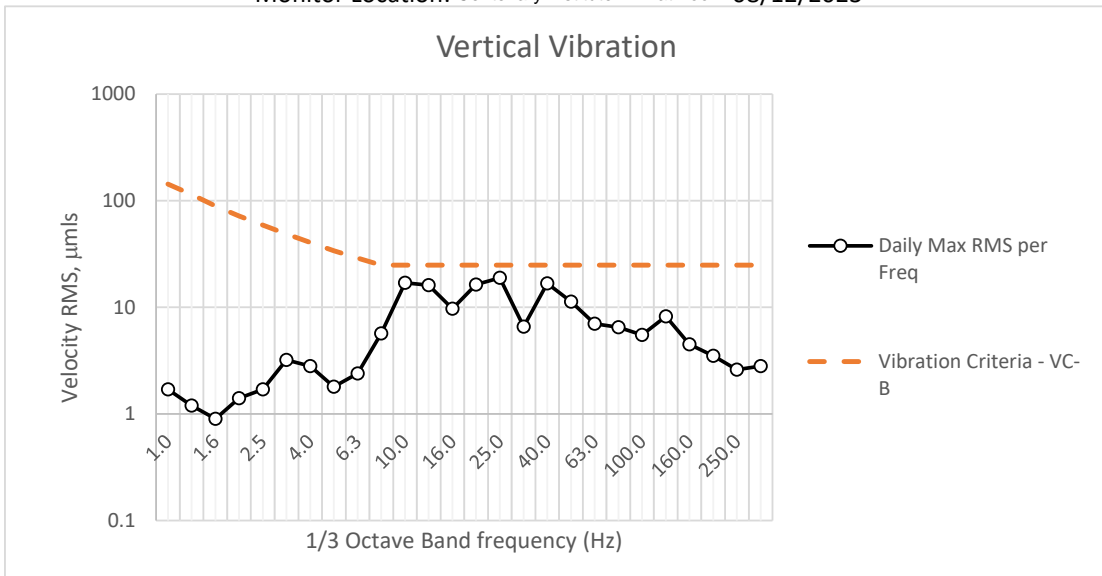


Fwd/Backwards

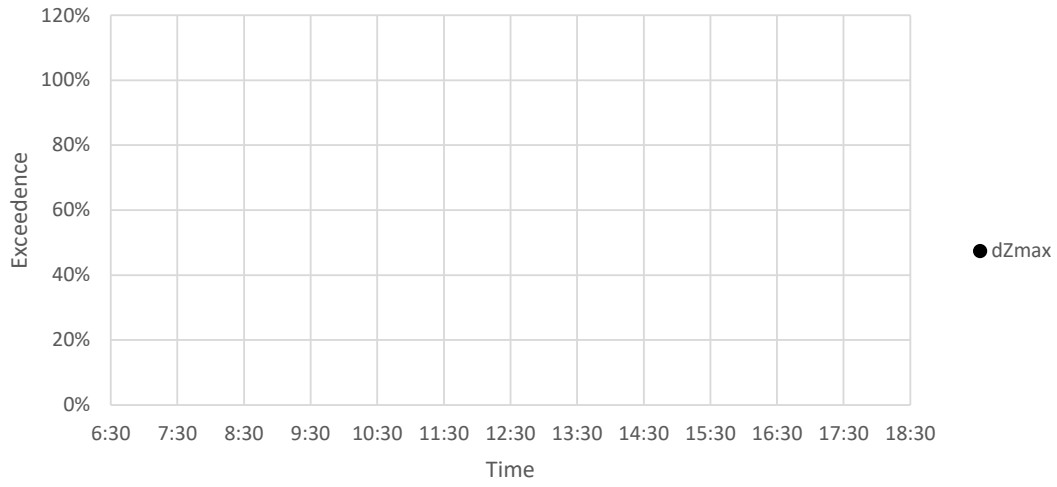


Sideways

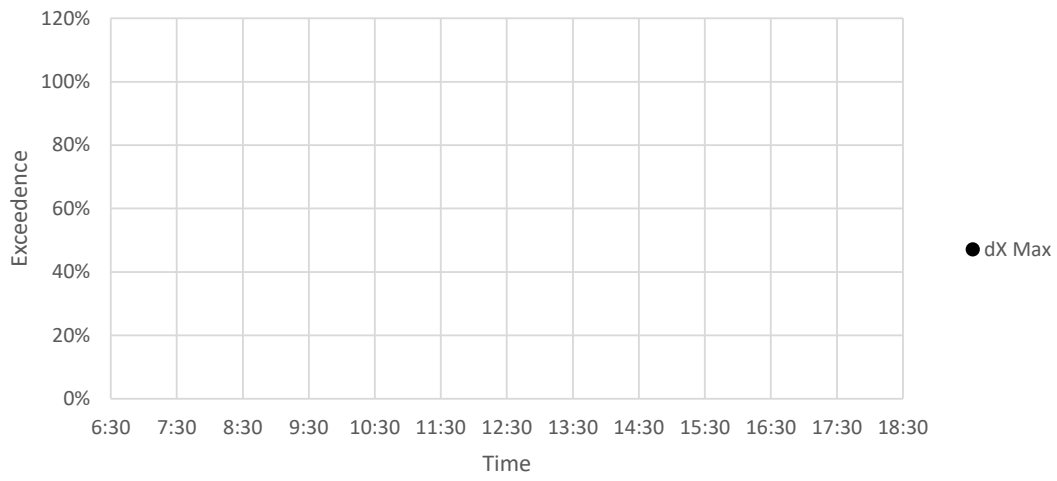




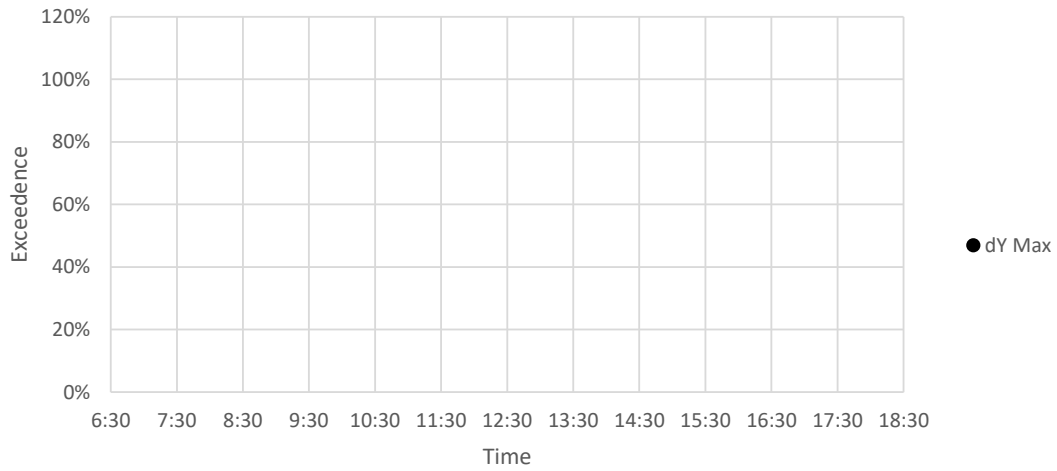
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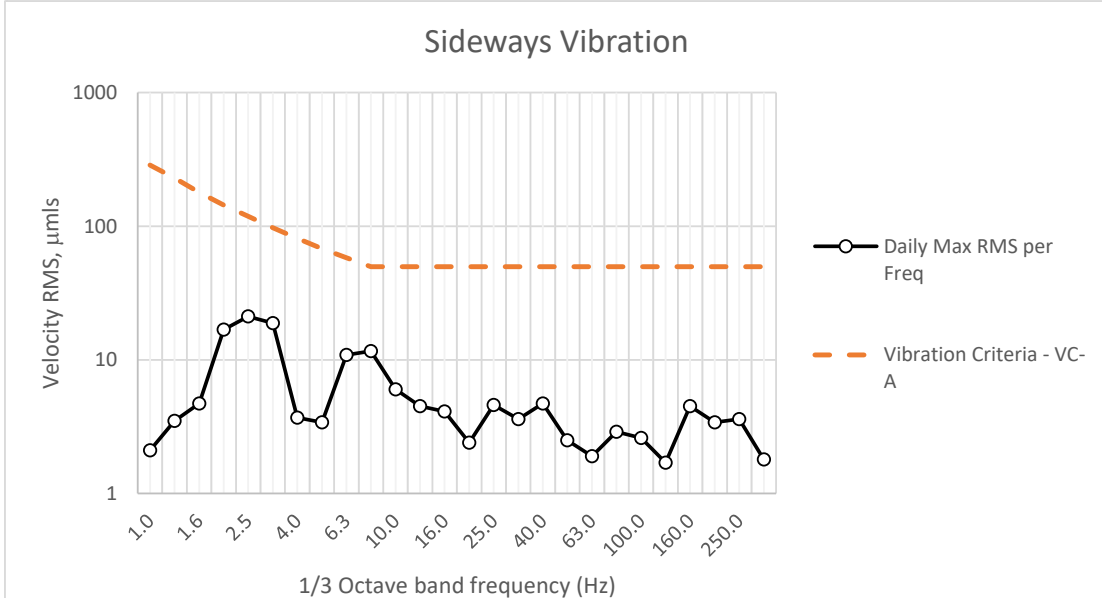
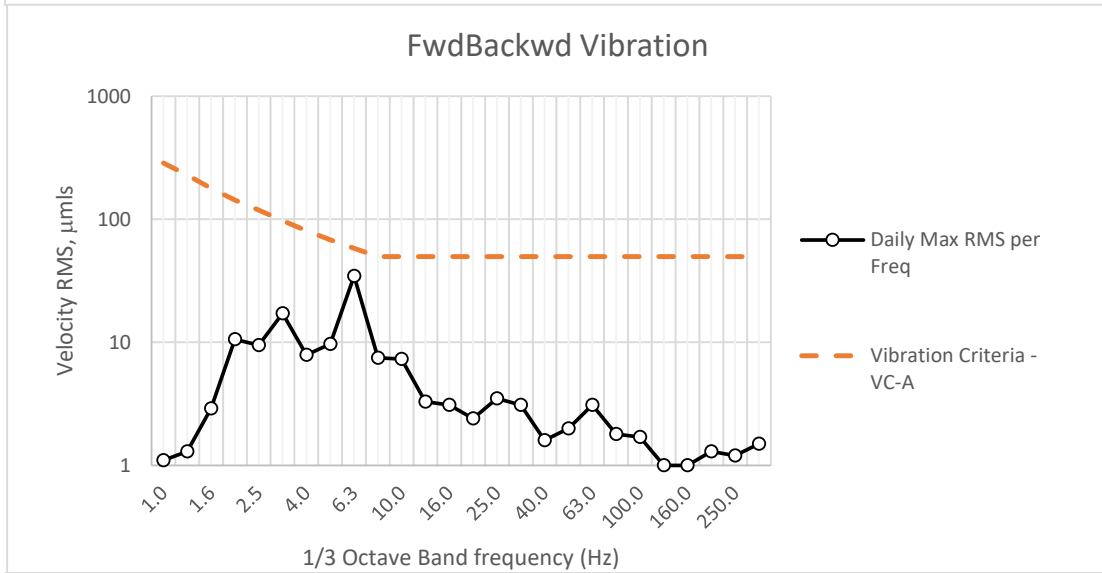
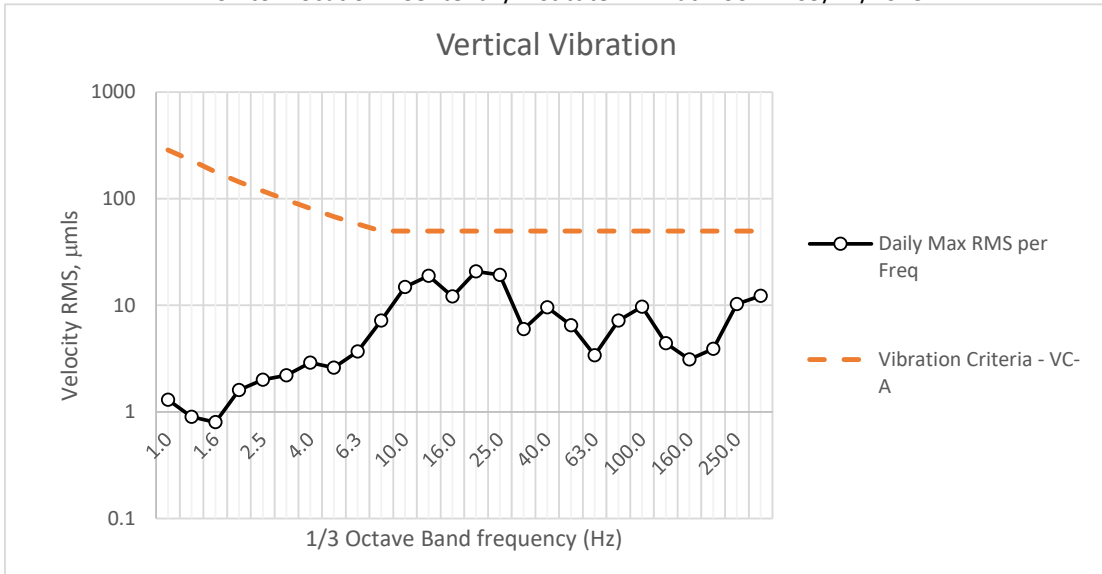


Fwd/Backwards

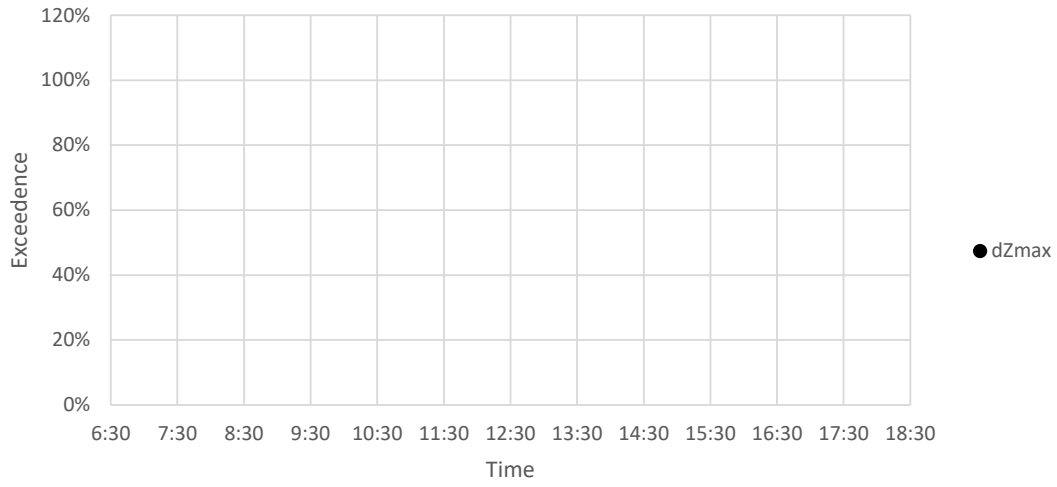


Sideways

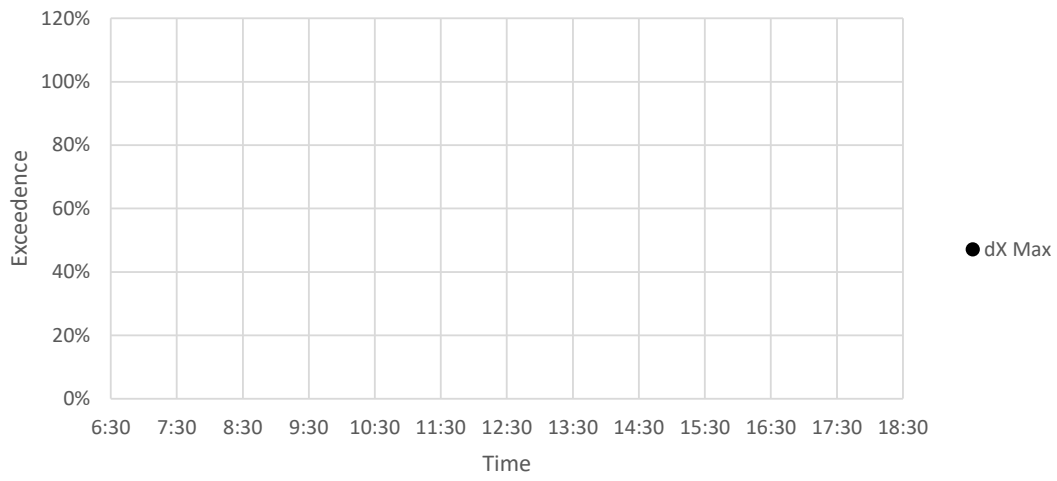




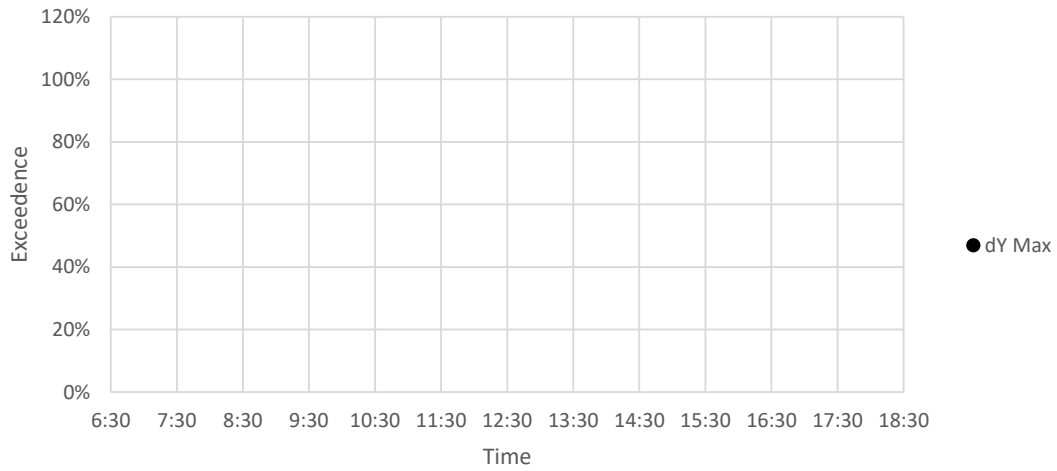
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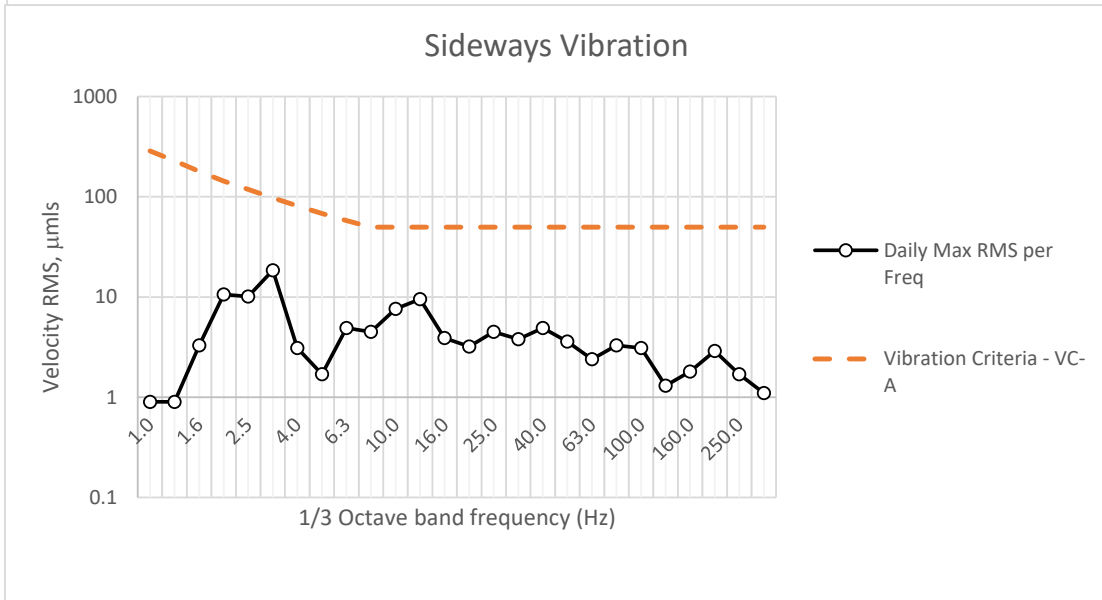
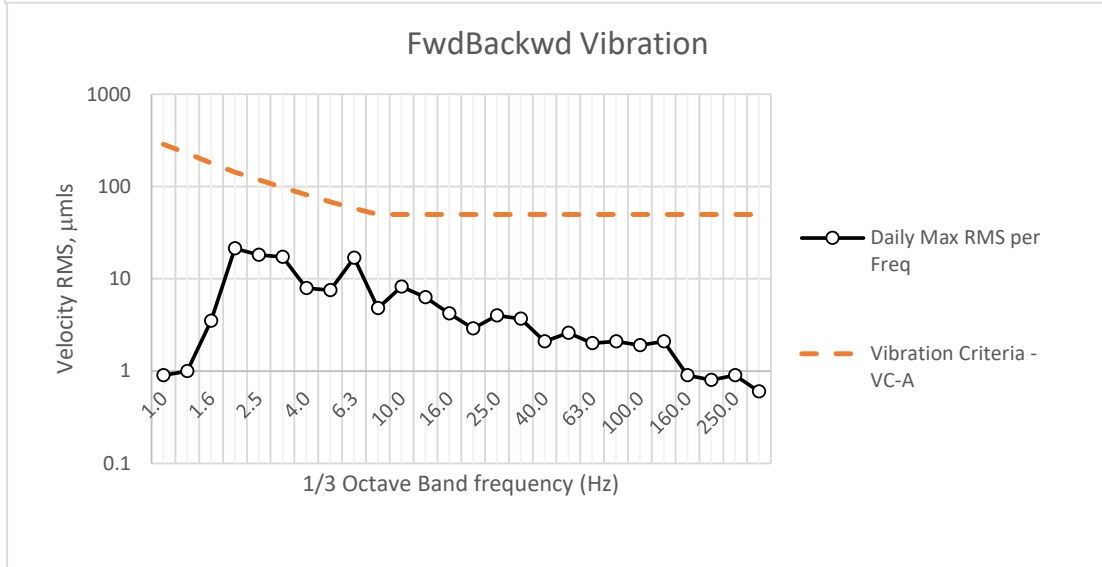
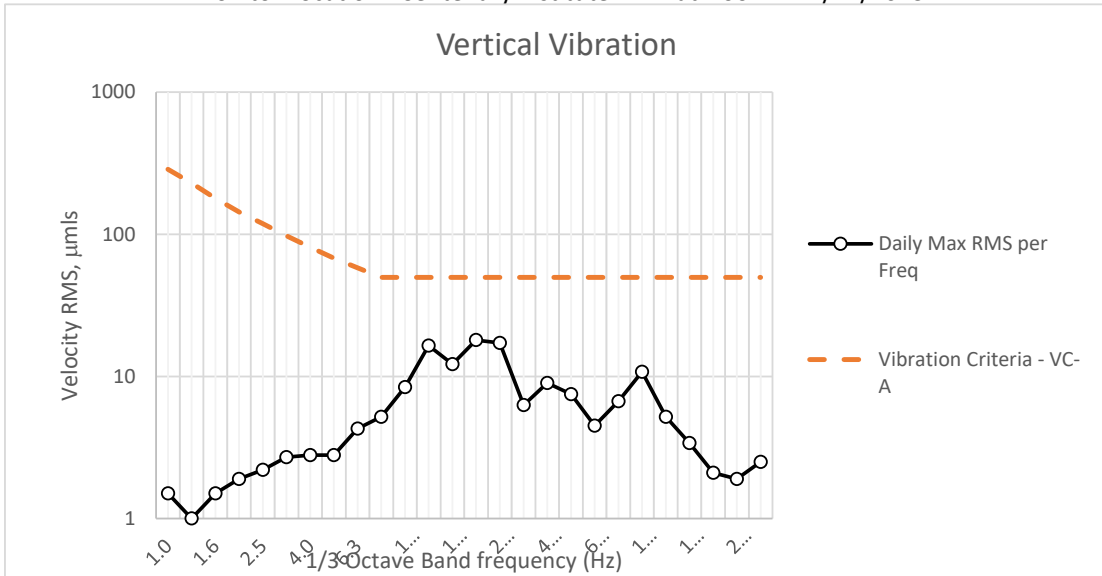


Fwd/Backwards

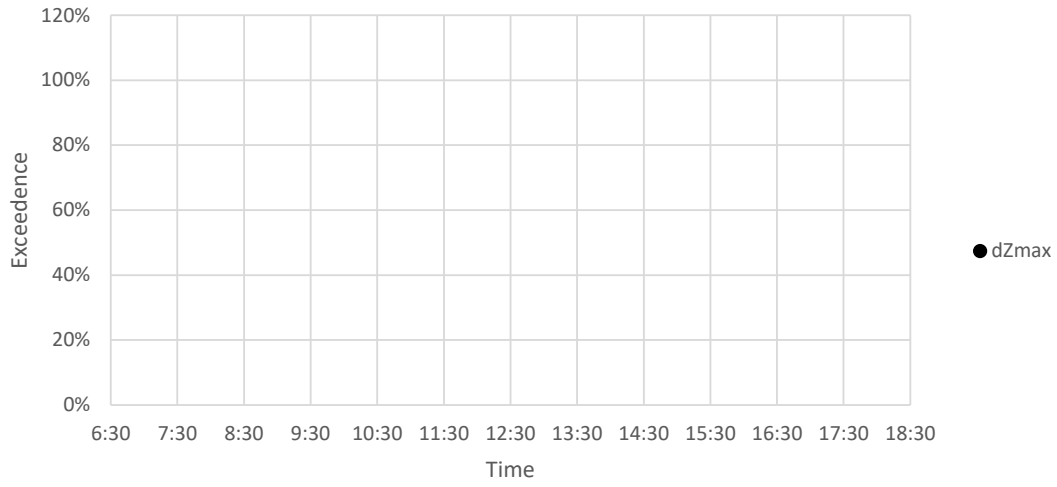


Sideways

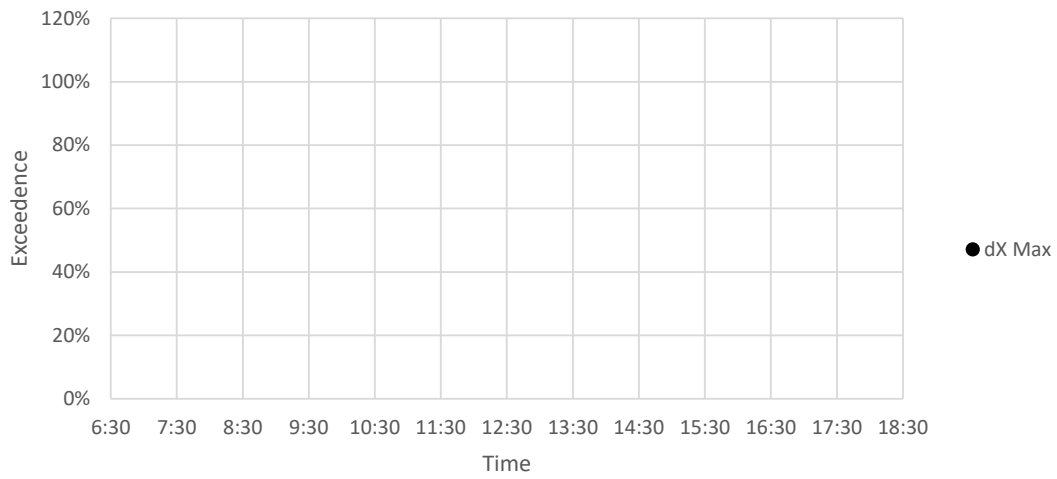




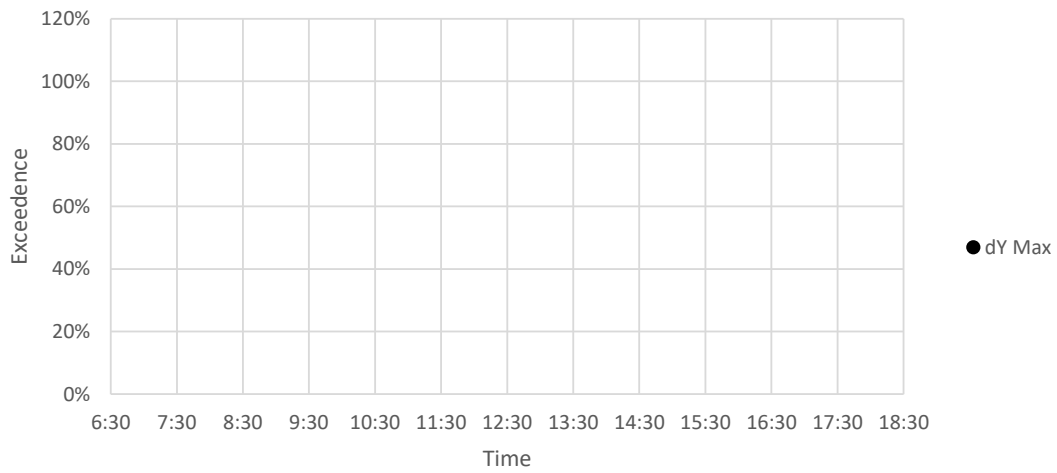
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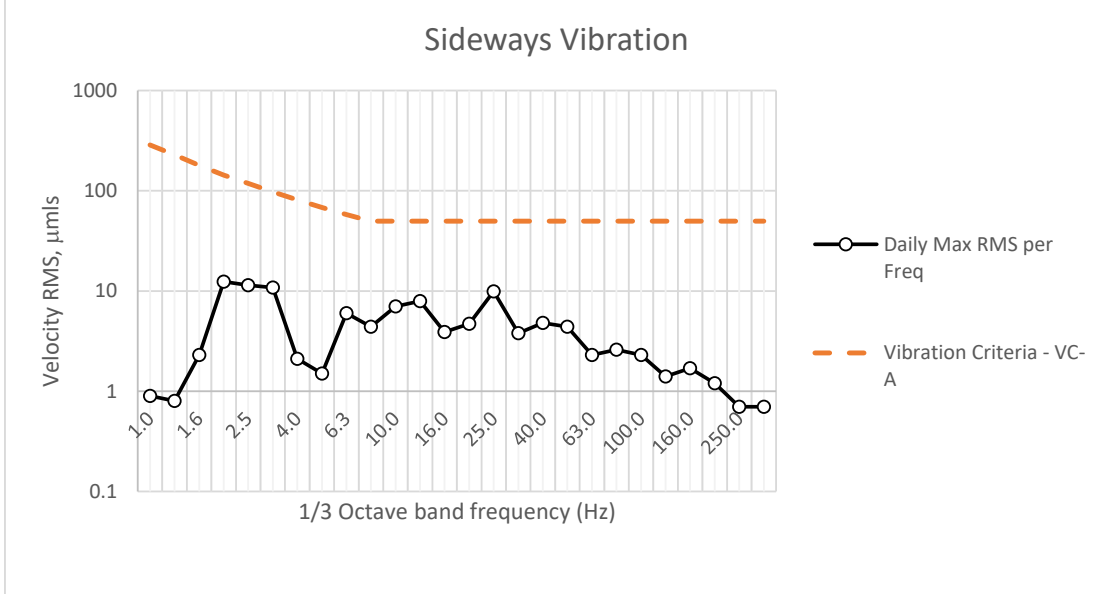
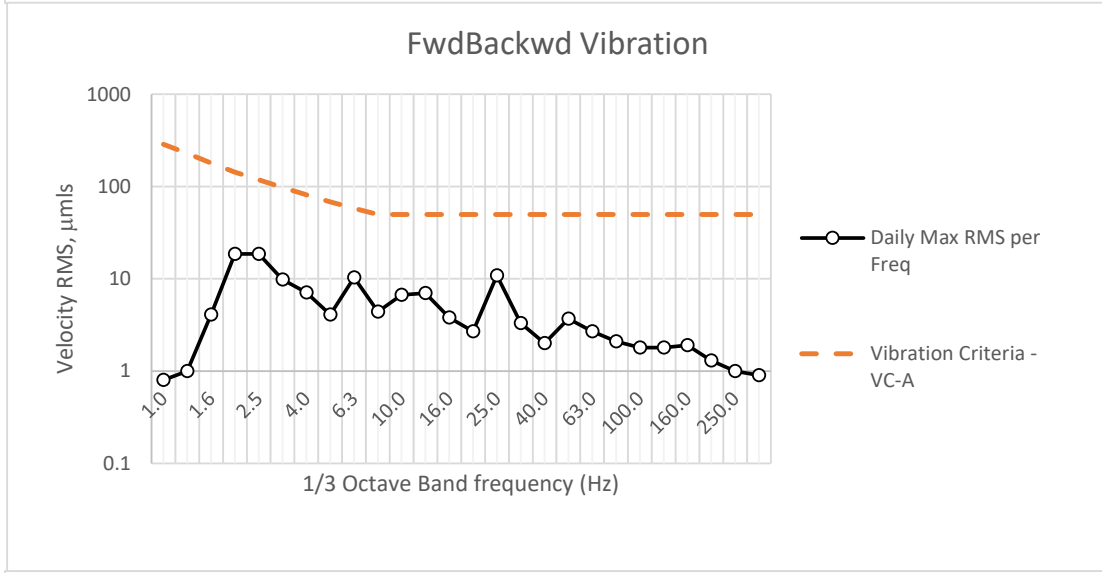
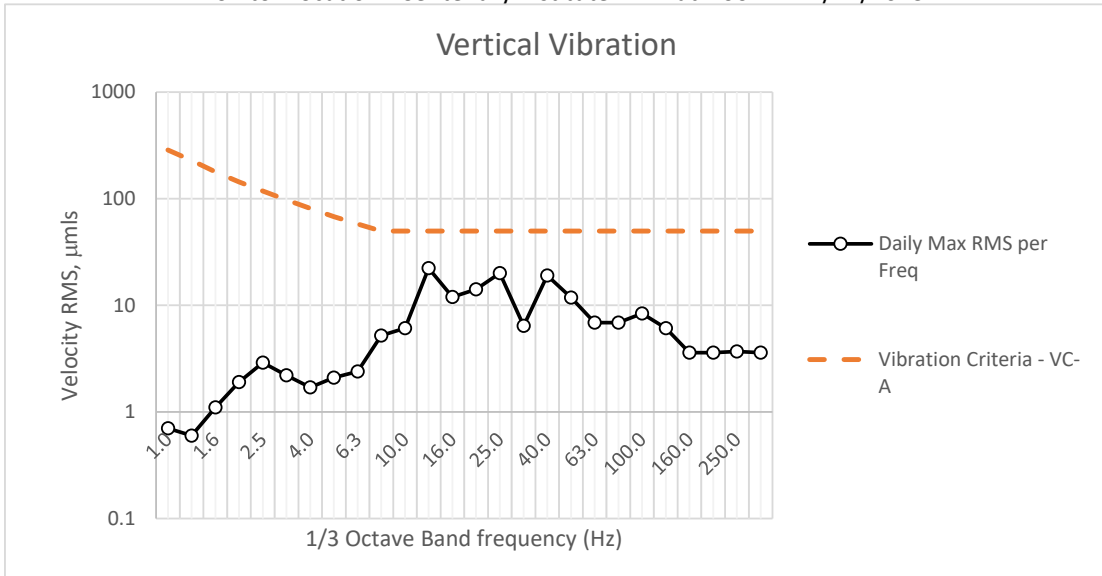


Fwd/Backwards

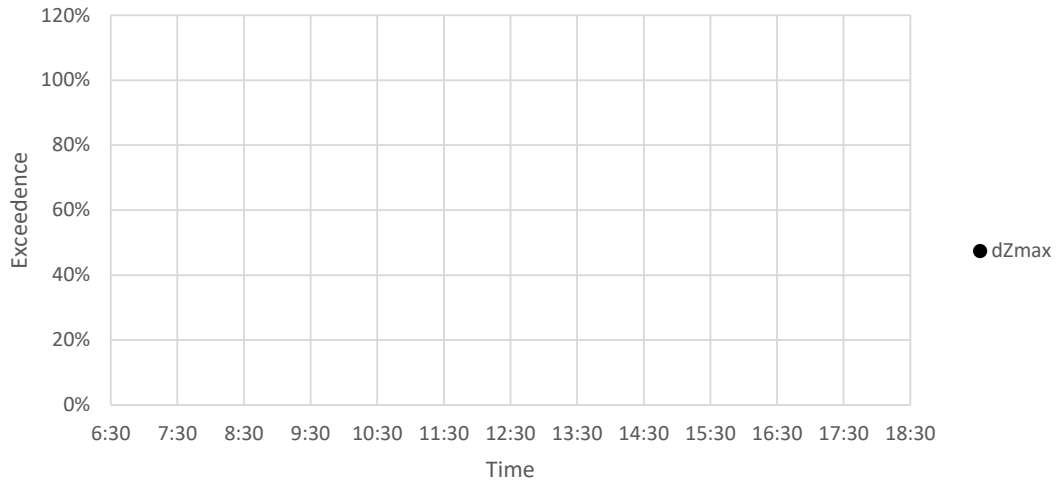


Sideways

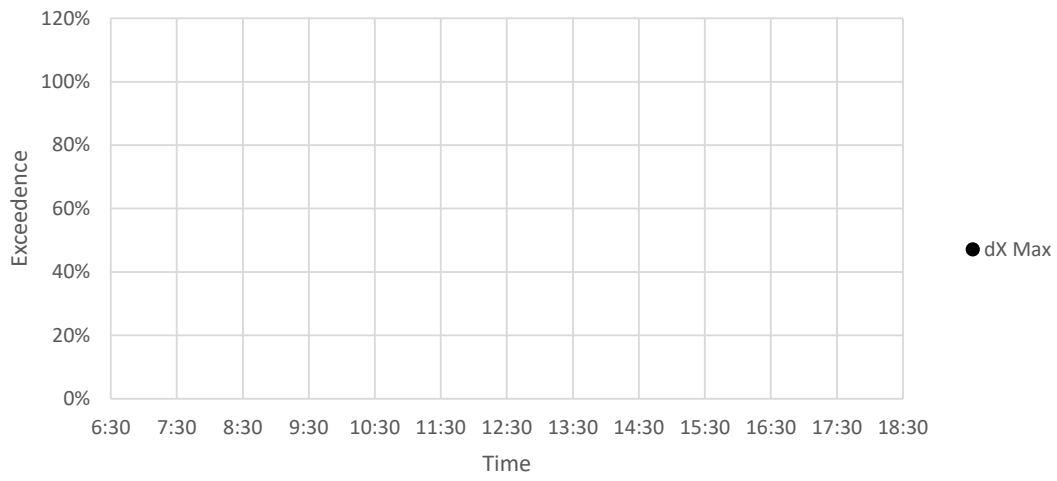




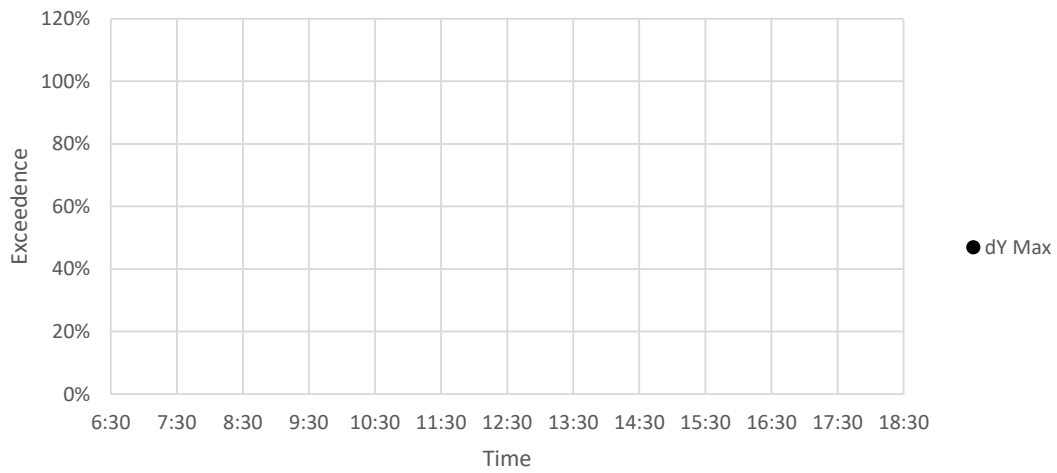
Vertical

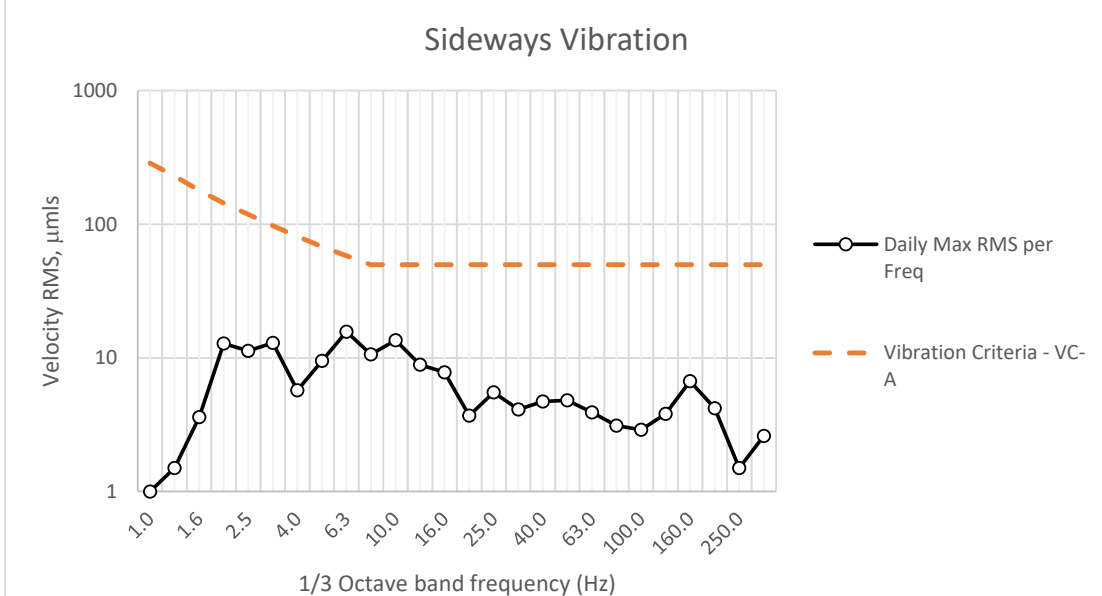
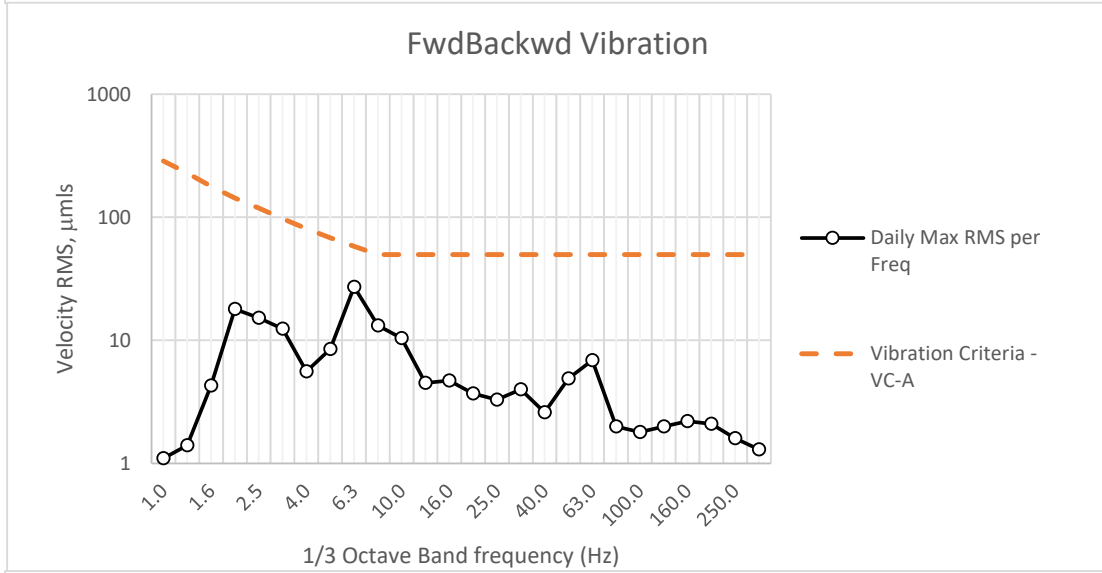
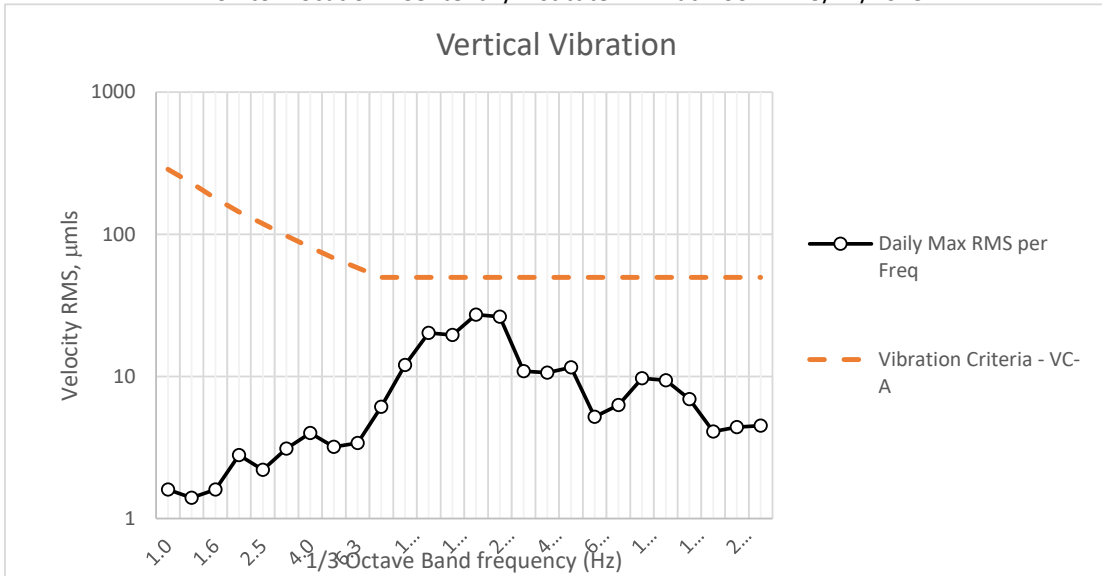


Fwd/Backwards

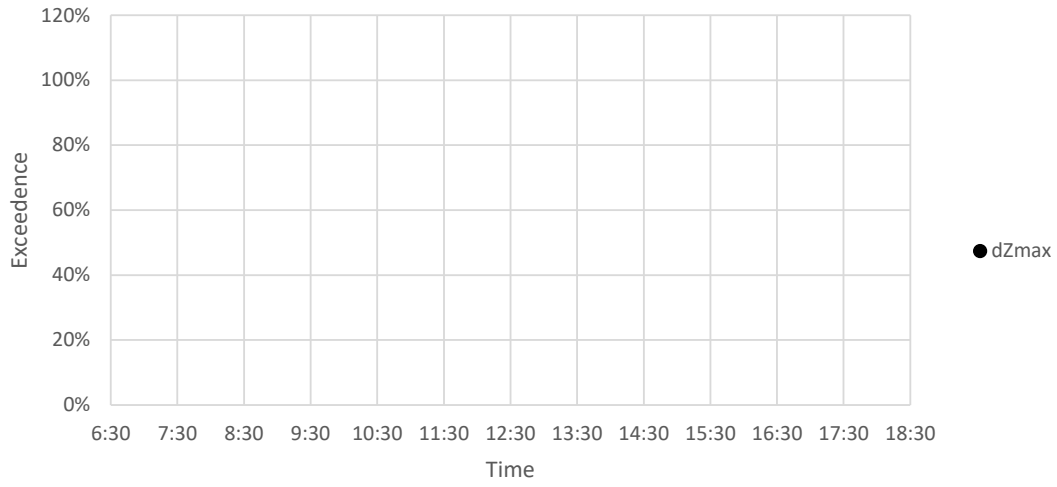


Sideways

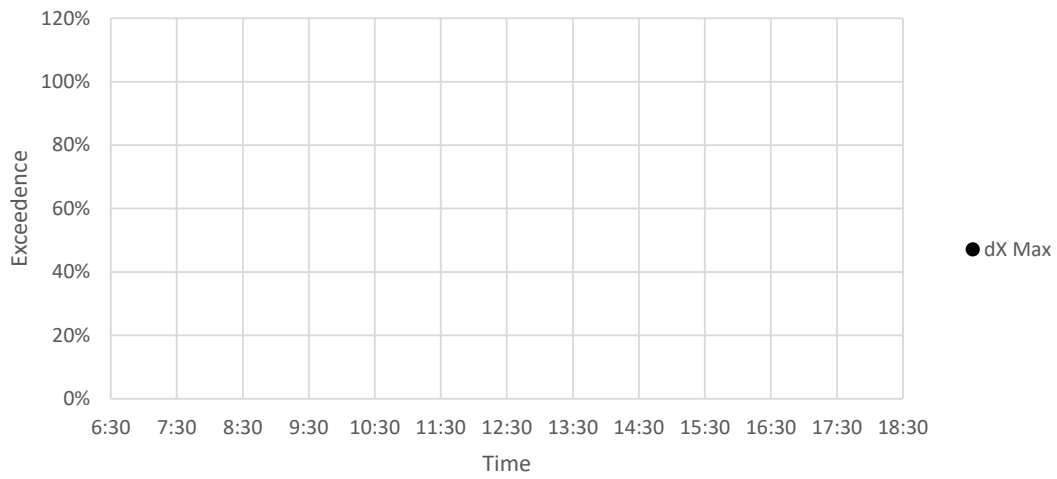




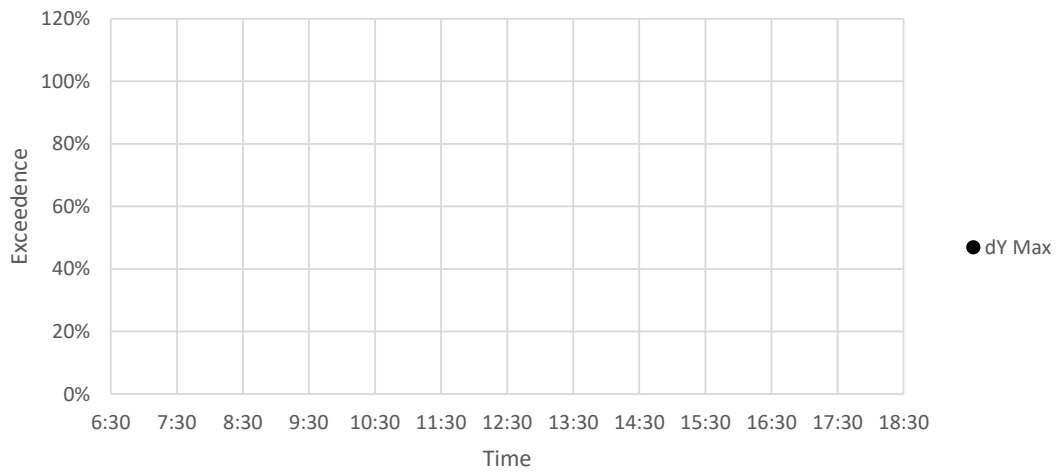
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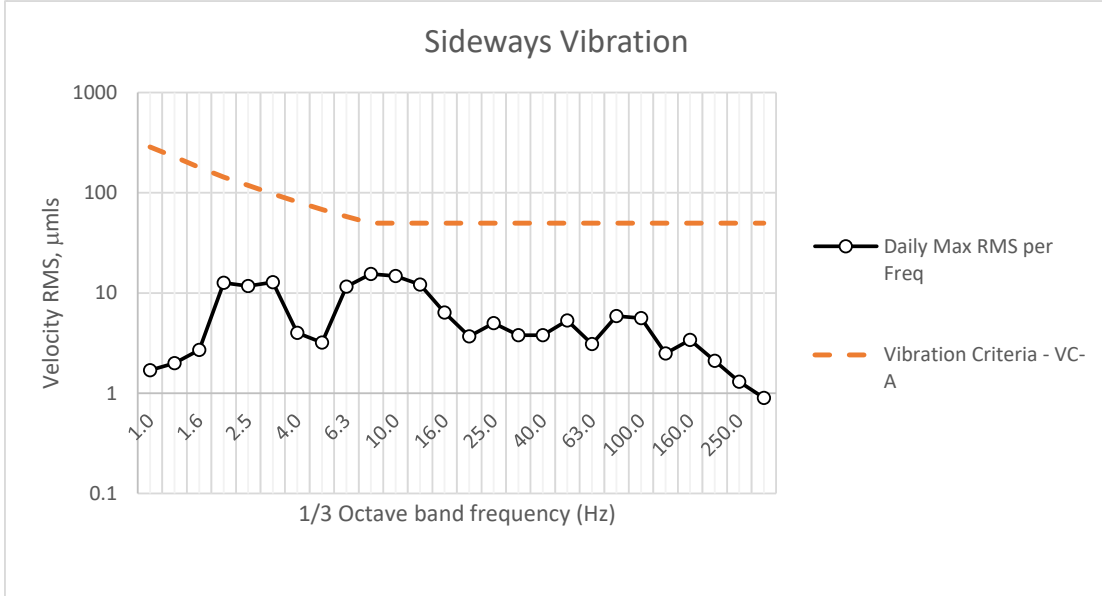
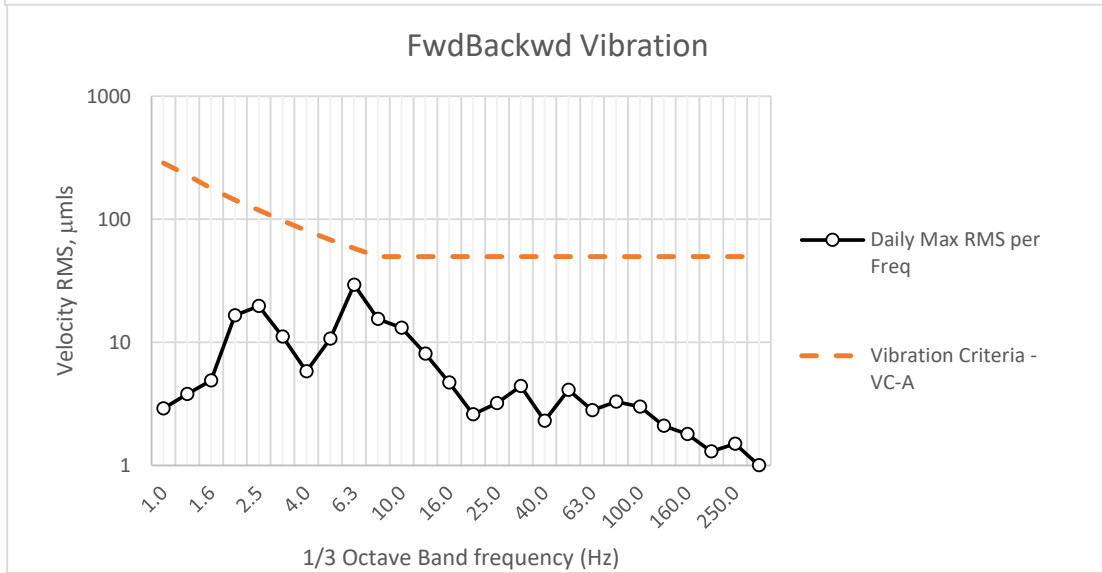
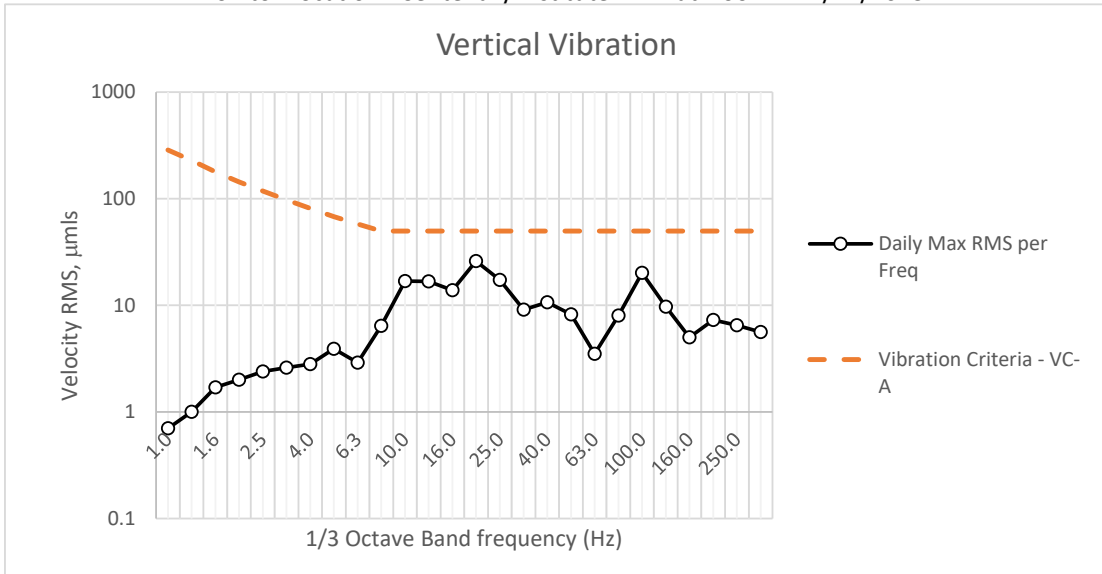


Fwd/Backwards

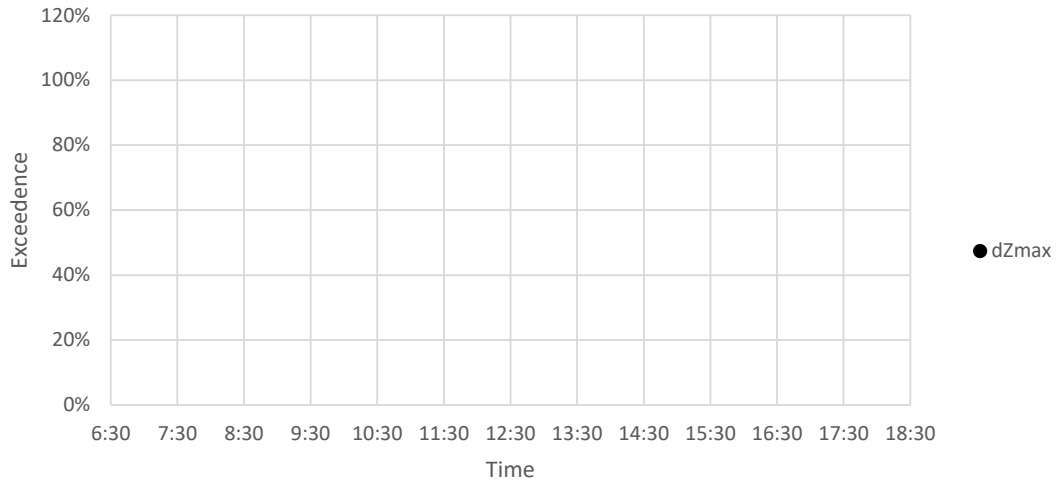


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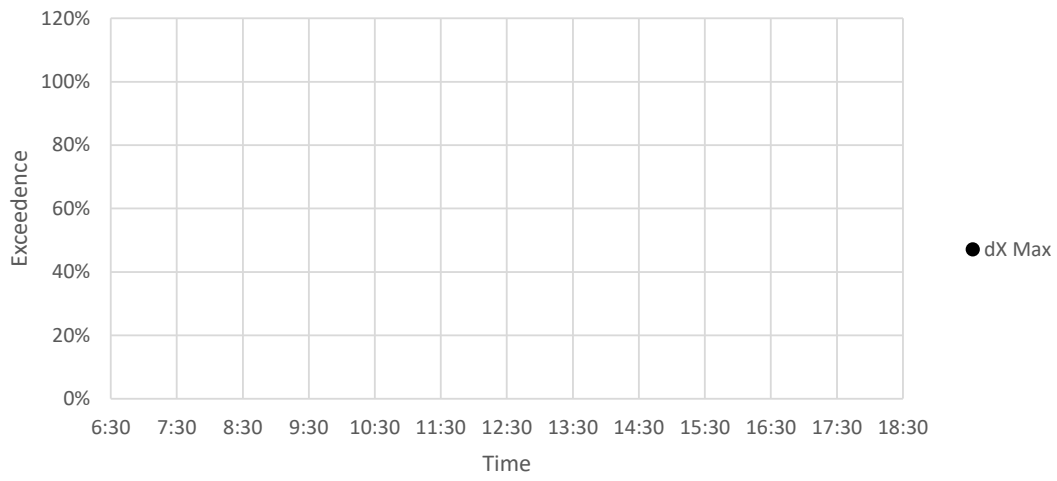




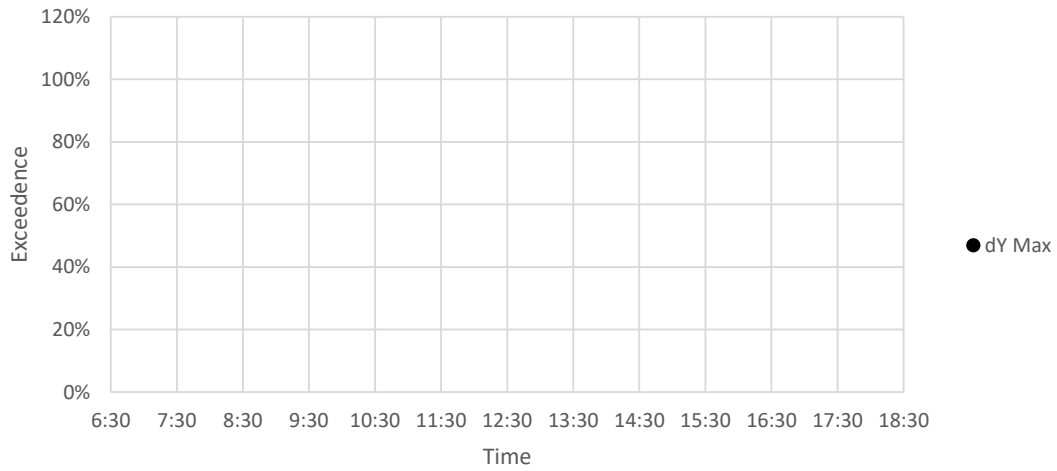
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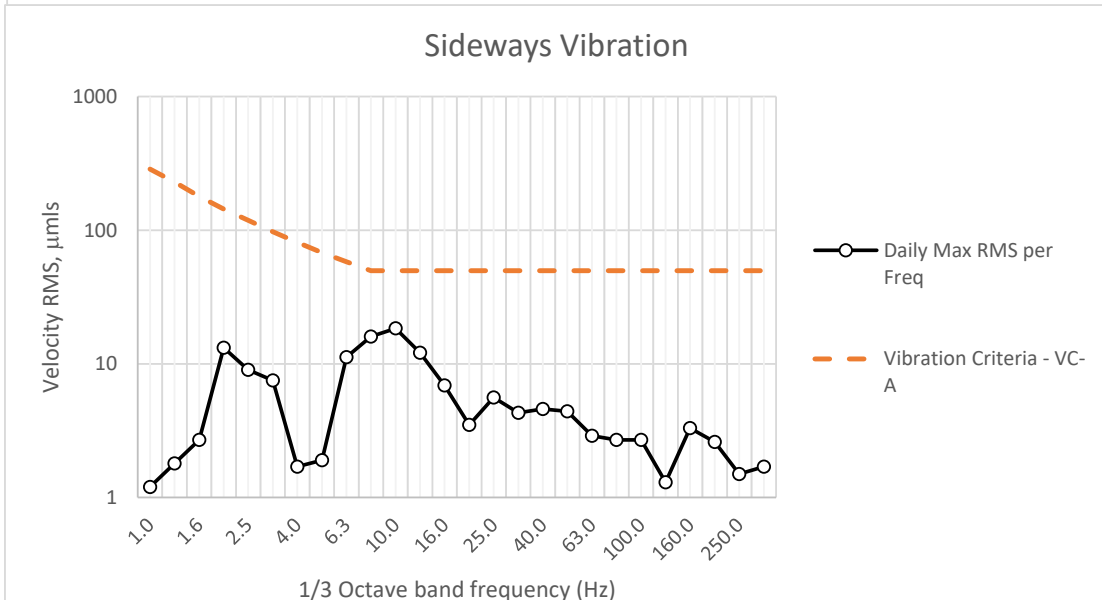
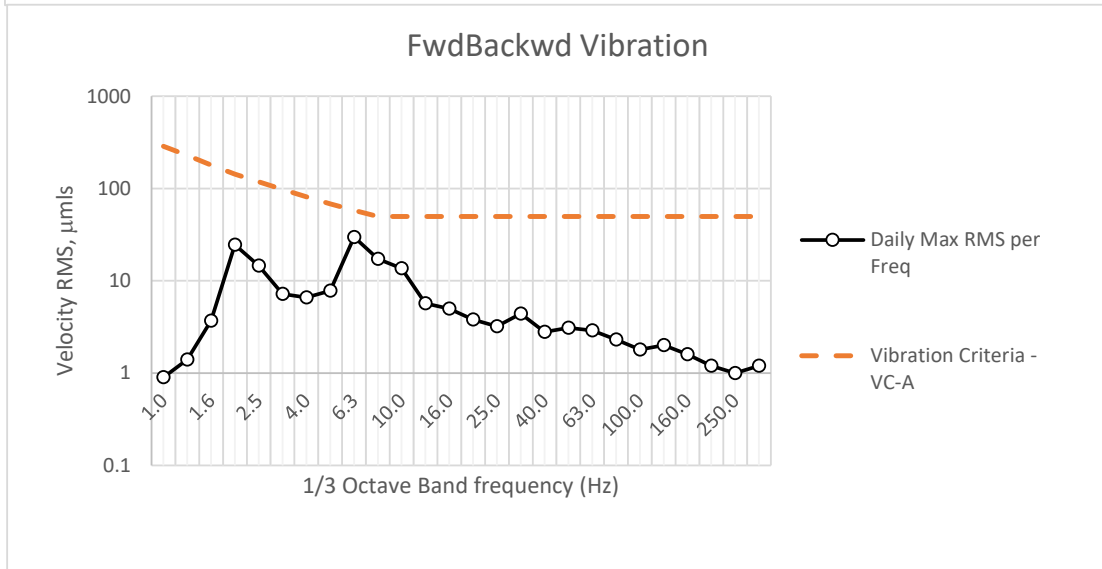
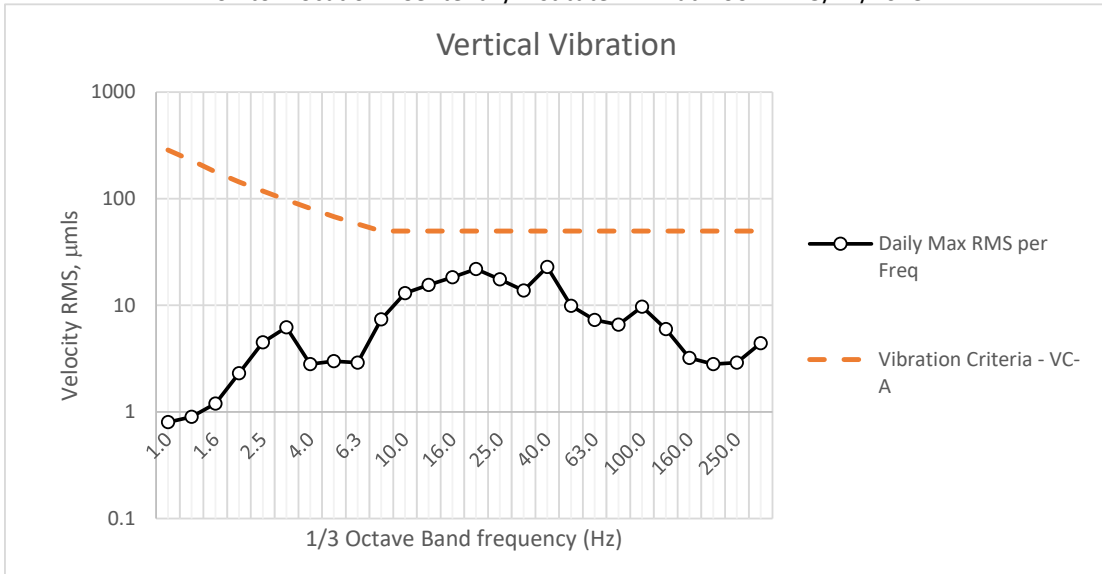


Fwd/Backwards

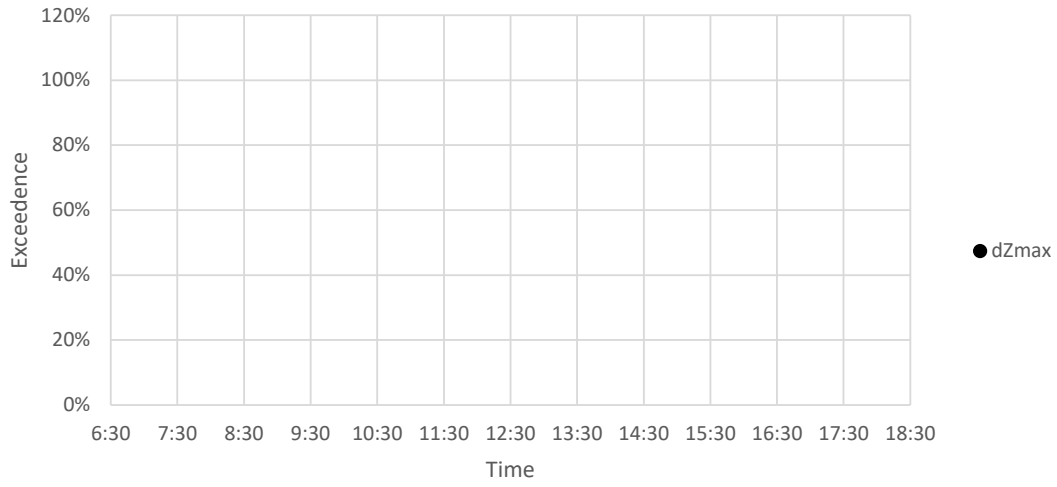


Sideways

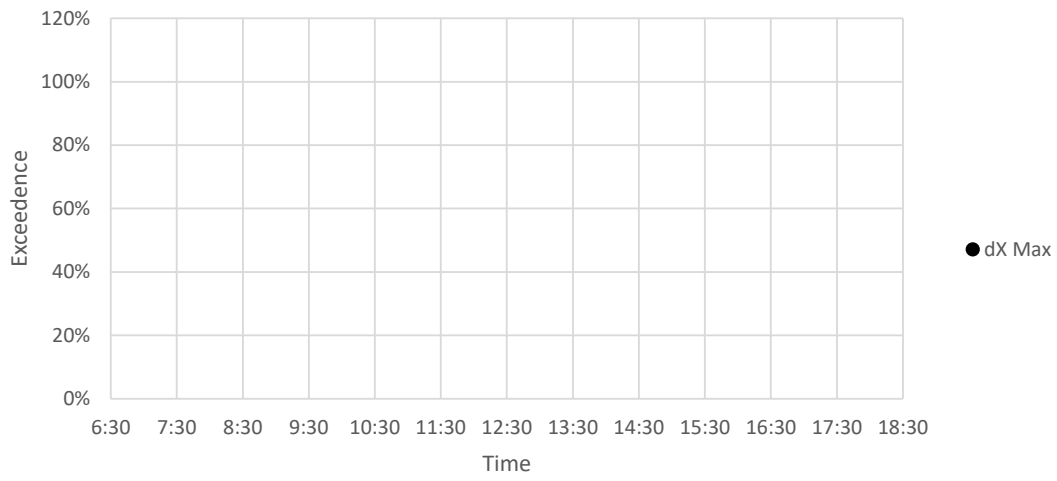




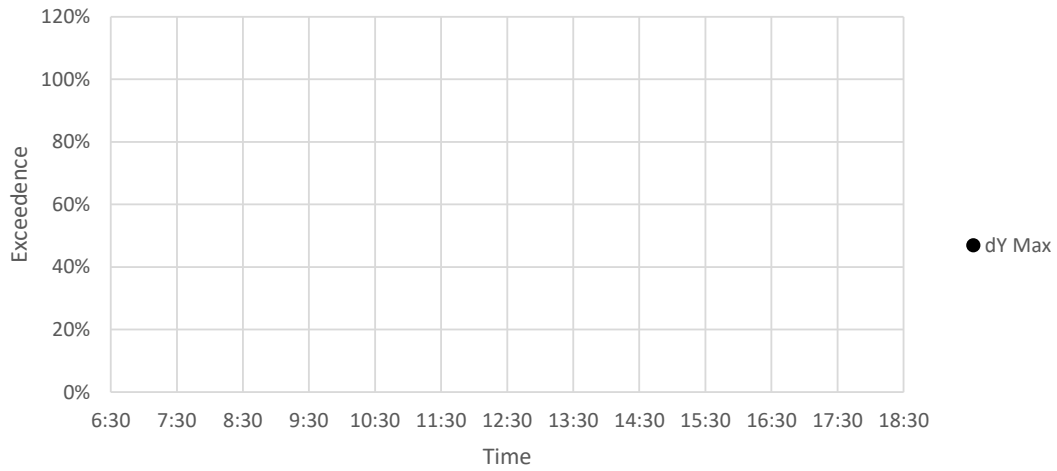
Vertical

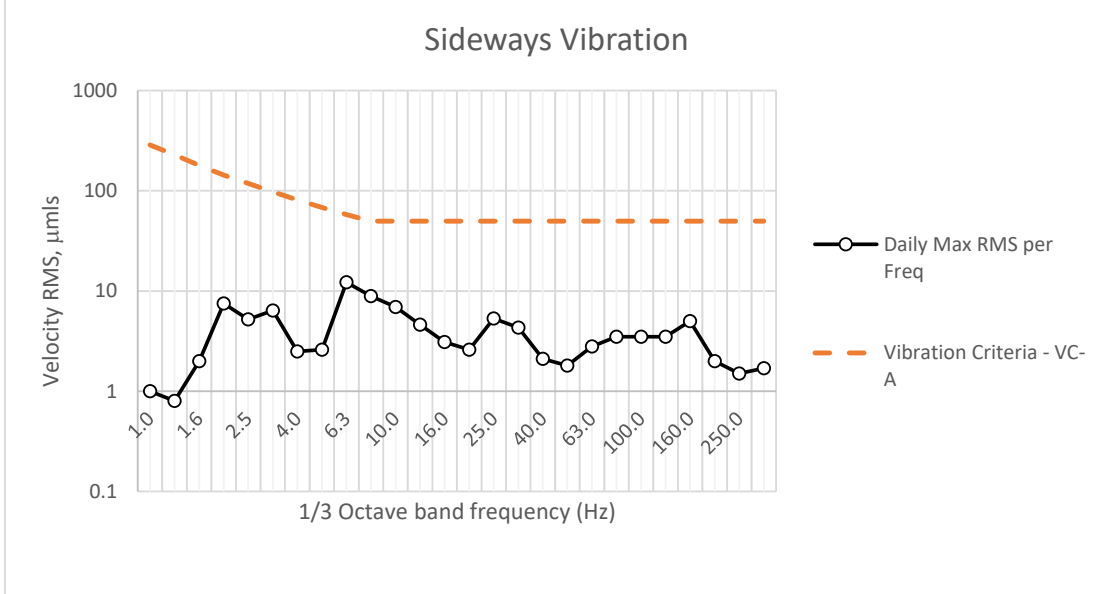
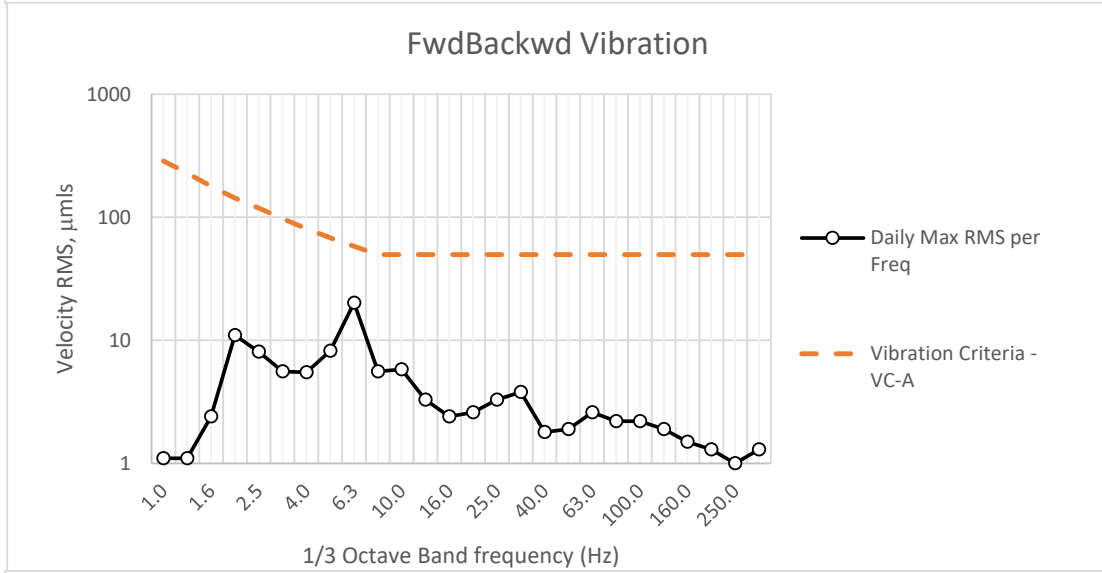
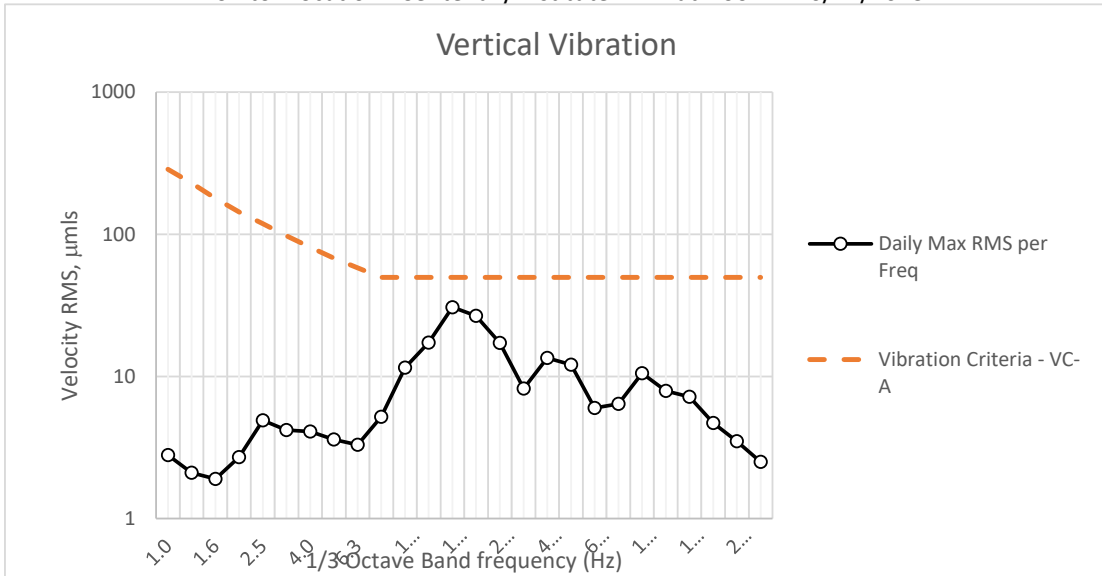


Fwd/Backwards

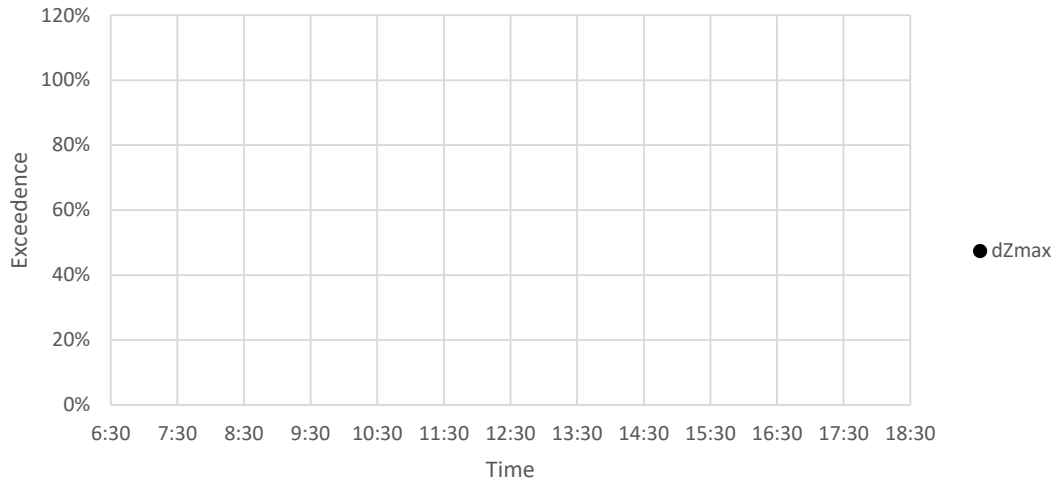


Sideways

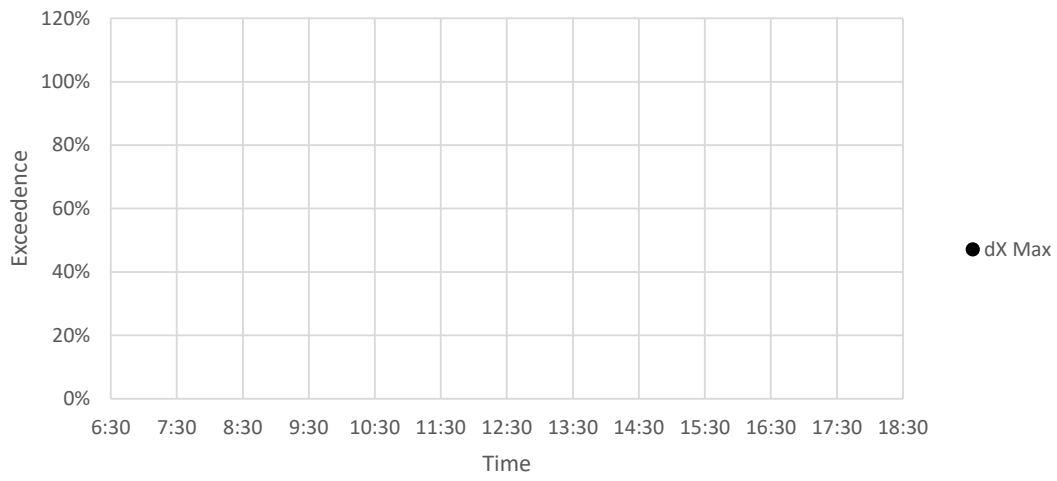




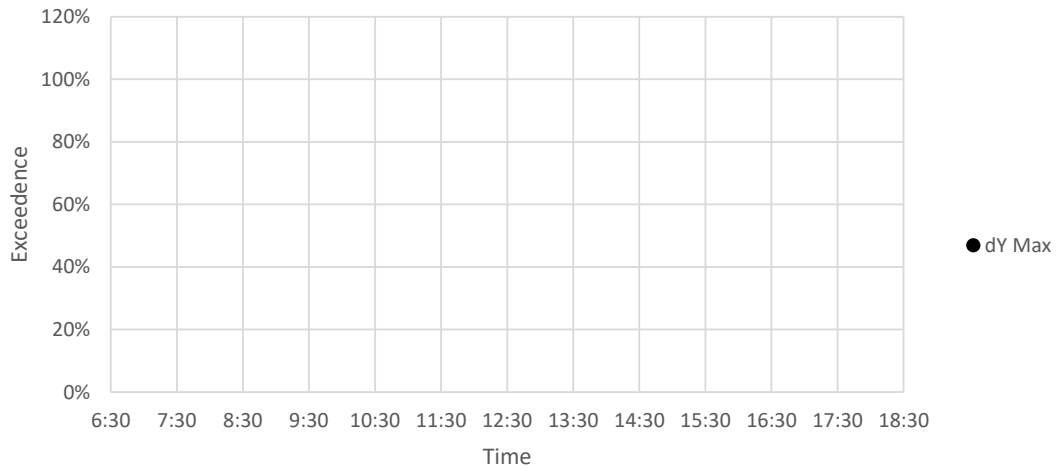
Vertical



Fwd/Backwards

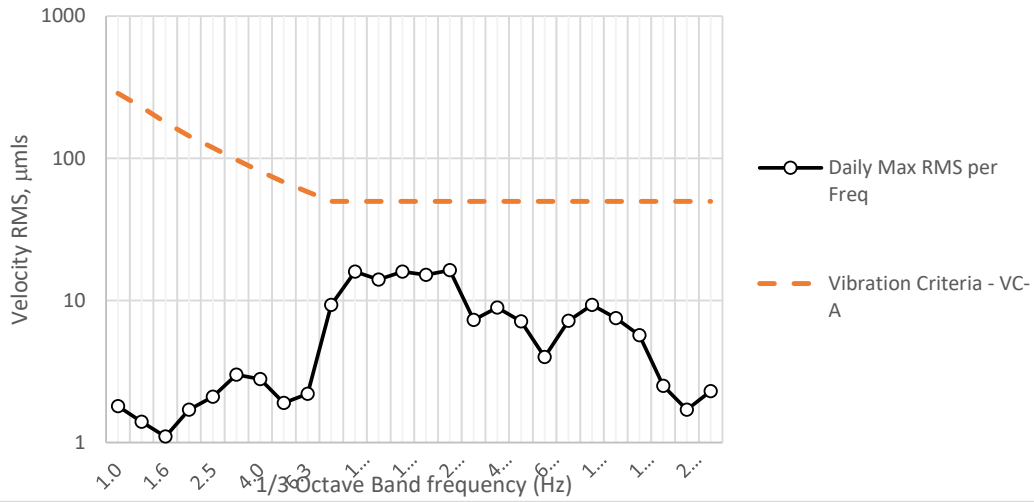


Sideways

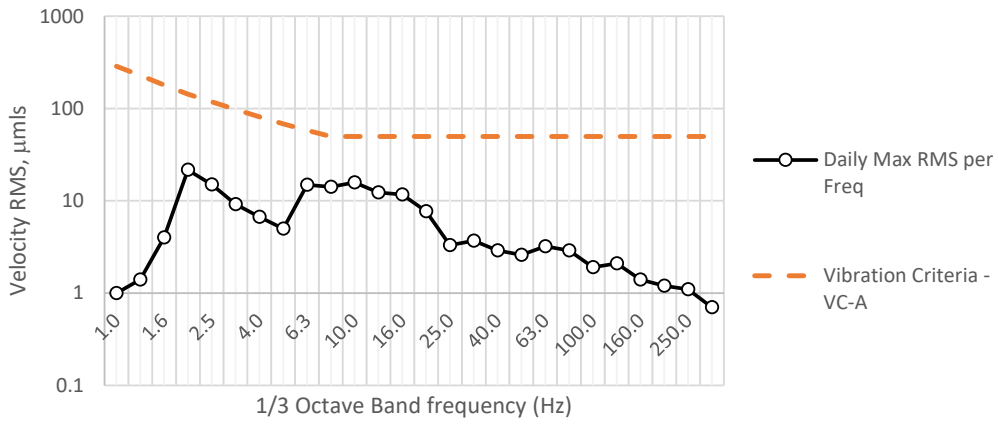


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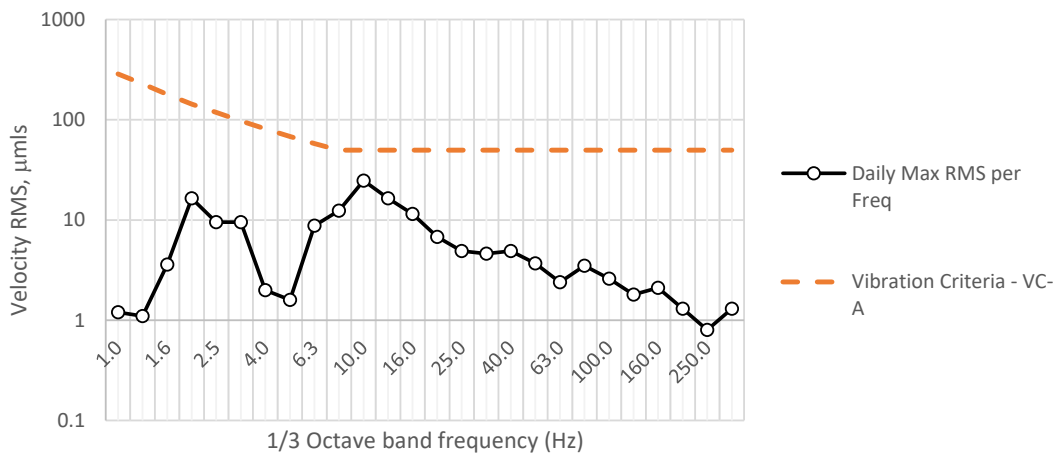
Vertical Vibration



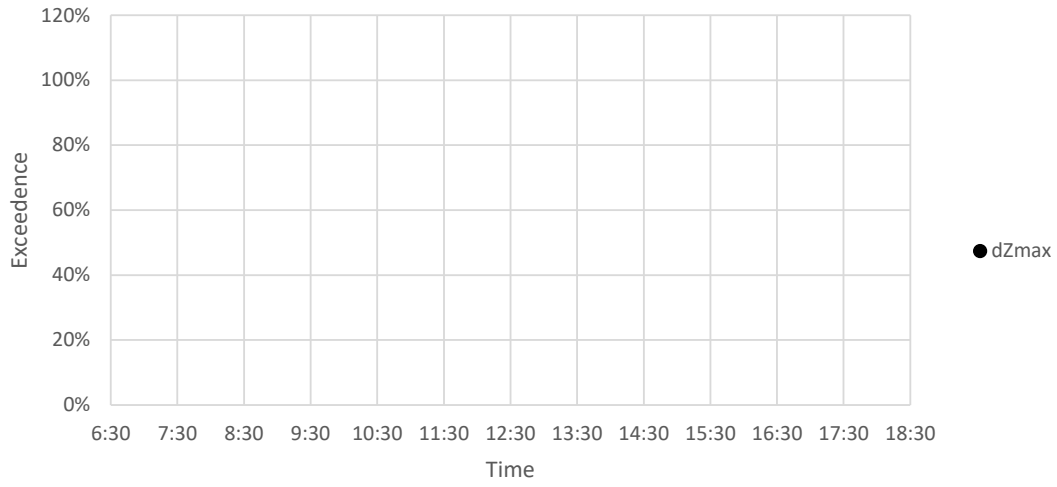
FwdBackwd Vibration



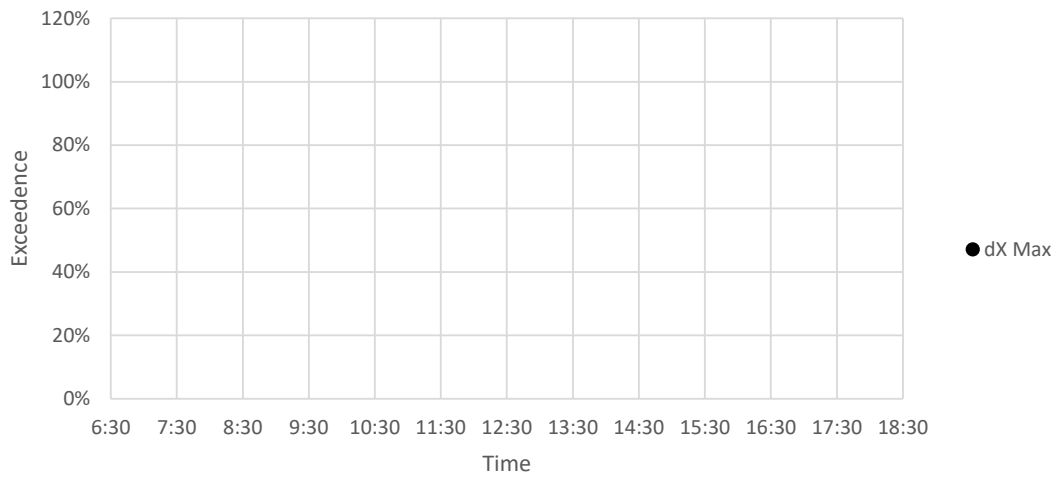
Sideways Vibration



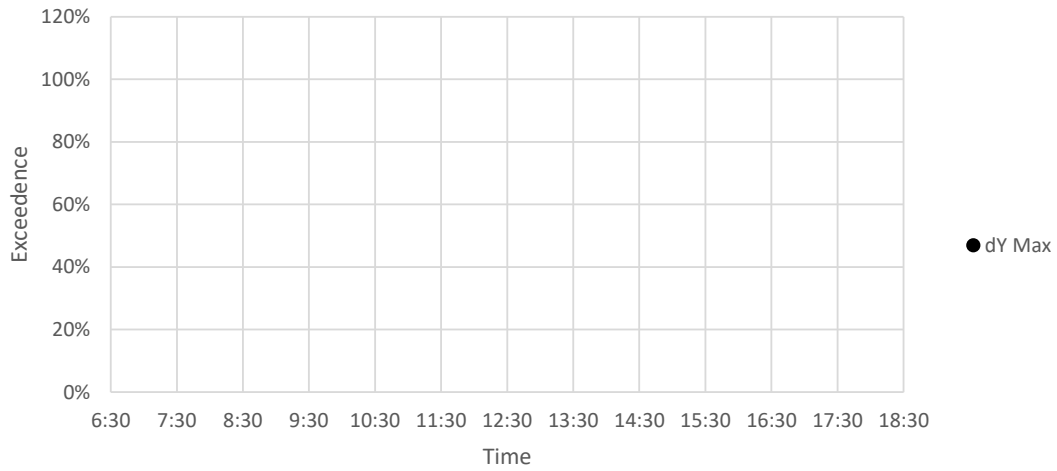
Vertical



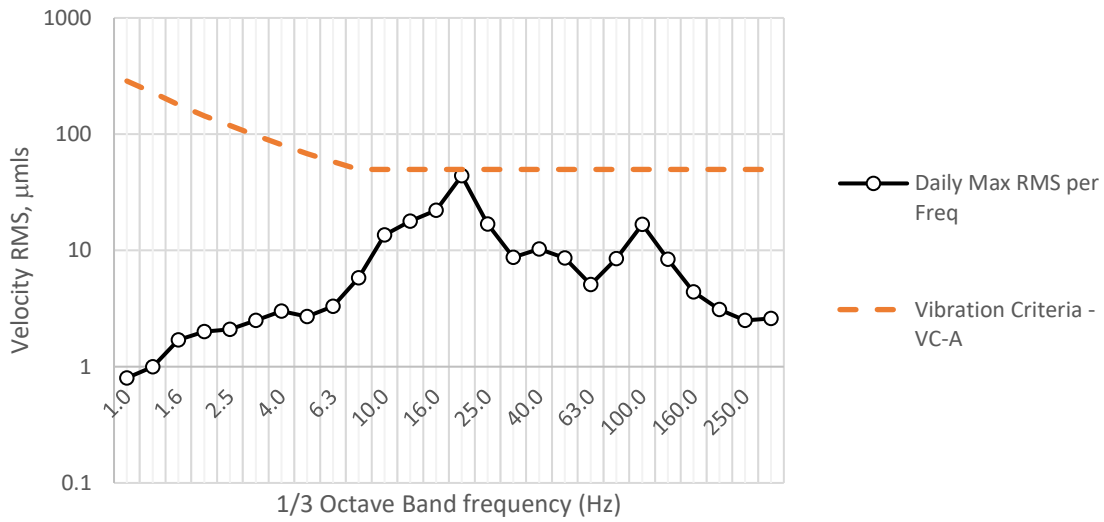
Fwd/Backwards



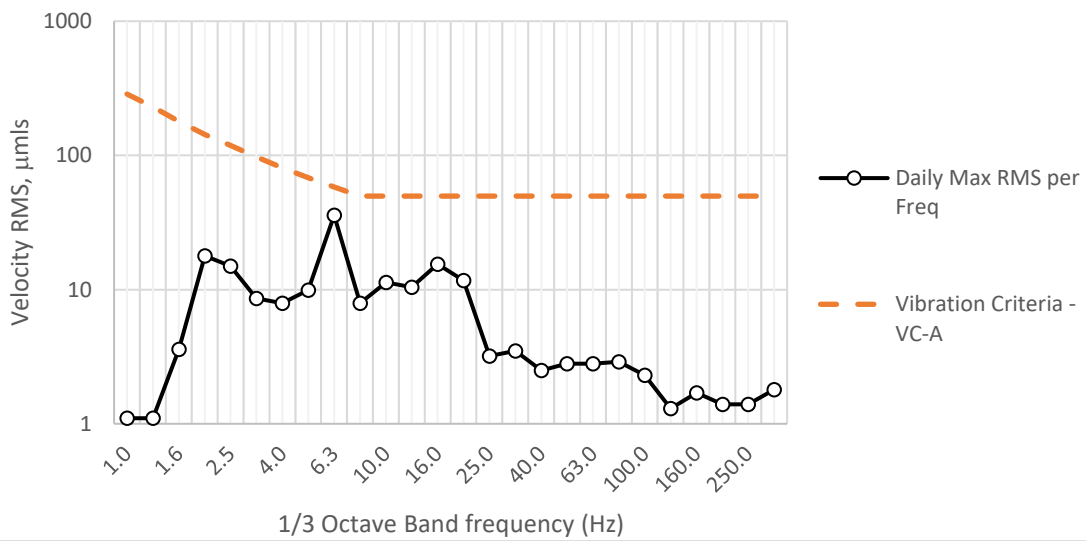
Sideways



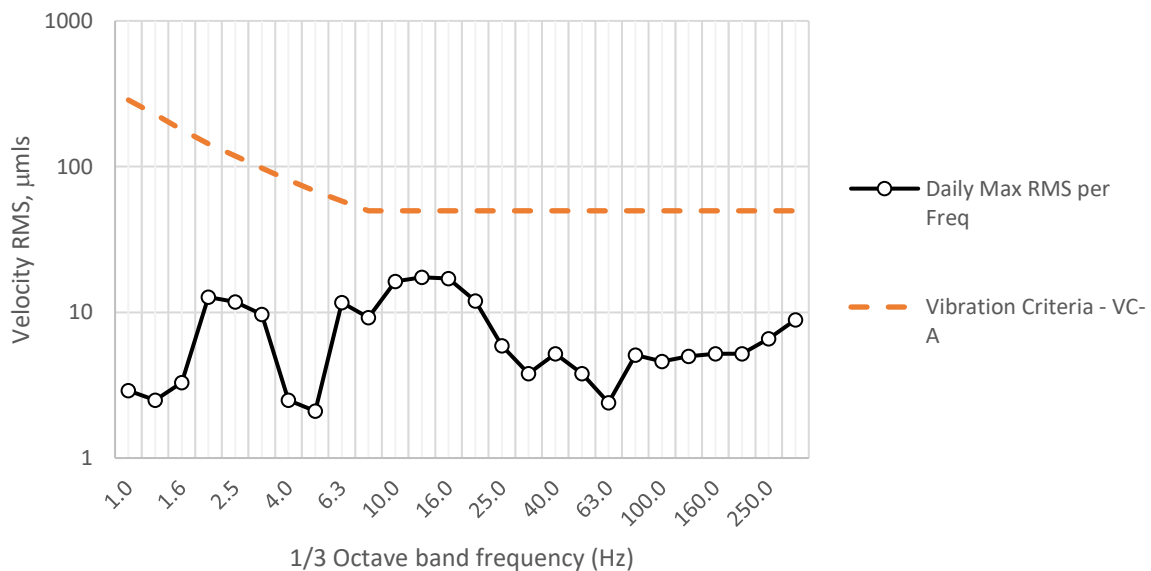
Vertical Vibration



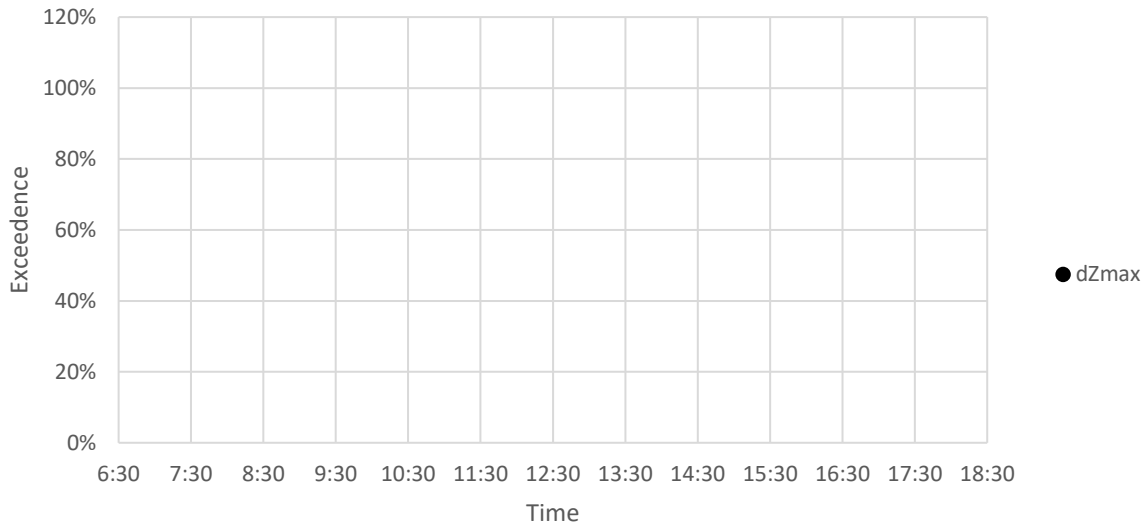
FwdBackwd Vibration



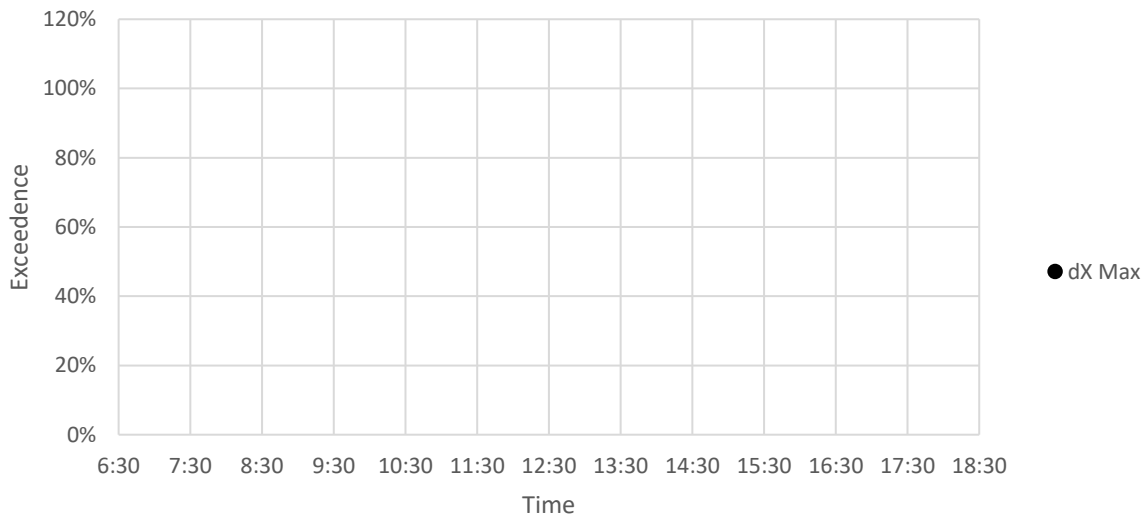
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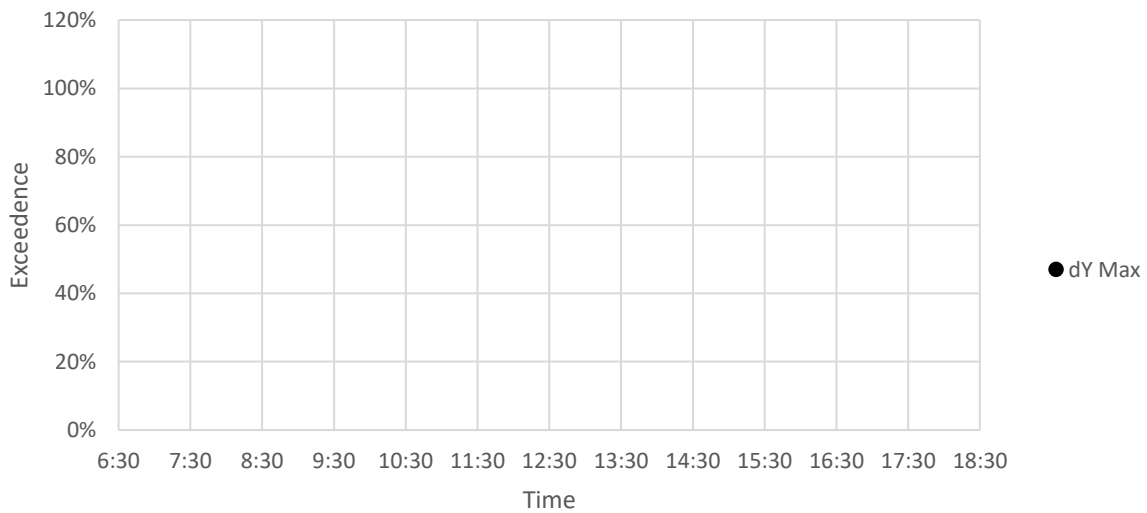
Vertical



Fwd/Backwards

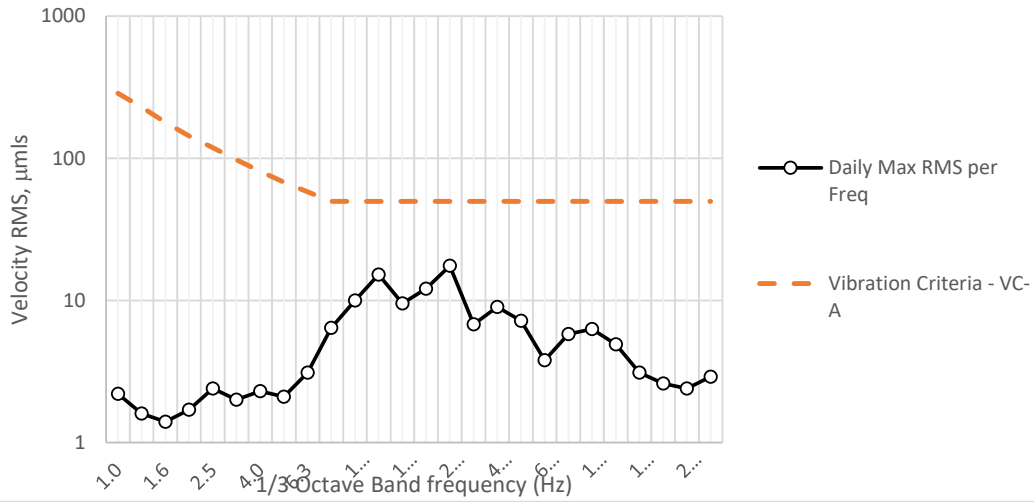


Sideways

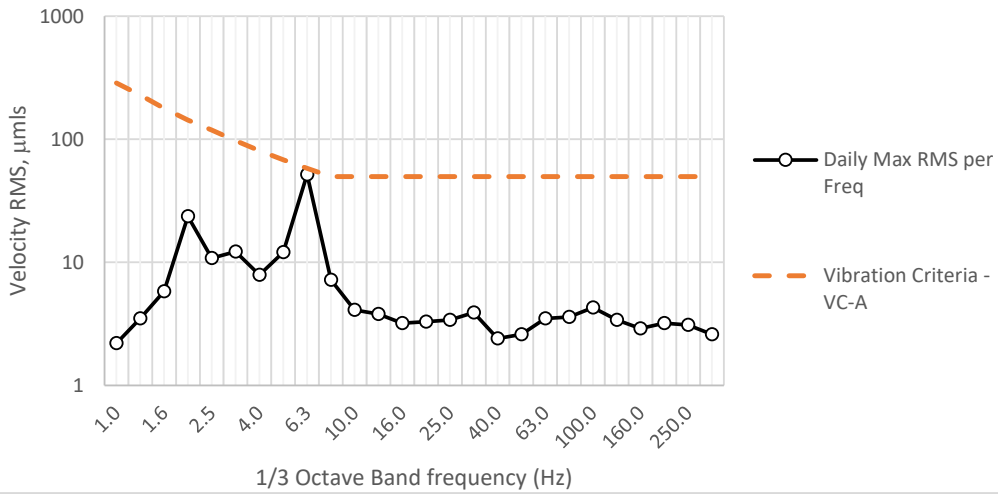


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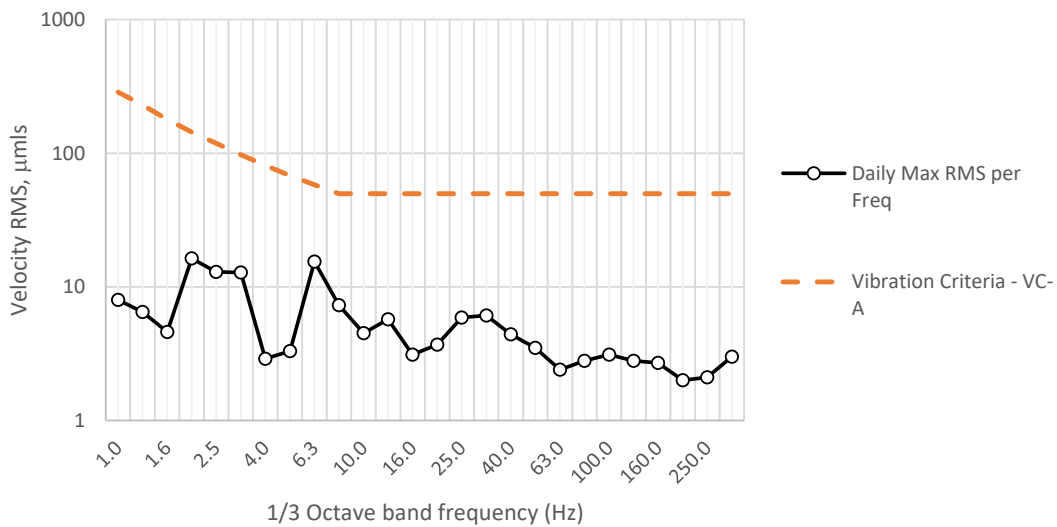
Vertical Vibration



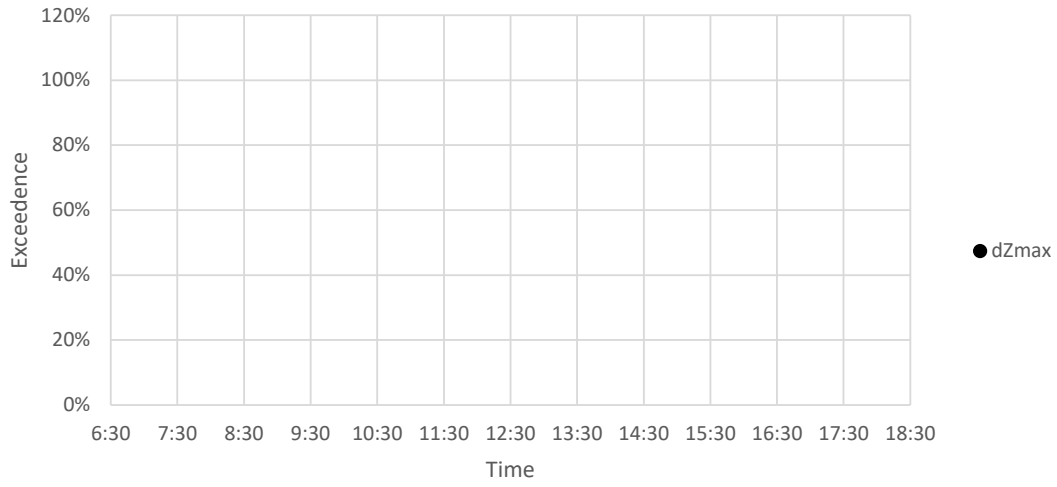
FwdBackwd Vibration



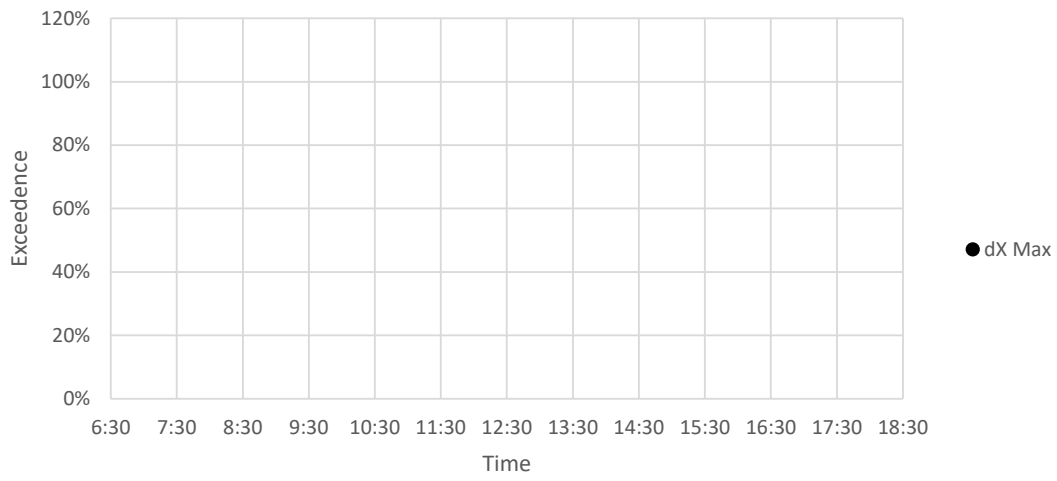
Sideways Vibration



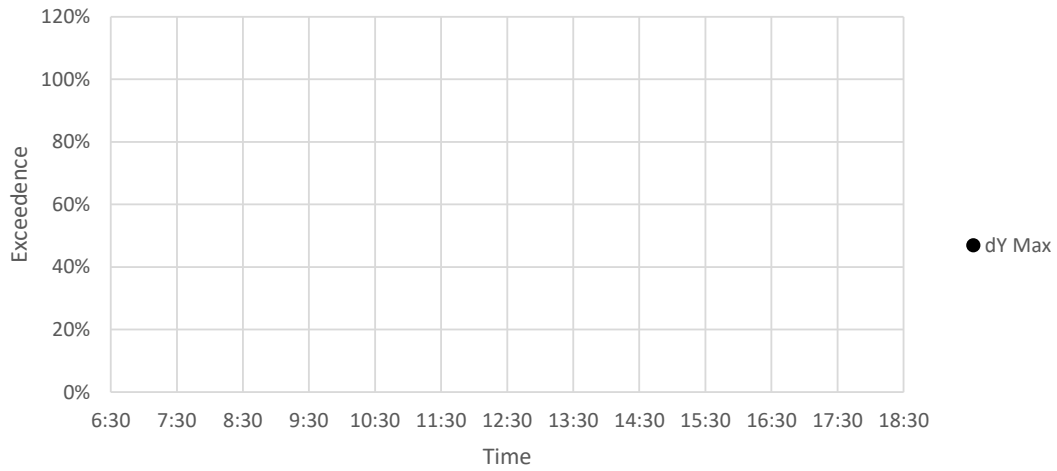
Vertical



Fwd/Backwards

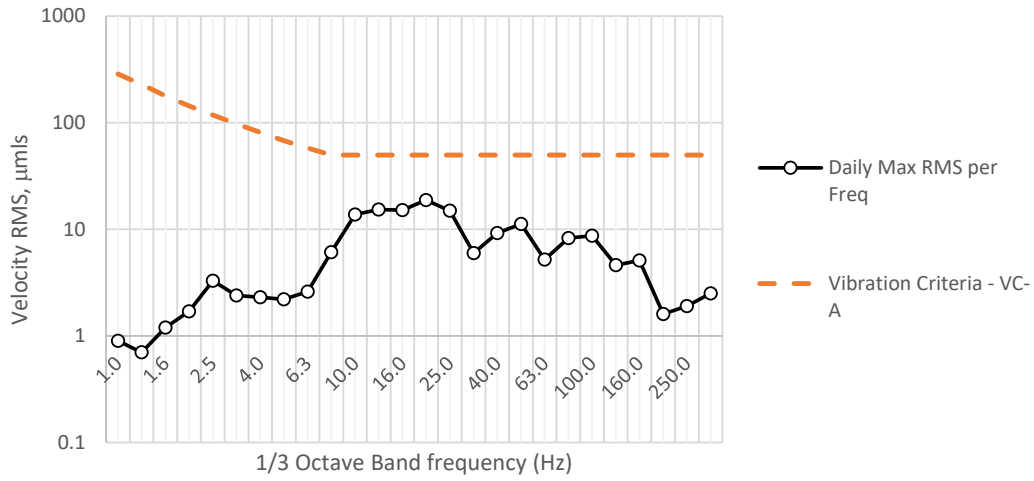


Sideways

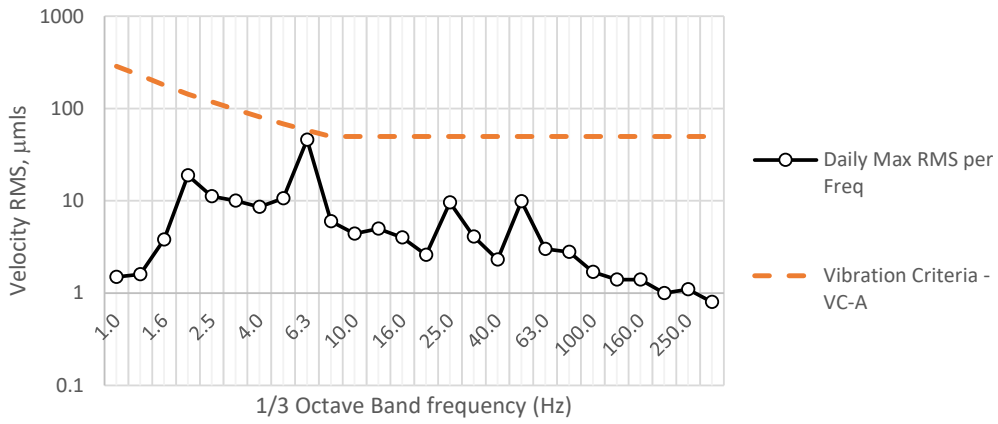


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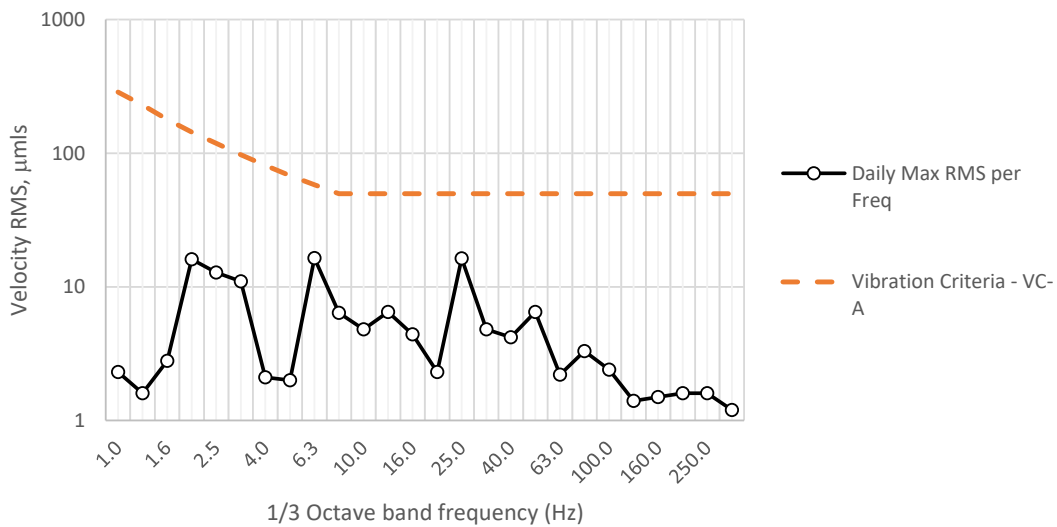
Vertical Vibration



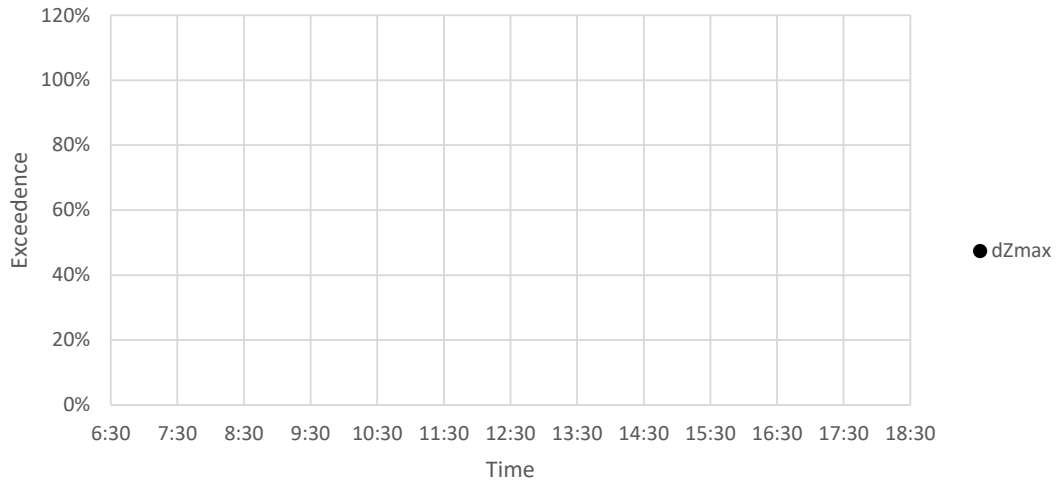
FwdBackwd Vibration



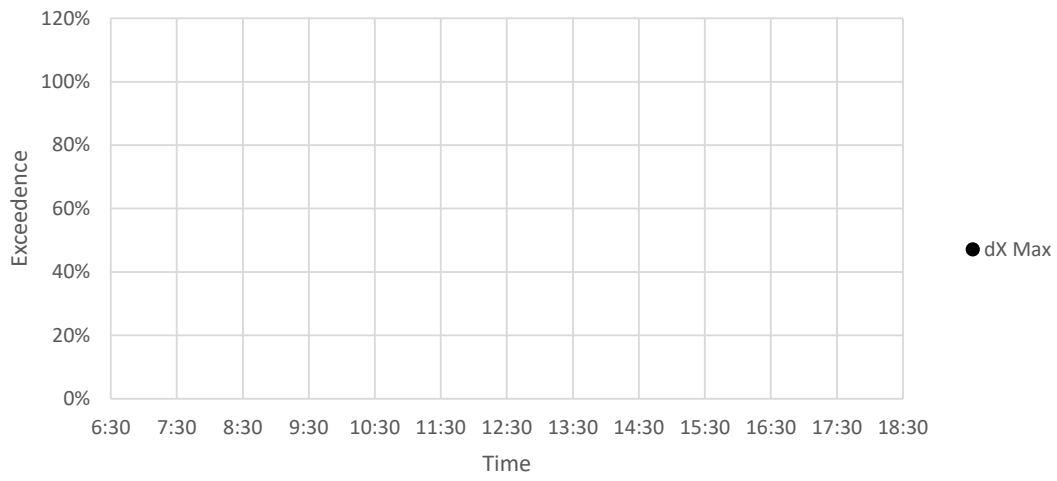
Sideways Vibration



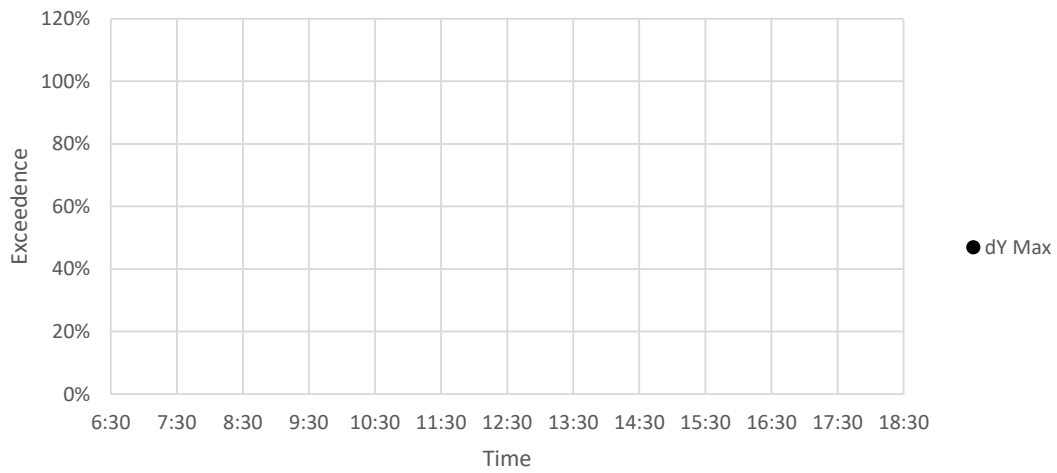
Vertical



Fwd/Backwards

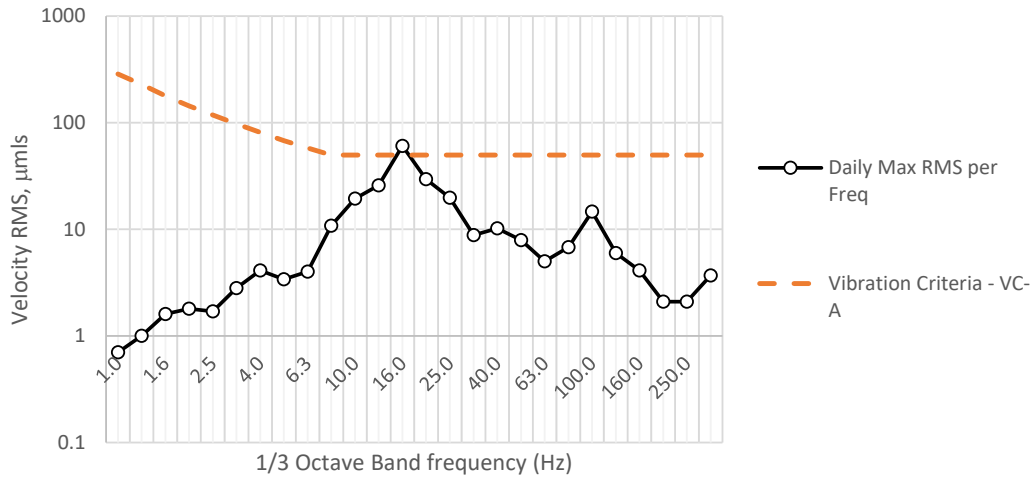


Sideways

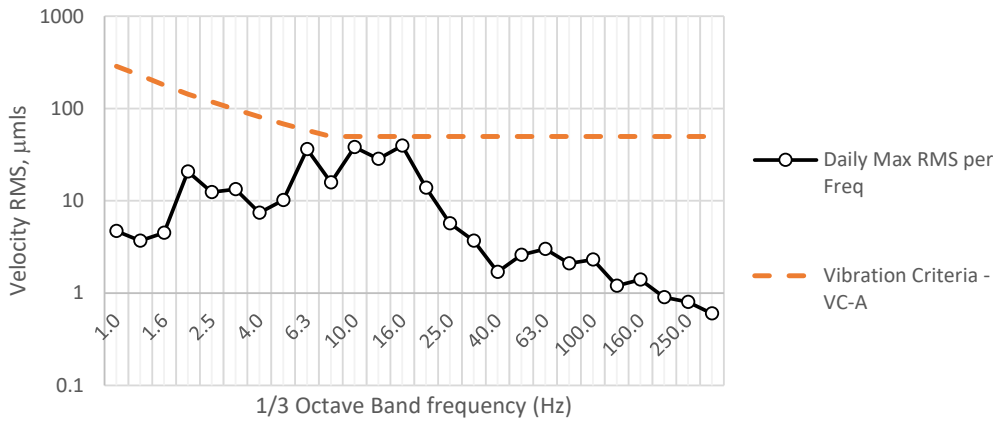


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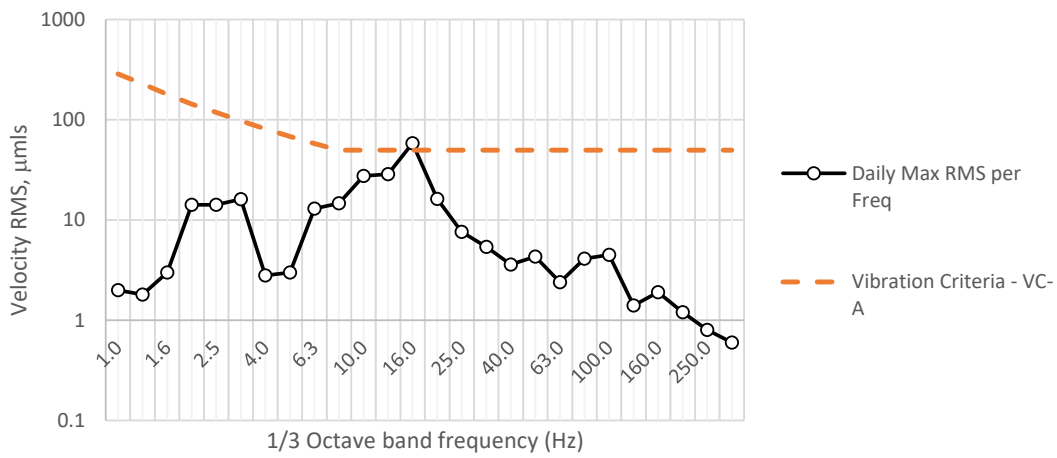
Vertical Vibration



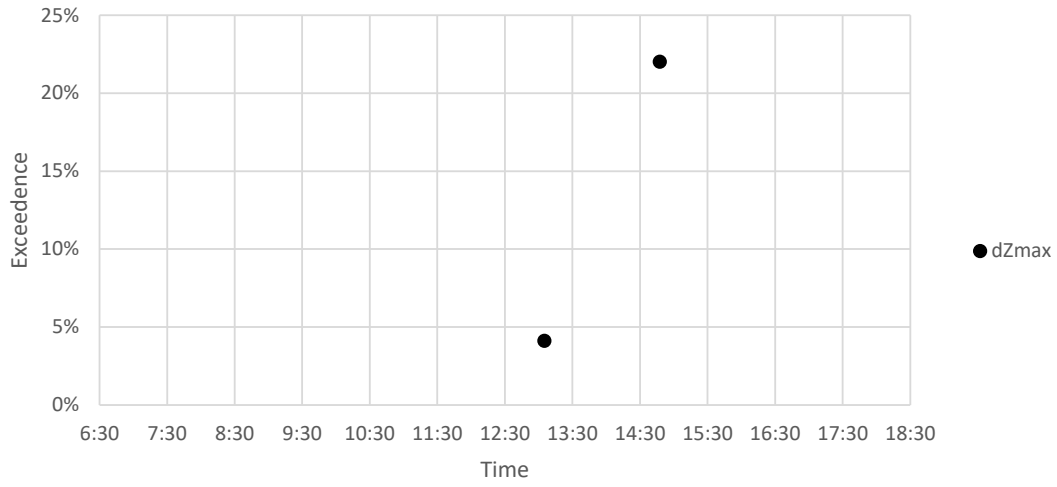
FwdBackwd Vibration



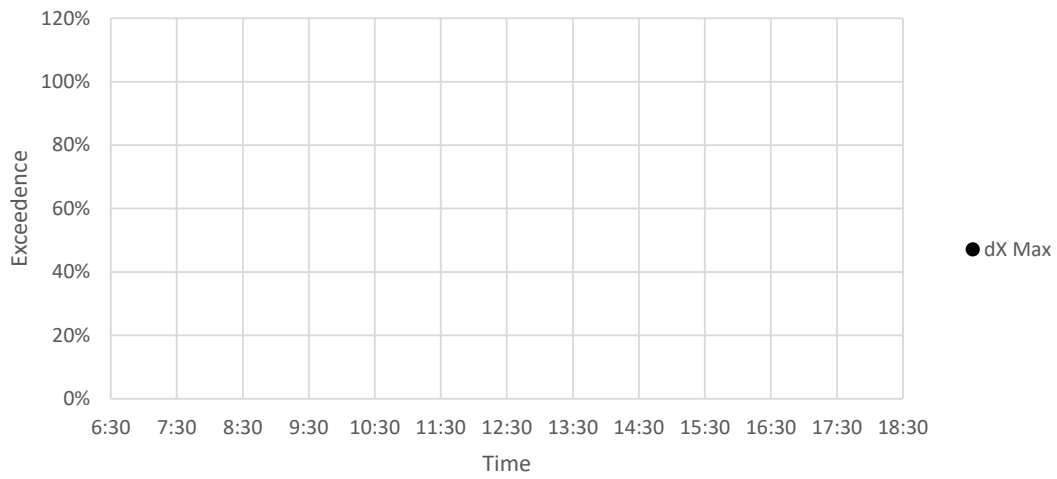
Sideways Vibration



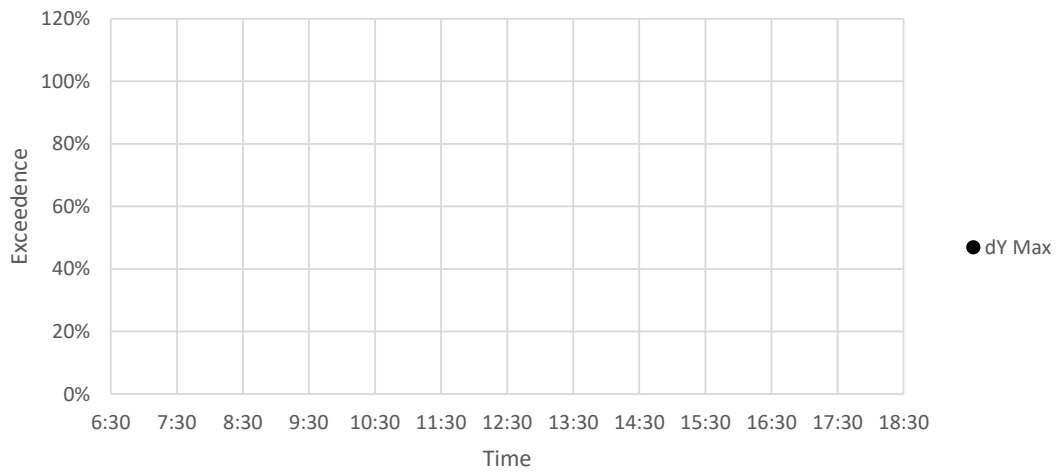
Vertical



Fwd/Backwards

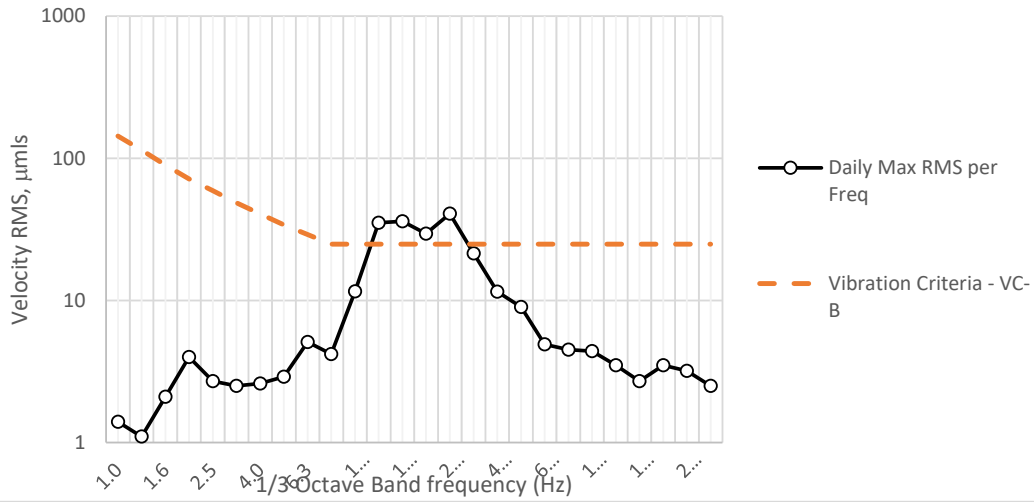


Sideways

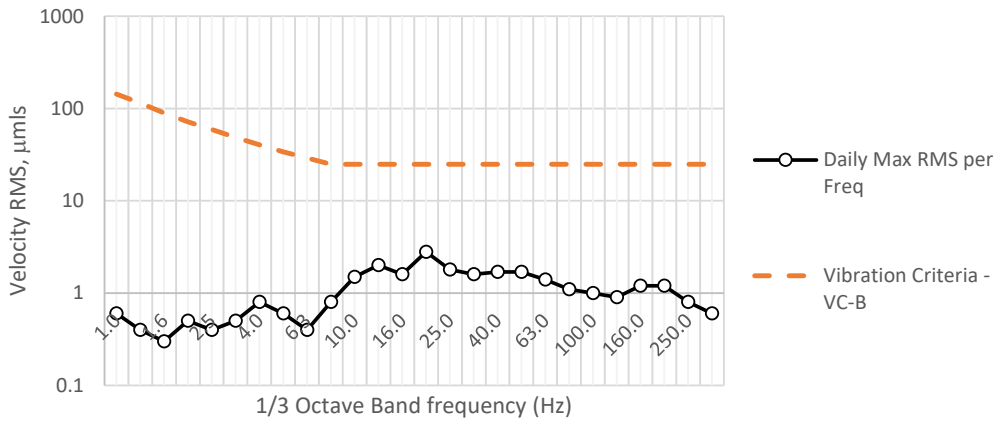


CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN CORRIDOR

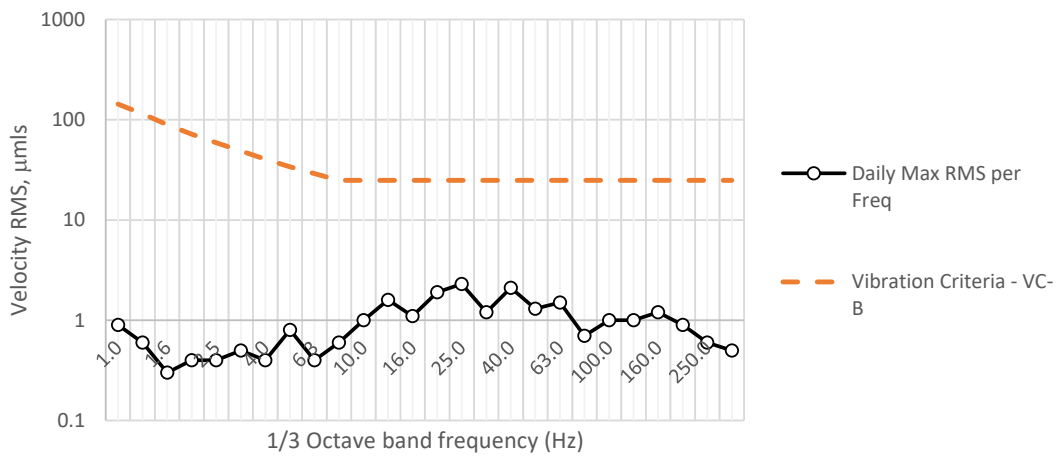
Vertical Vibration



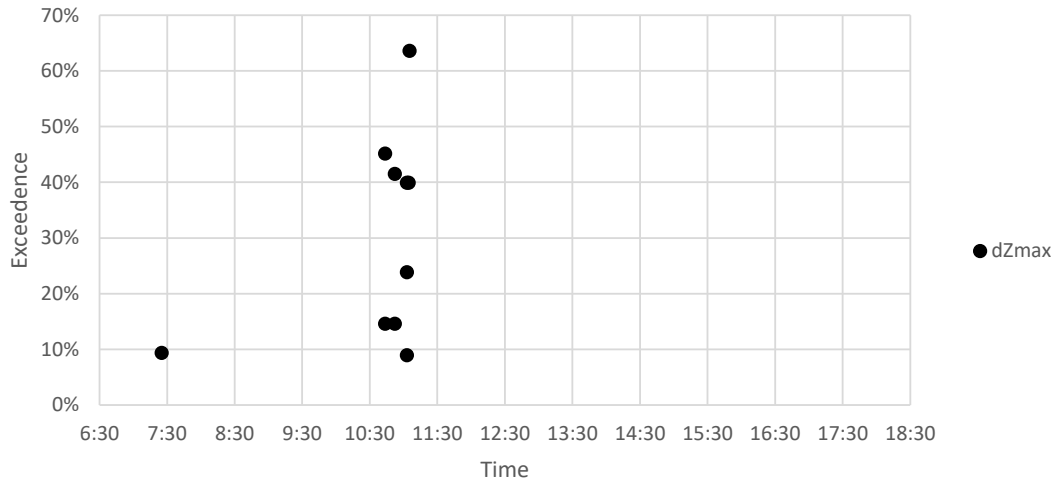
FwdBackwd Vibration



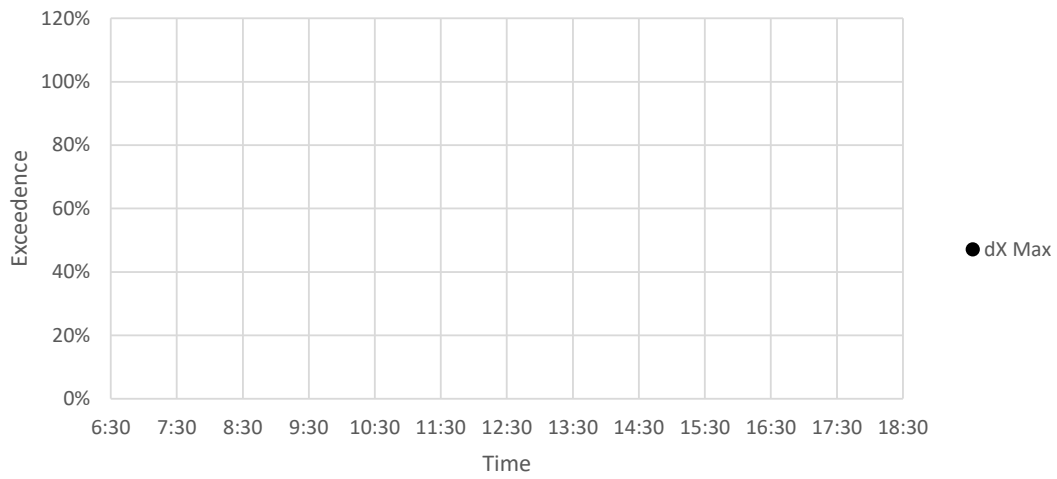
Sideways Vibration



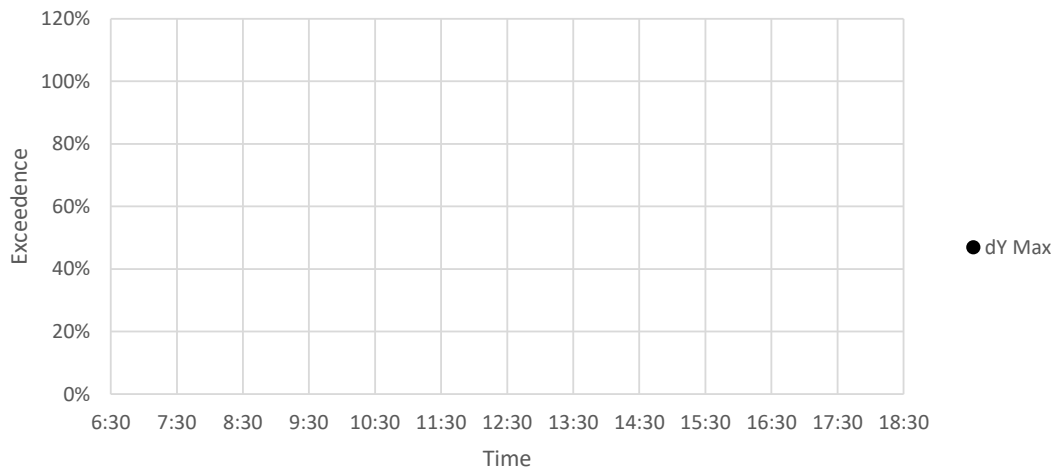
Vertical



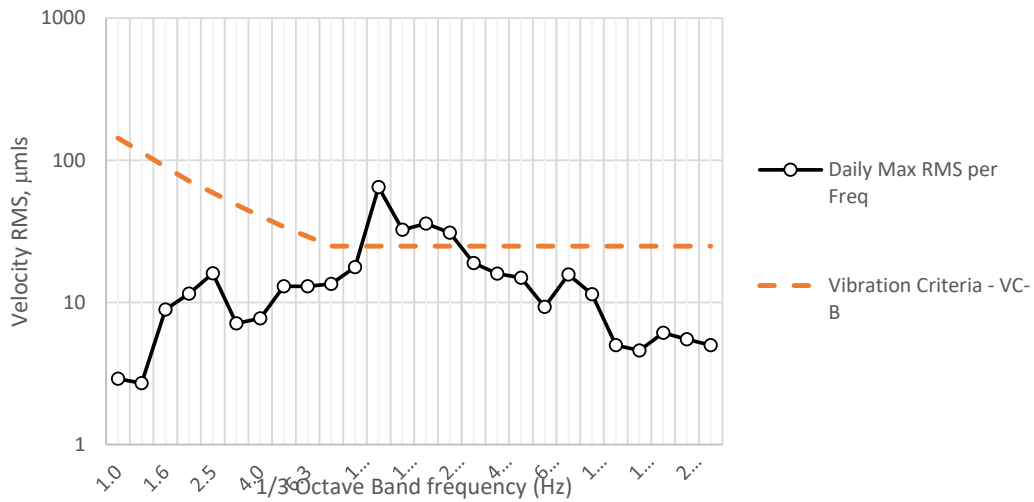
Fwd/Backwards



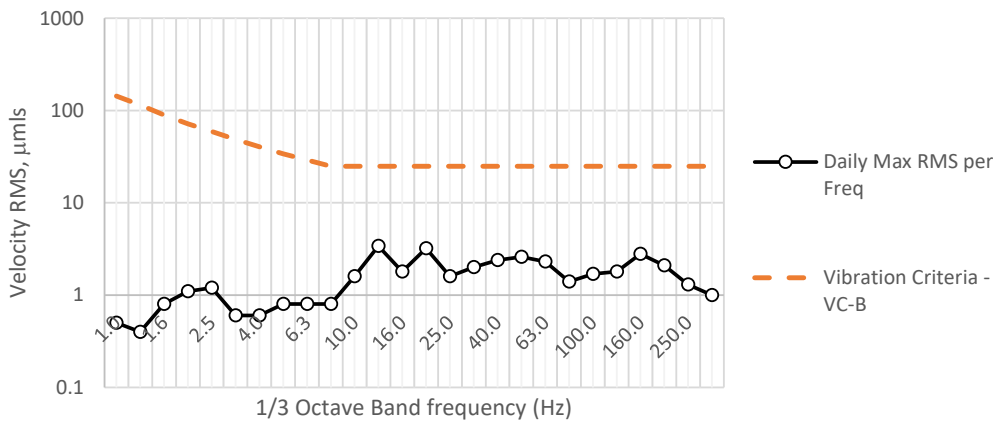
Sideways



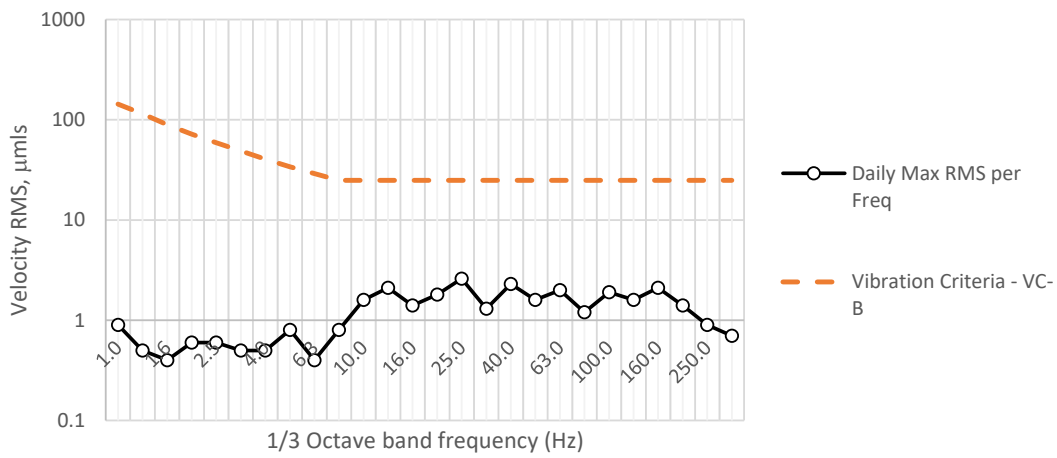
Vertical Vibration



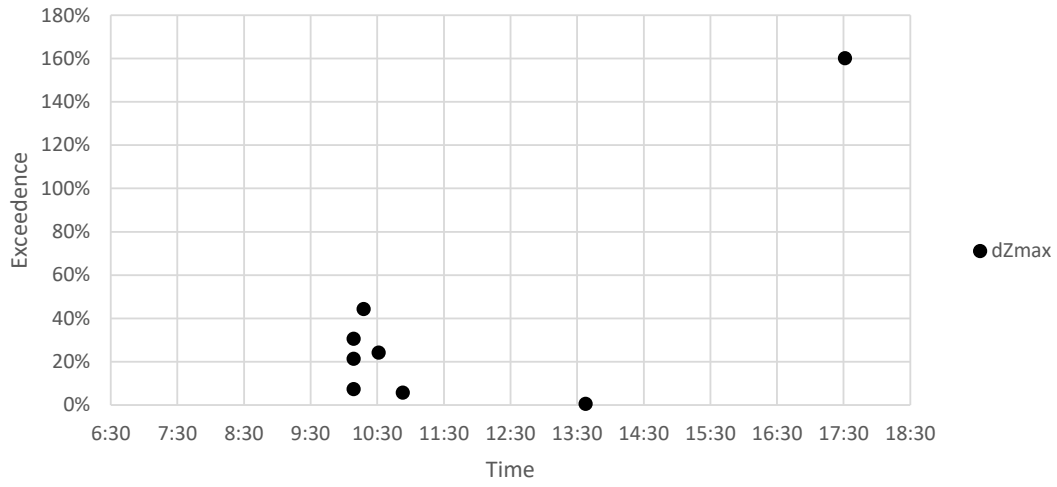
FwdBackwd Vibration



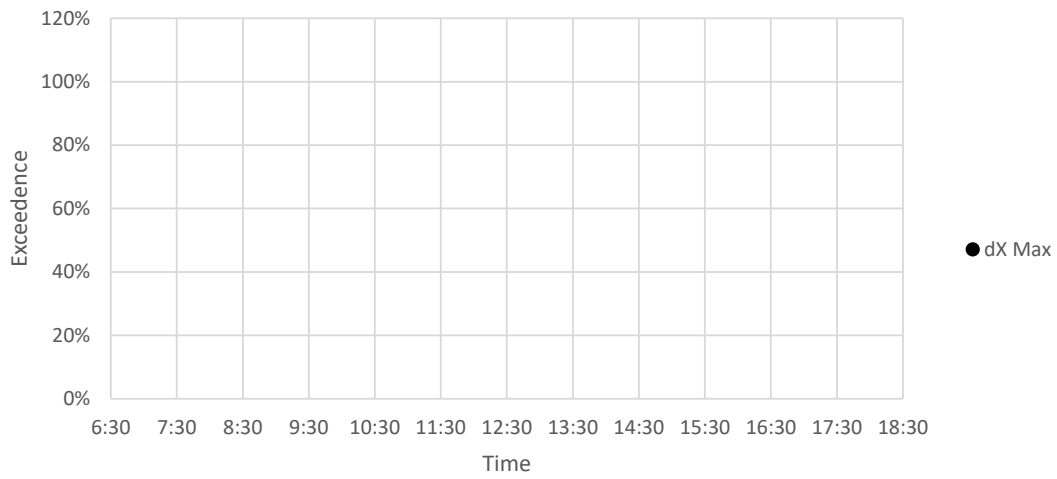
Sideways Vibration



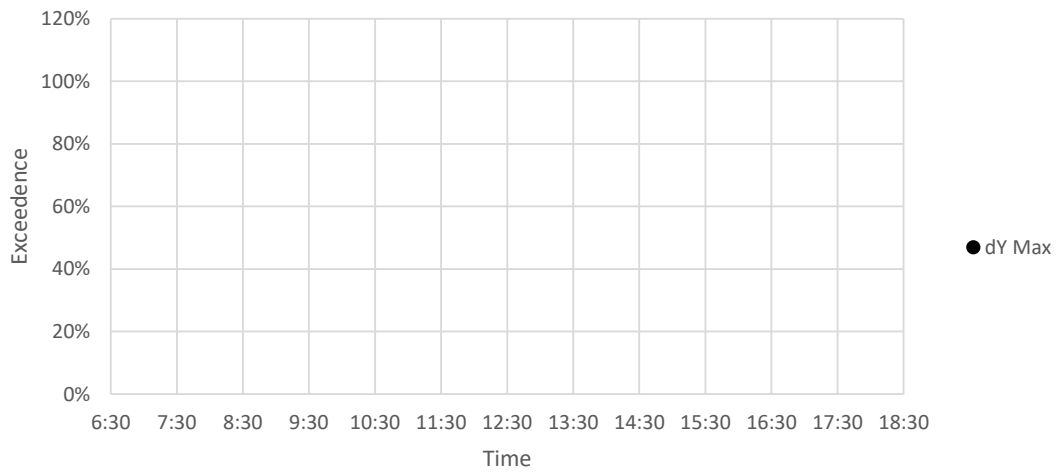
Vertical



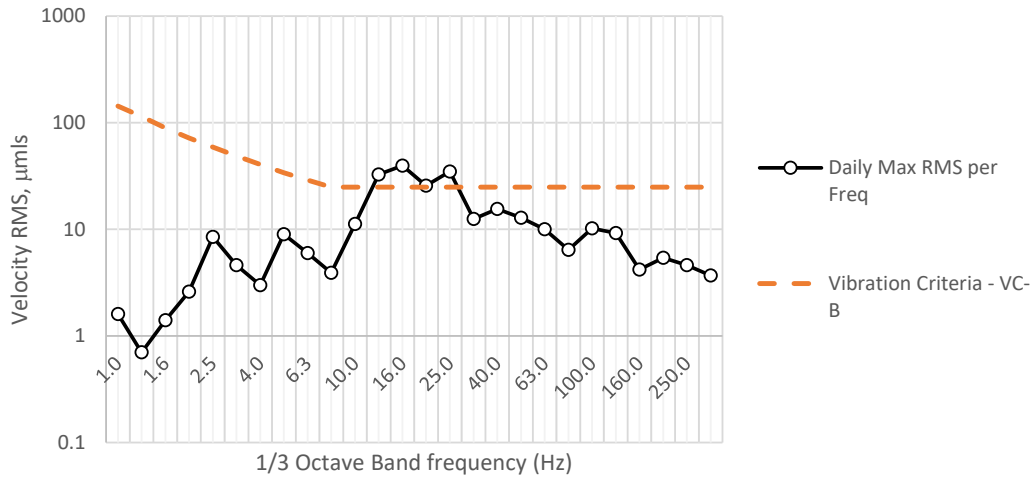
Fwd/Backwards



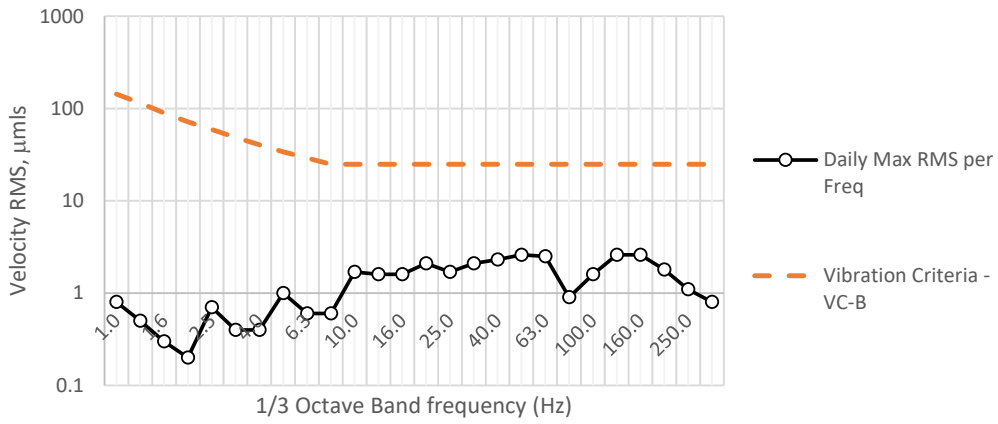
Sideways



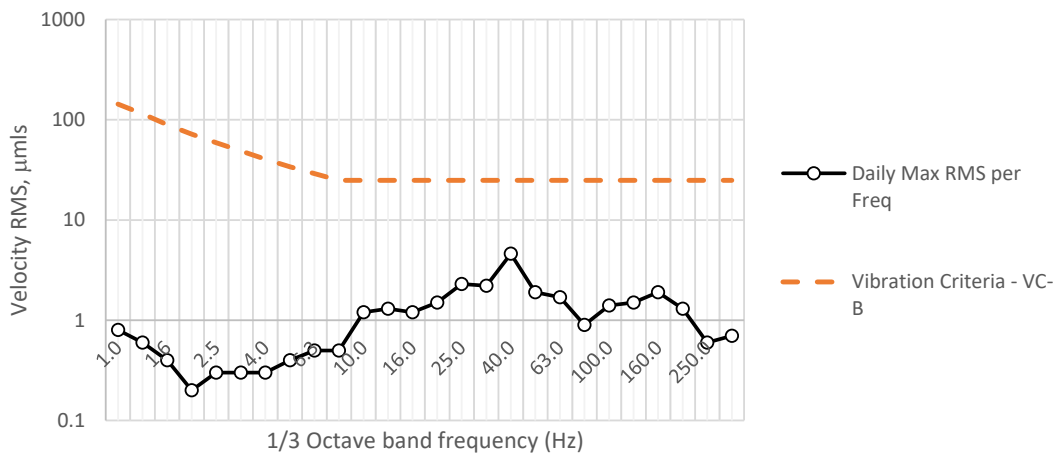
Vertical Vibration



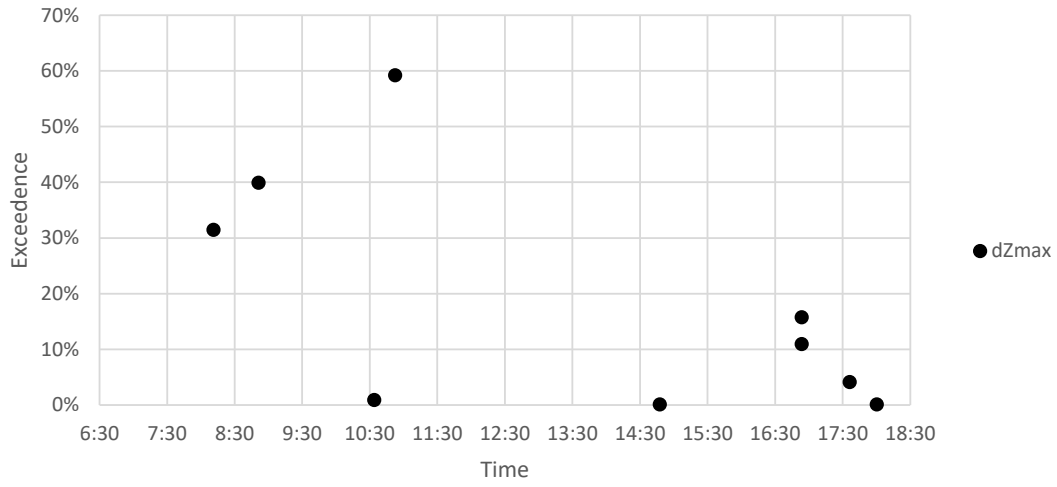
FwdBackwd Vibration



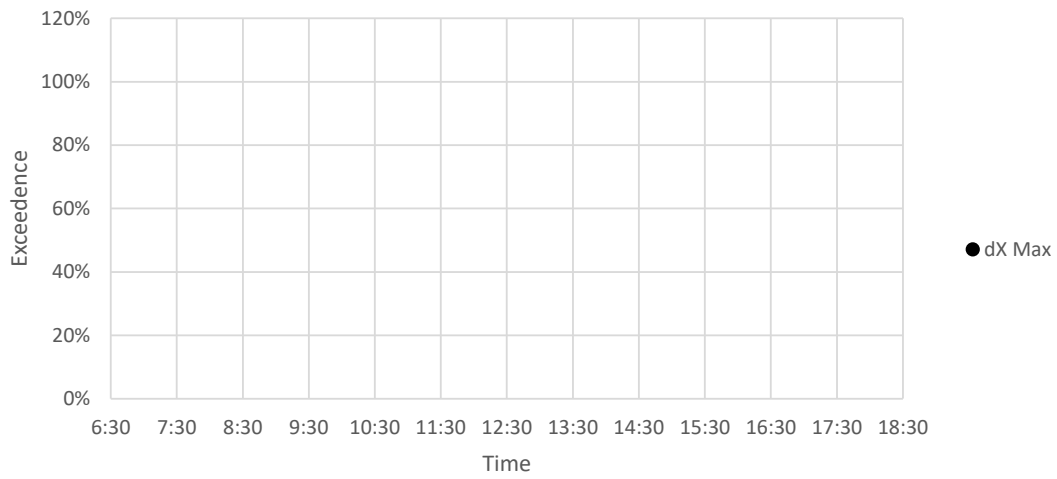
Sideways Vibration



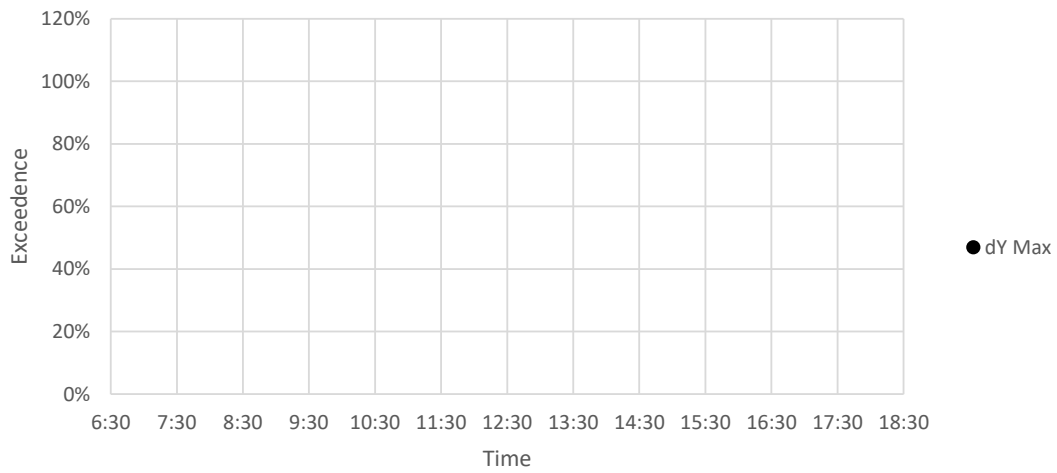
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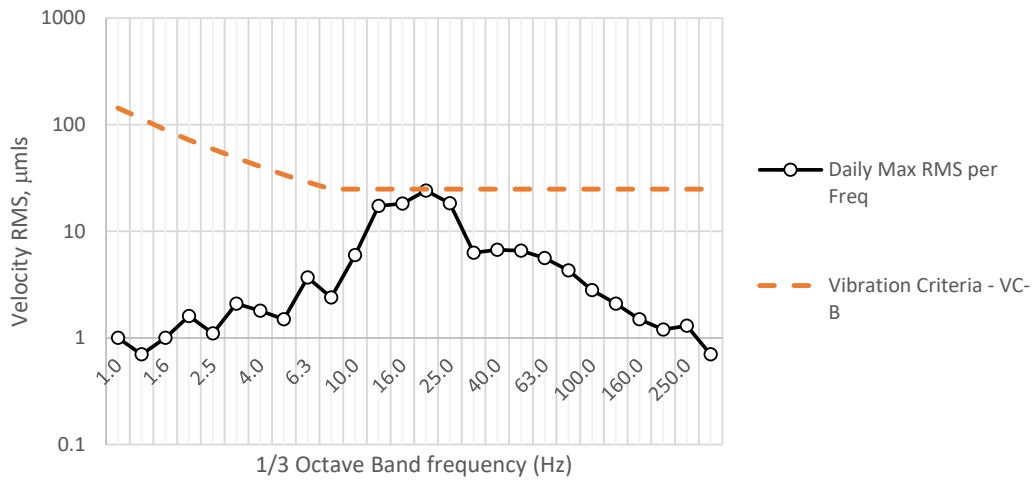
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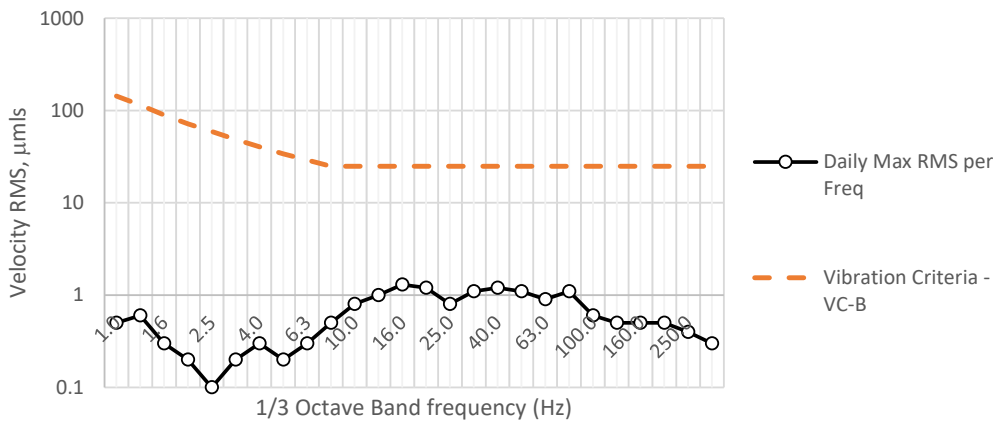
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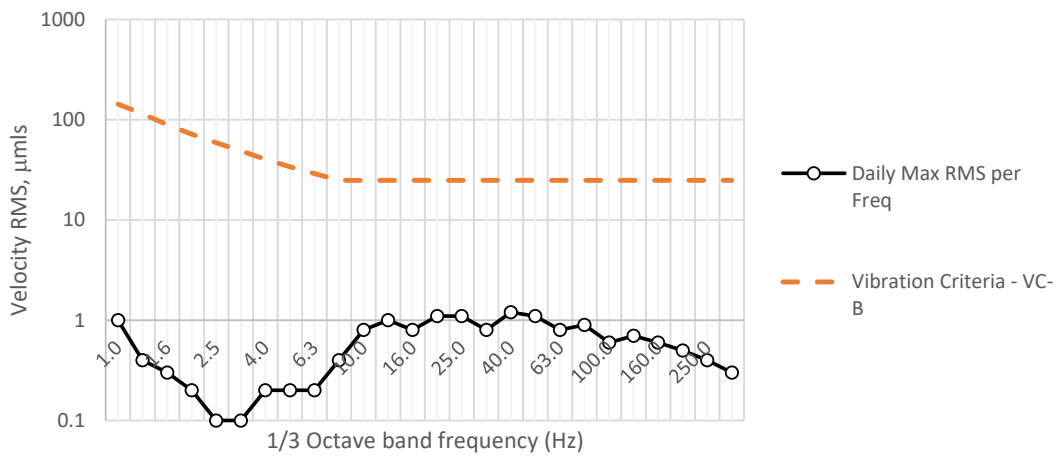
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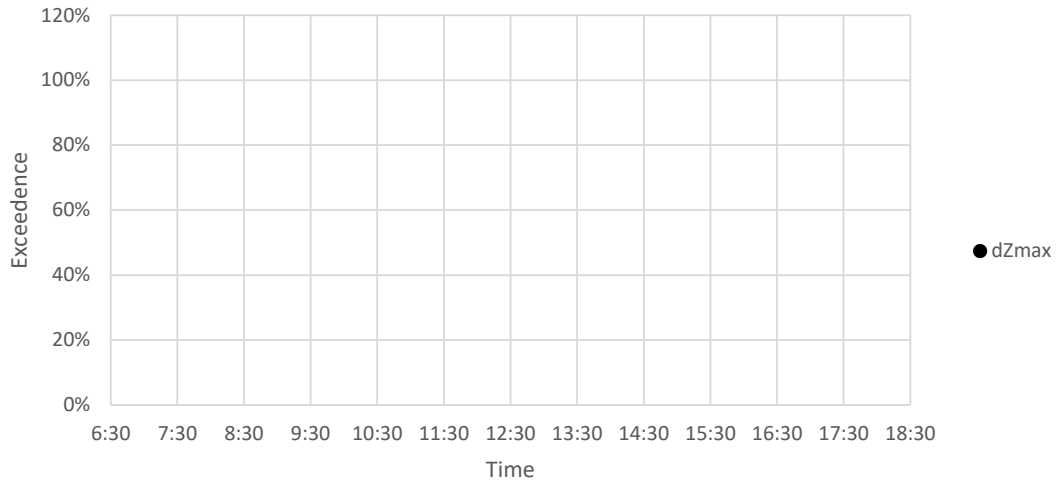
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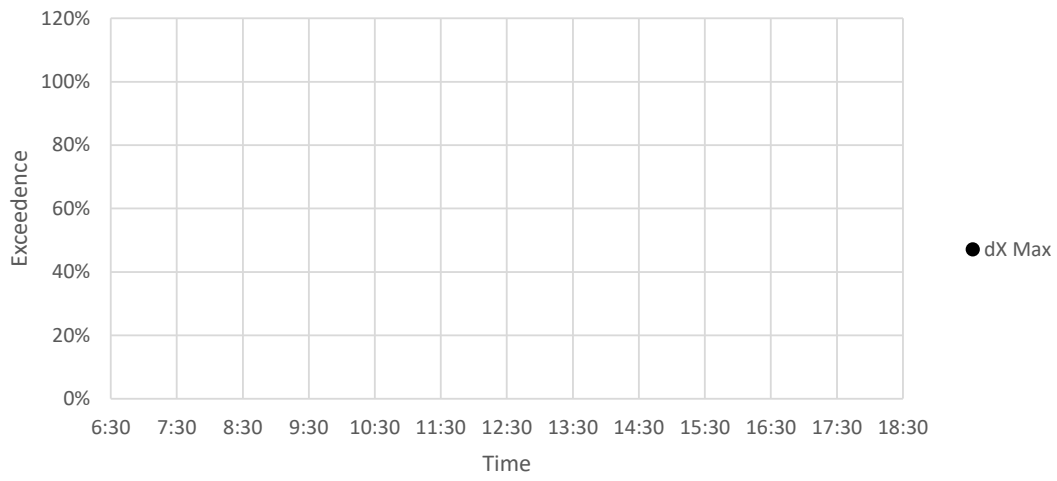
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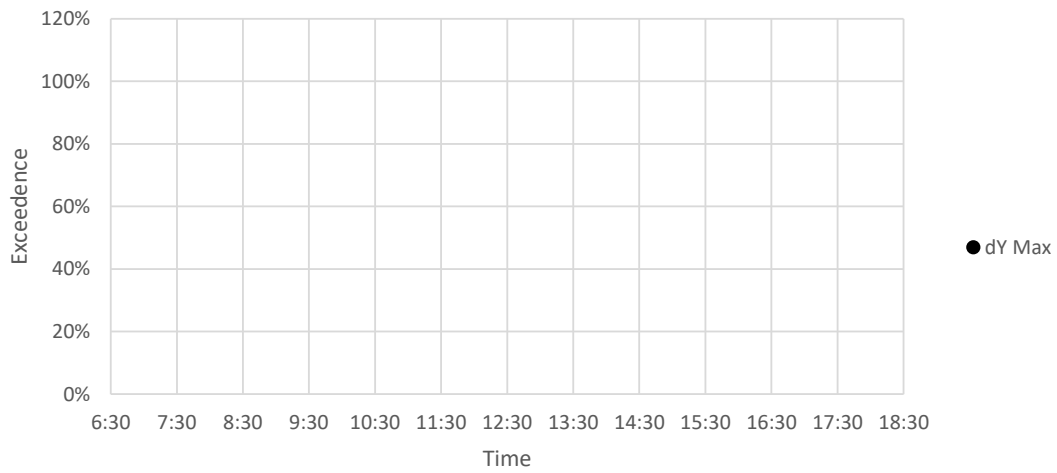
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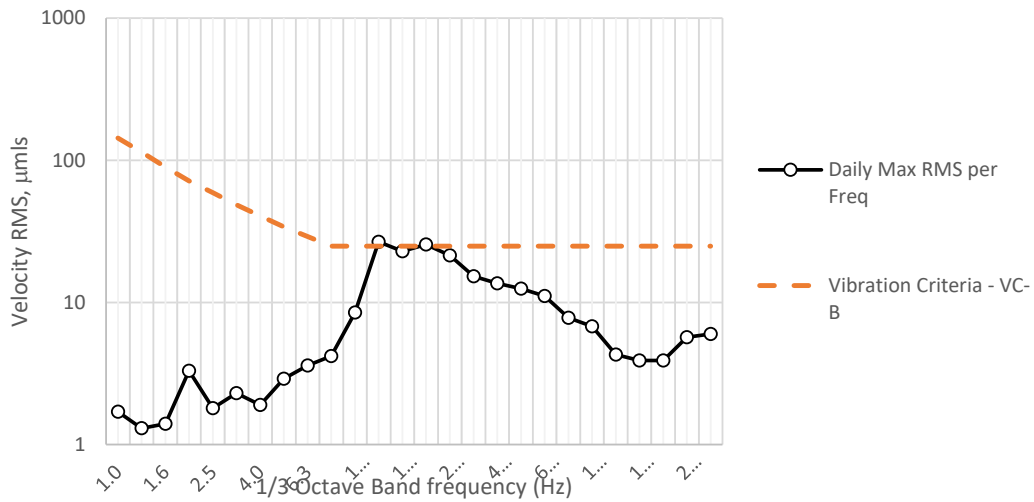
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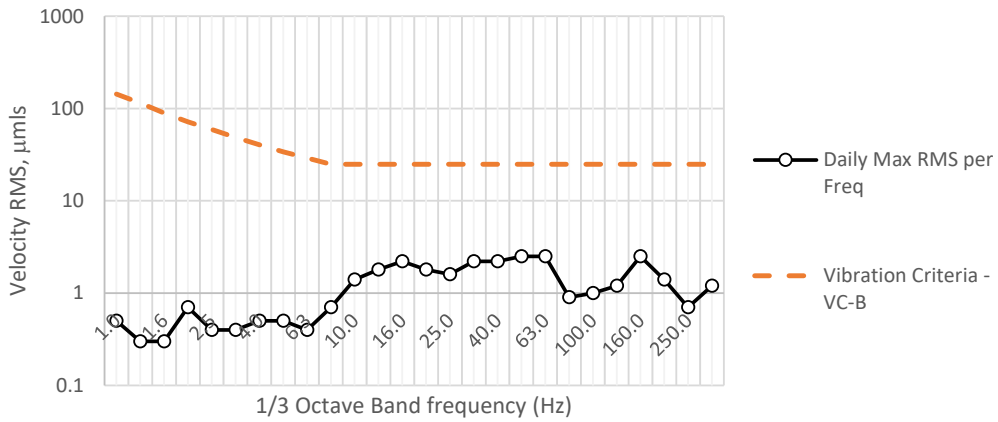
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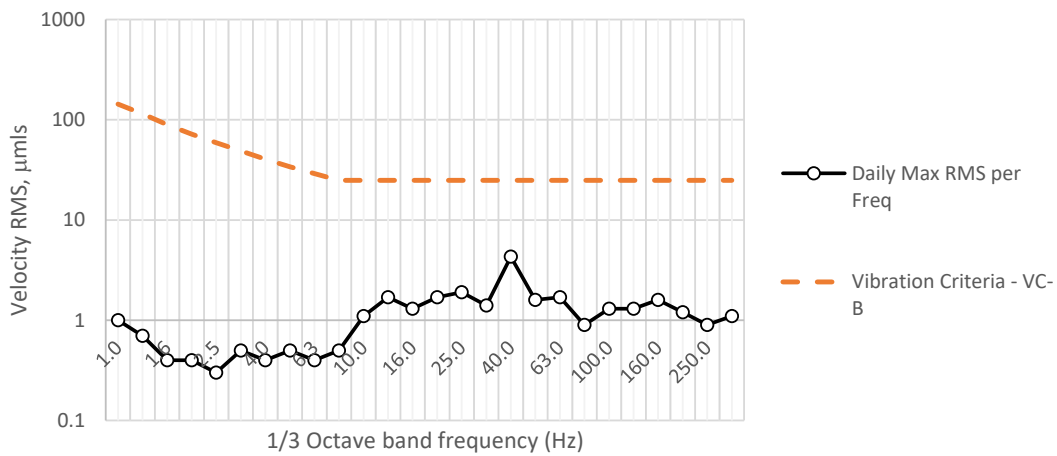
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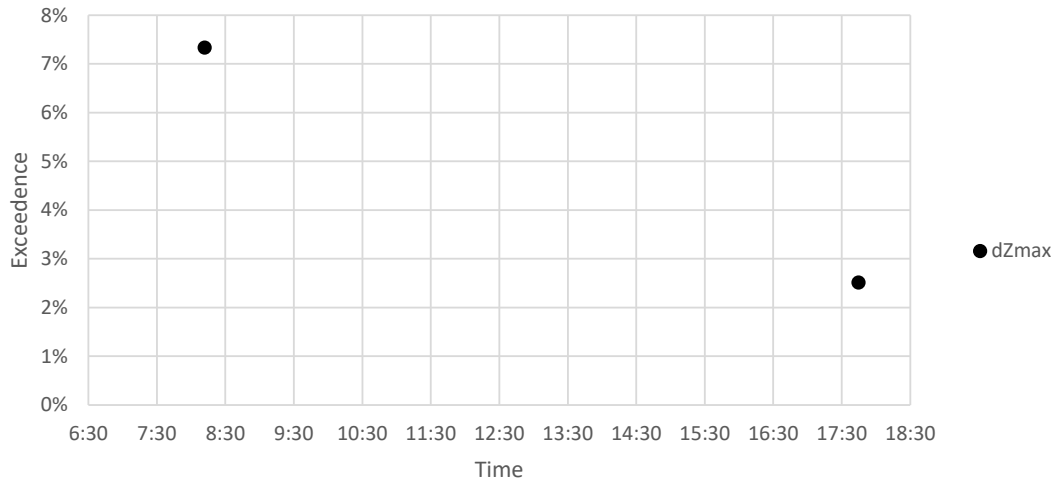
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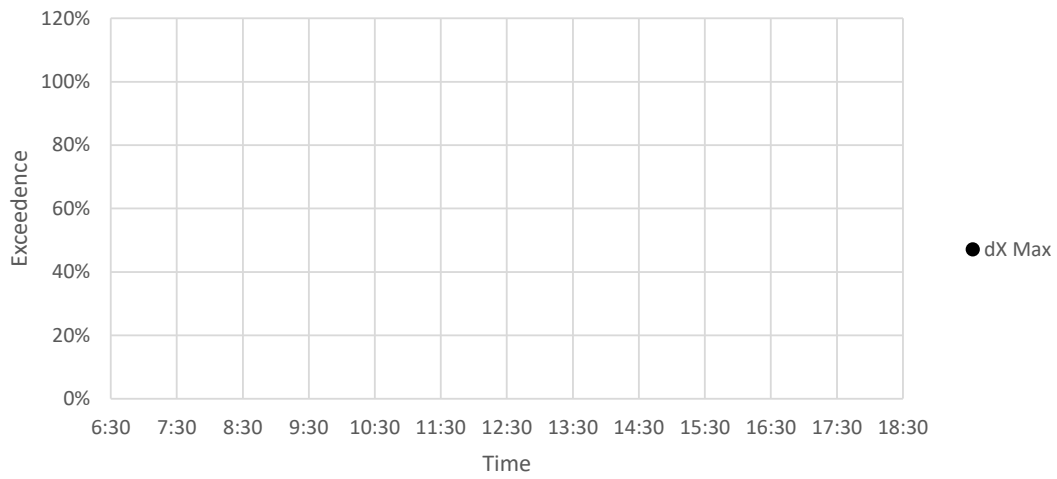
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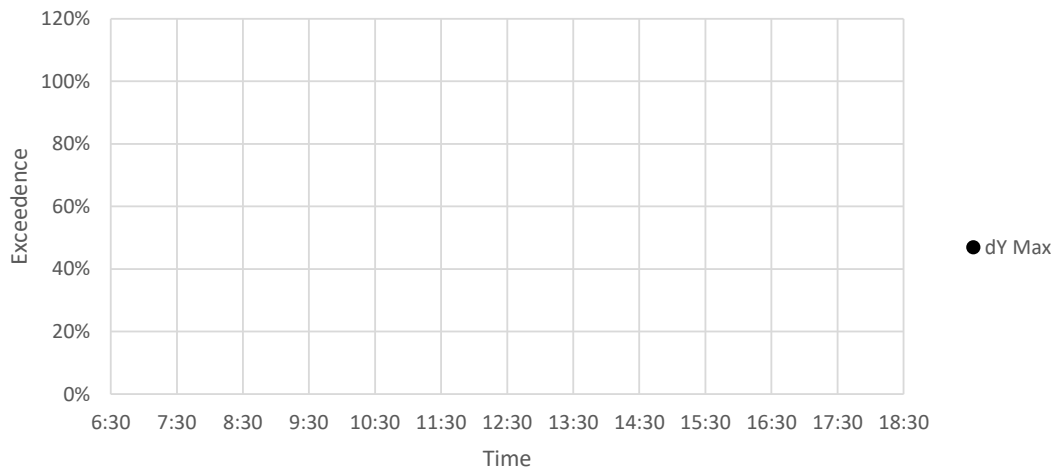
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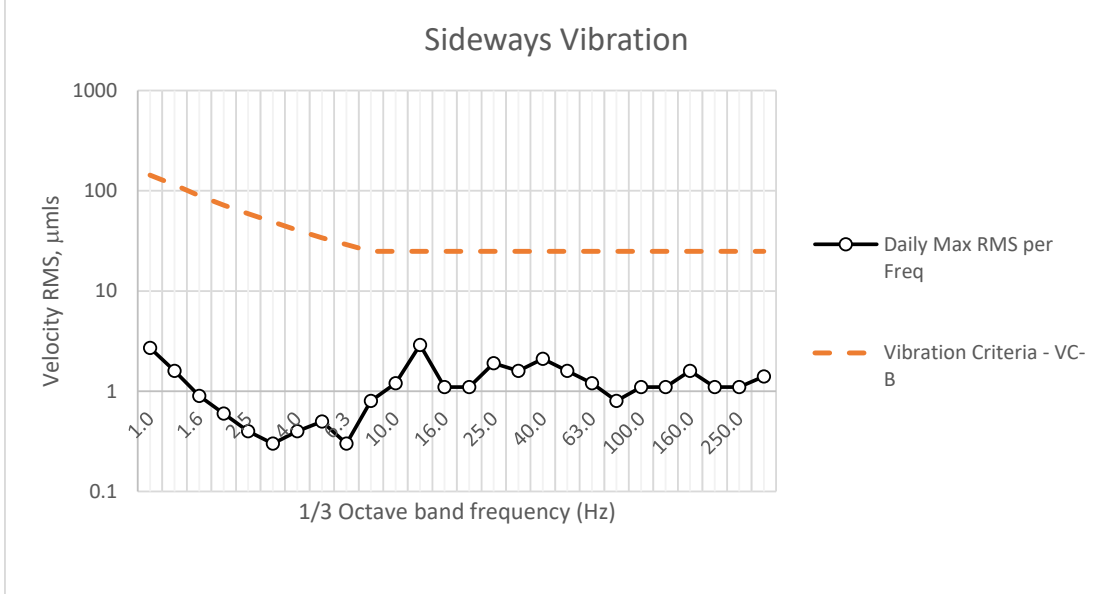
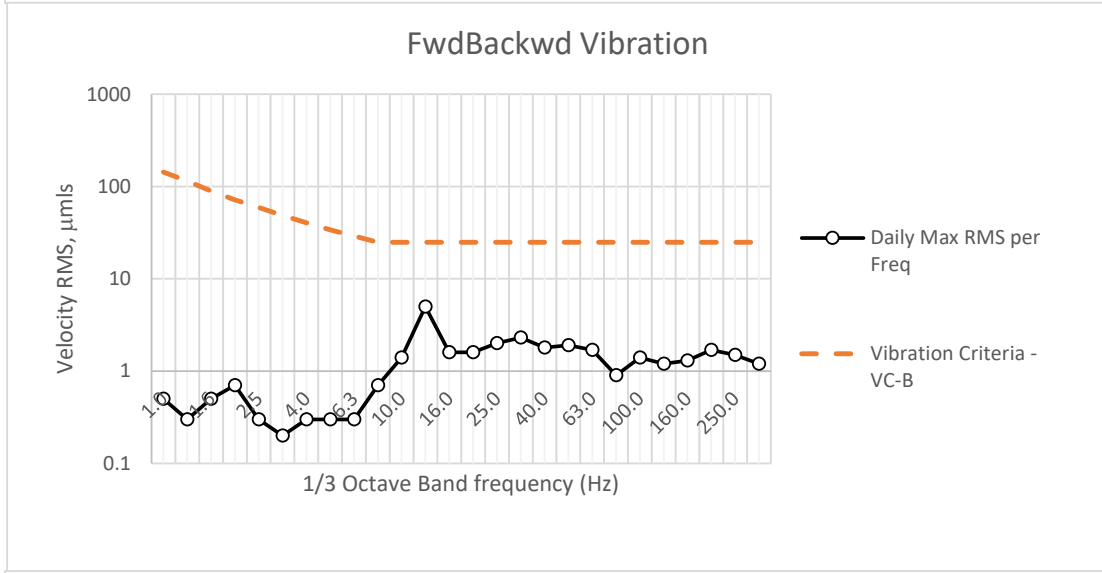
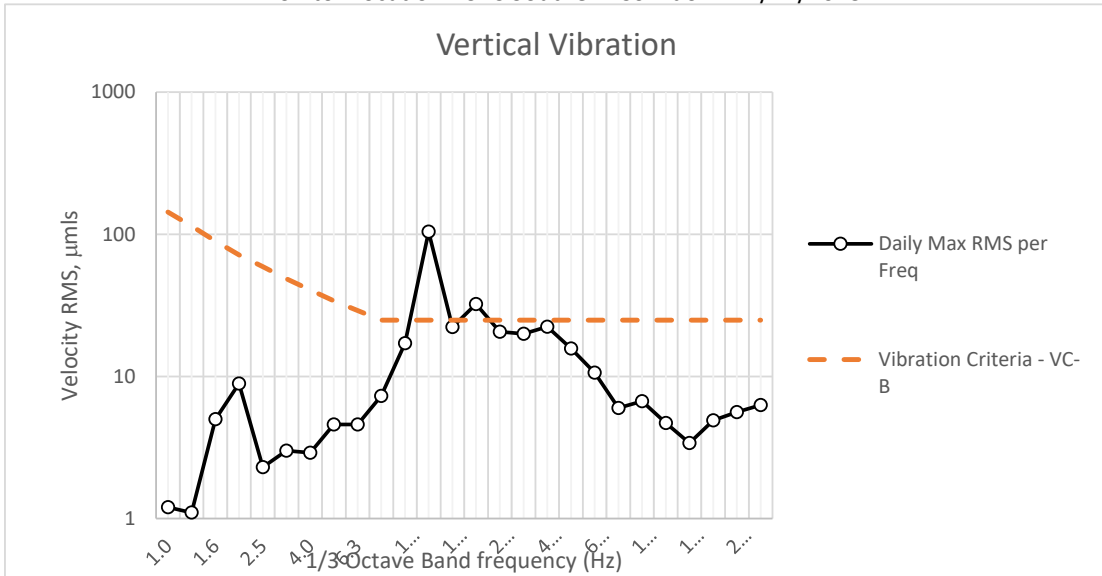


Fwd/Backwards

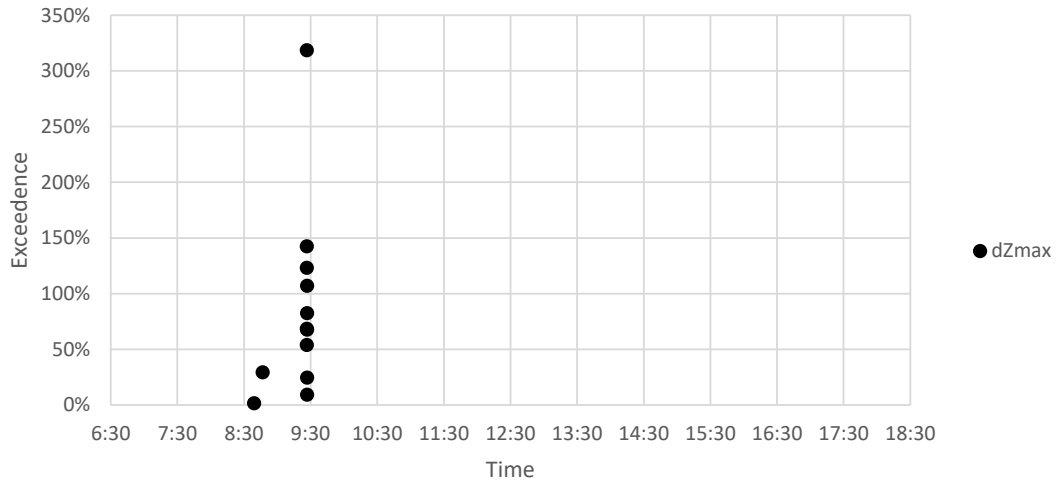


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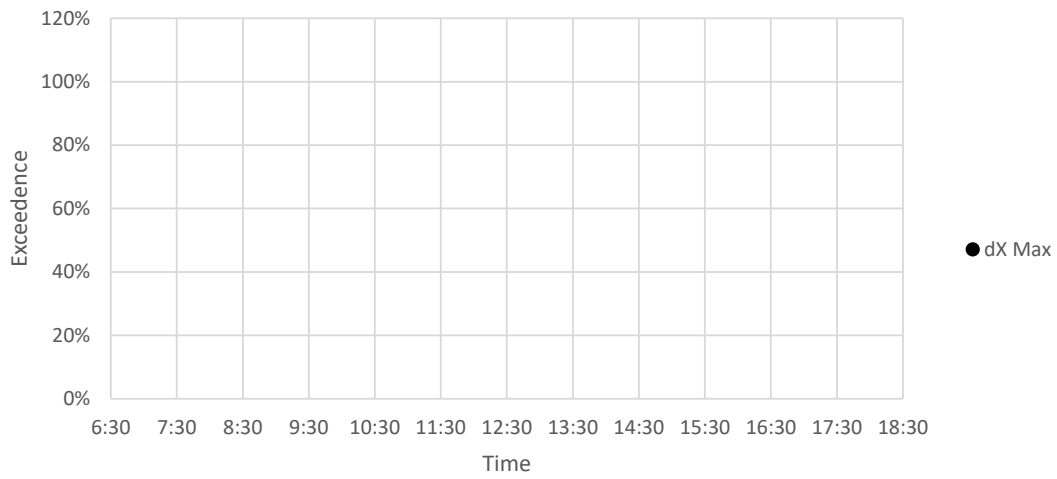




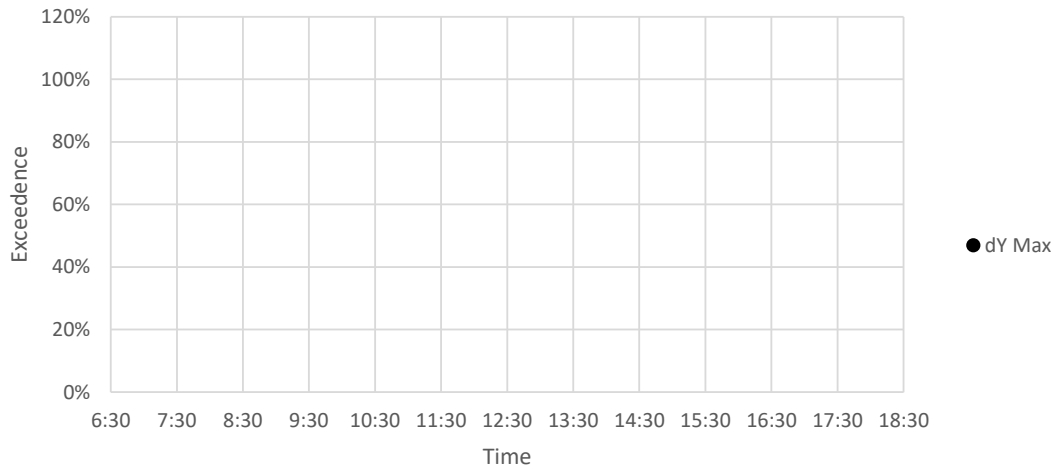
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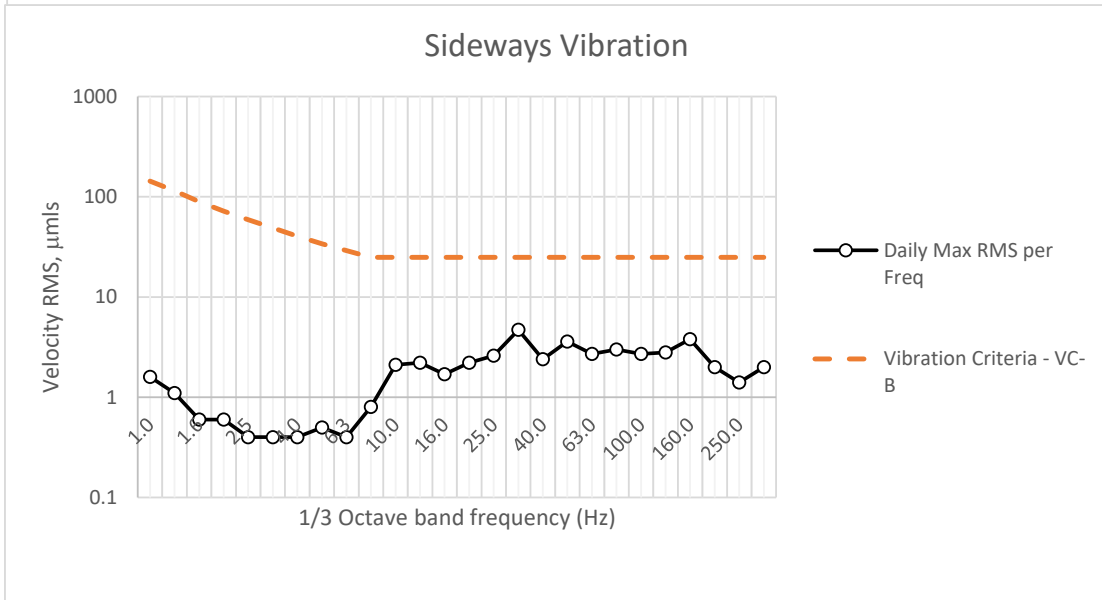
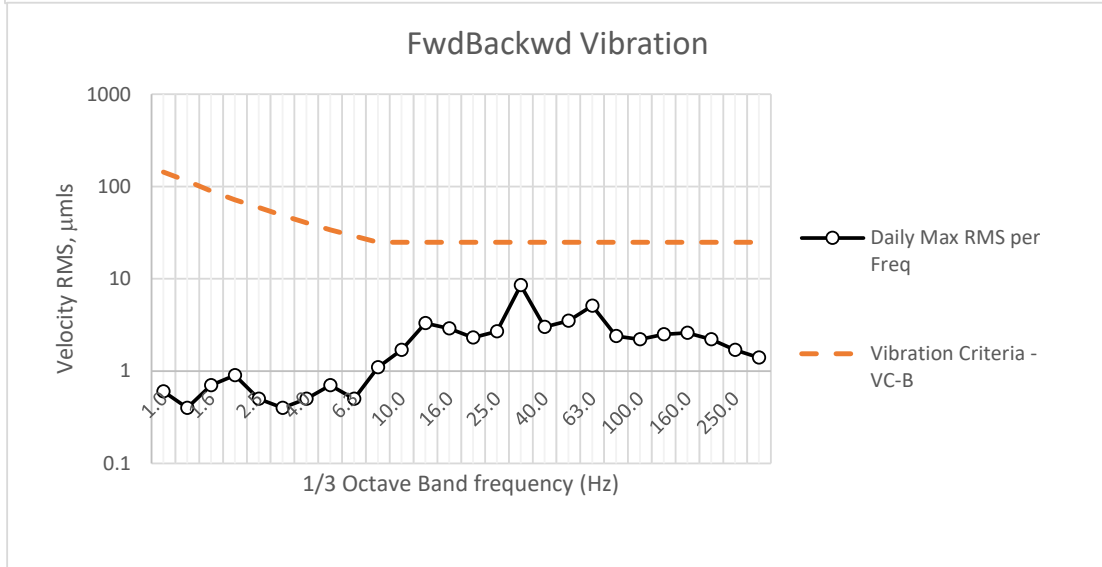
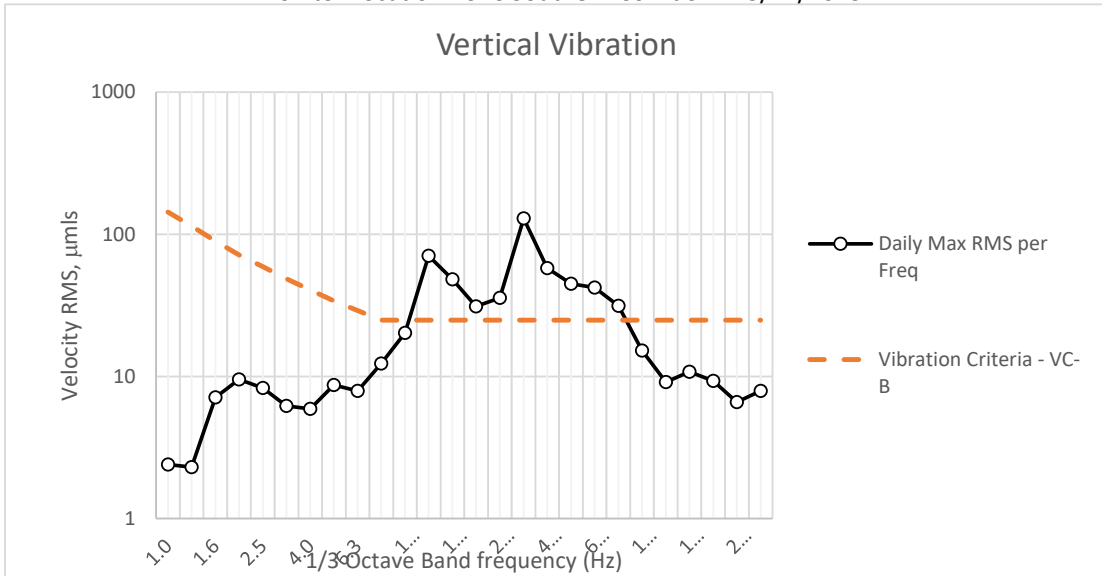


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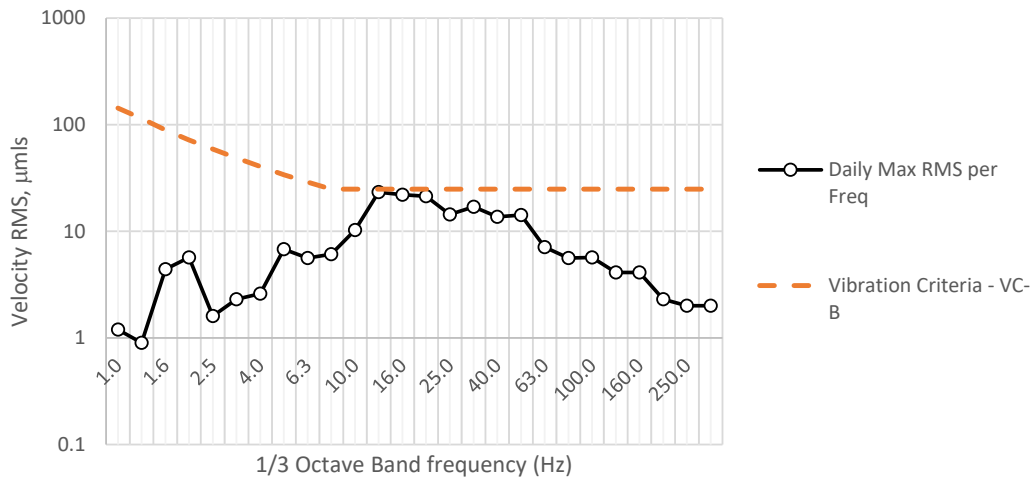


Sideways

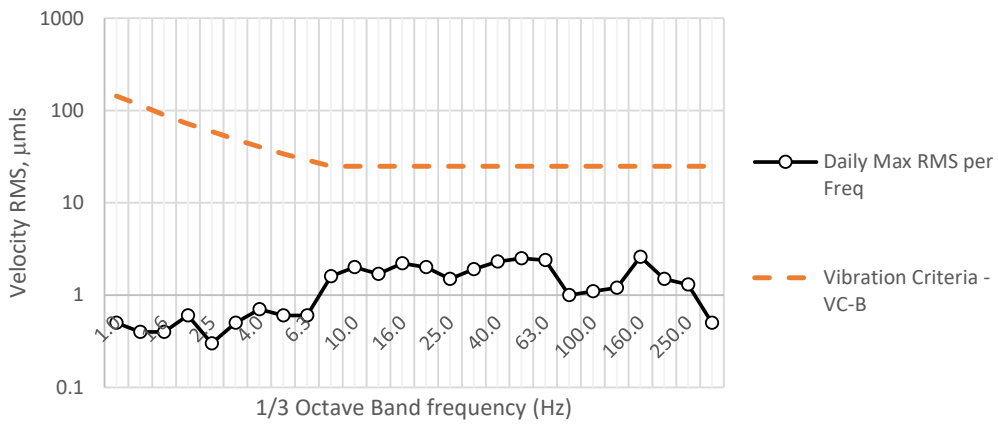




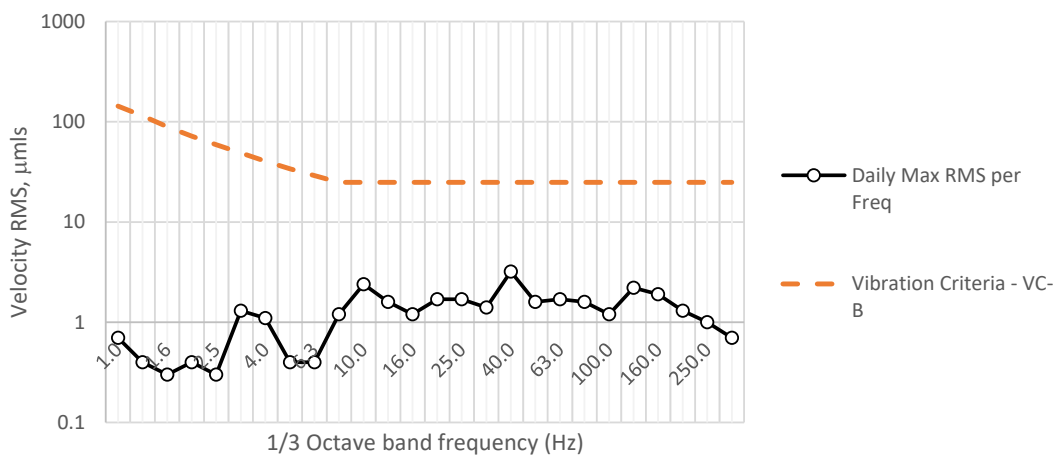
Vertical Vibration



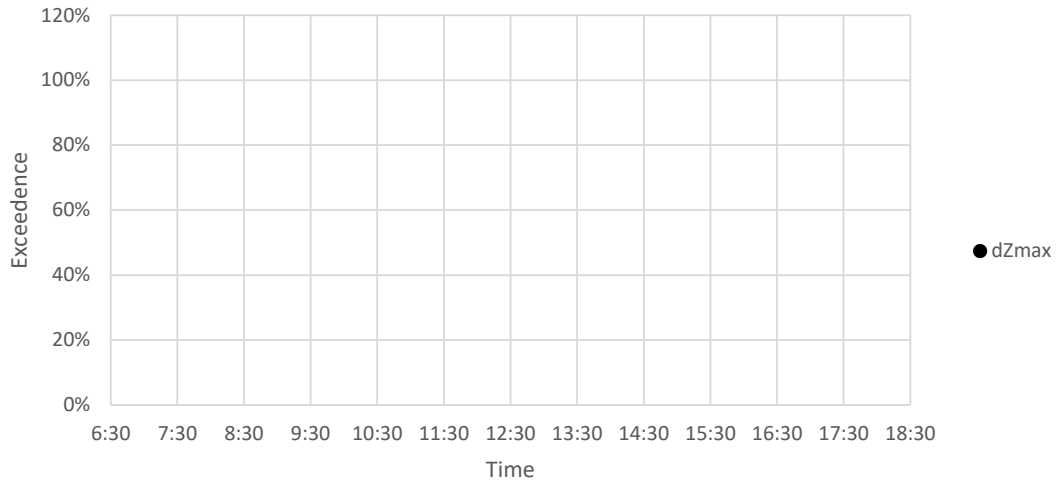
FwdBackwd Vibration



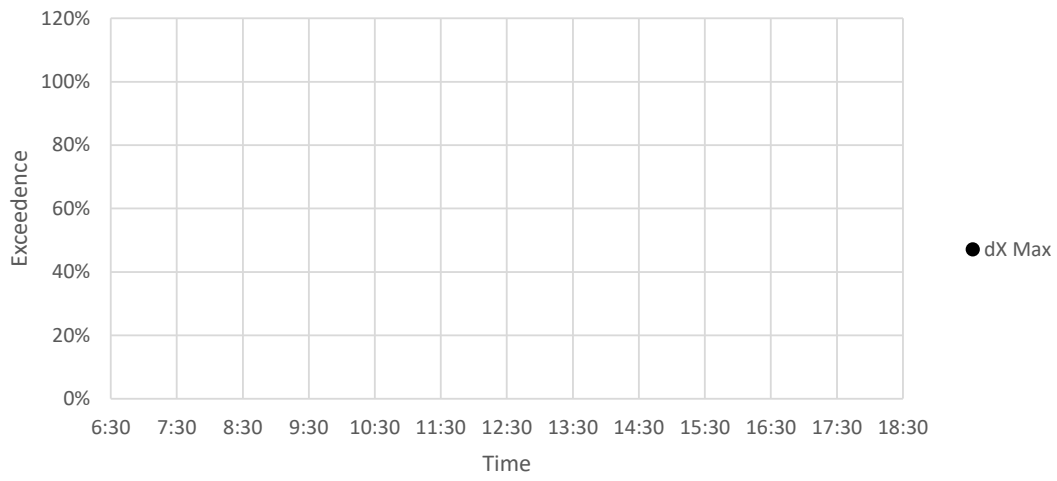
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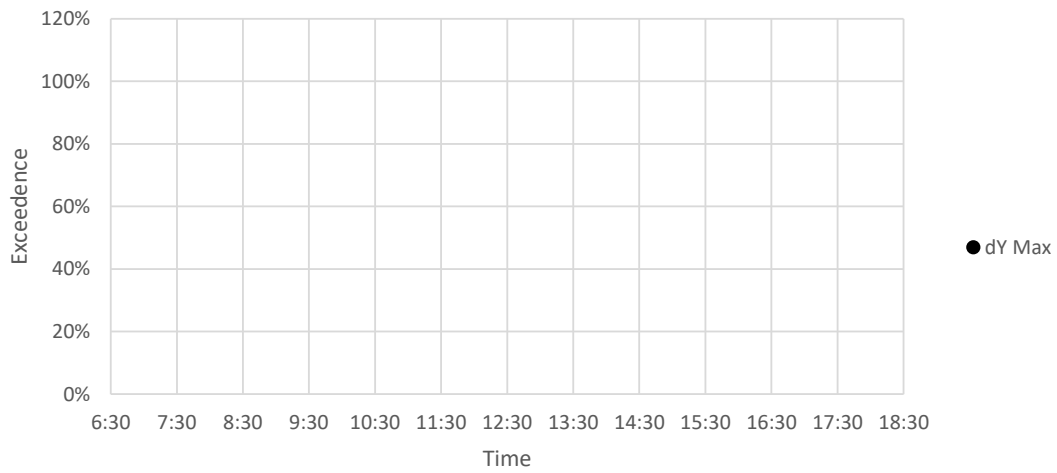
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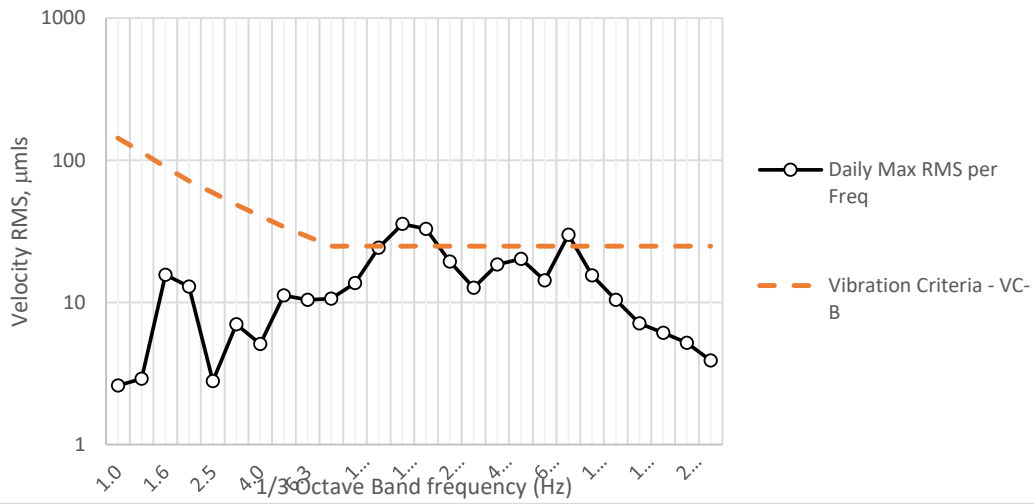
Fwd/Backwards



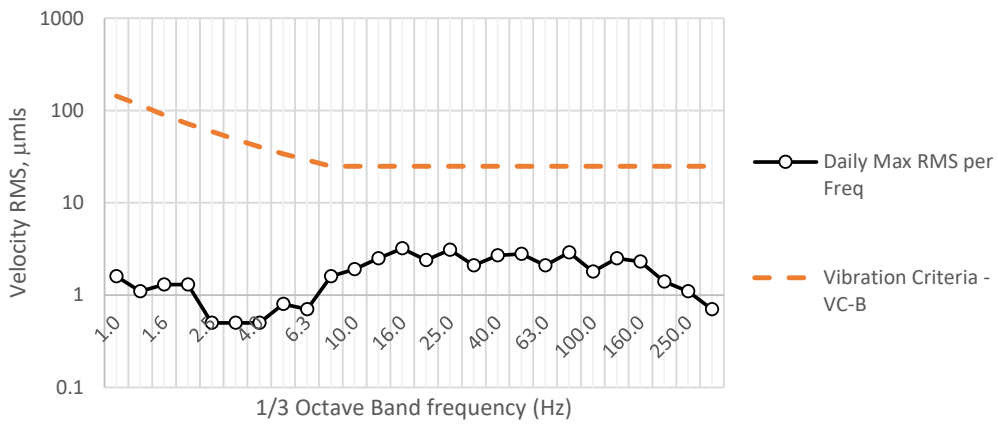
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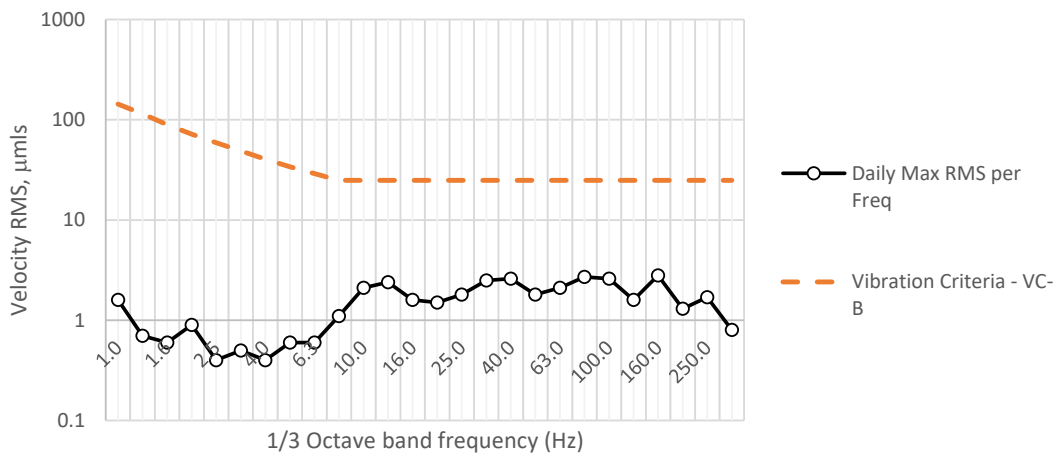
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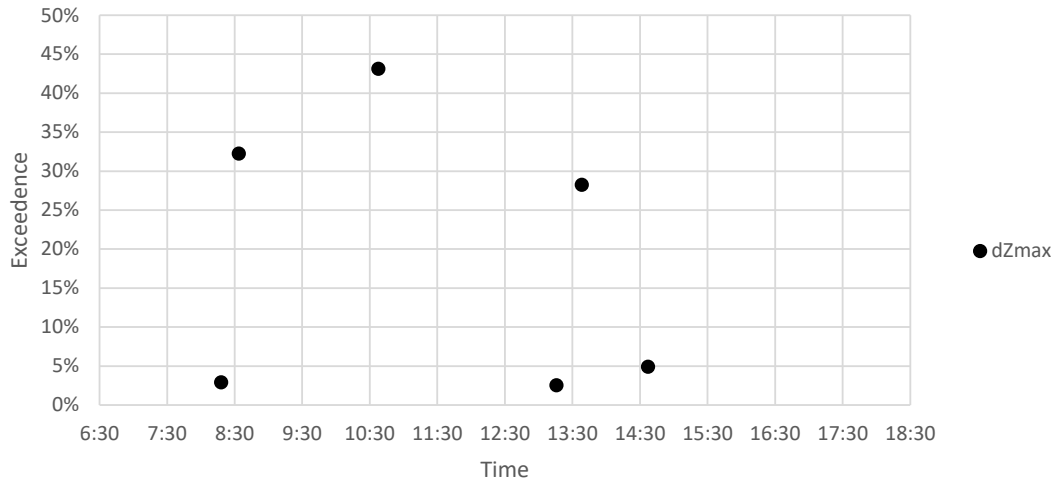
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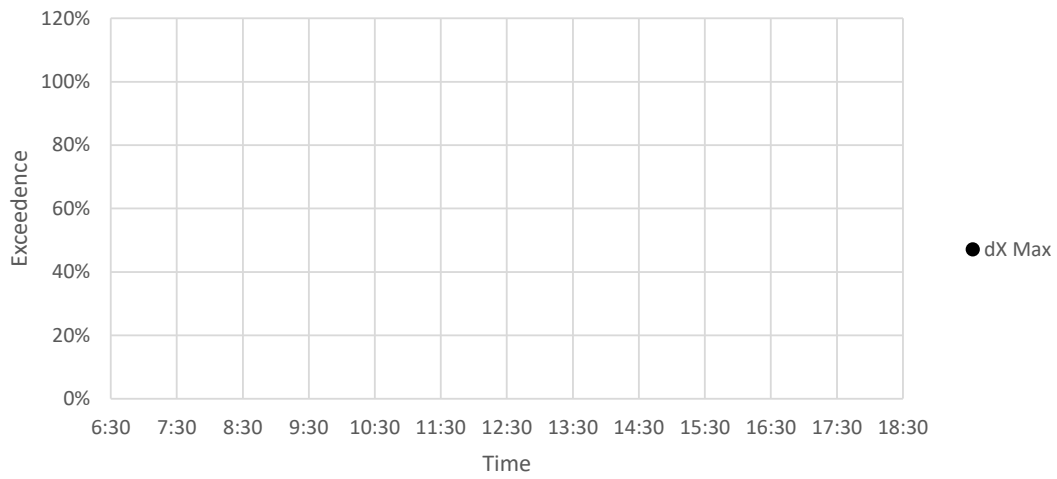
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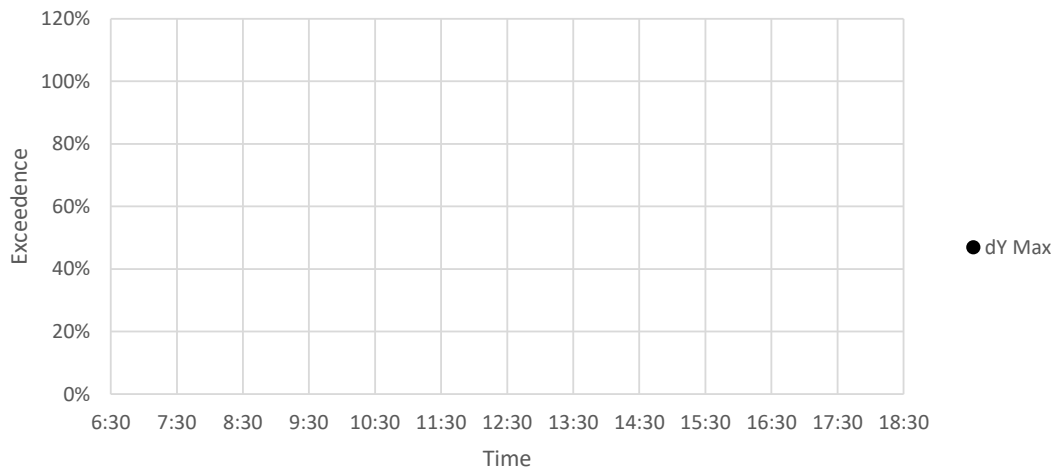
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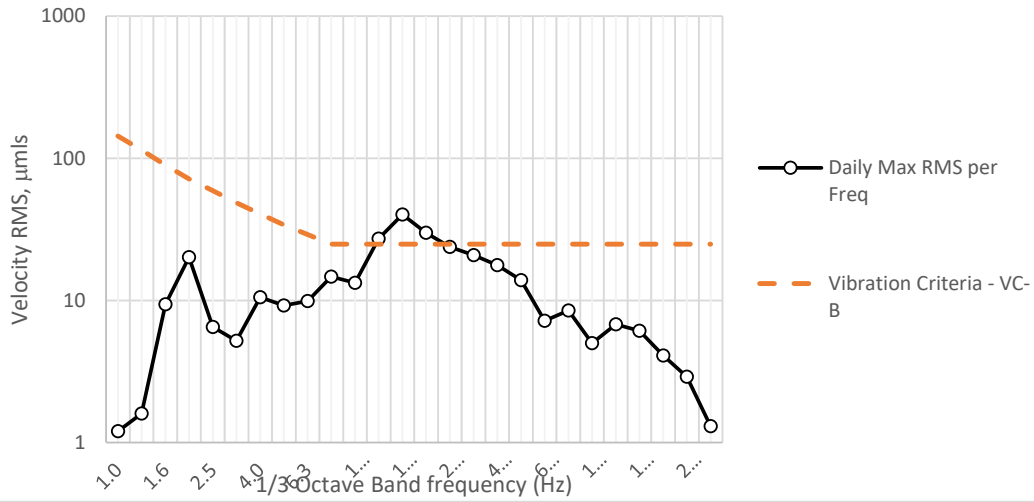
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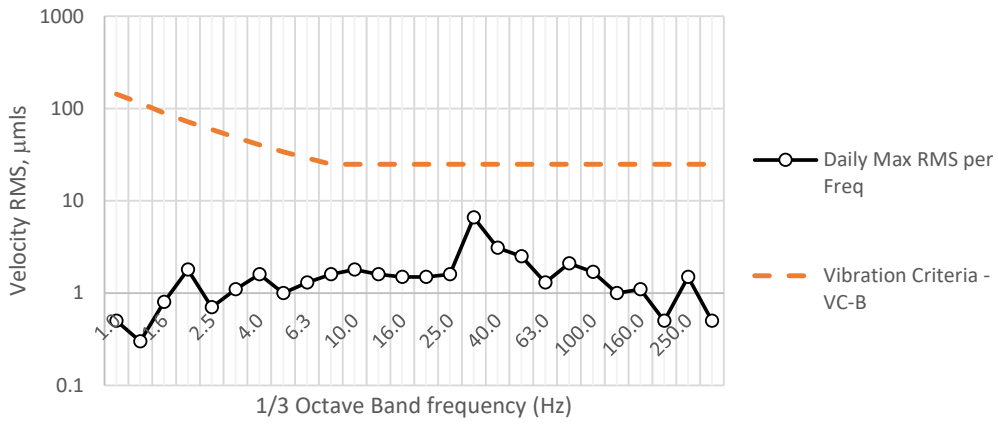
Sideways



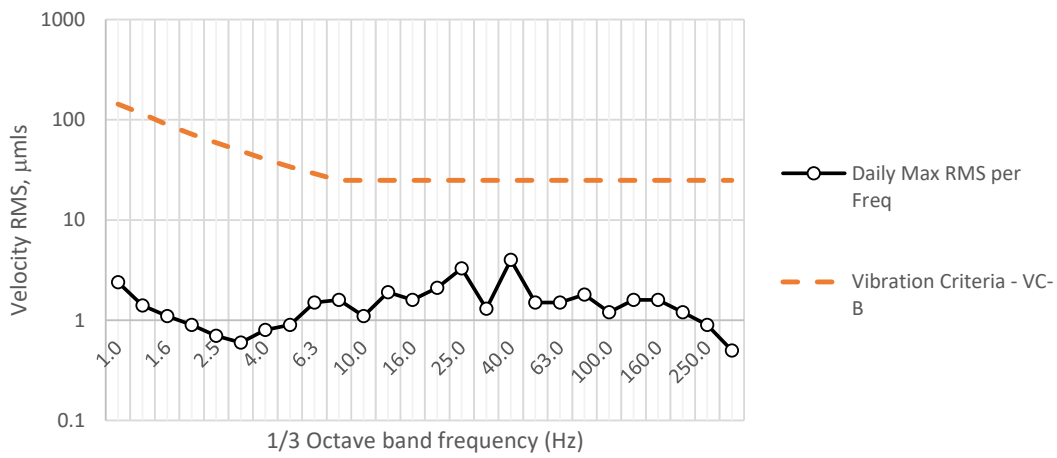
Vertical Vibration



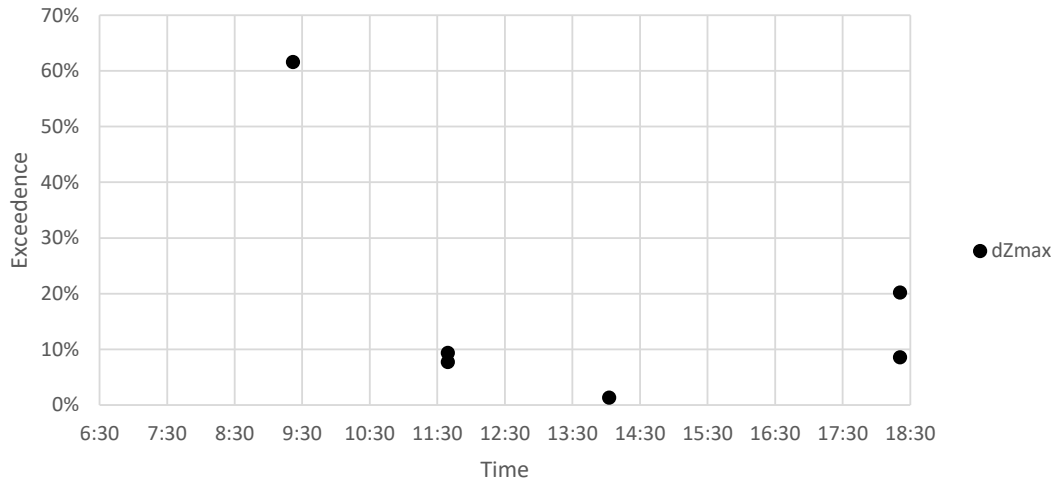
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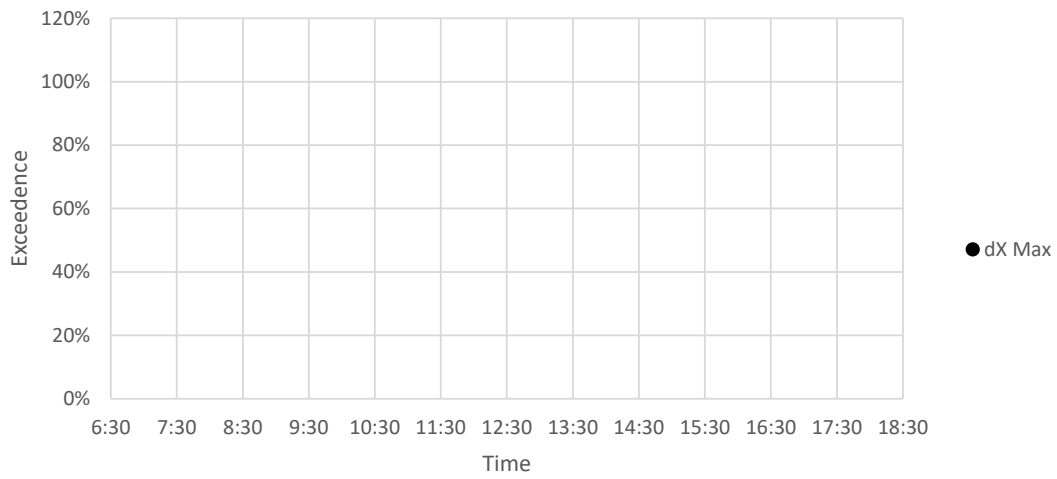
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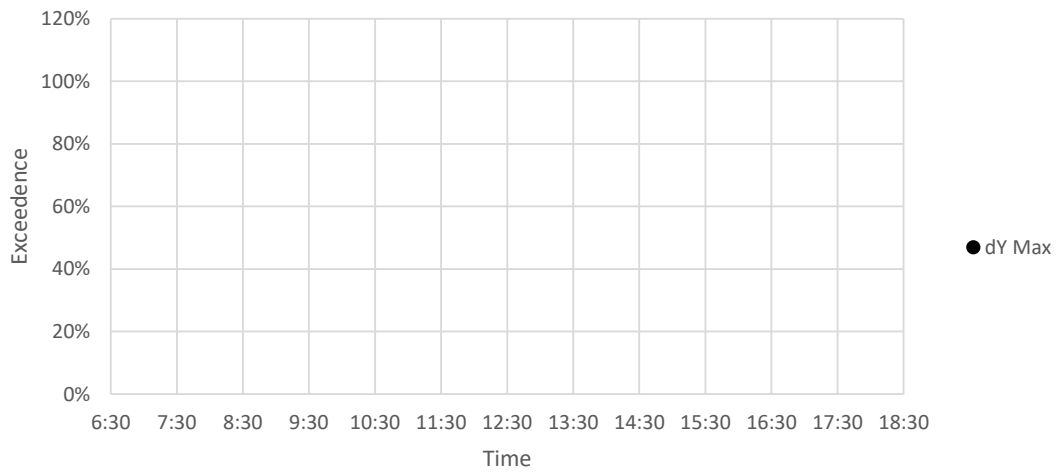
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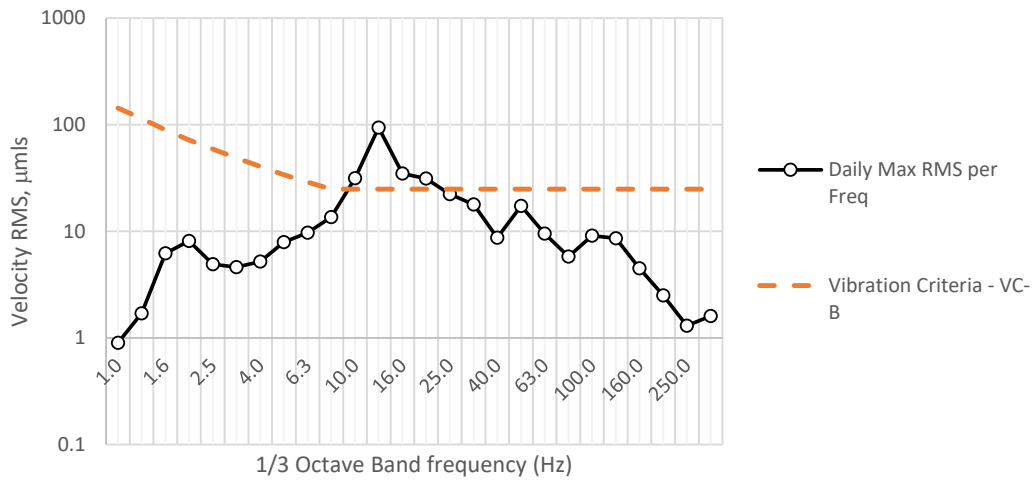
Fwd/Backwards



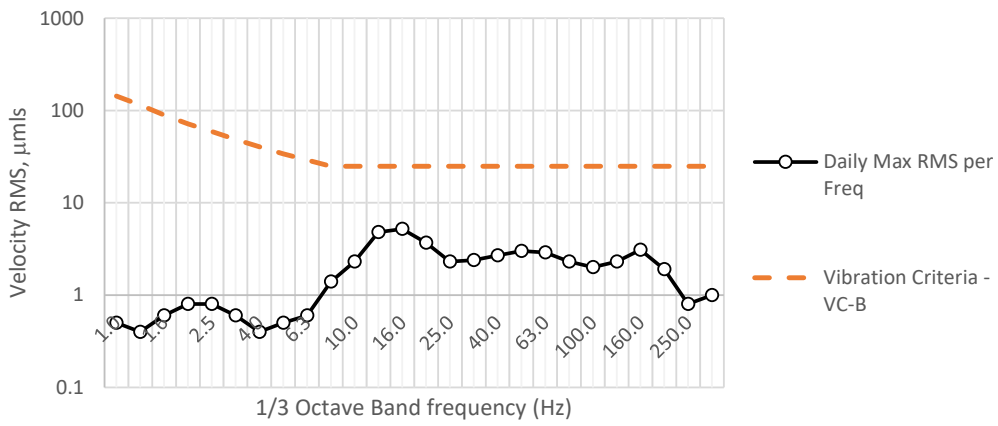
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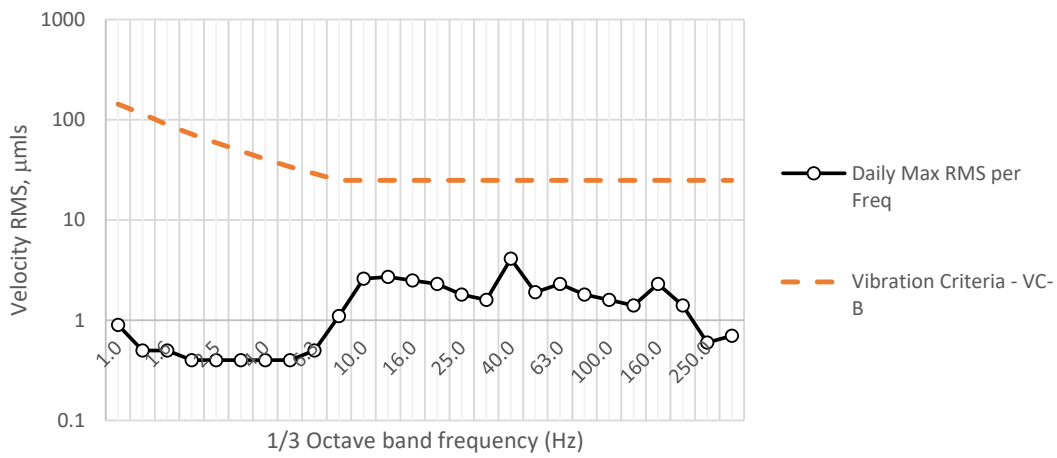
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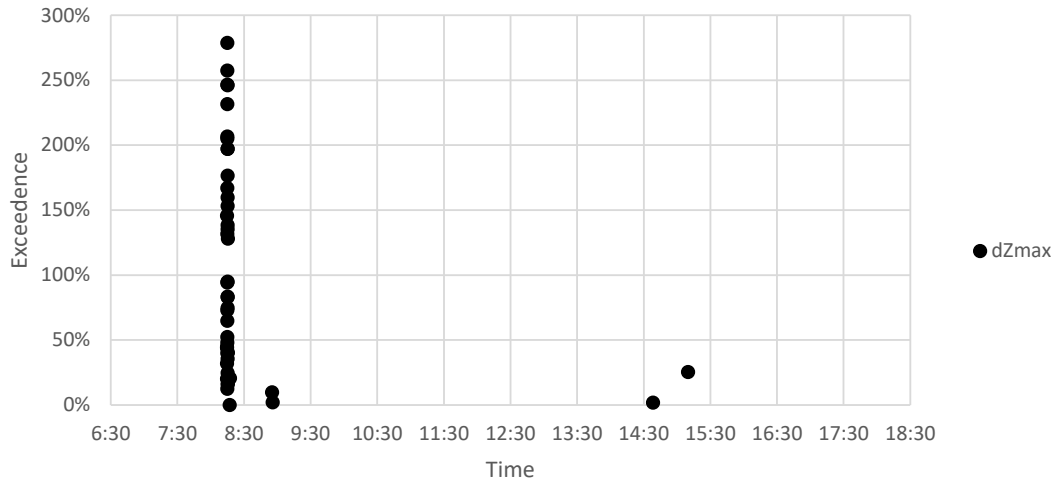
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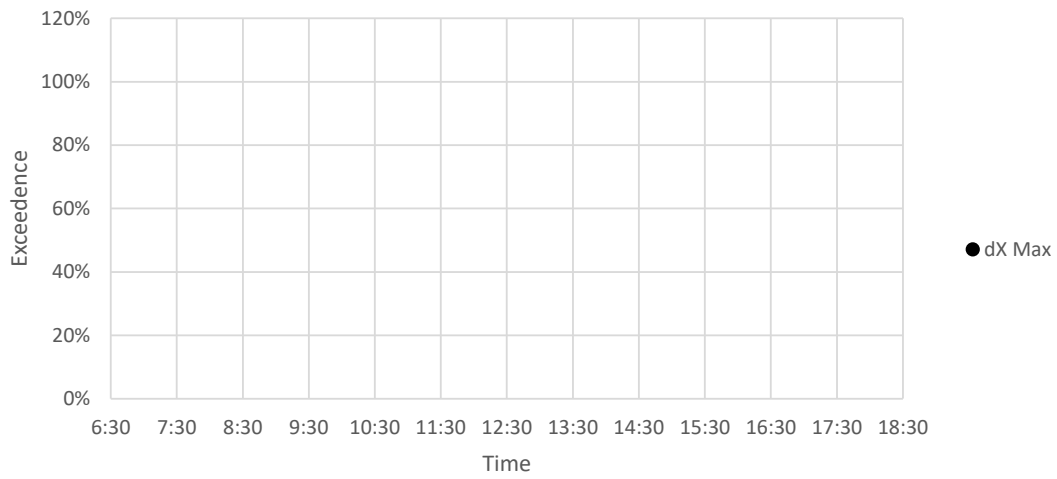
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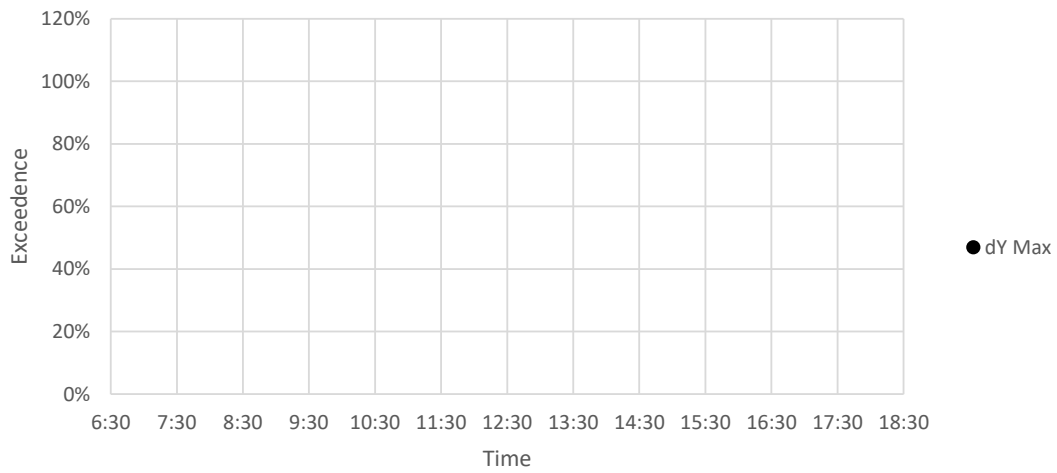
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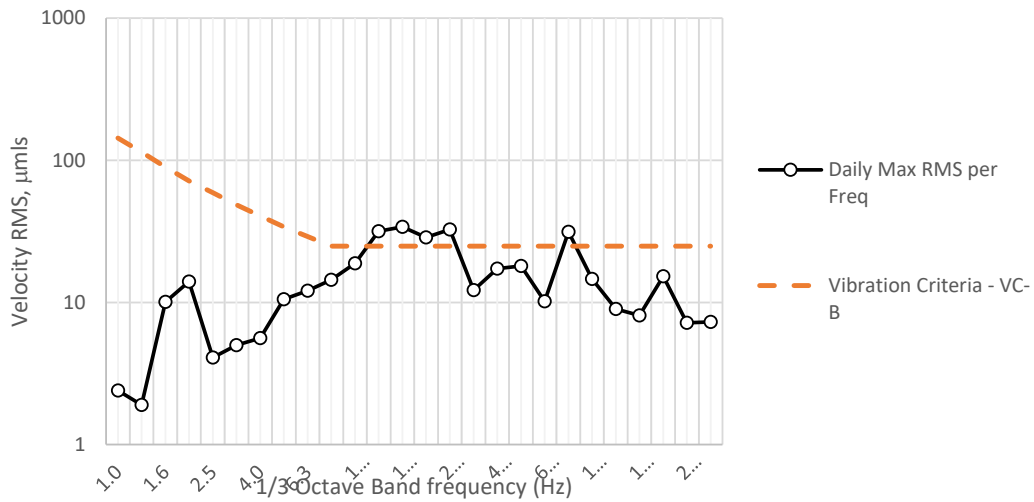
Fwd/Backwards



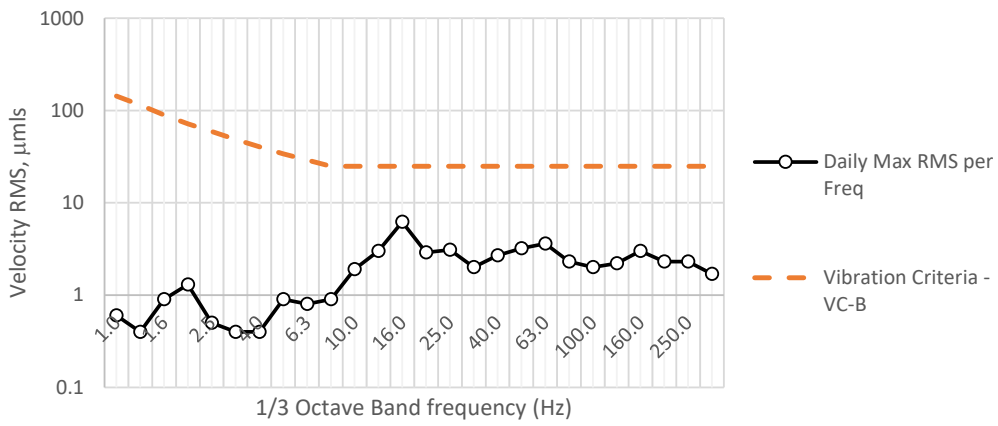
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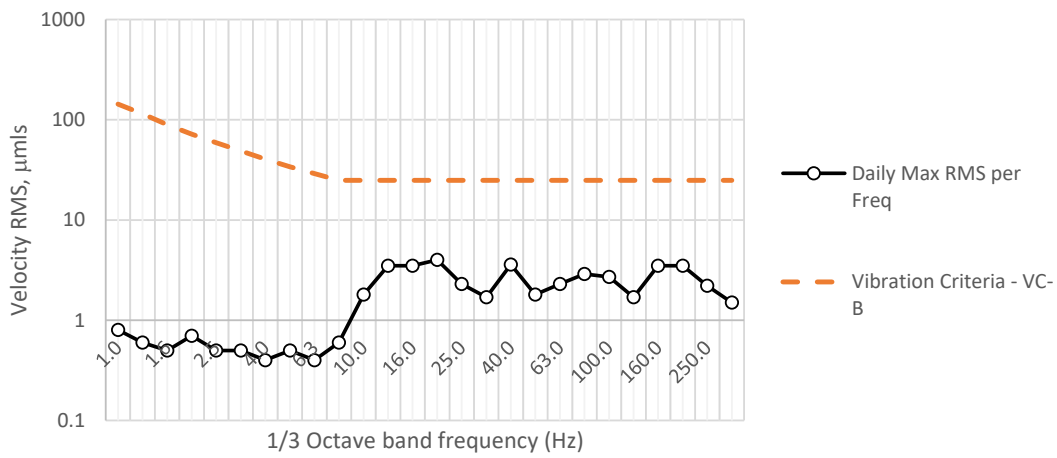
Vertical Vibration



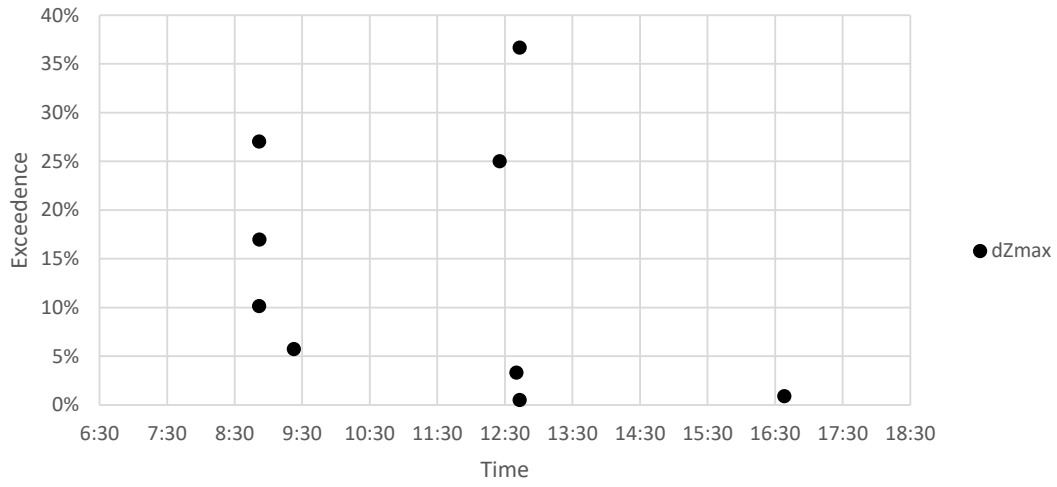
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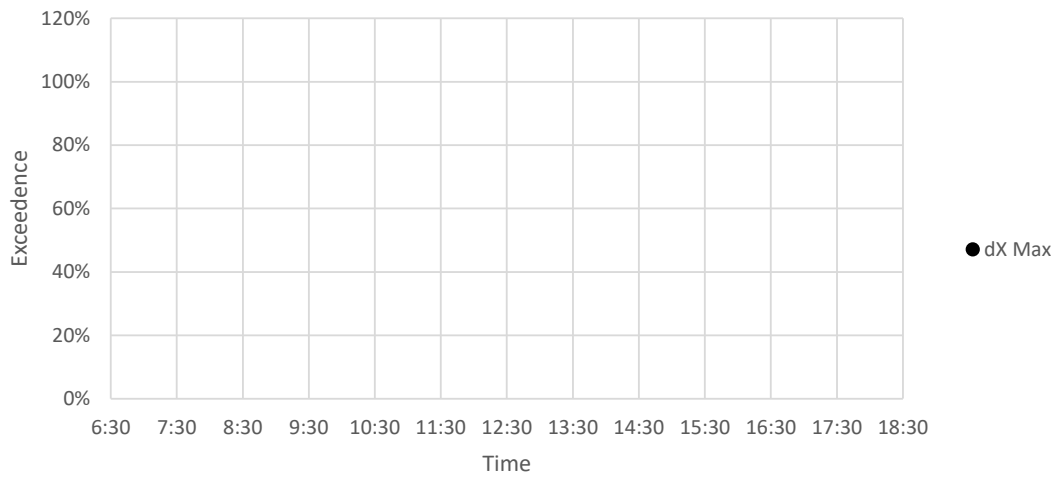
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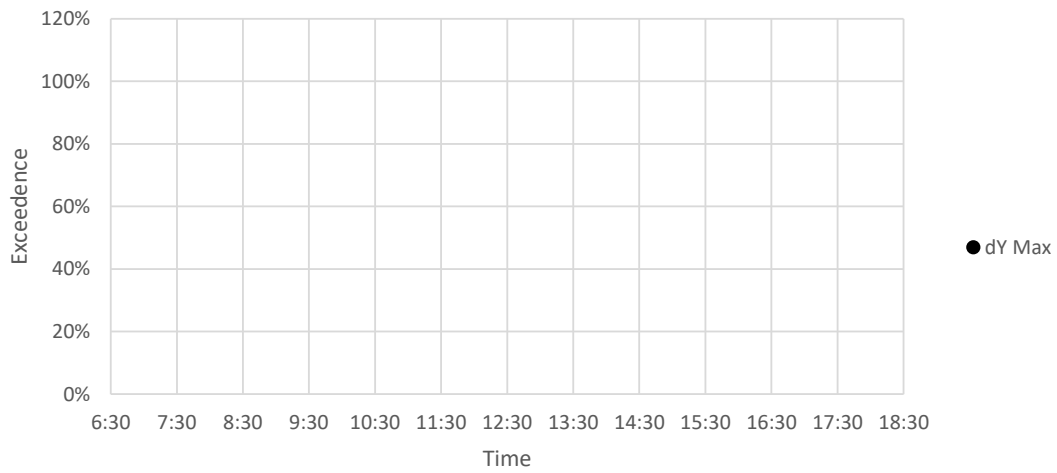
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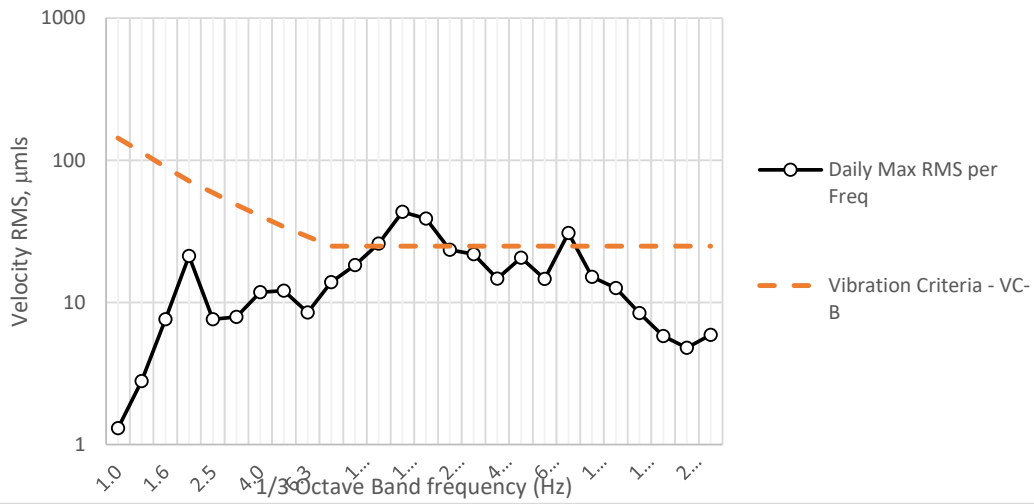
Fwd/Backwards



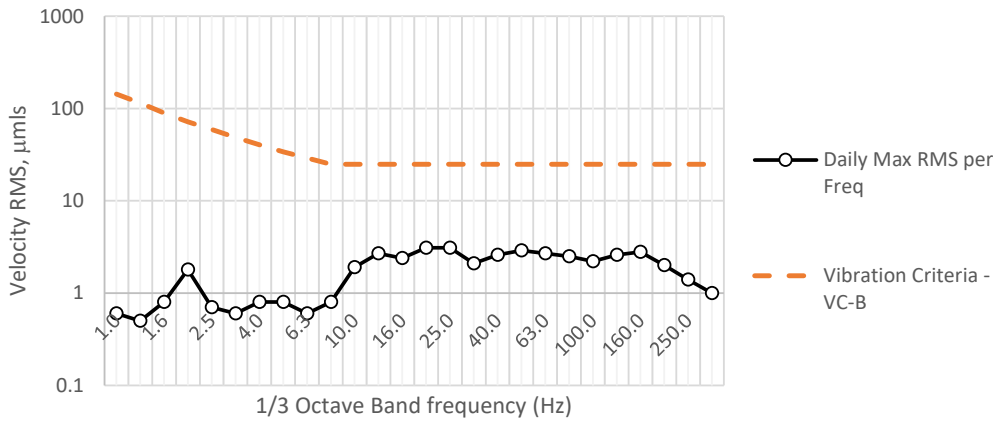
Sideways



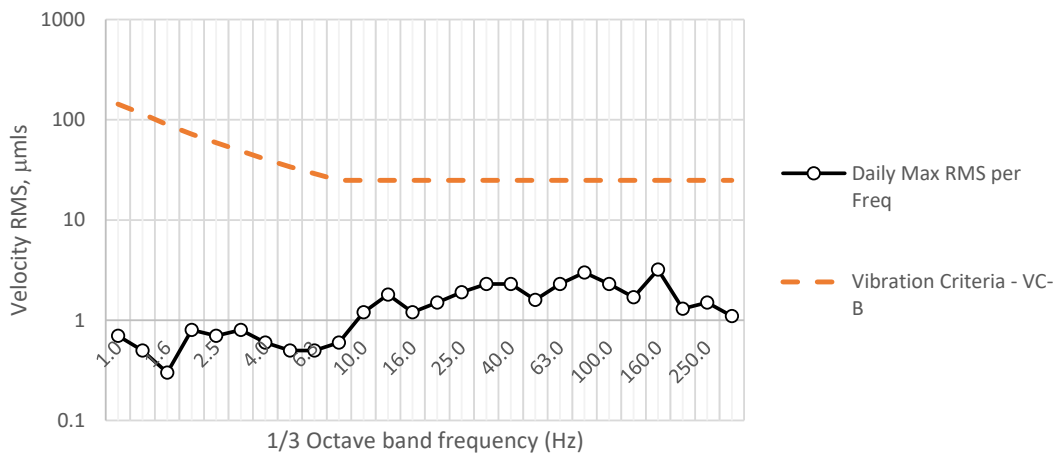
Vertical Vibration



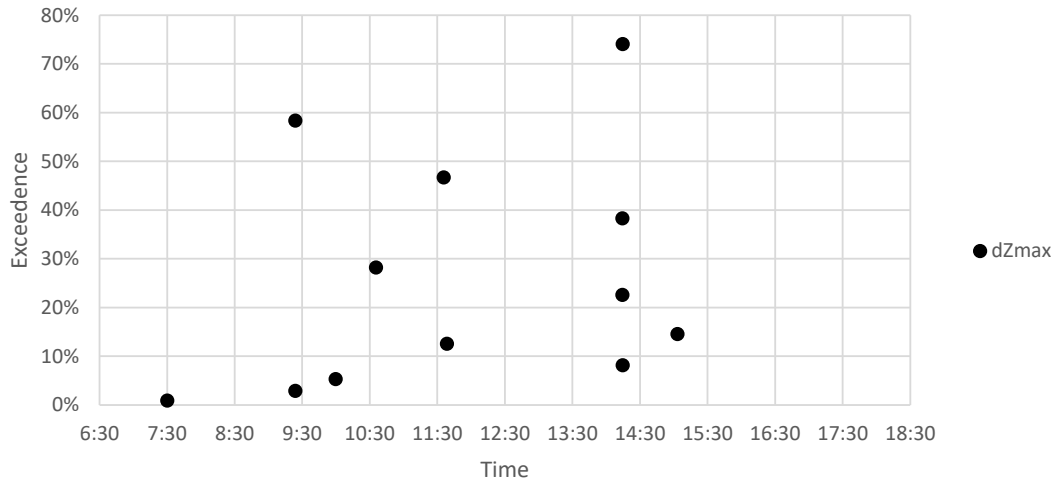
FwdBackwd Vibration



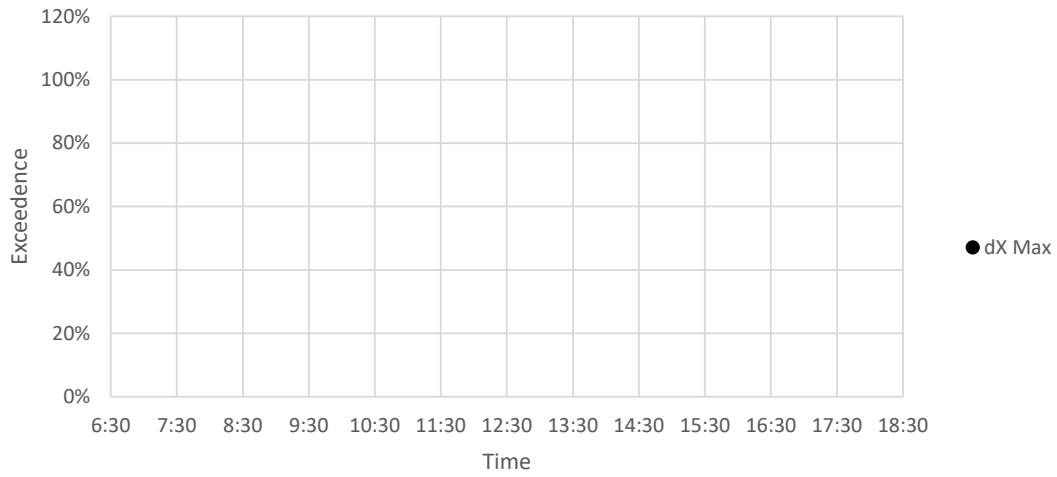
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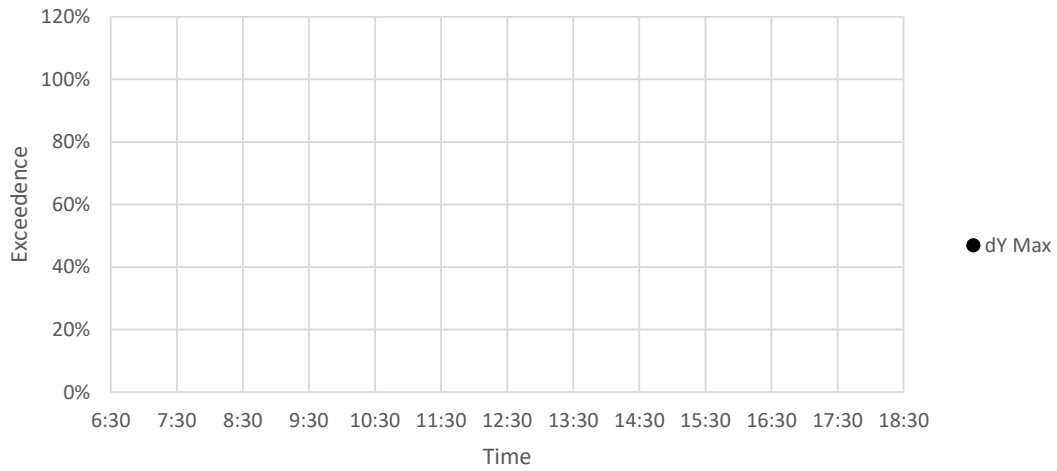
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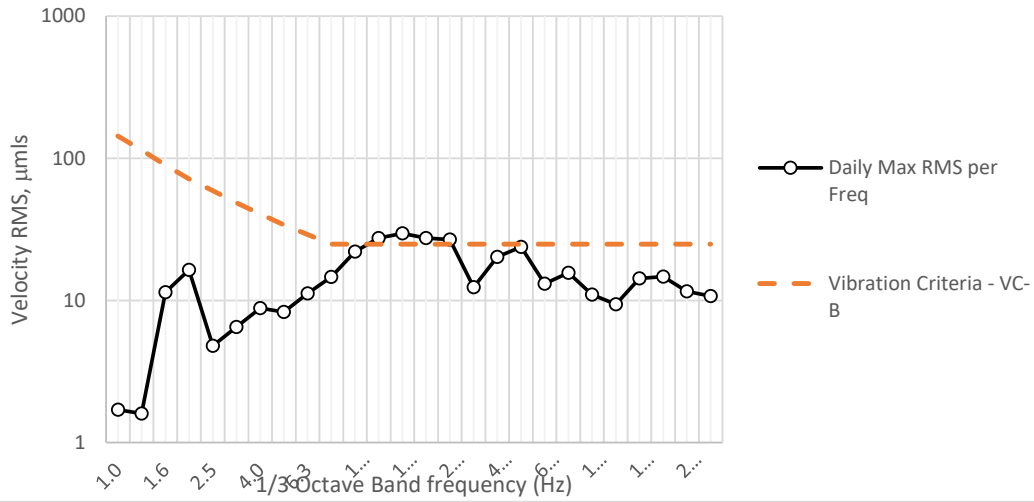
Fwd/Backwards



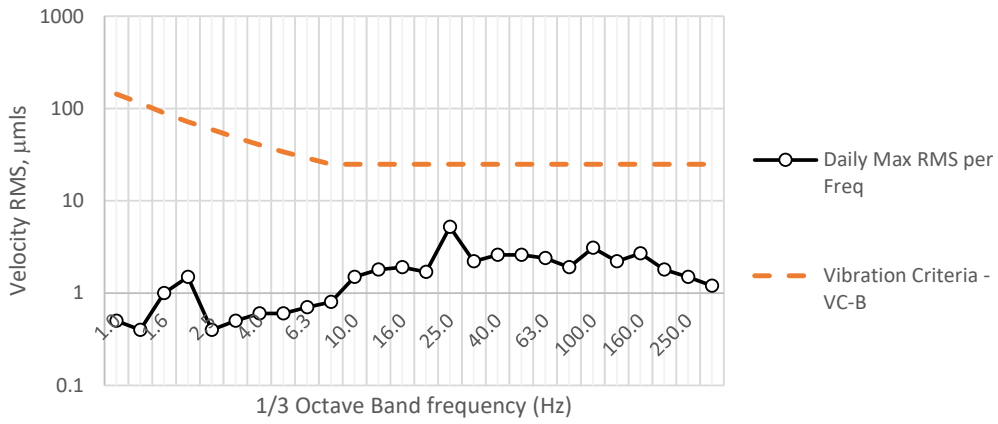
Sideways



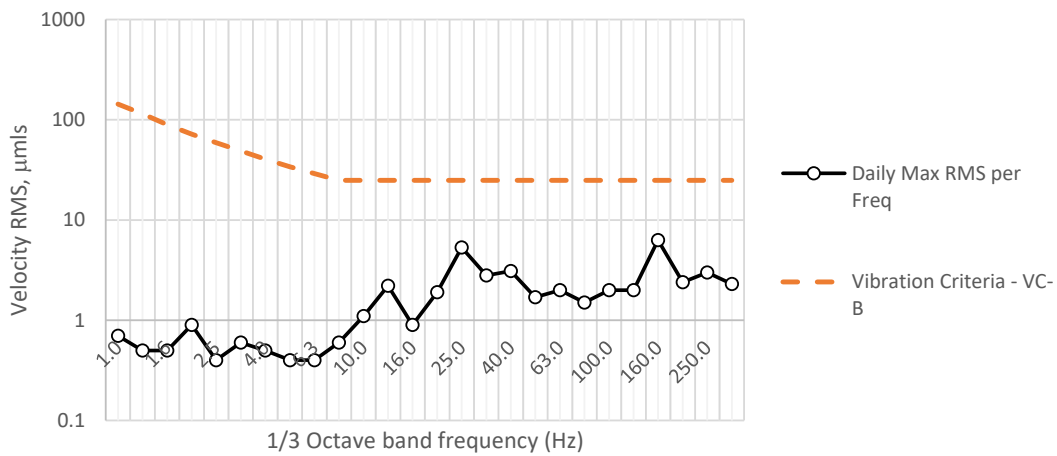
Vertical Vibration



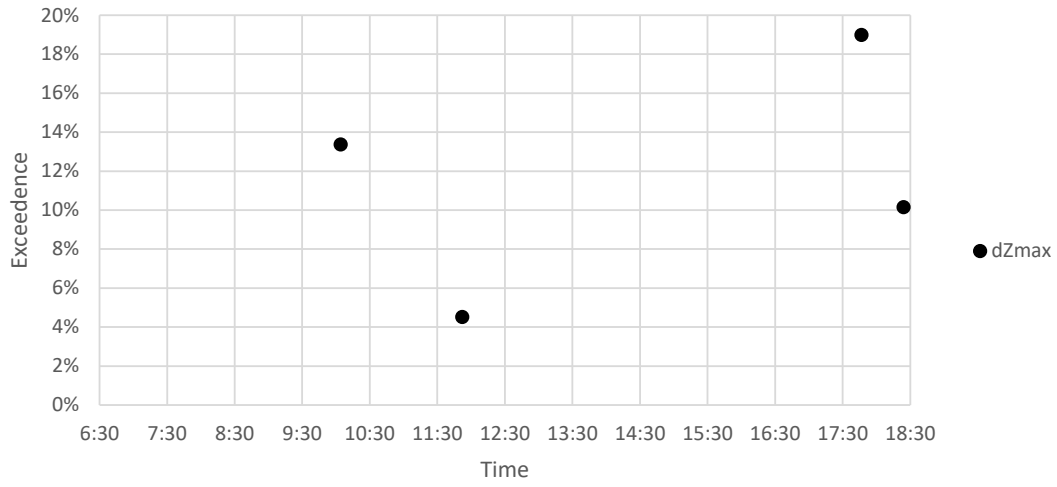
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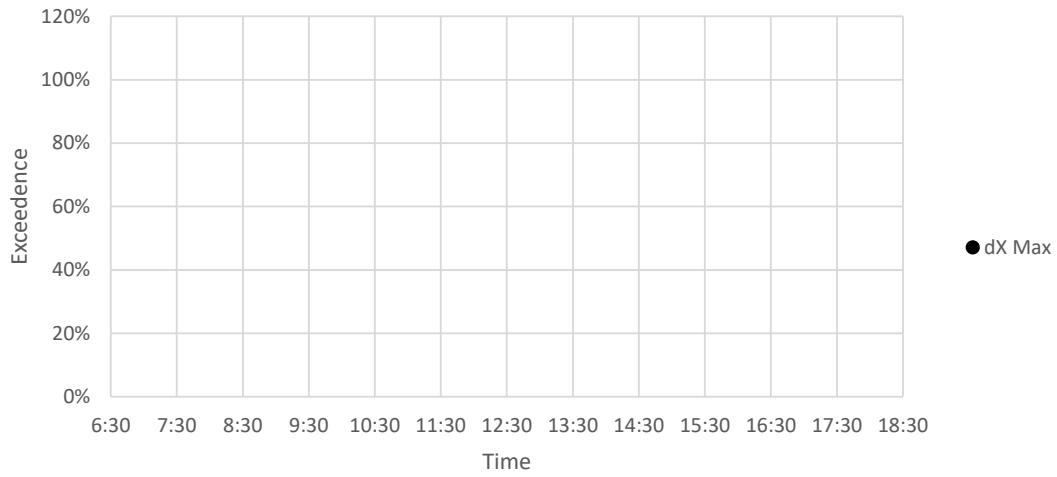
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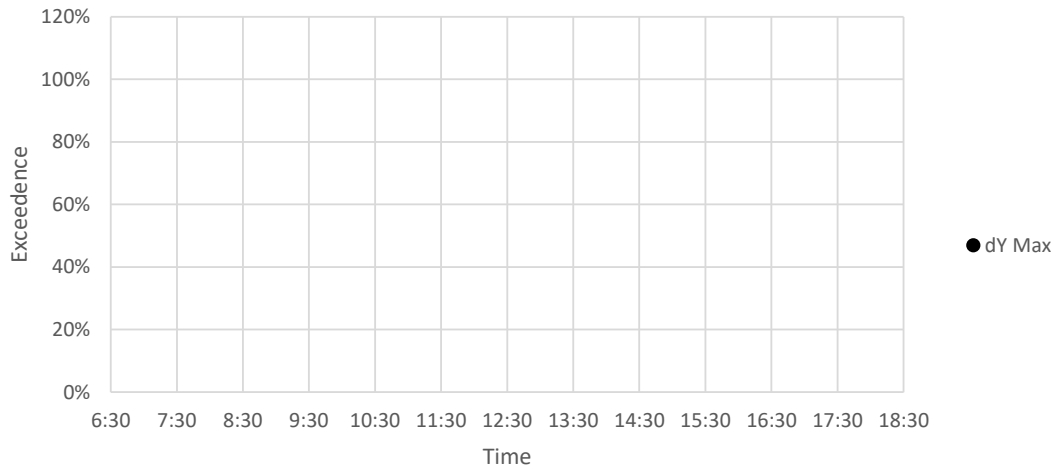
Vertical

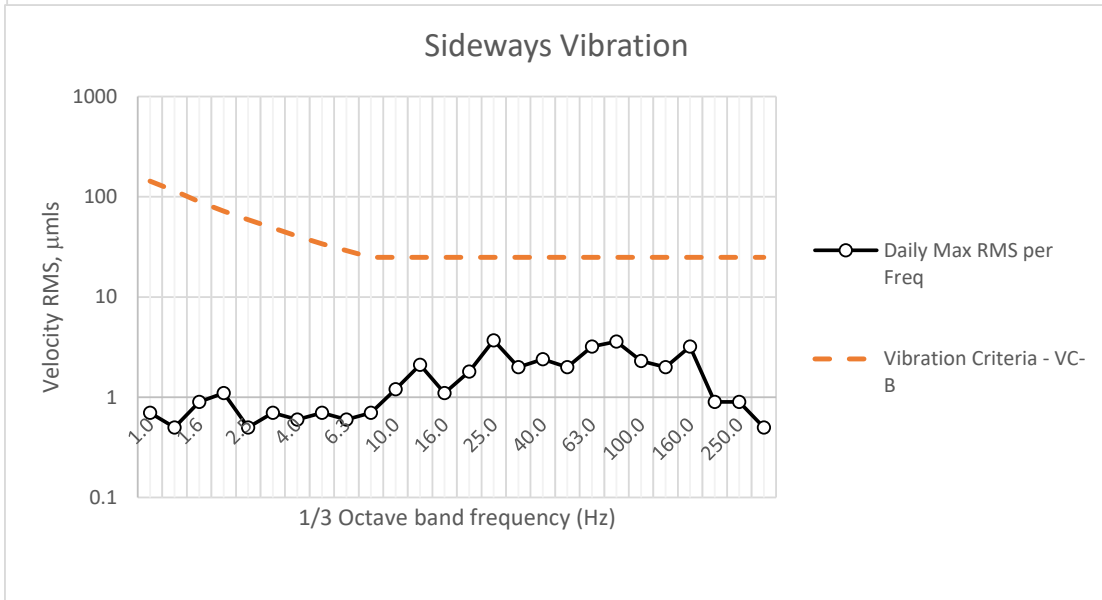
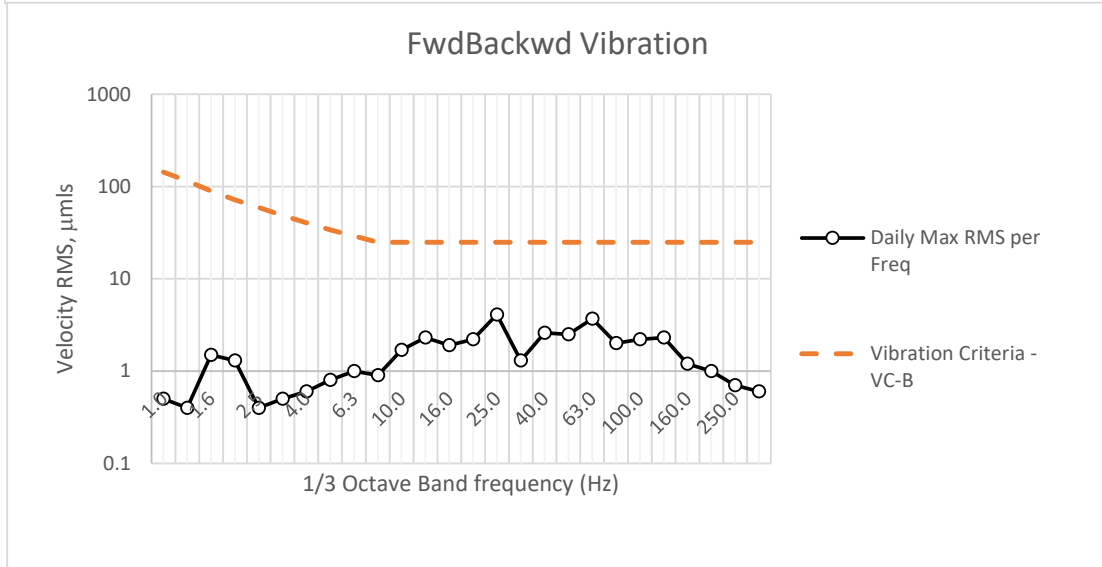
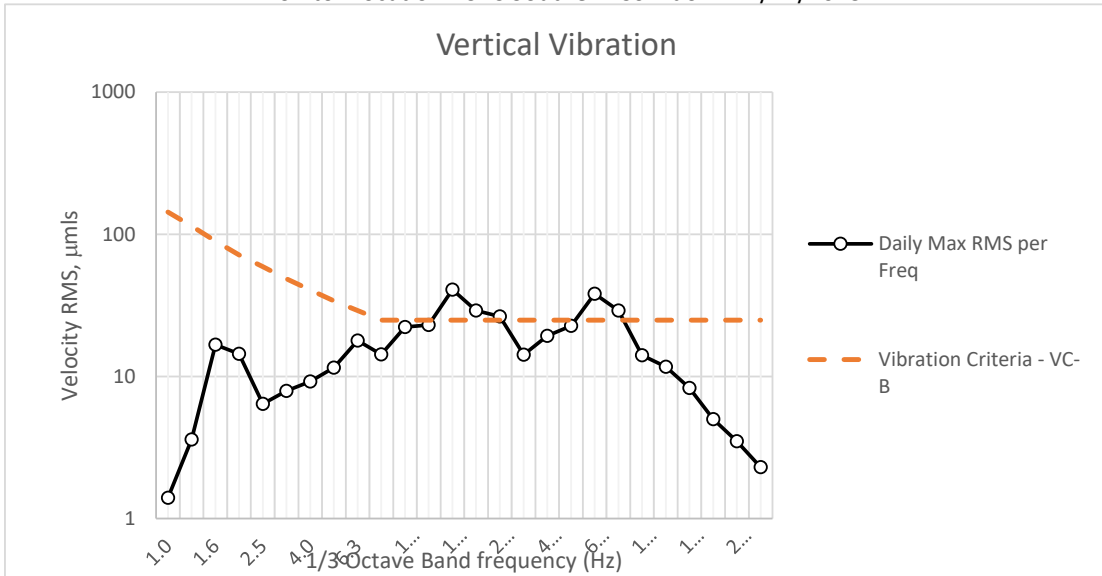


Fwd/Backwards

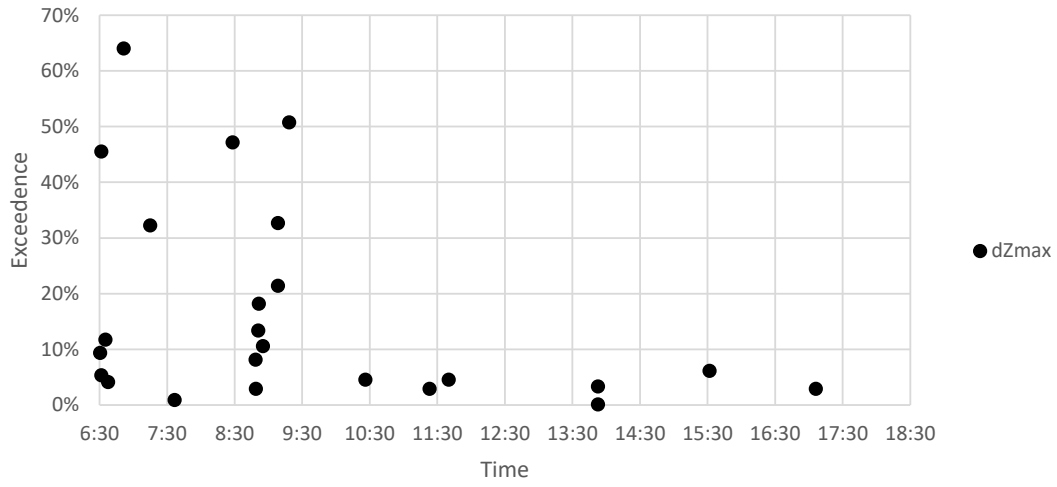


Sideways

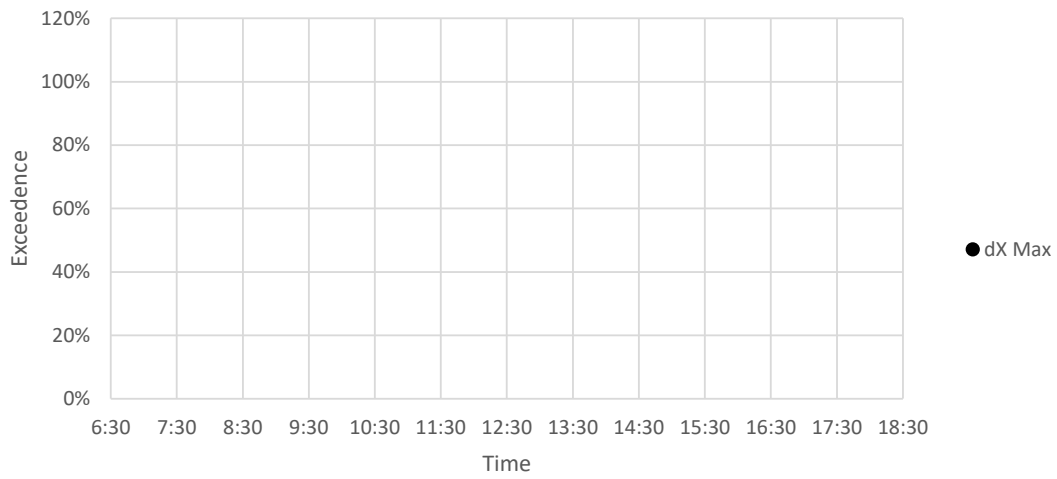




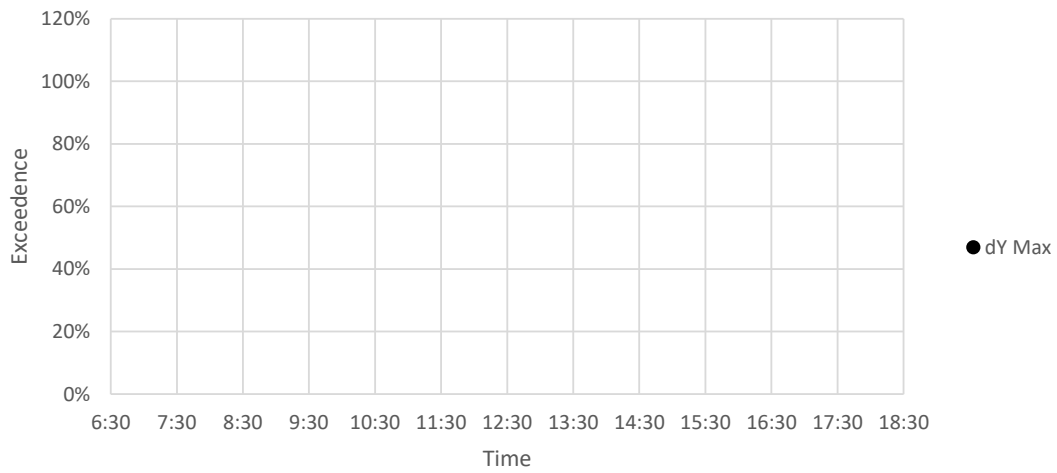
Vertical



Fwd/Backwards

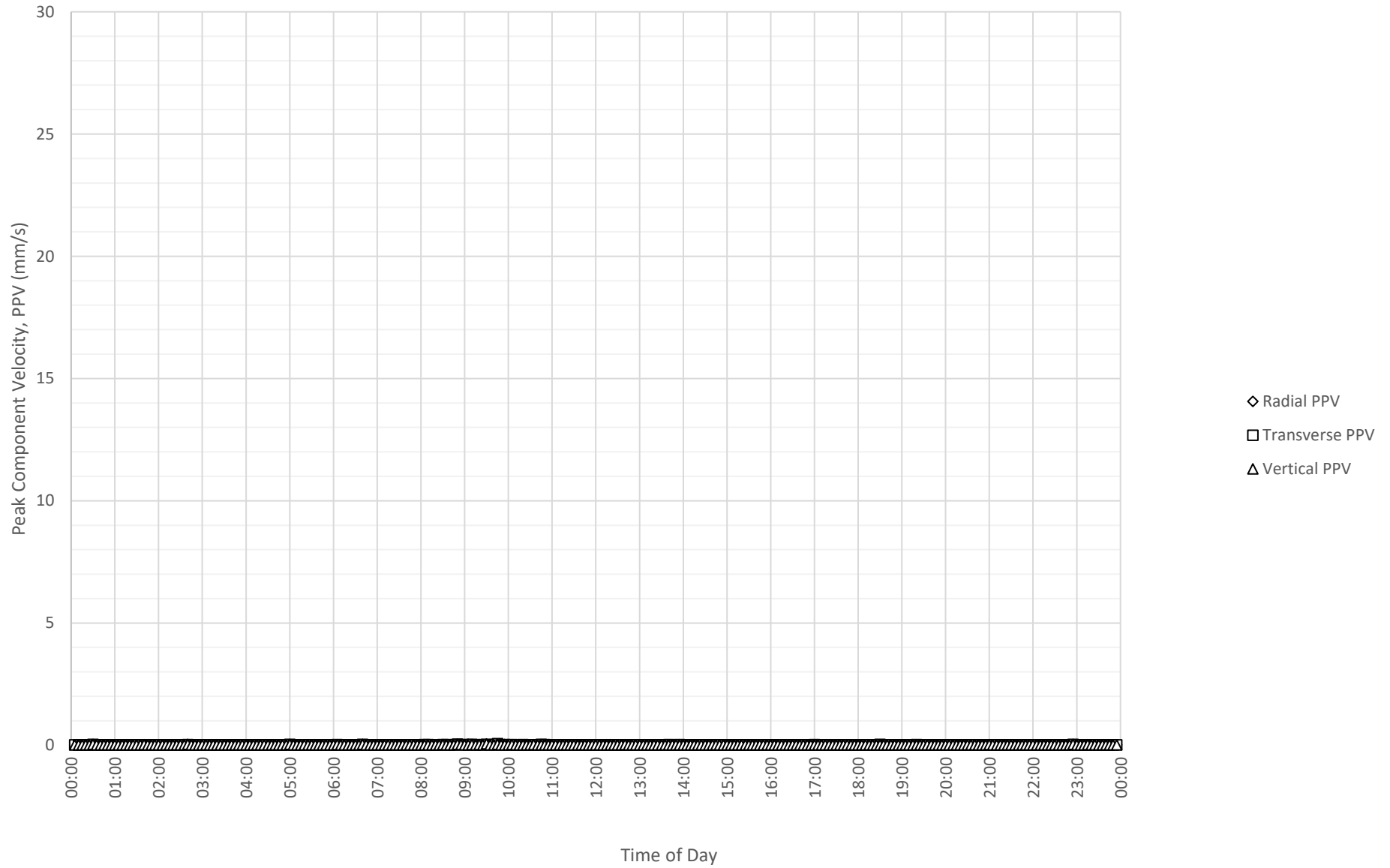


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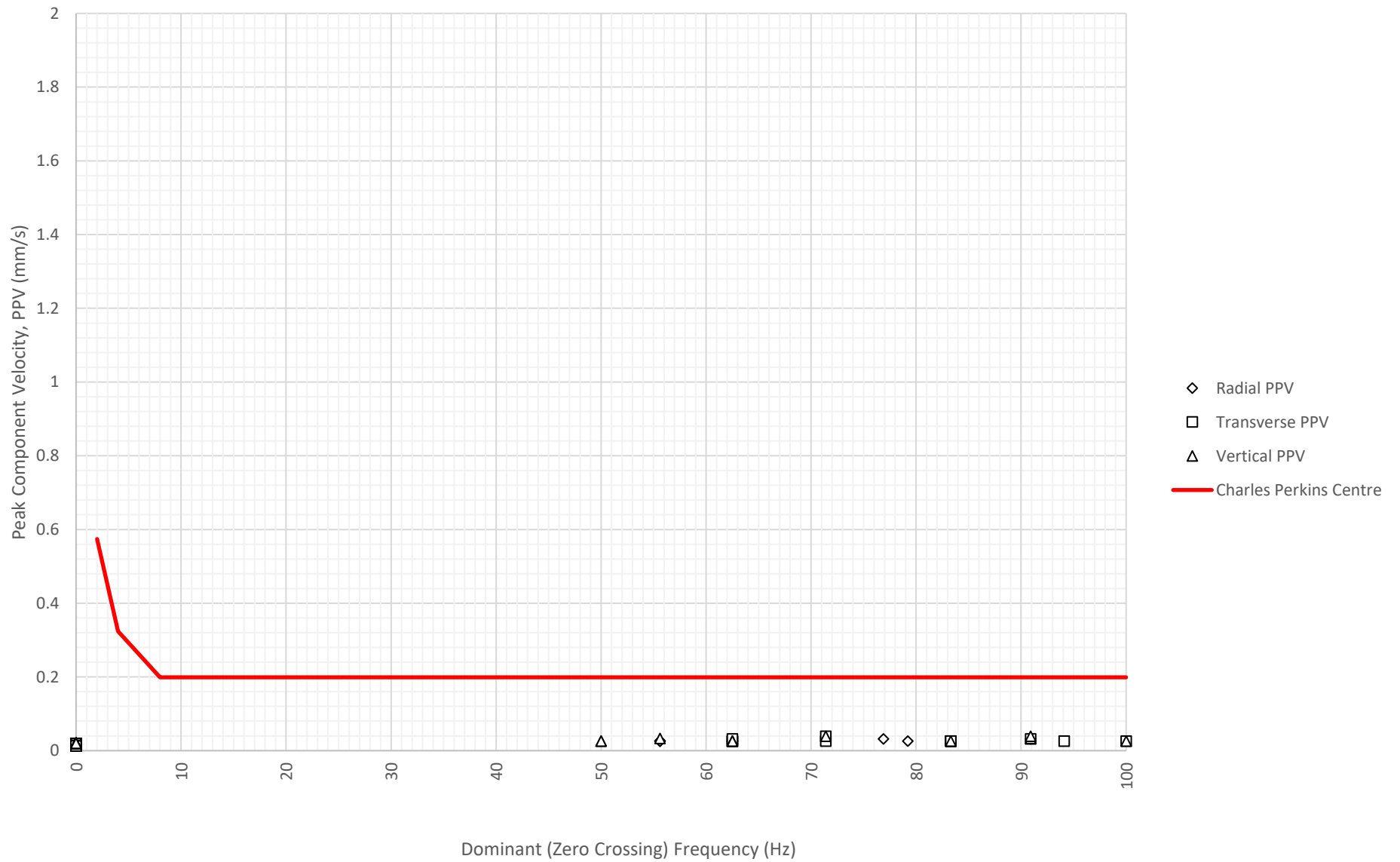


CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN WING OBSERVATION ROOM E

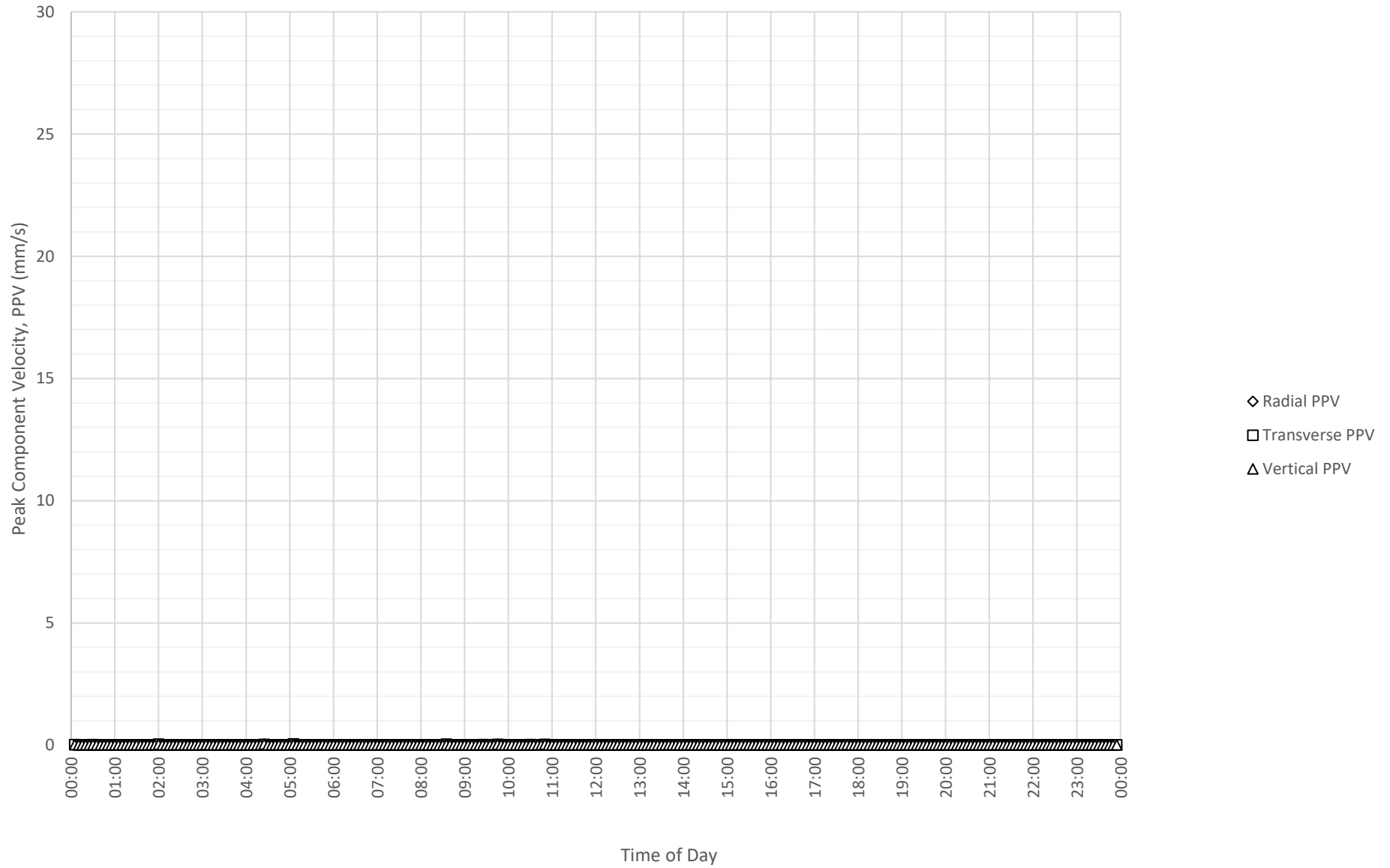
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 7-12-2023



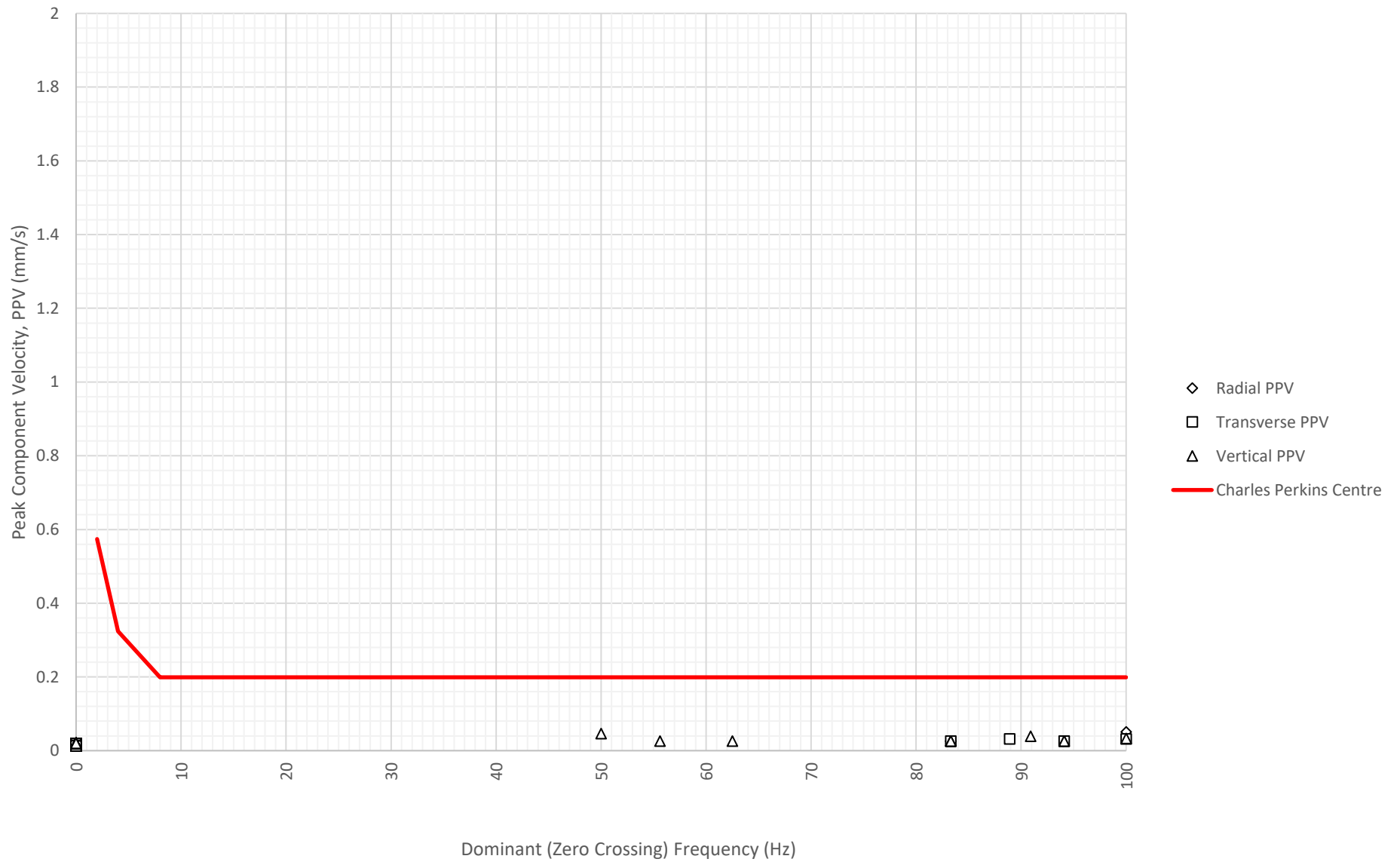
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 7-12-2023



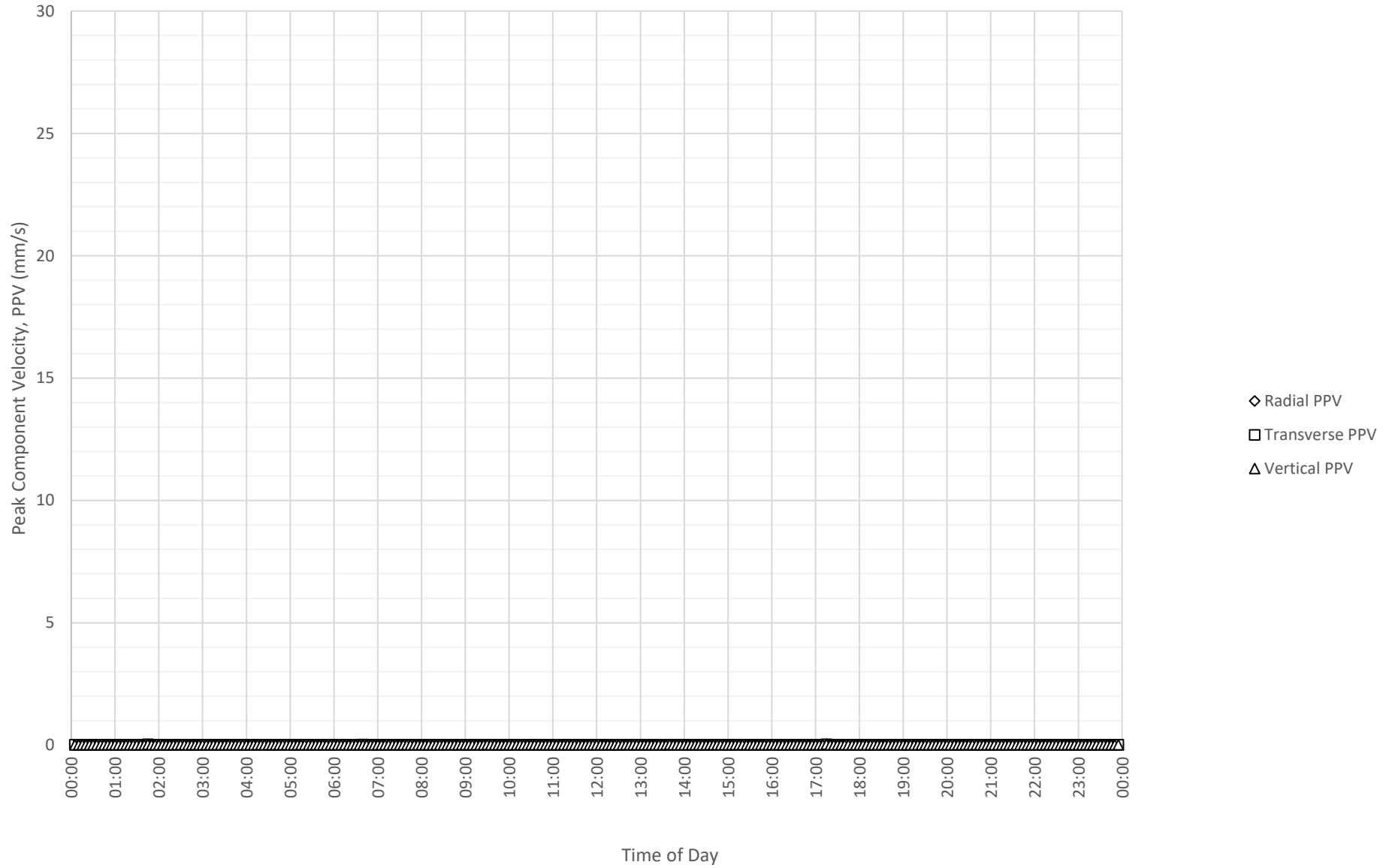
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 8-12-2023



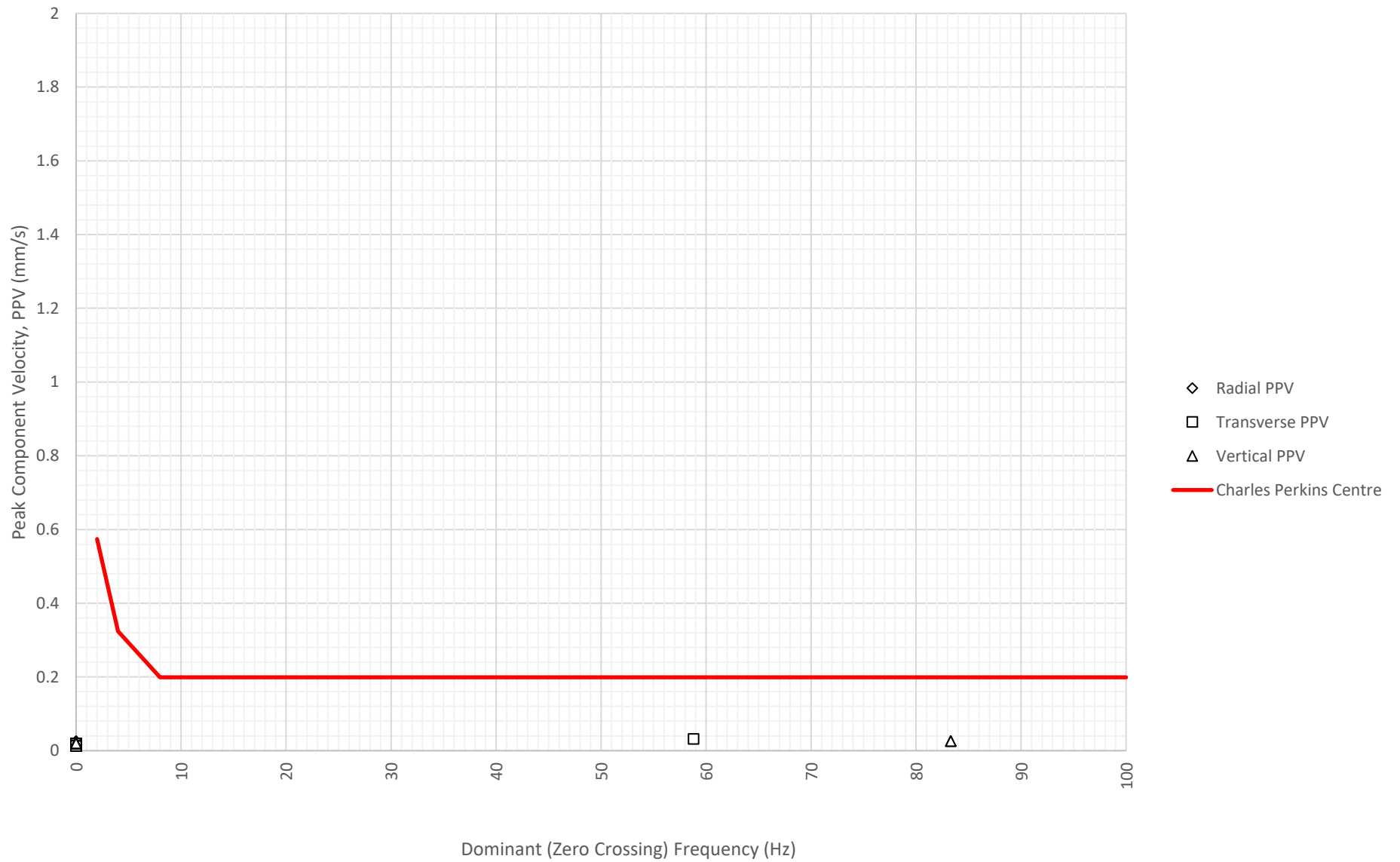
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 8-12-2023



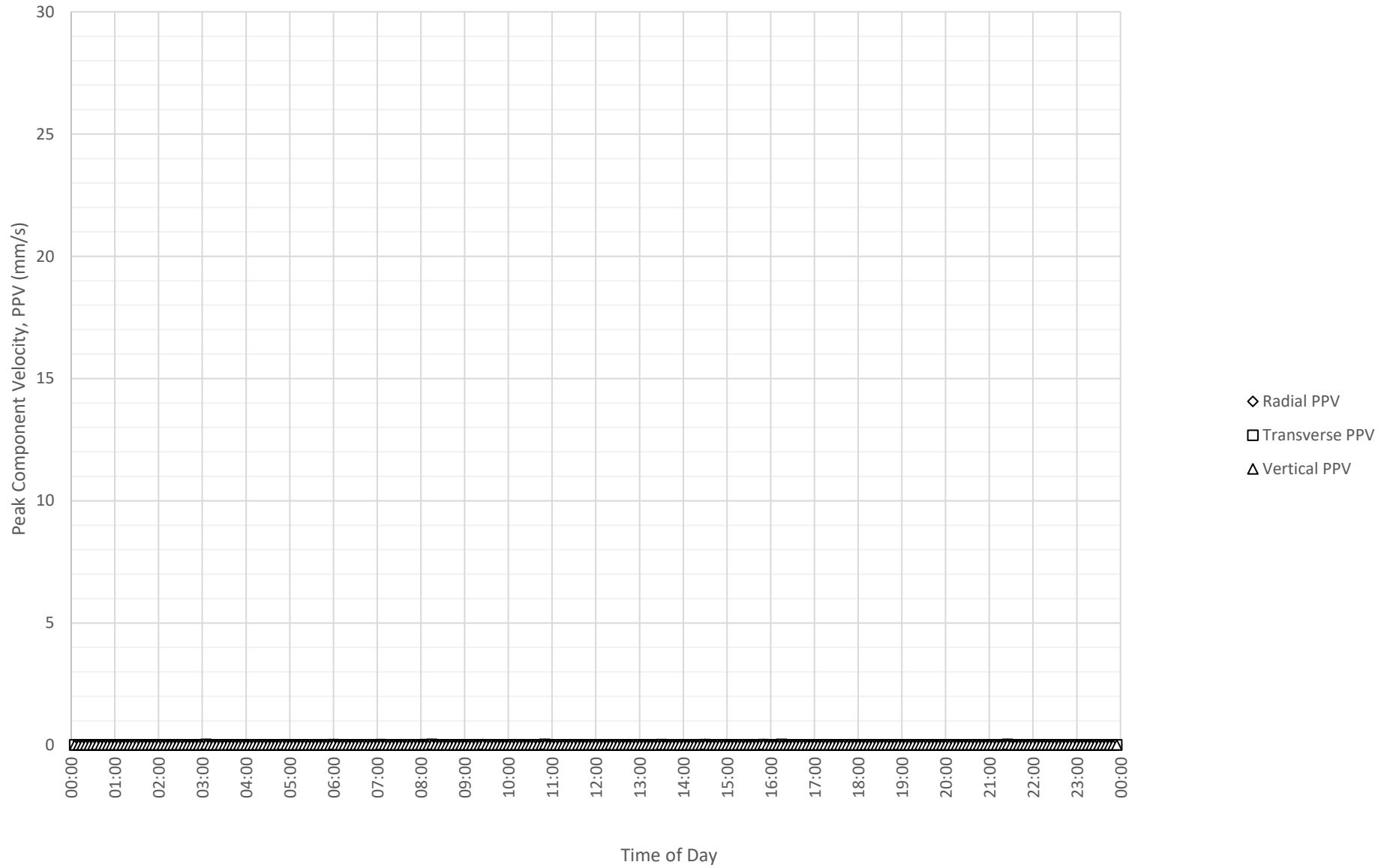
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 9-12-2023



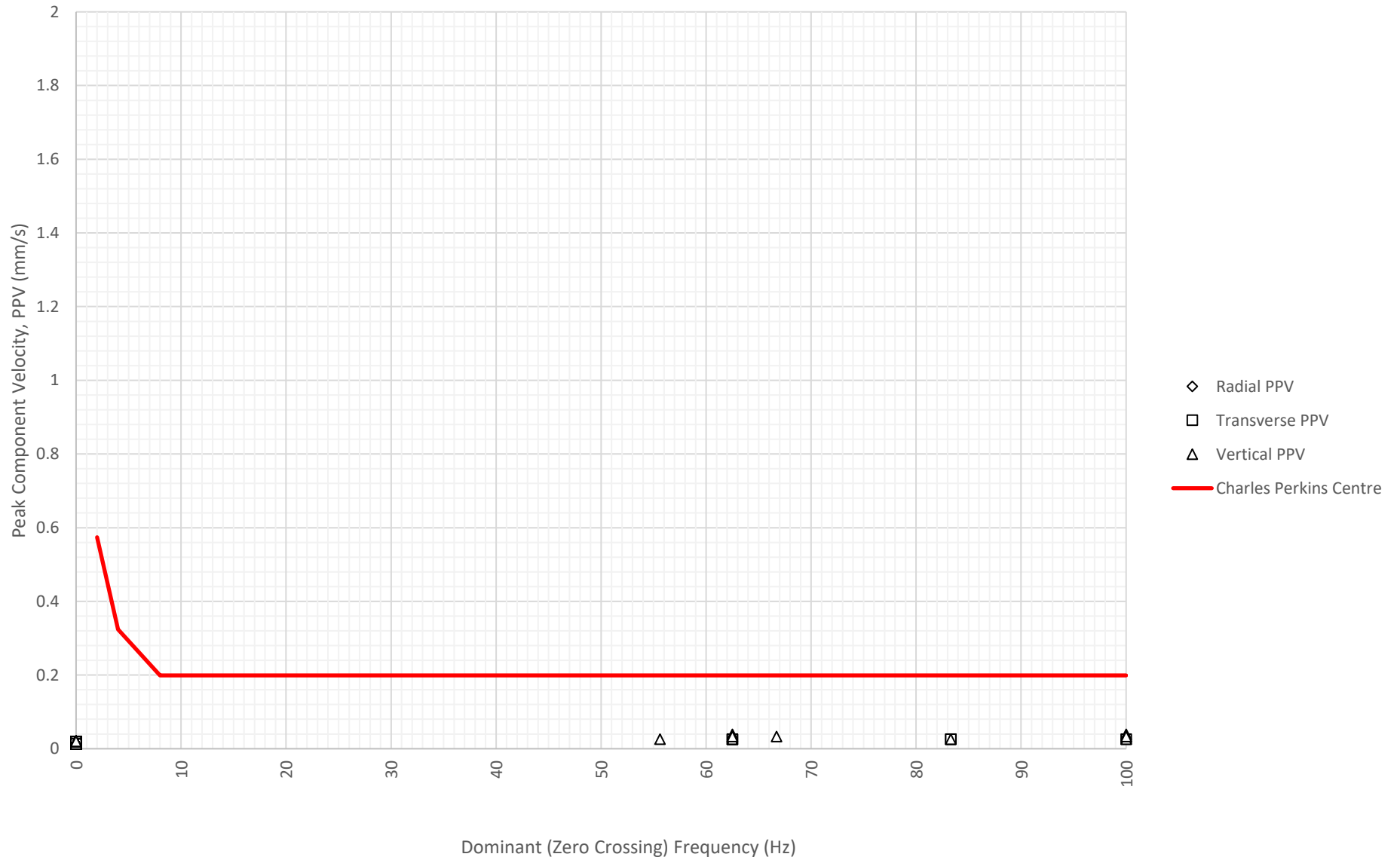
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 9-12-2023



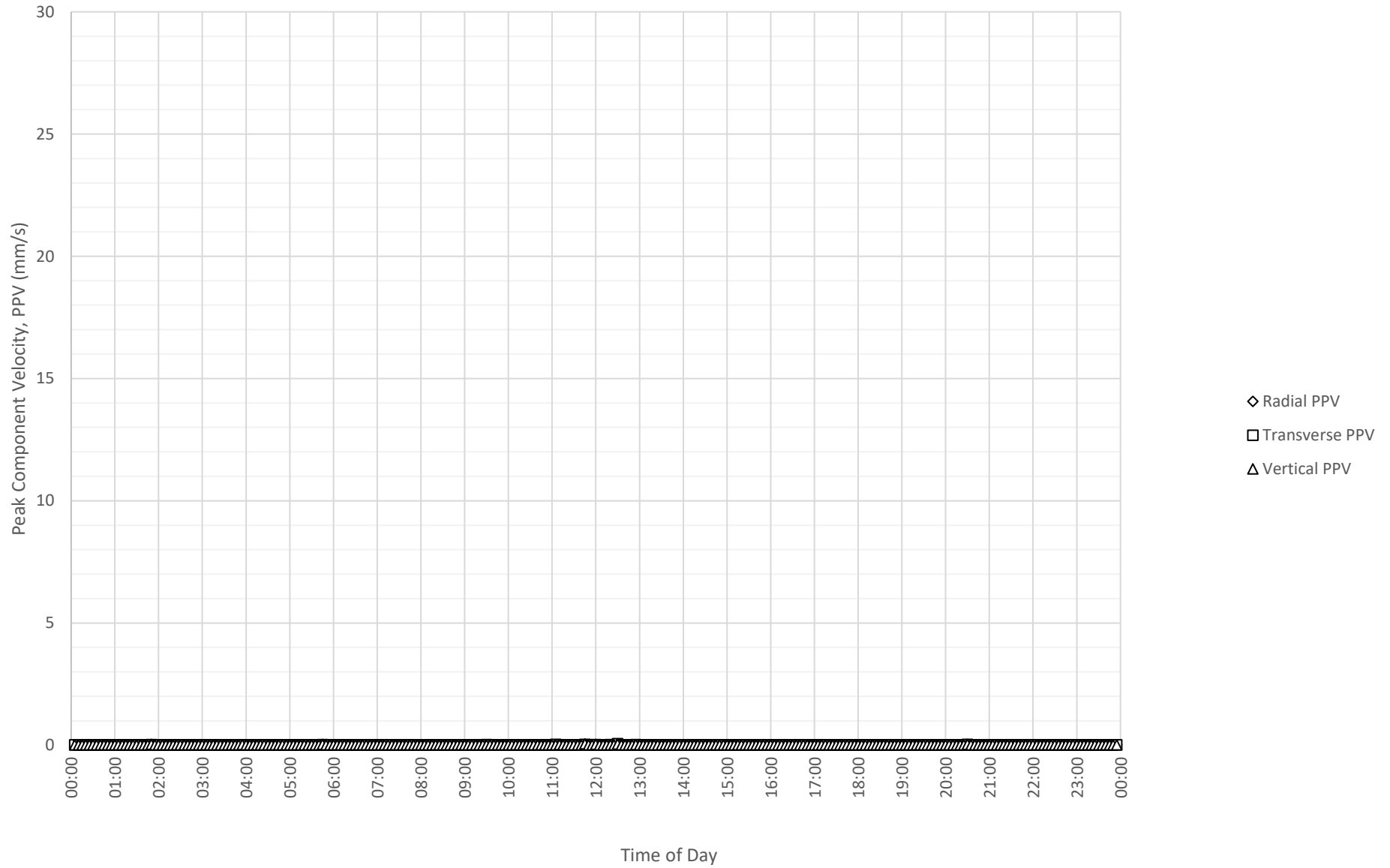
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 10-12-2023



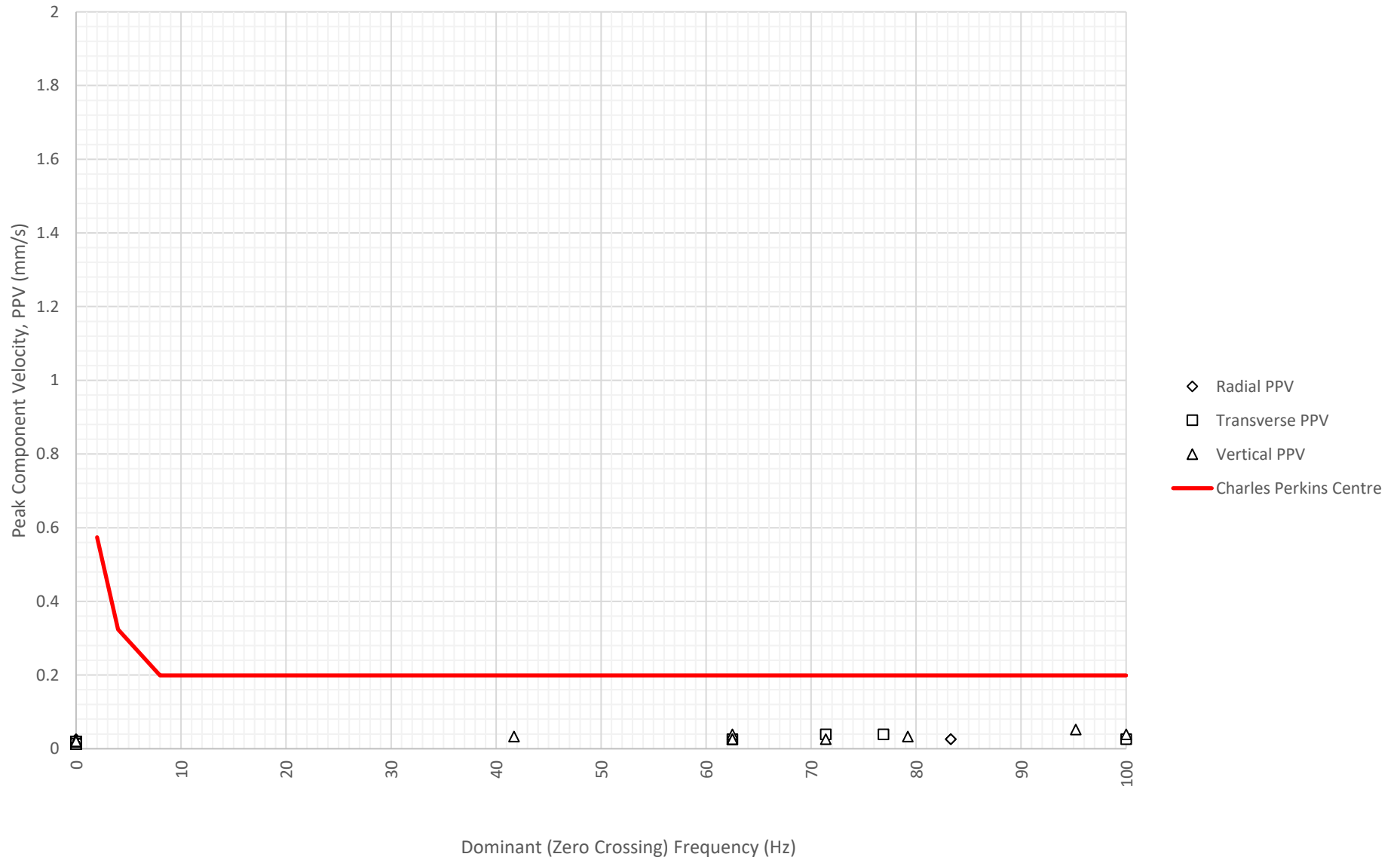
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 10-12-2023



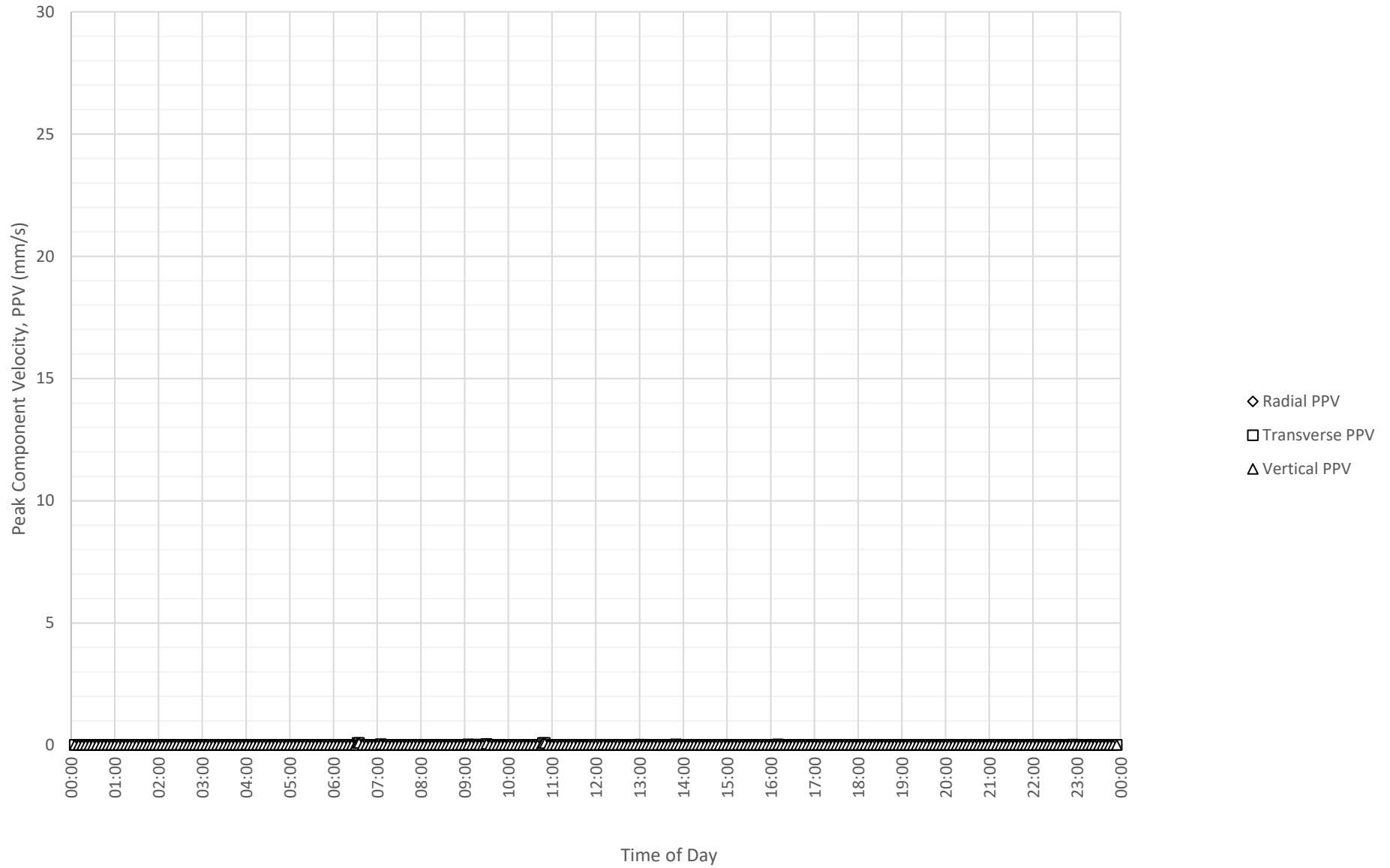
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 11-12-2023



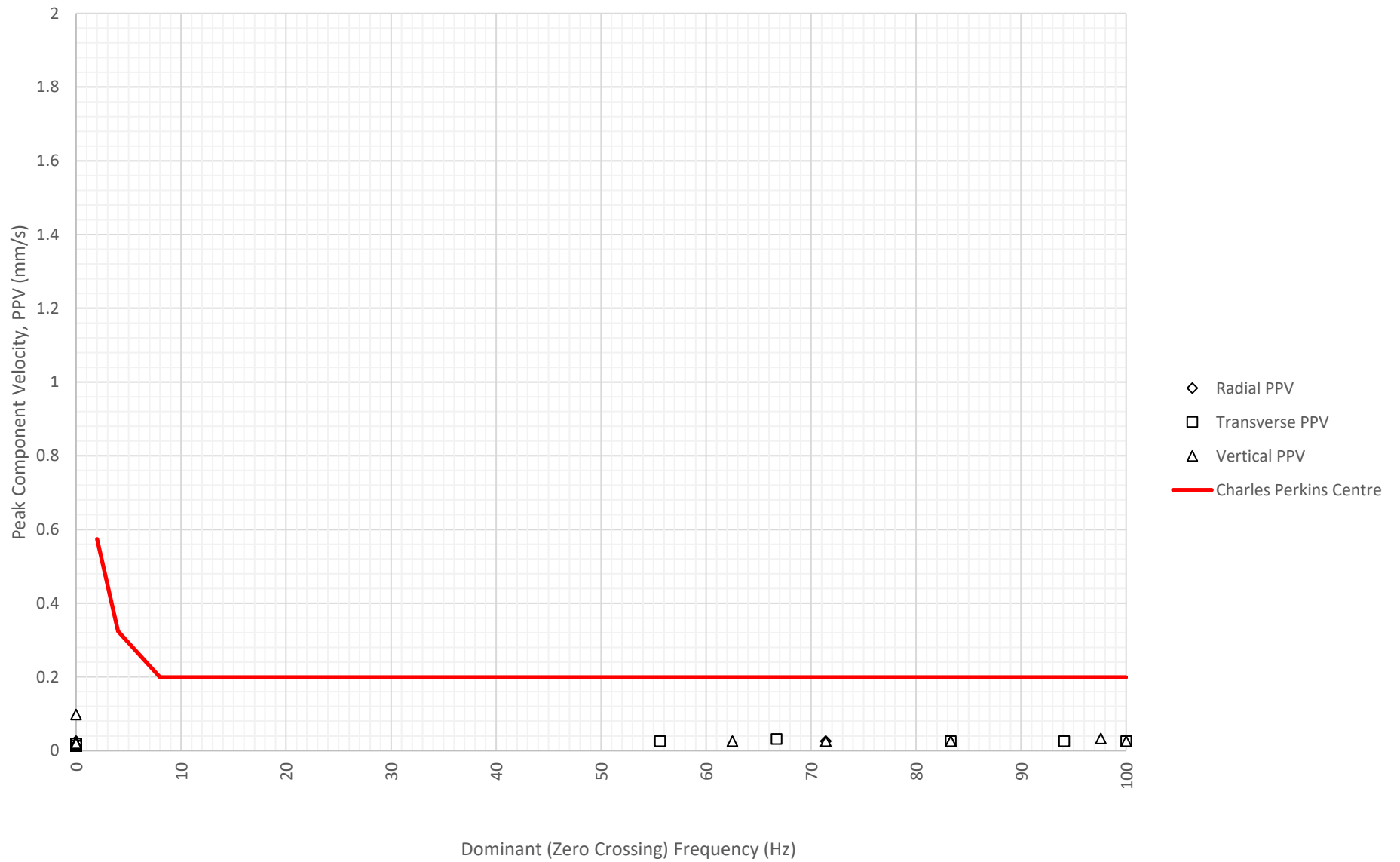
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 11-12-2023



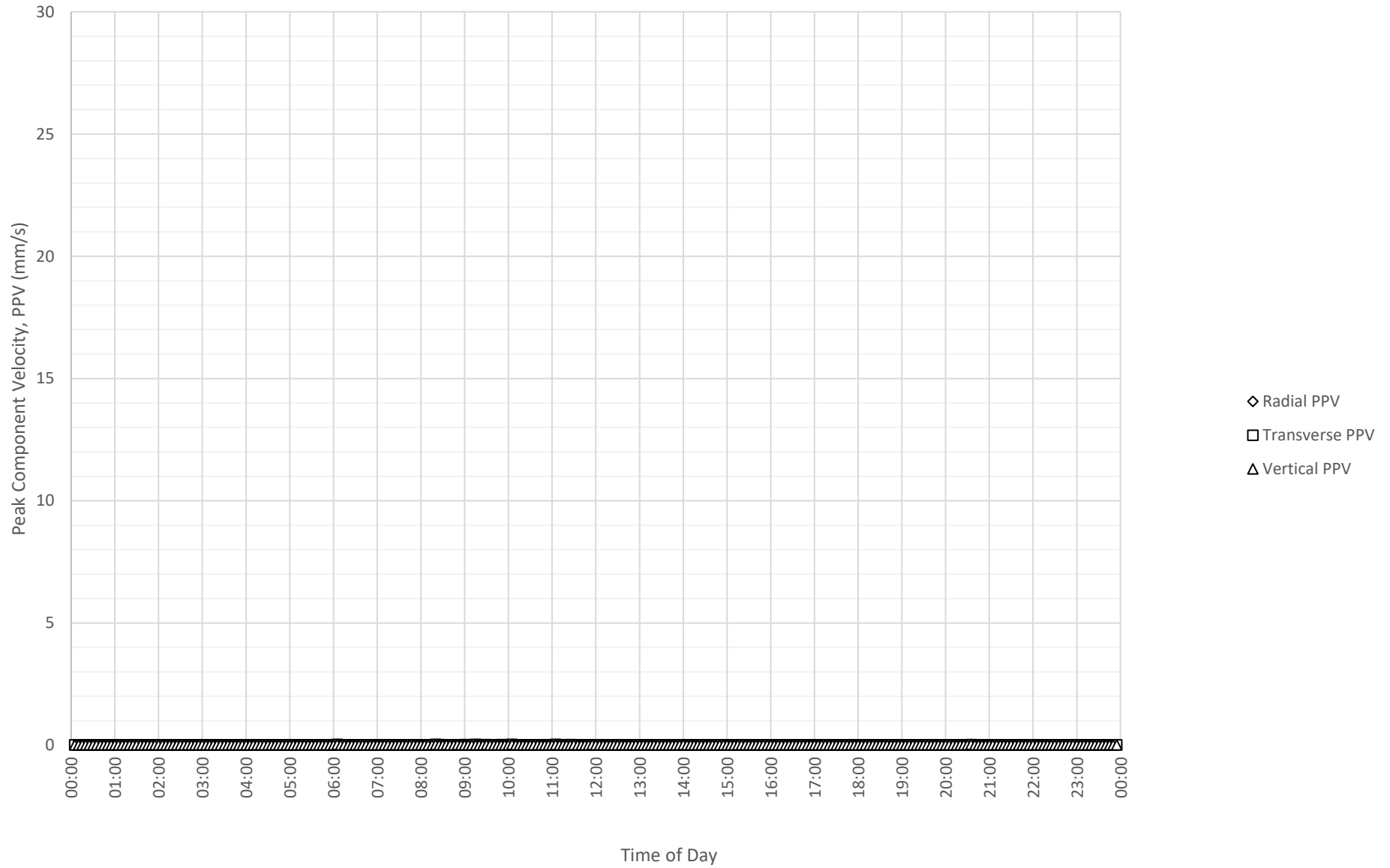
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 12-12-2023



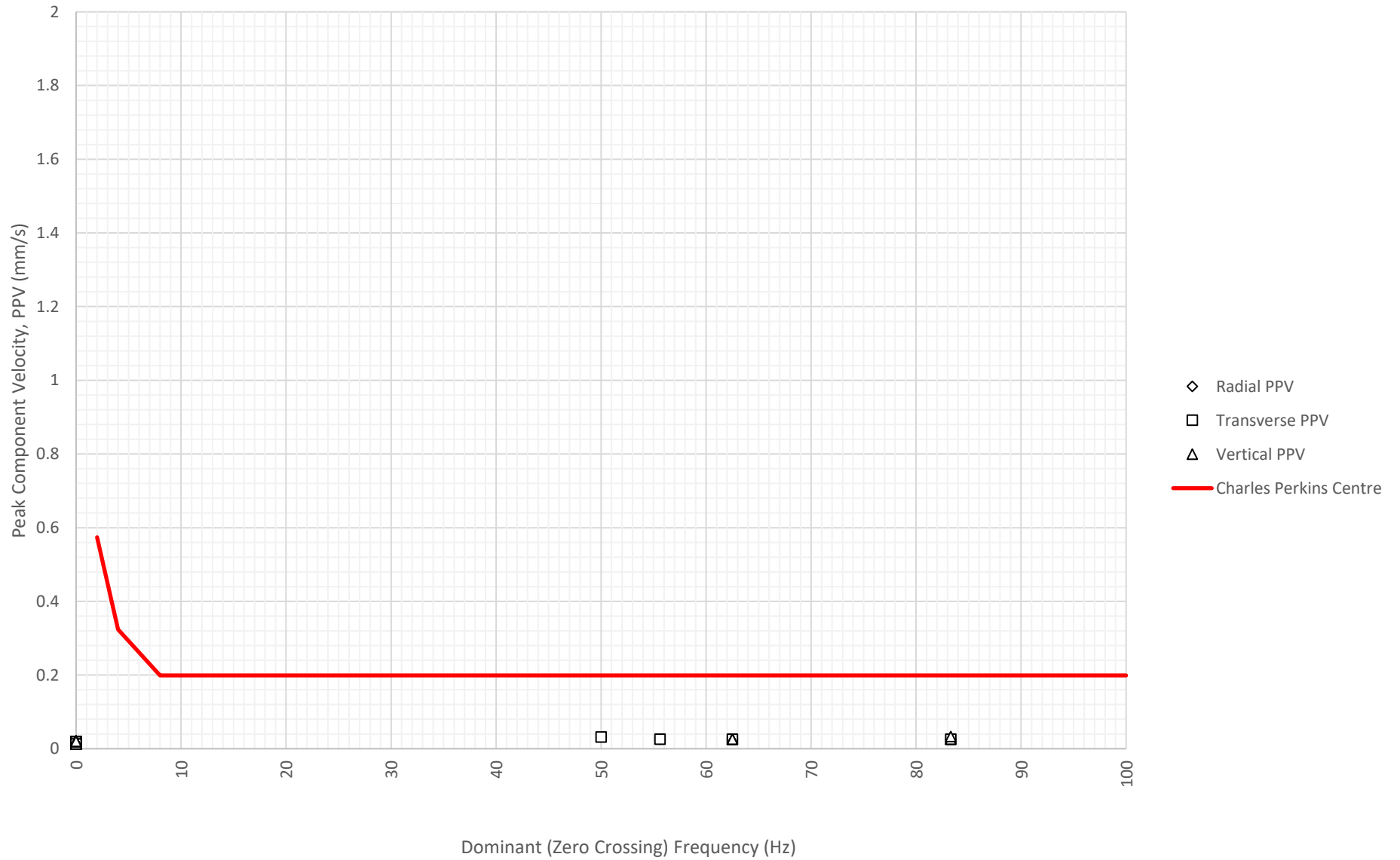
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 12-12-2023



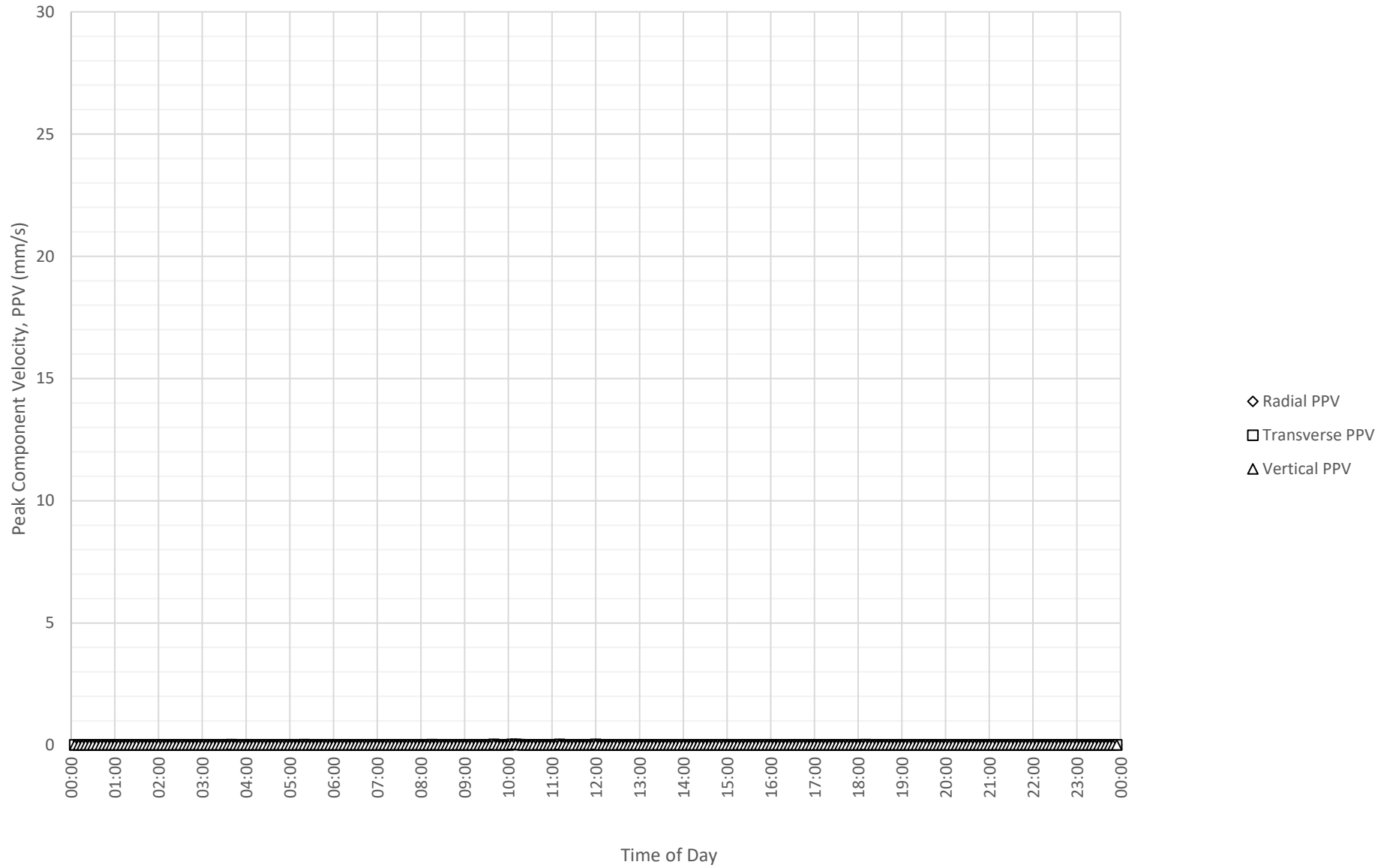
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 13-12-2023



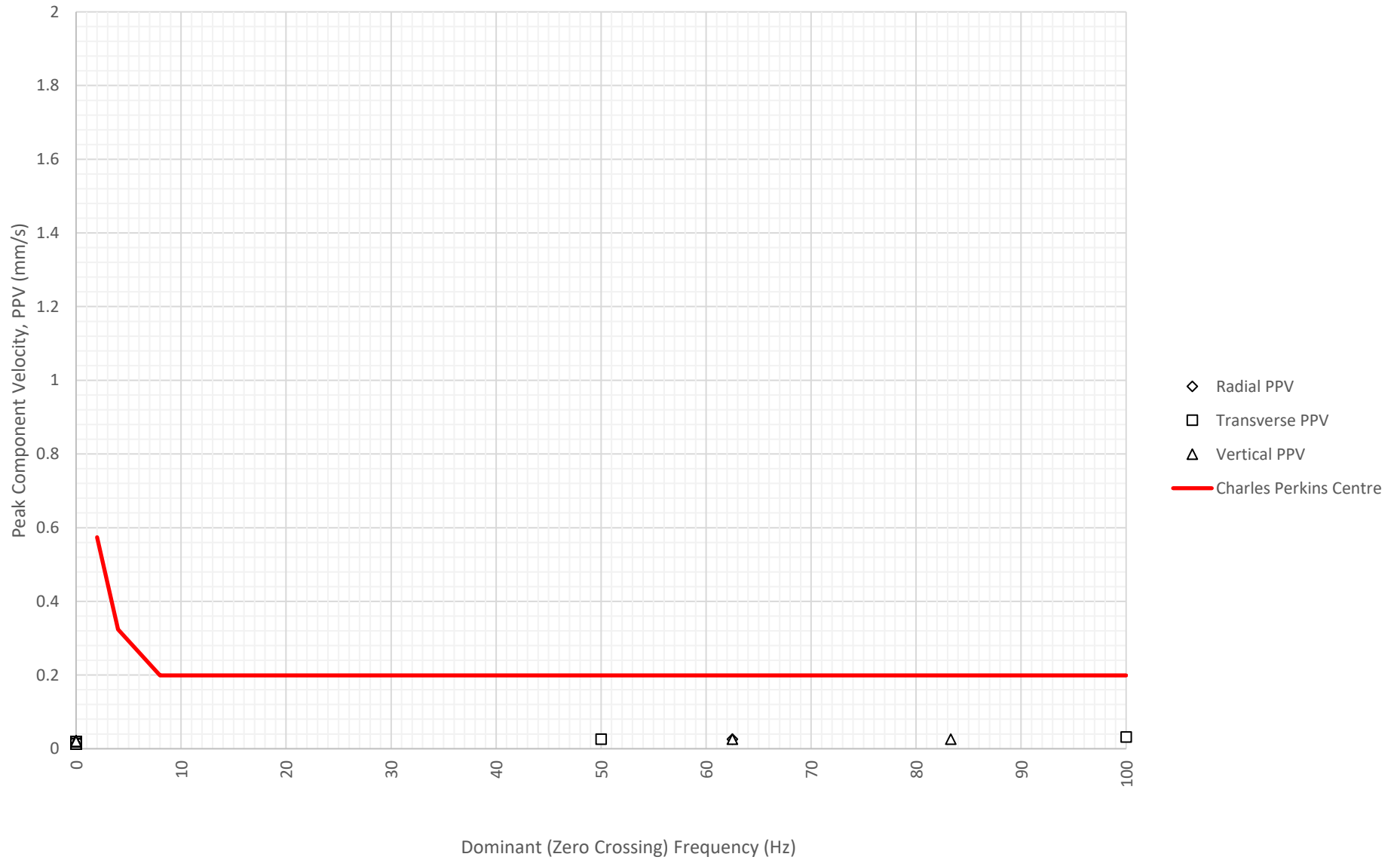
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E
on 13-12-2023



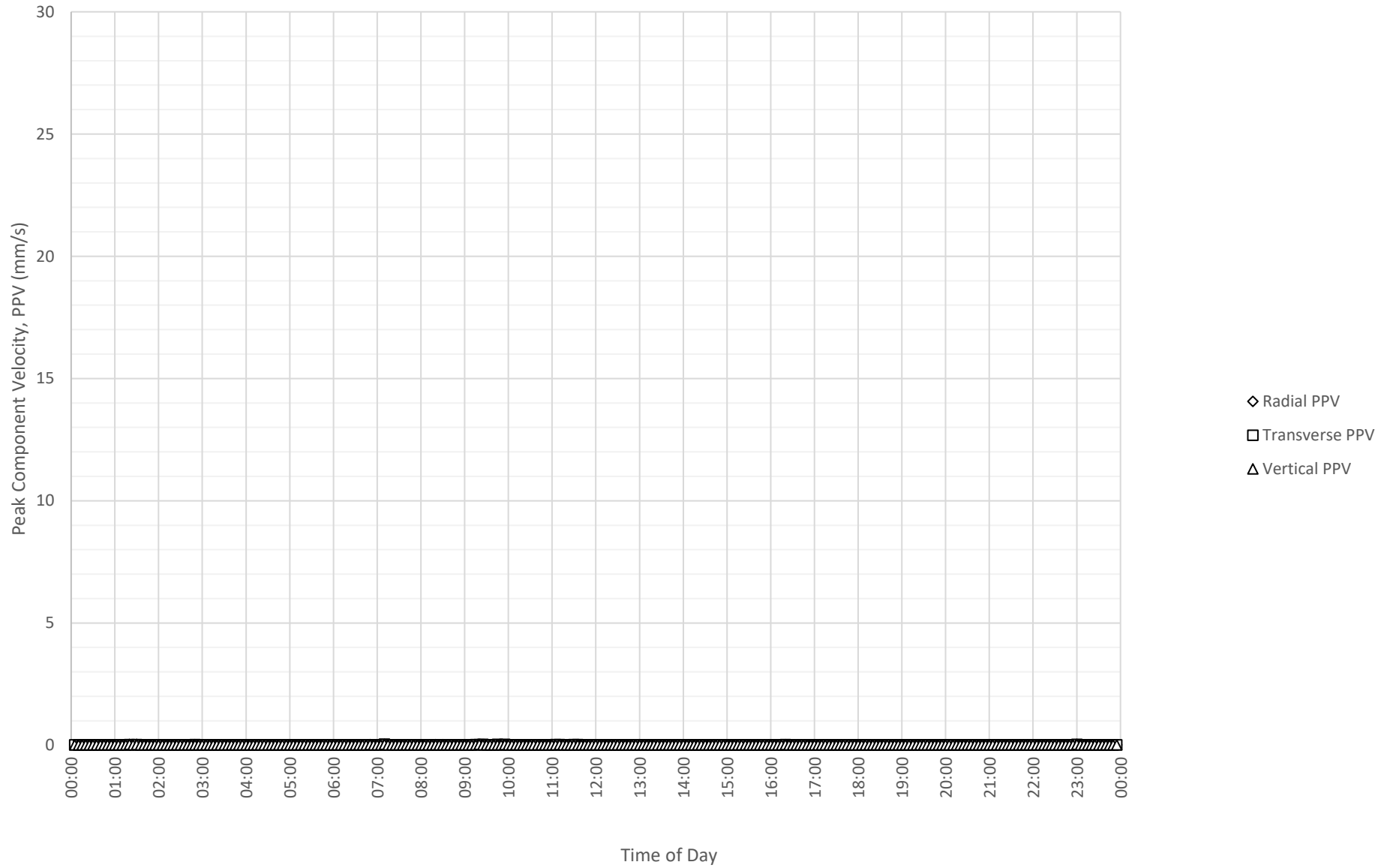
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 14-12-2023



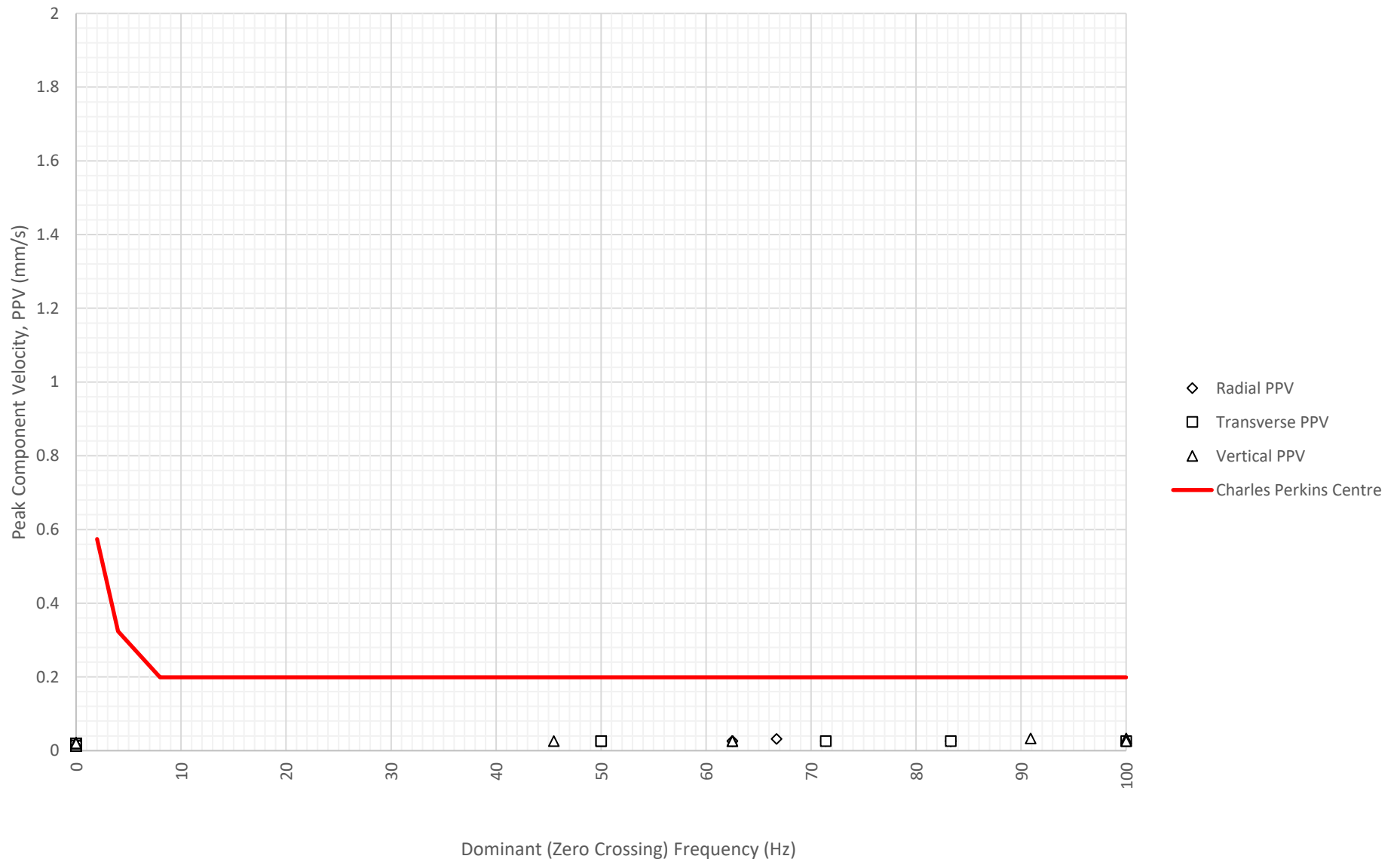
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E
on 14-12-2023



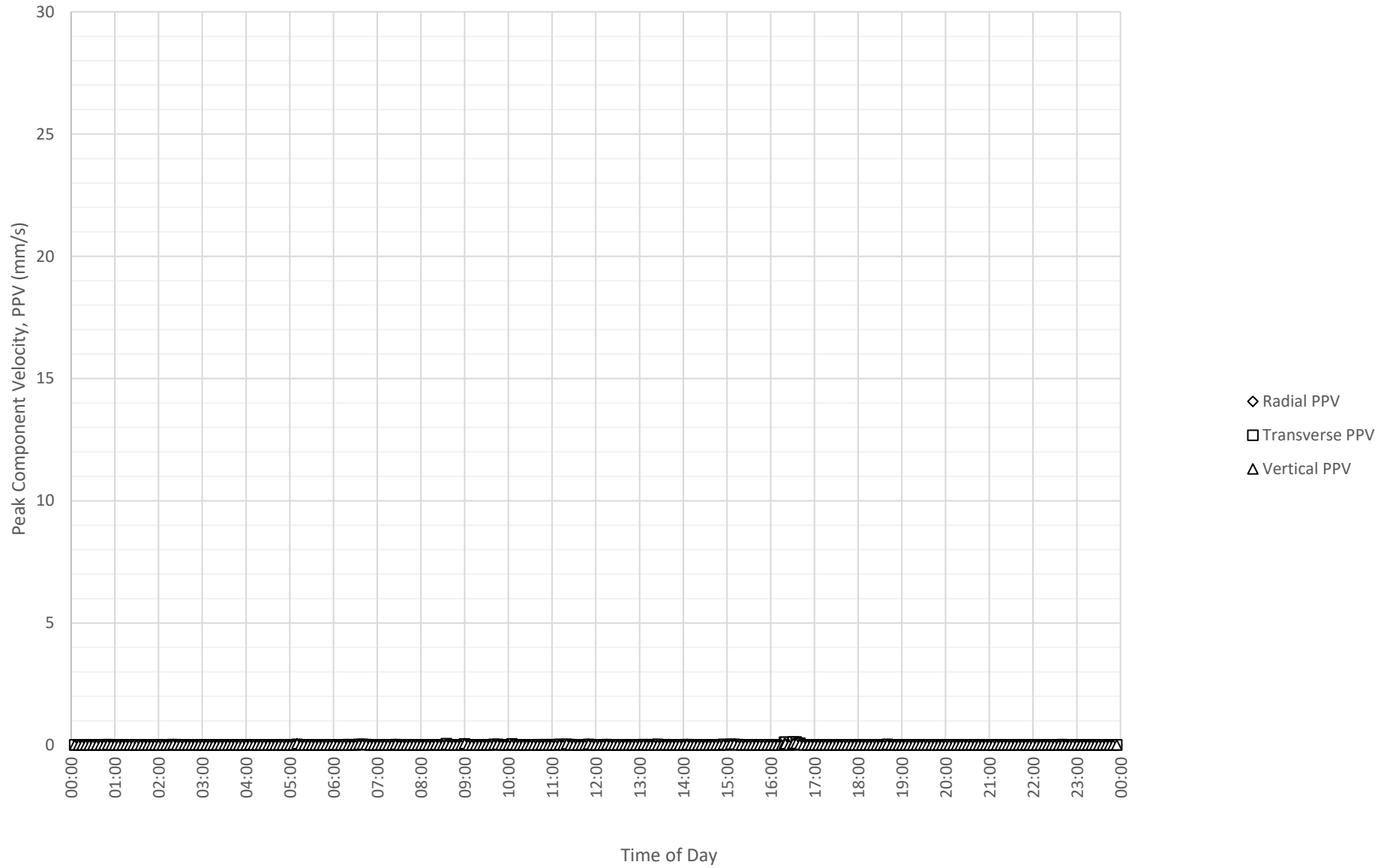
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 15-12-2023



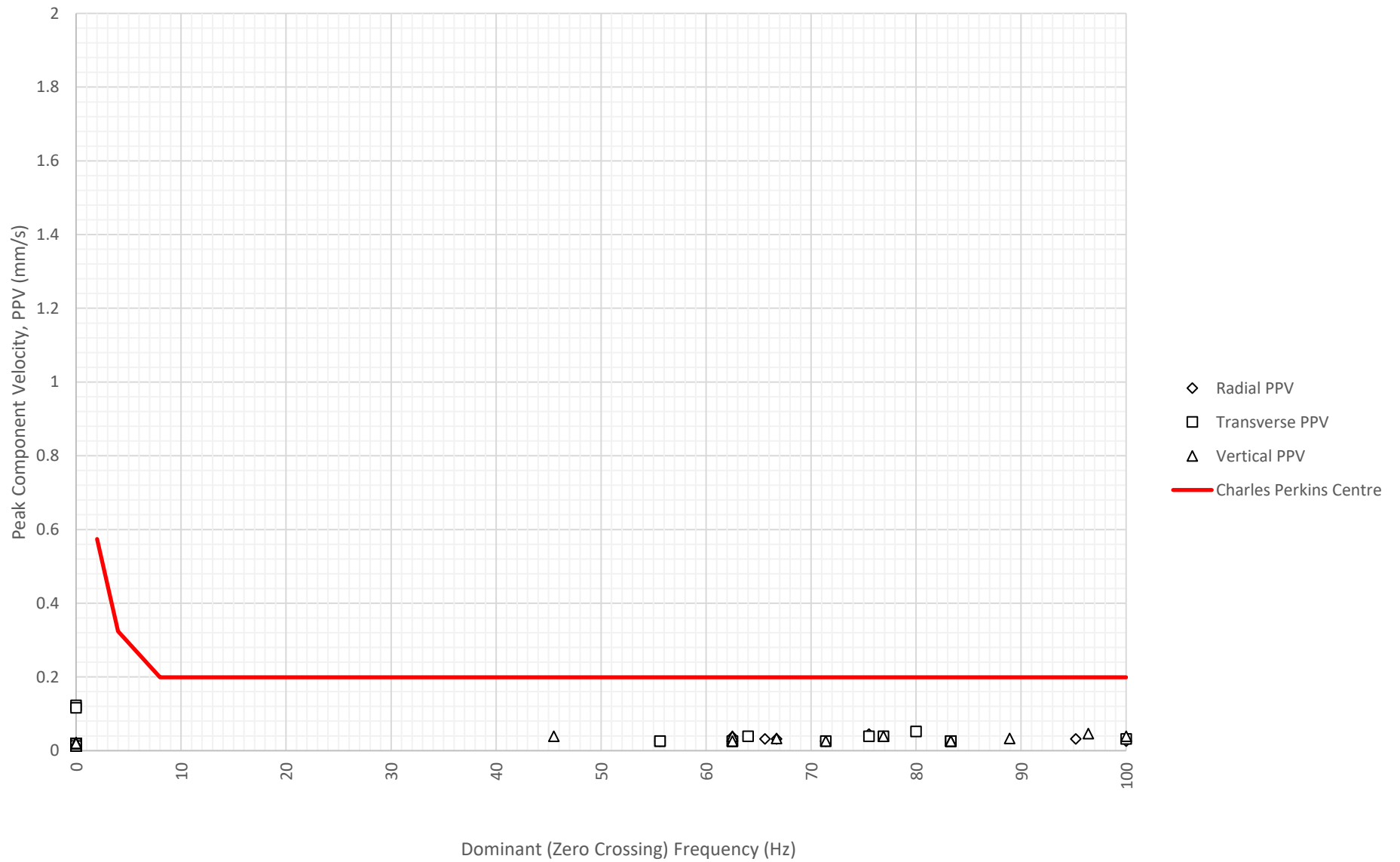
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 15-12-2023



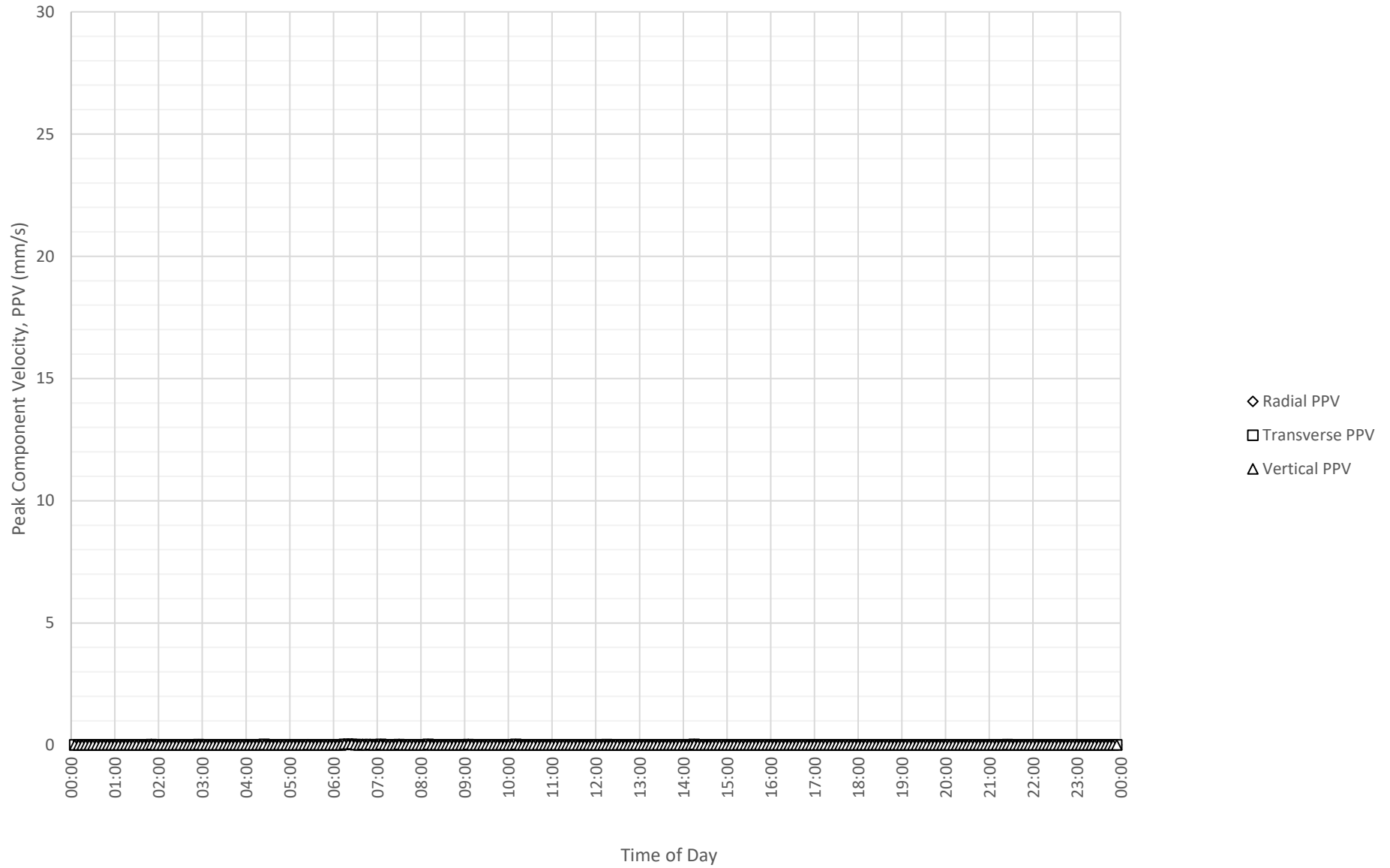
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 16-12-2023



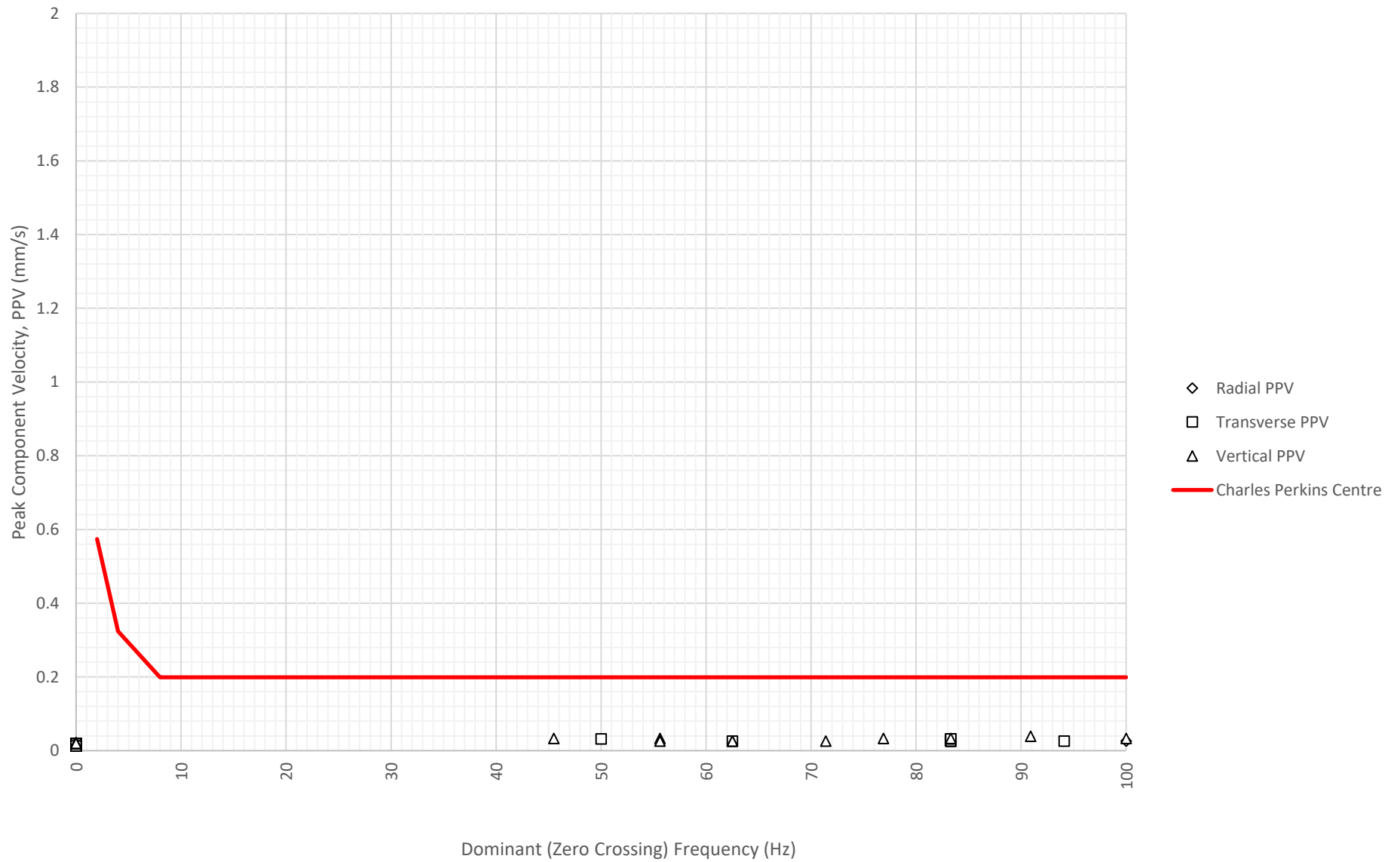
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 16-12-2023



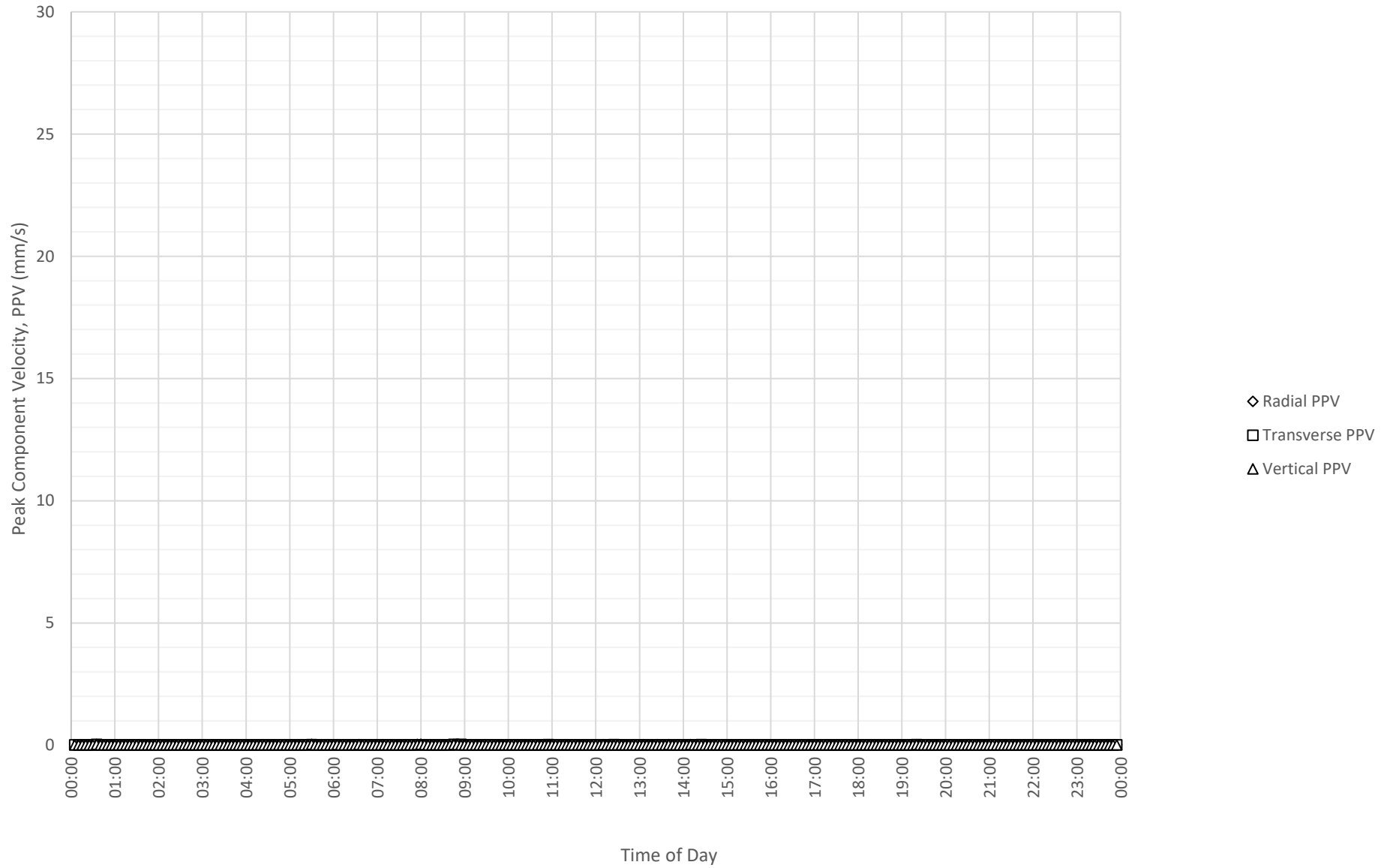
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 17-12-2023



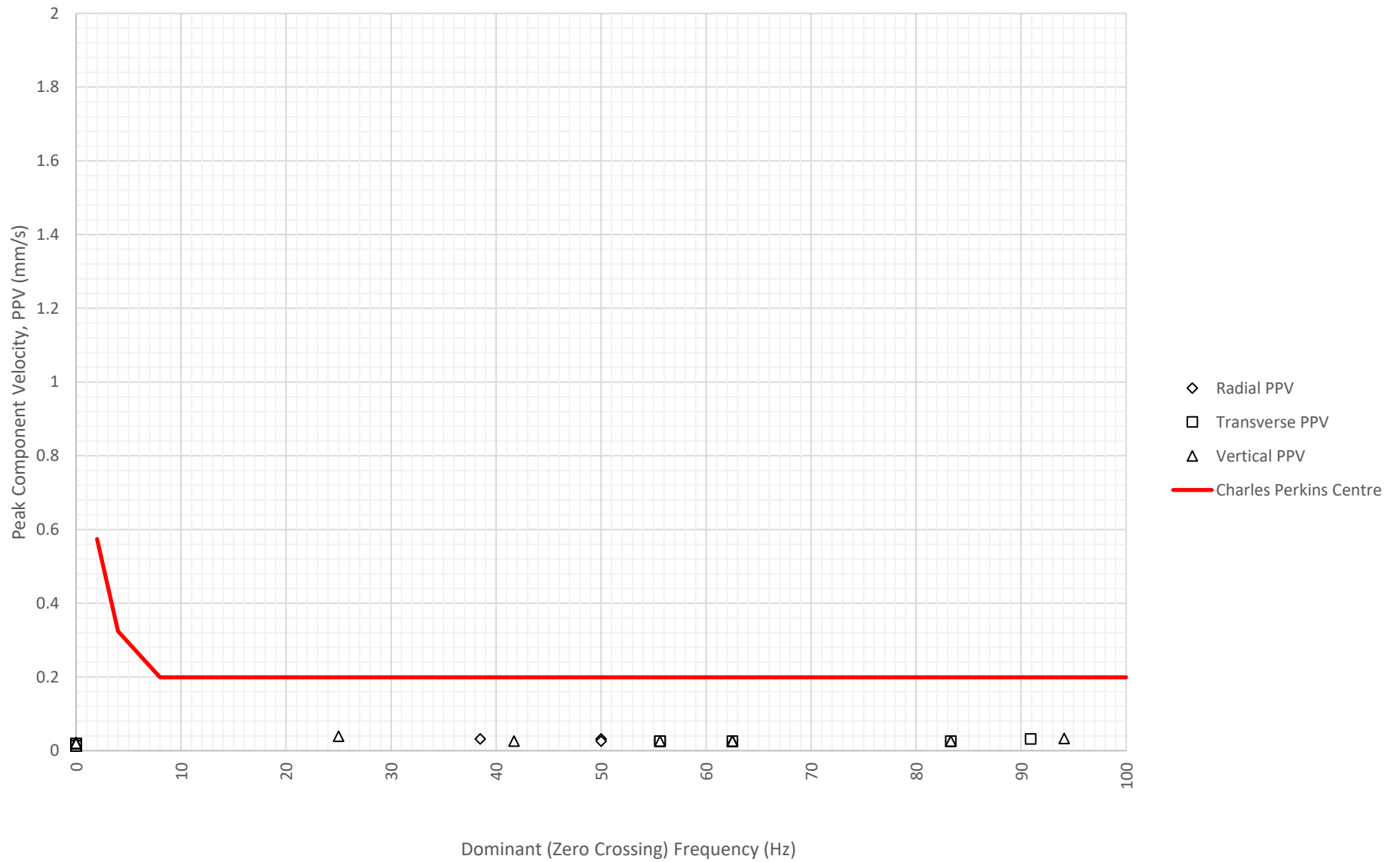
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 17-12-2023



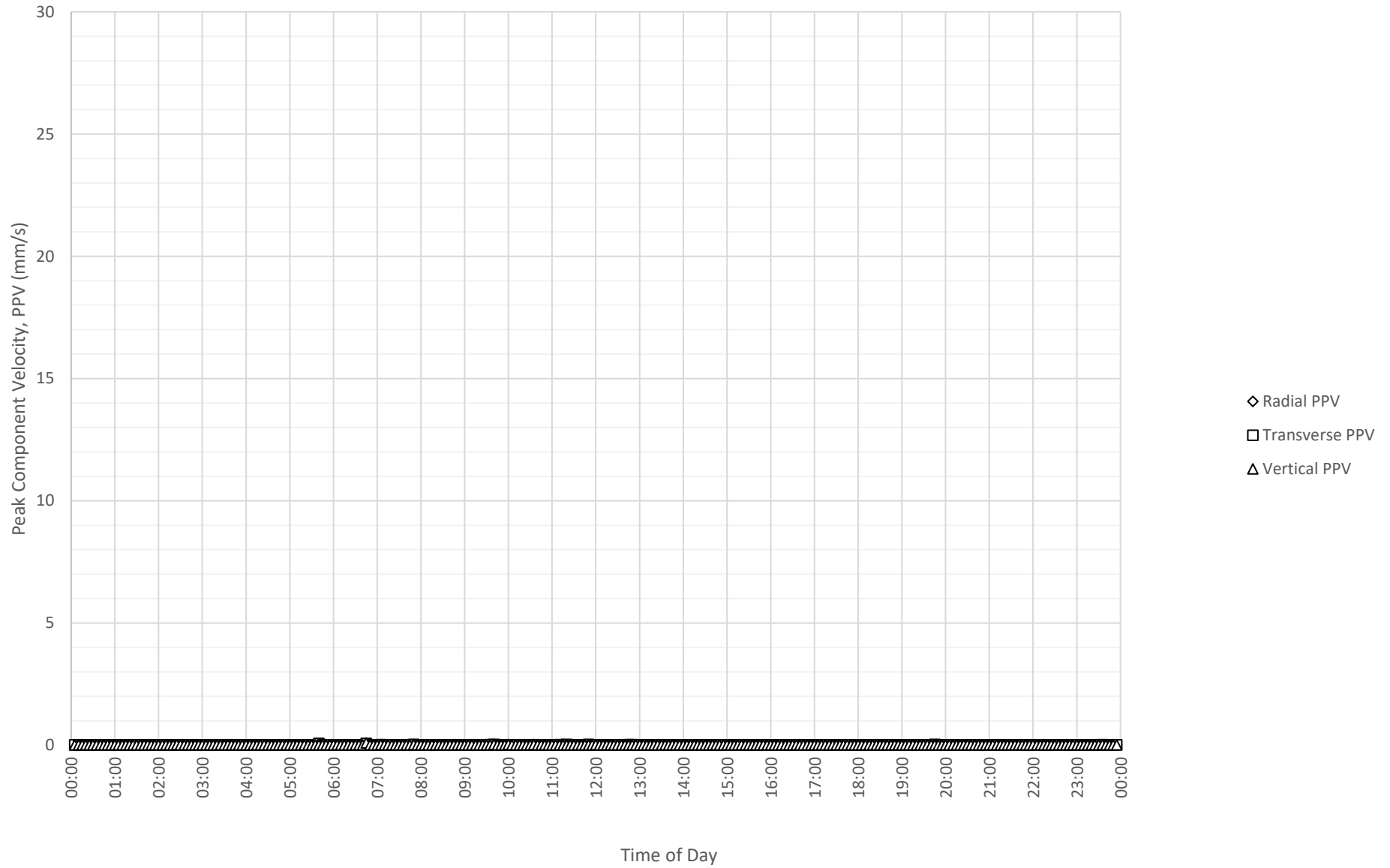
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 18-12-2023



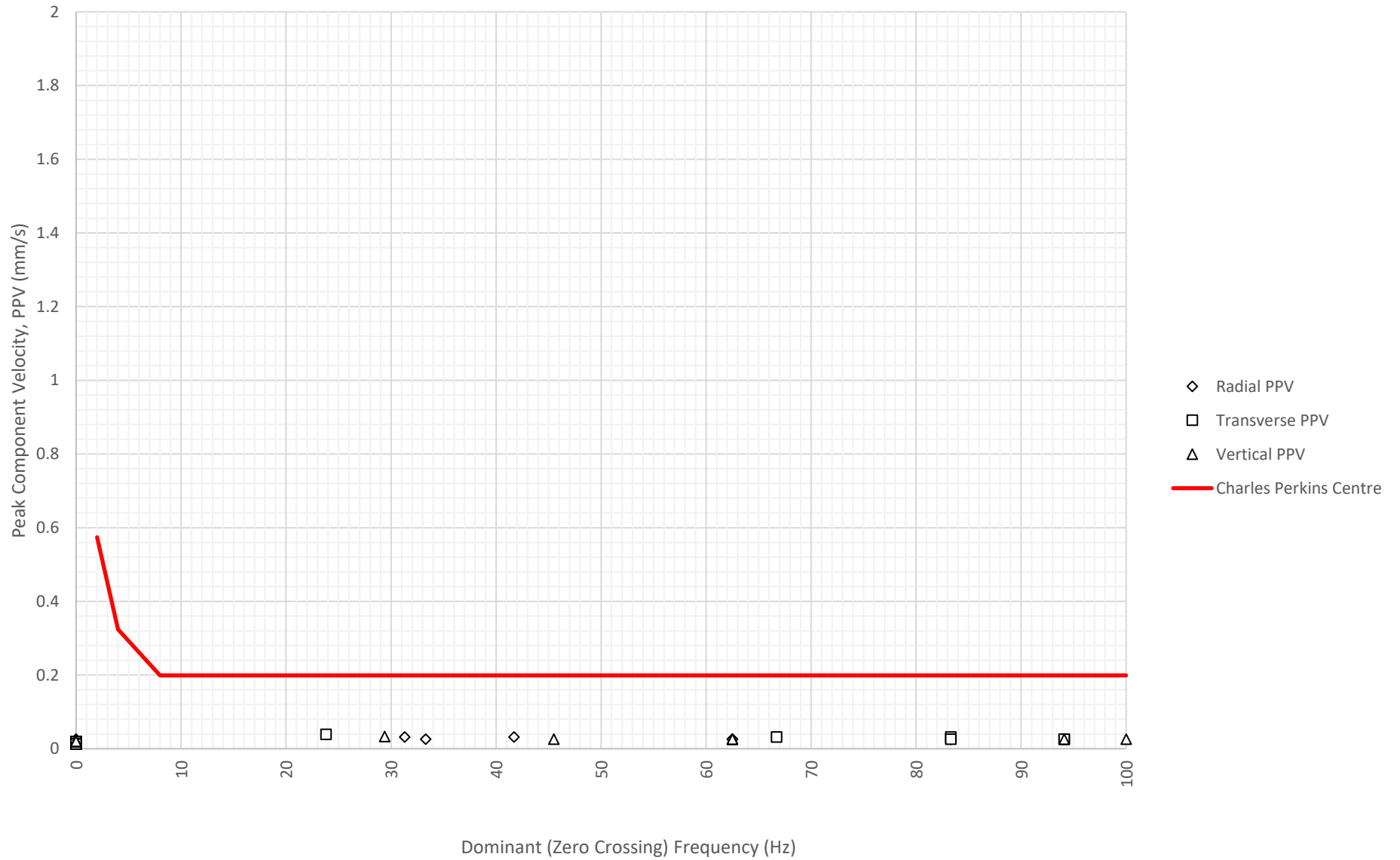
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E
on 18-12-2023



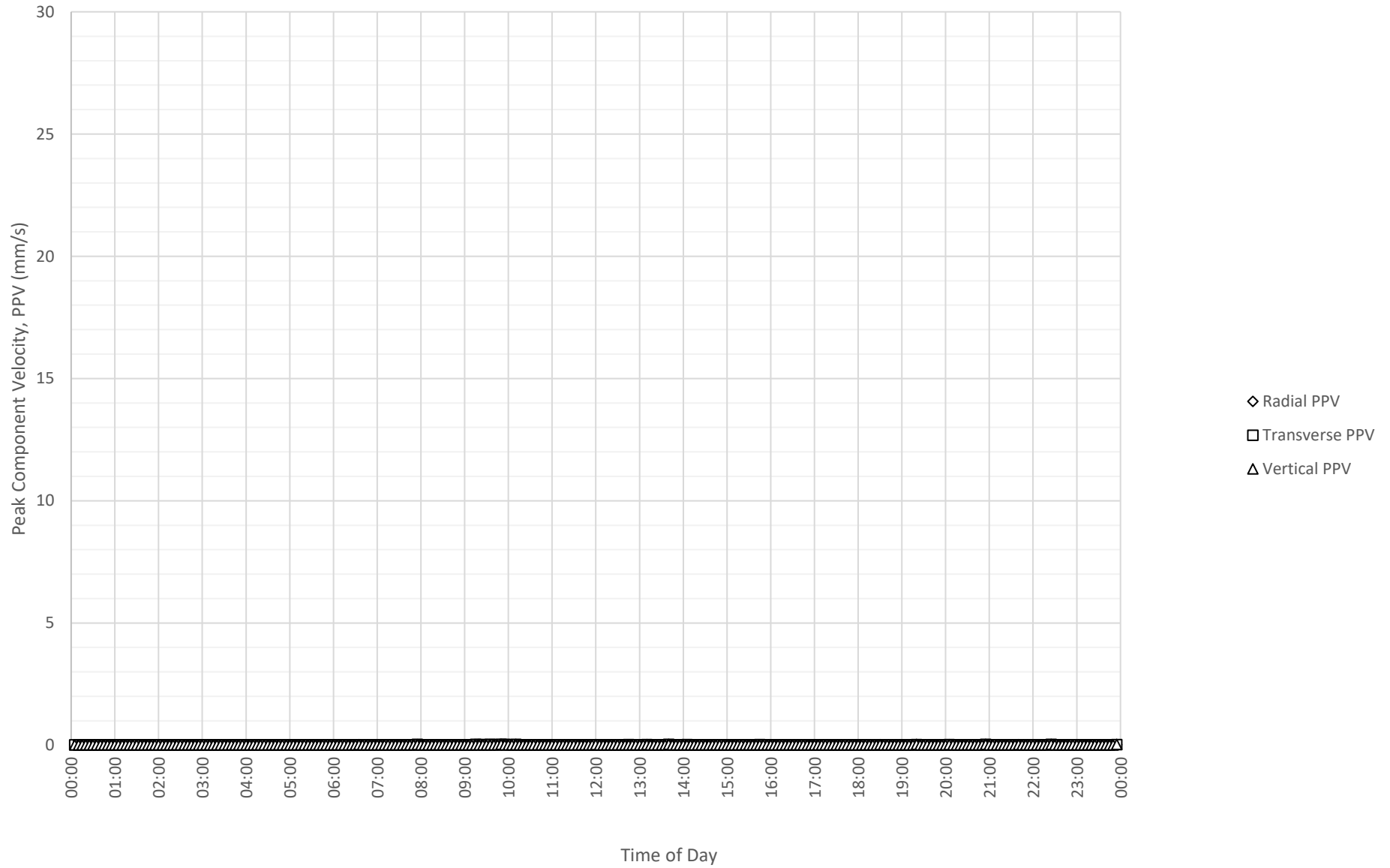
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 19-12-2023



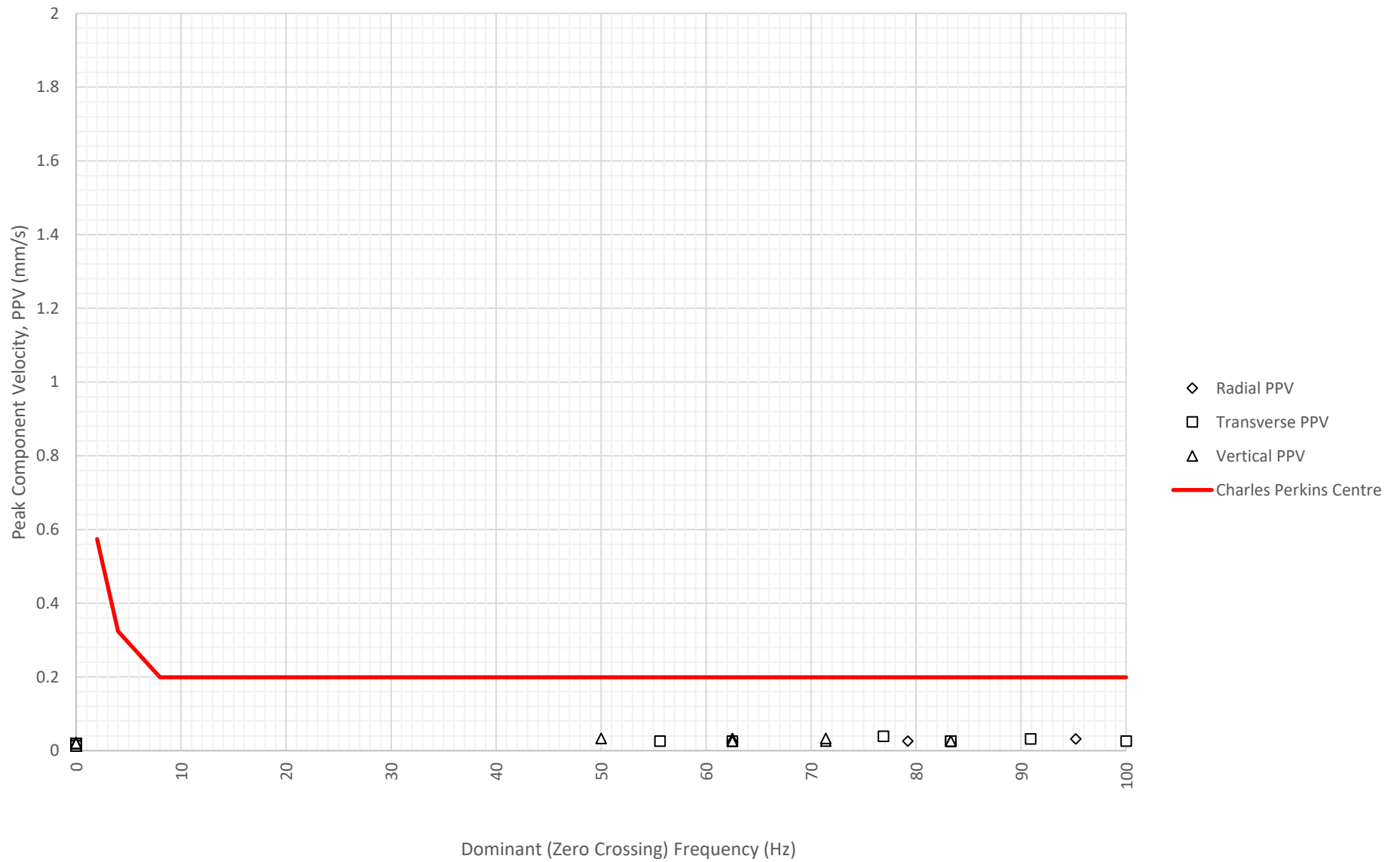
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 19-12-2023



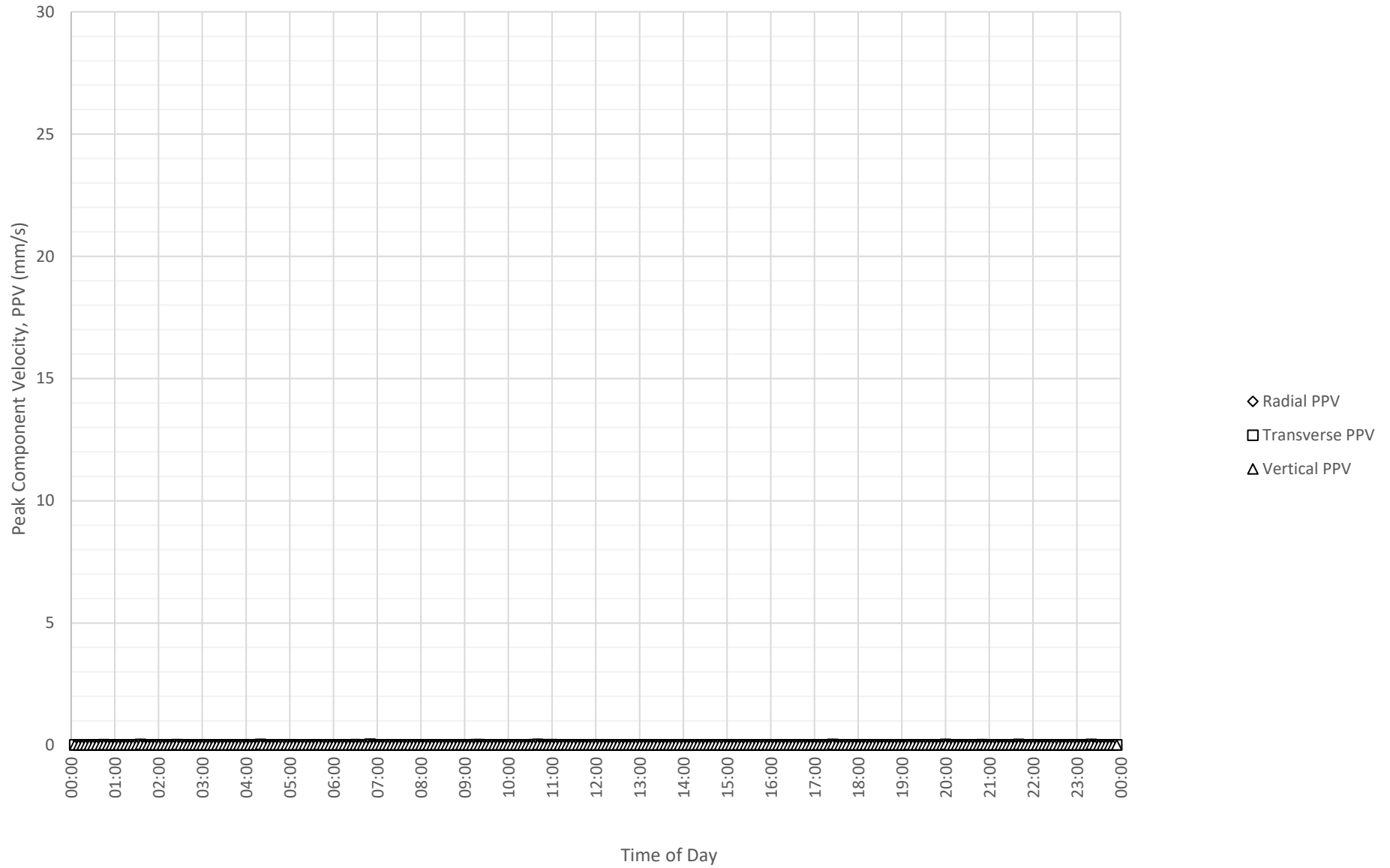
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 20-12-2023



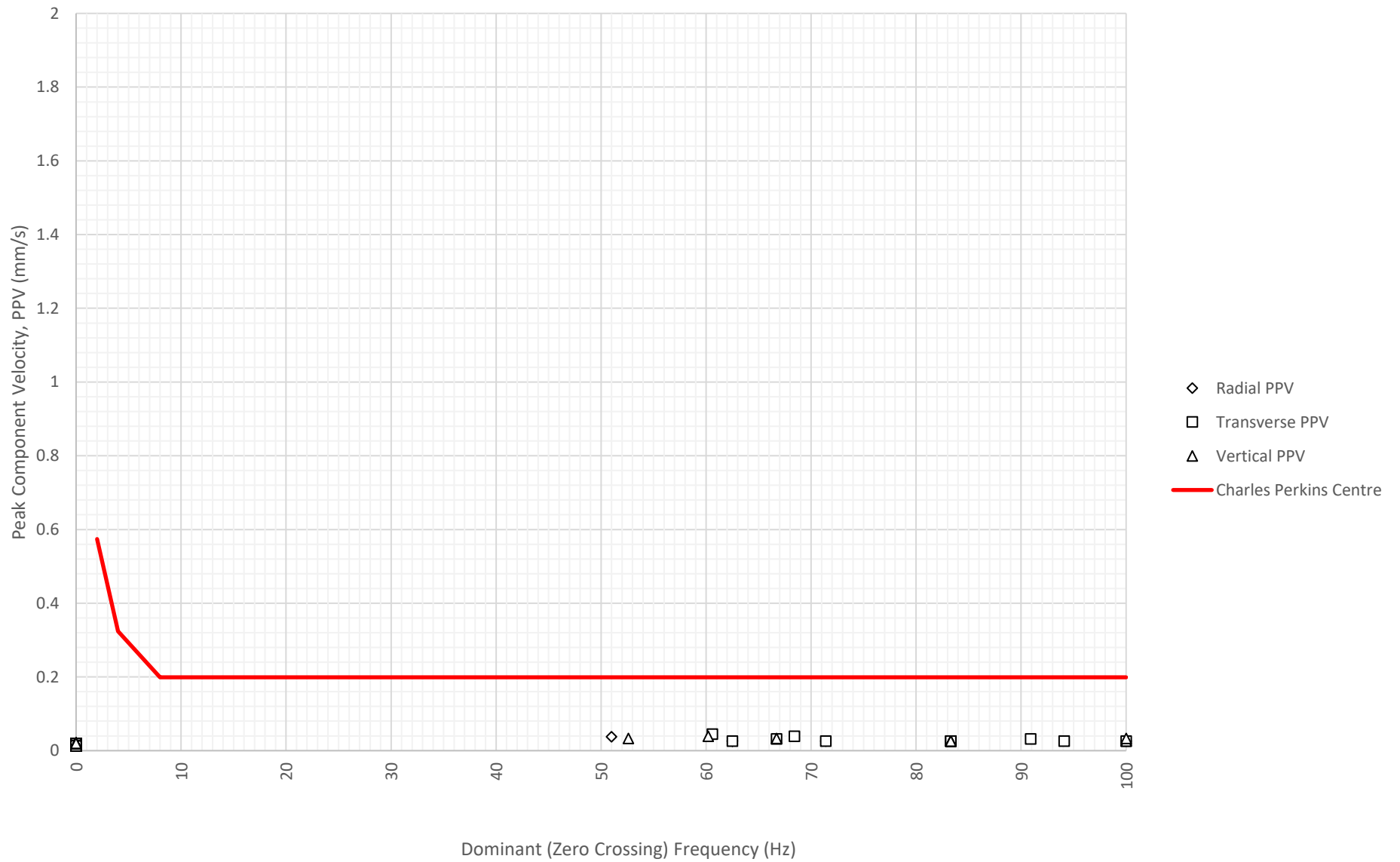
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E
on 20-12-2023



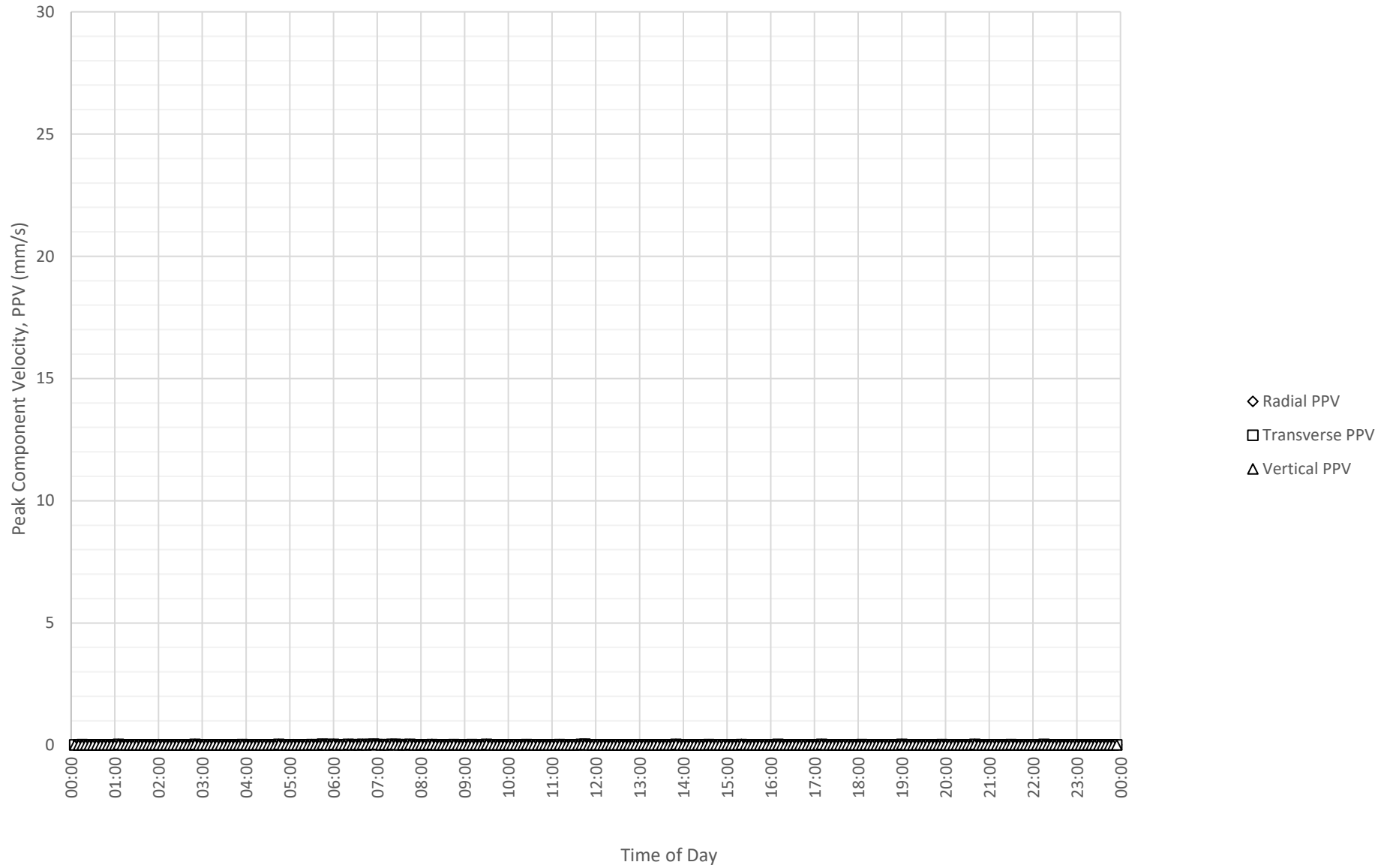
Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 21-12-2023



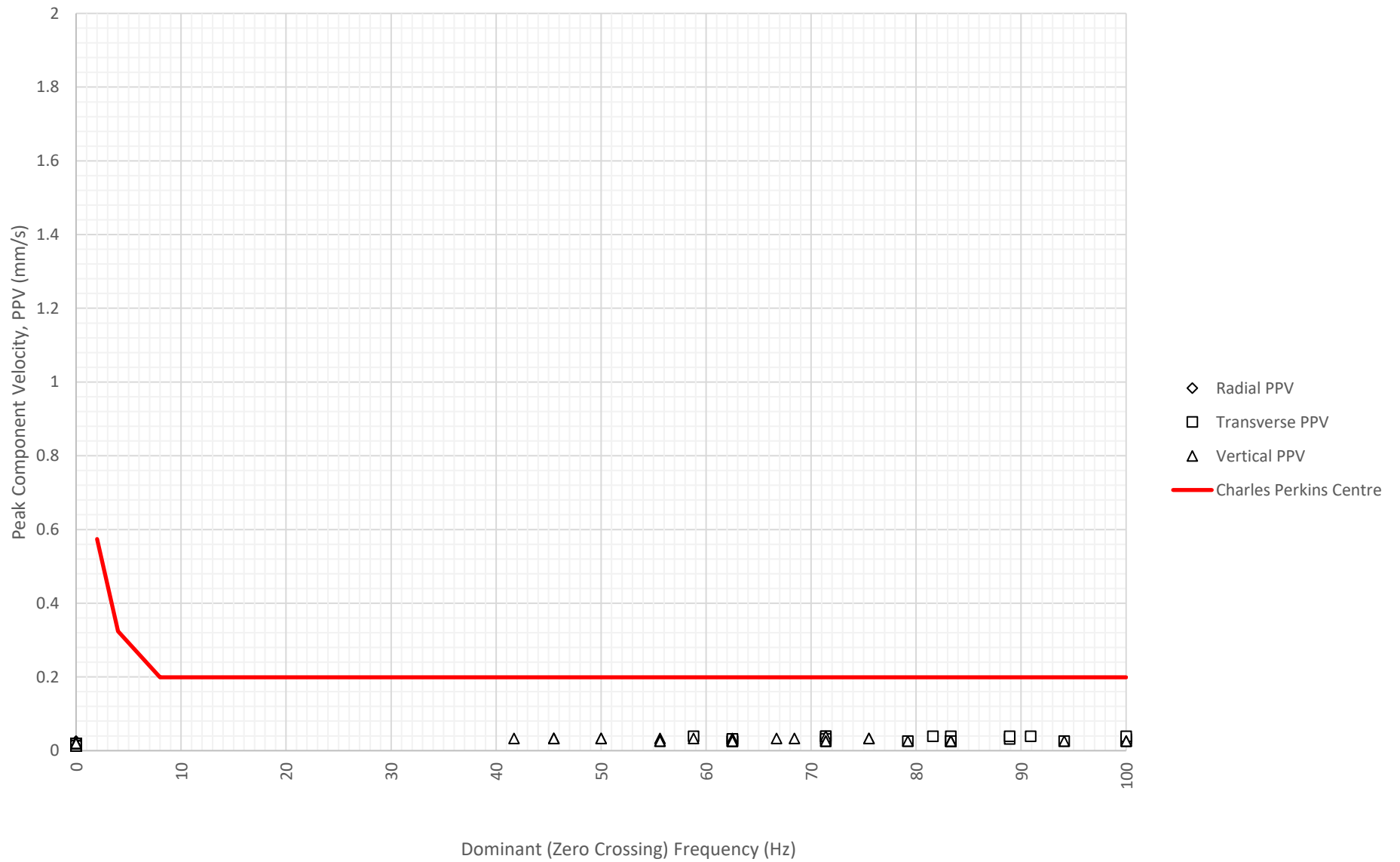
Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 21-12-2023



Daily Monitored Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 22-12-2023

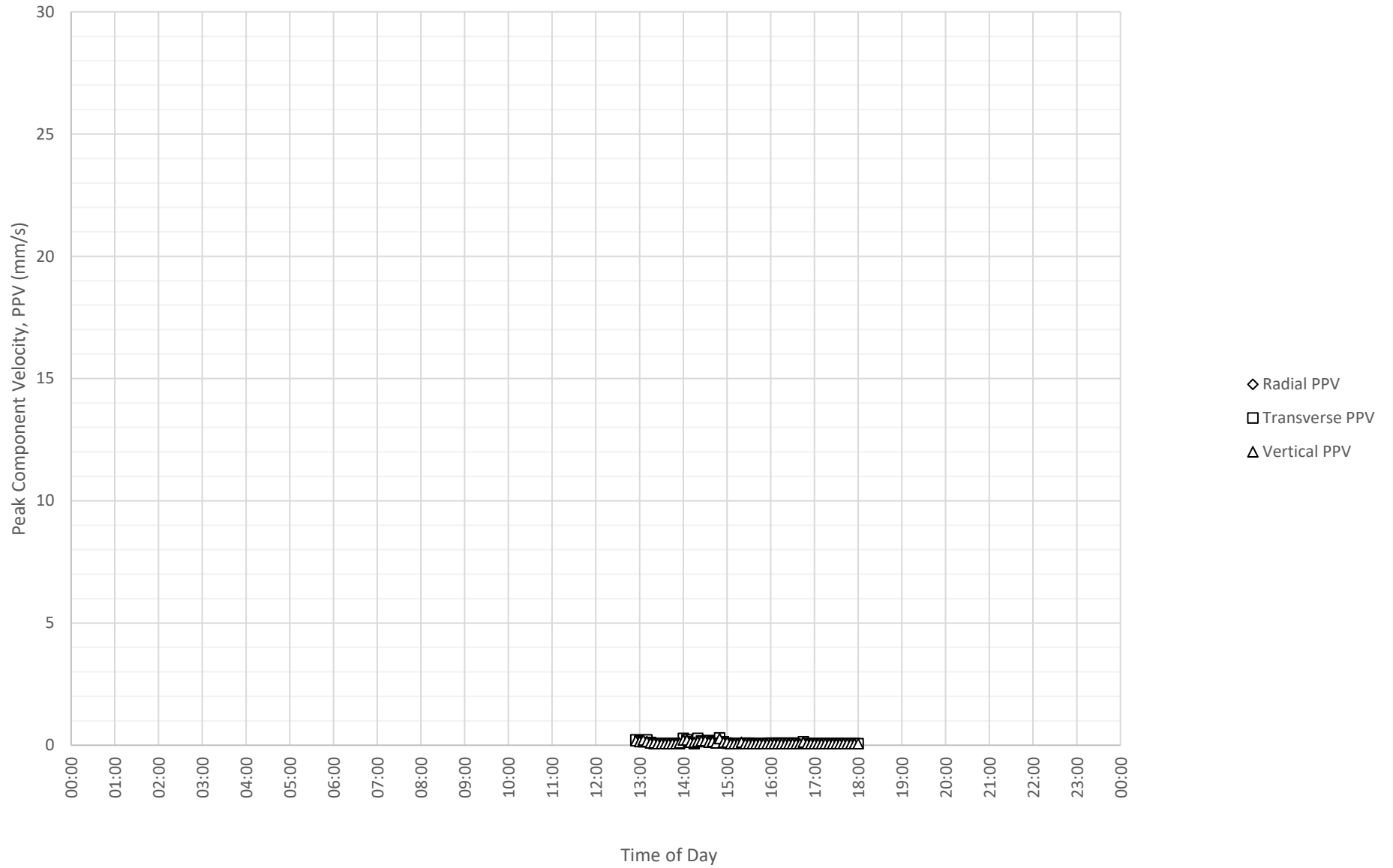


Frequency Content of Vibration Levels at Charles Perkins Centre - Southern Wing Observation Room E on 22-12-2023

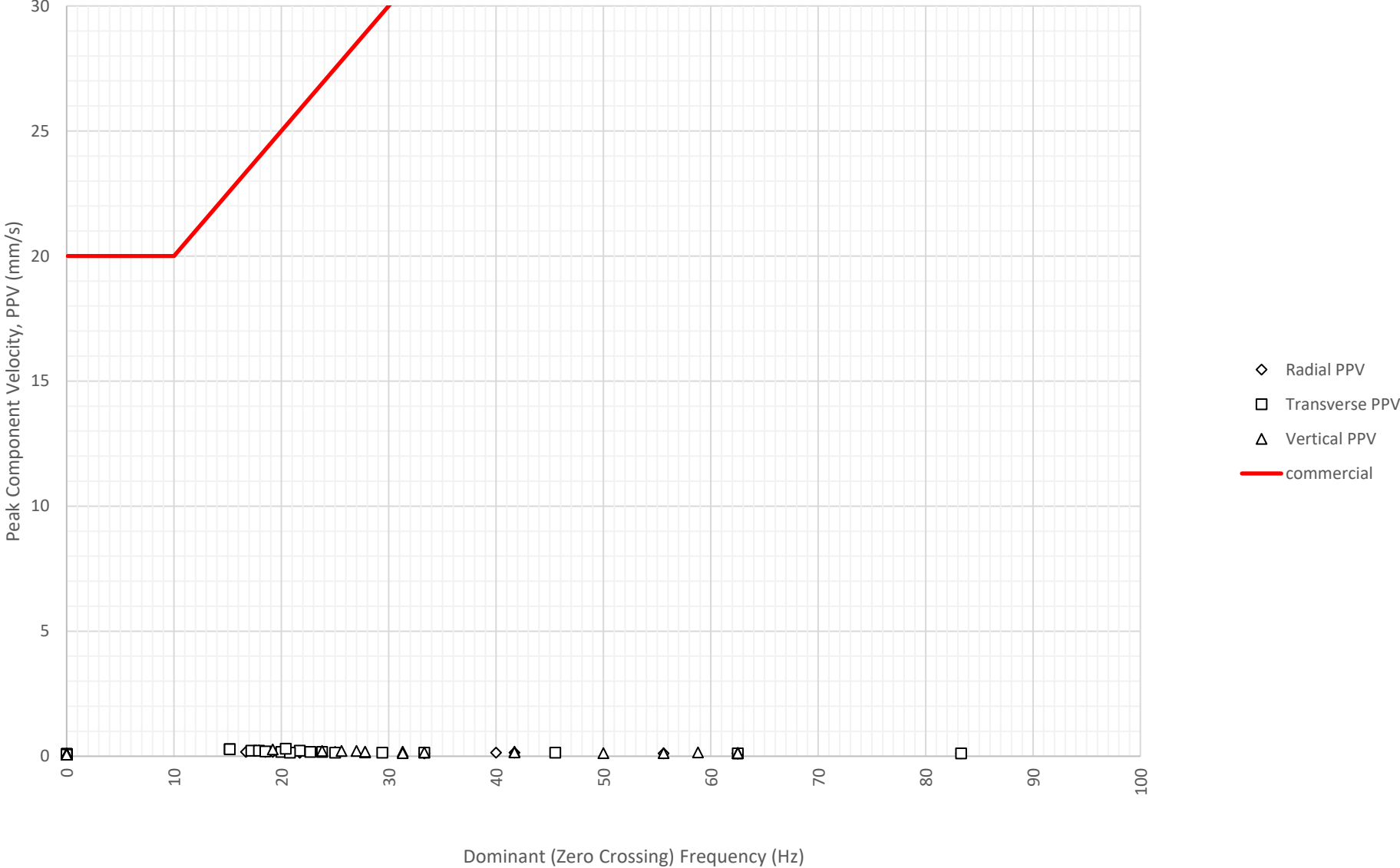


OUTSIDE SUSAN WAKIL HEALTH BUILDING

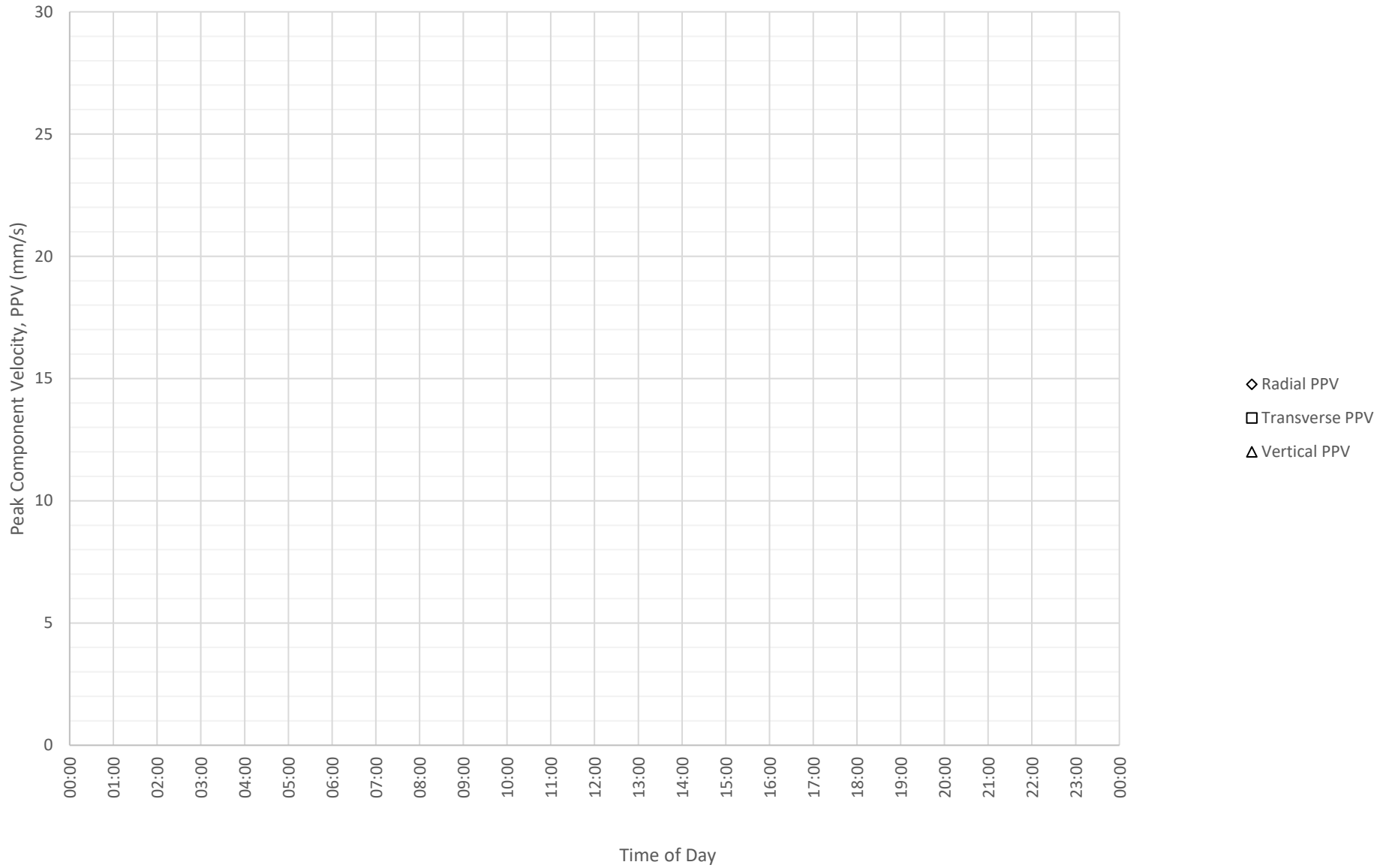
Daily Monitored Vibration Levels at Susan Wakil Health Building on 7-12-2023



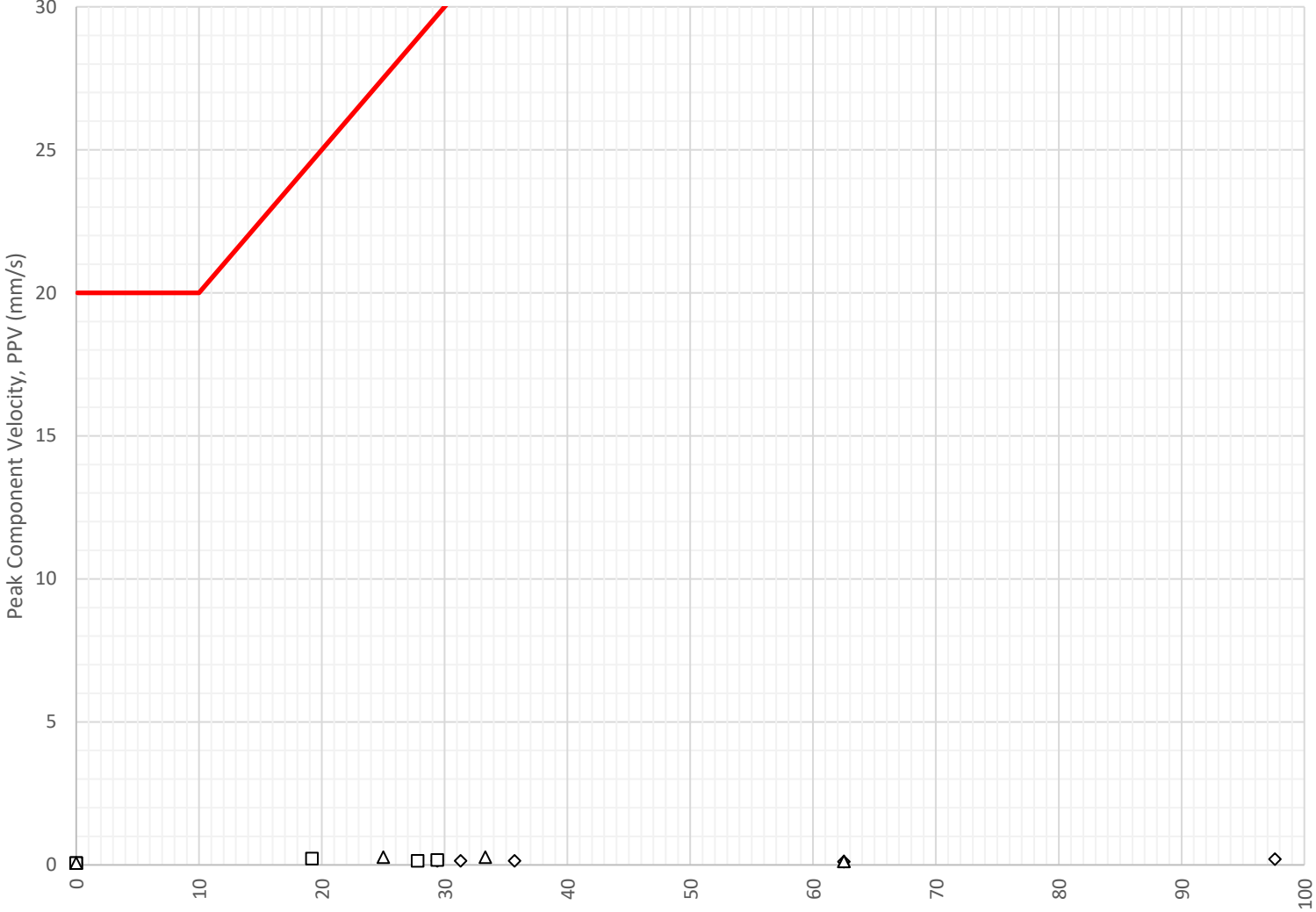
Frequency Content of Vibration Levels at Susan Wakil Health Building on 7-12-2023



Daily Monitored Vibration Levels at Susan Wakil Health Building on 8-12-2023



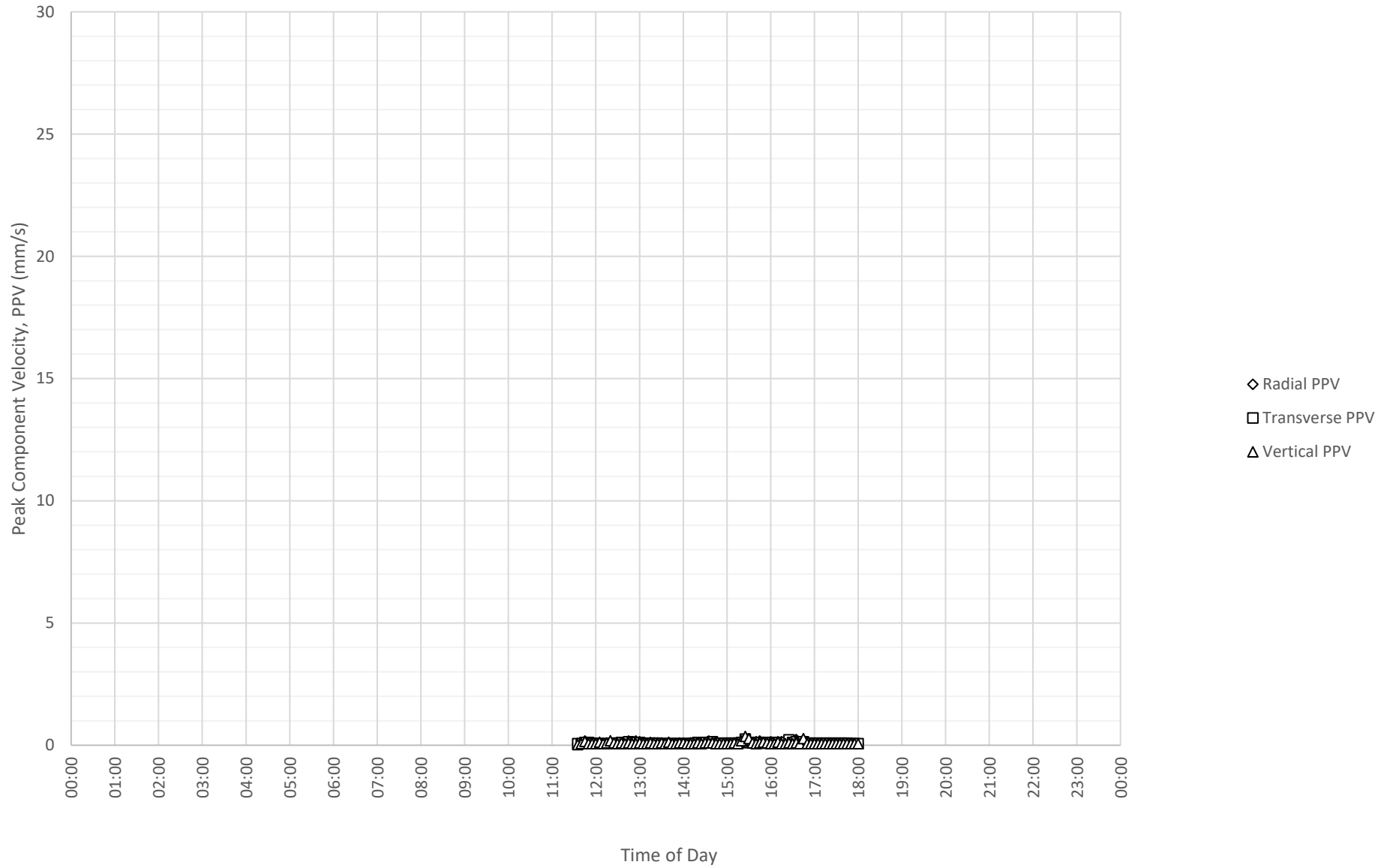
Frequency Content of Vibration Levels at Susan Wakil Health Building on 8-12-2023



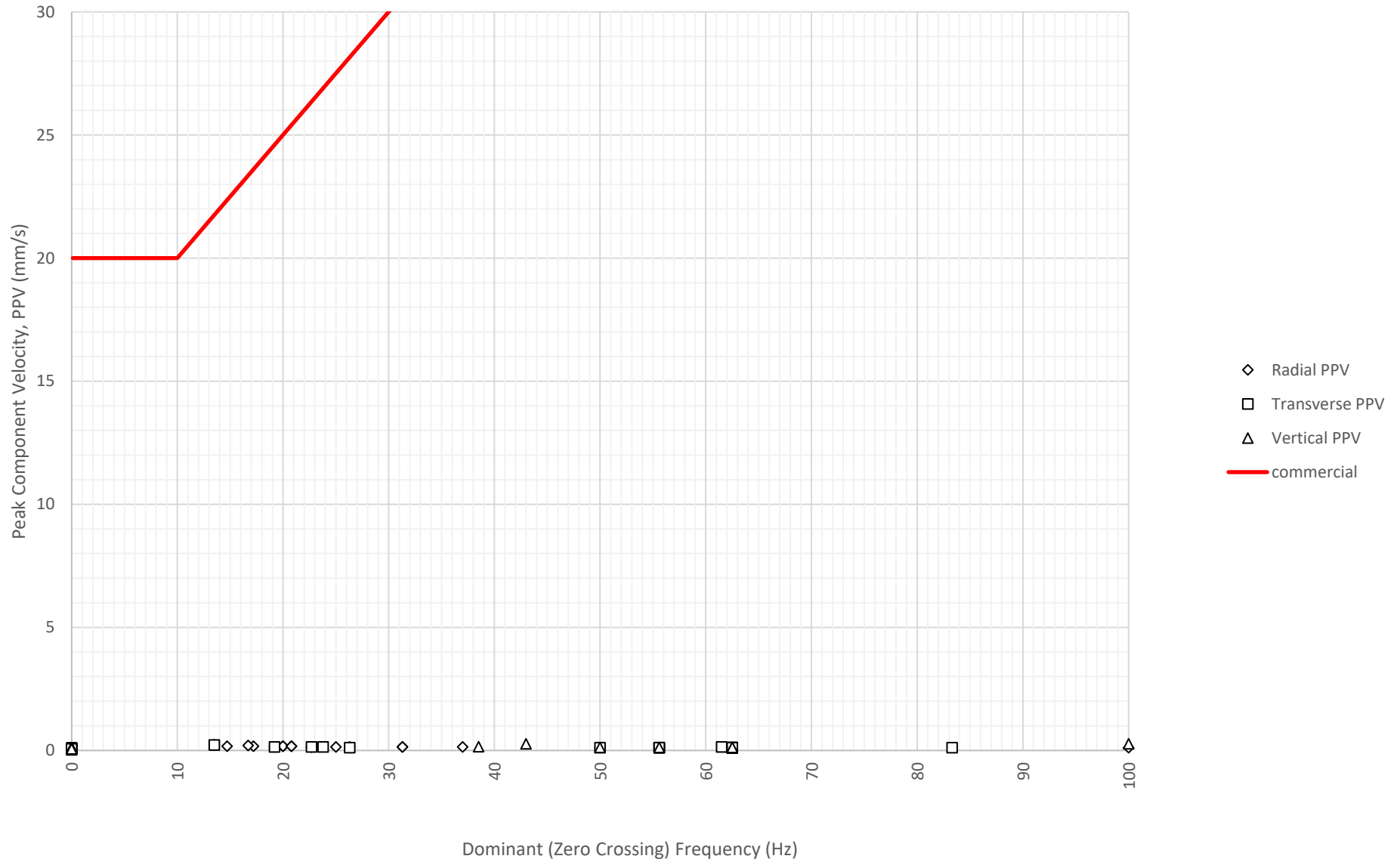
- ◇ Radial PPV
- Transverse PPV
- △ Vertical PPV
- commercial

Dominant (Zero Crossing) Frequency (Hz)

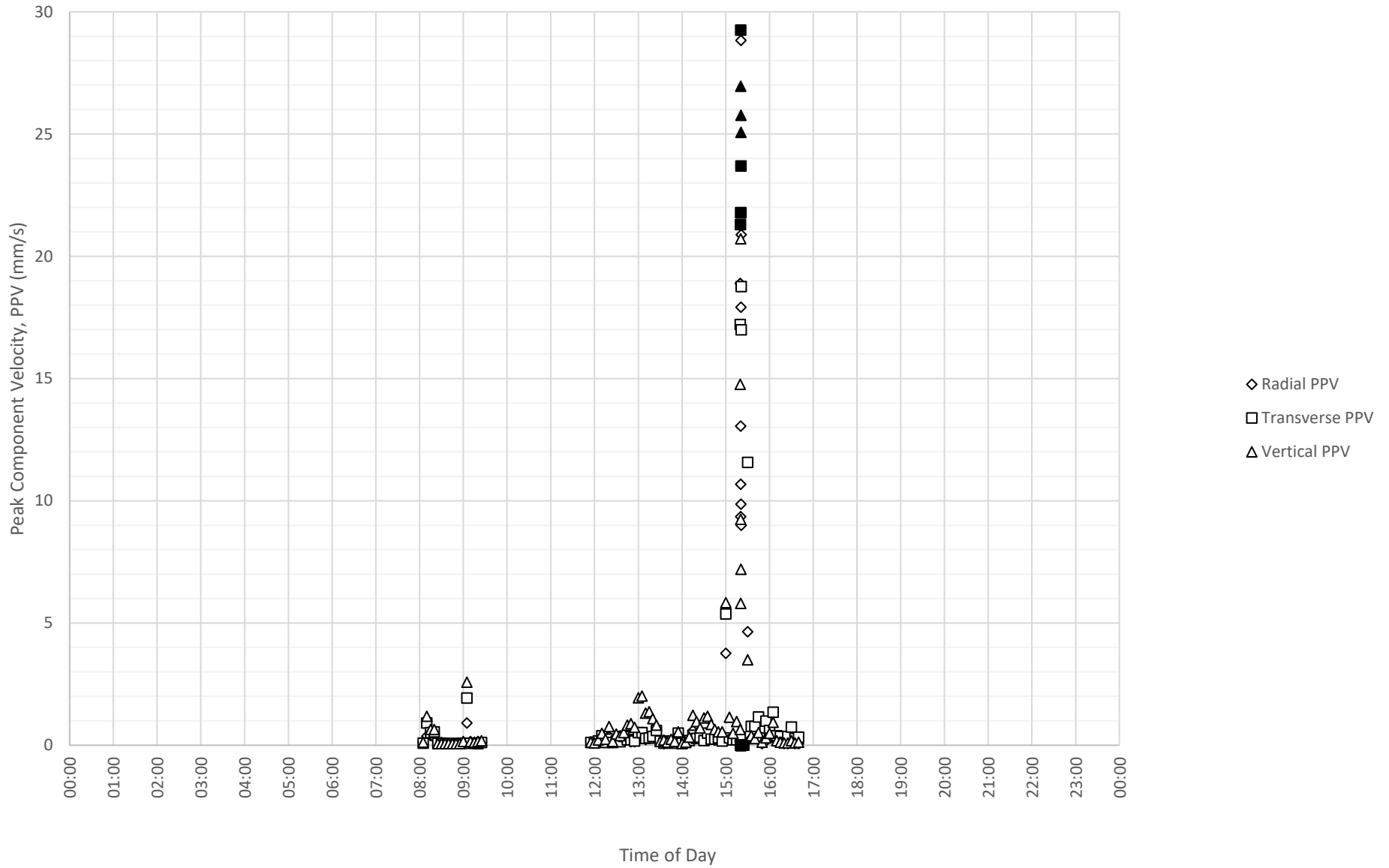
Daily Monitored Vibration Levels at Susan Wakil Health Building on 11-12-2023



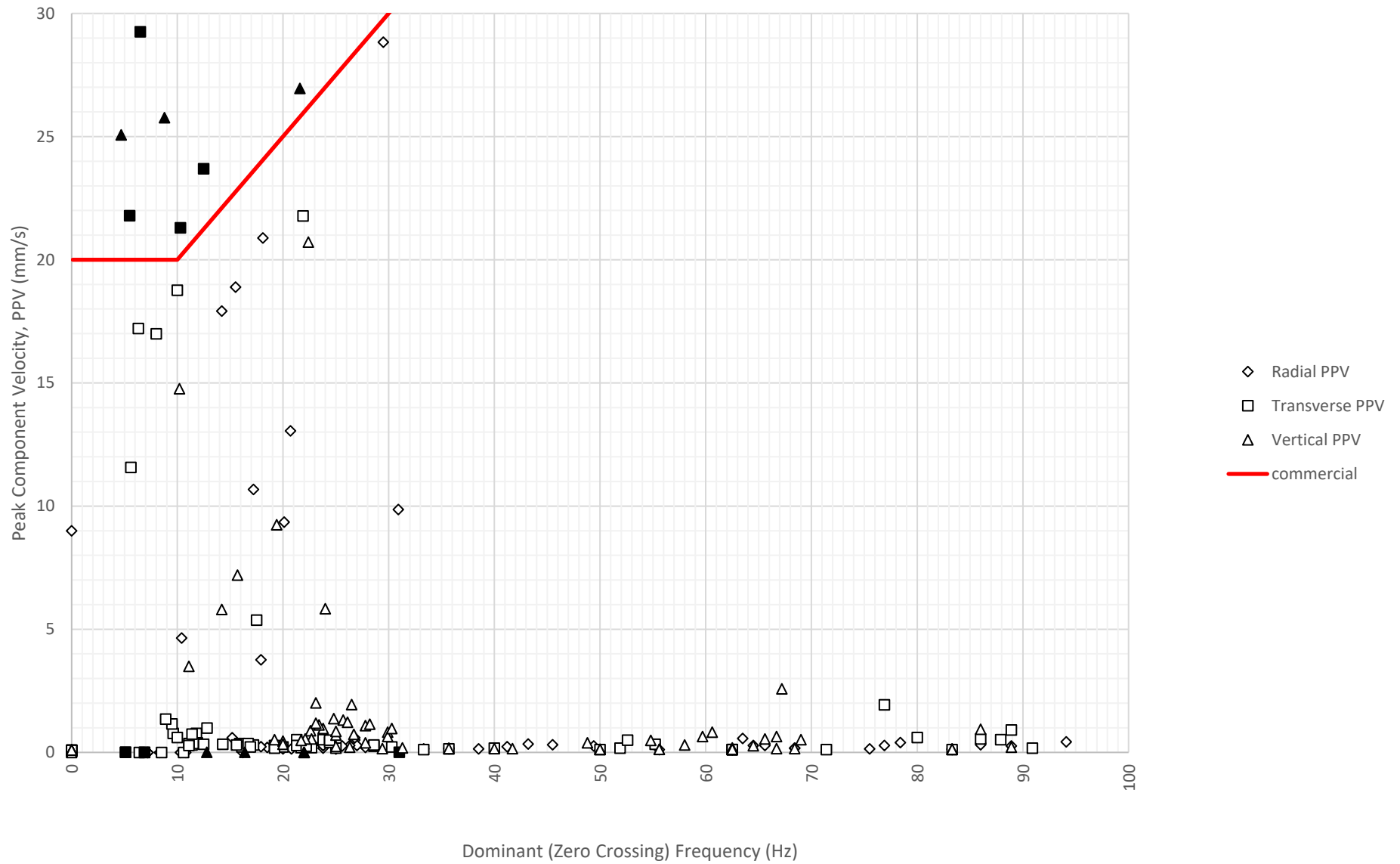
Frequency Content of Vibration Levels at Susan Wakil Health Building on 11-12-2023



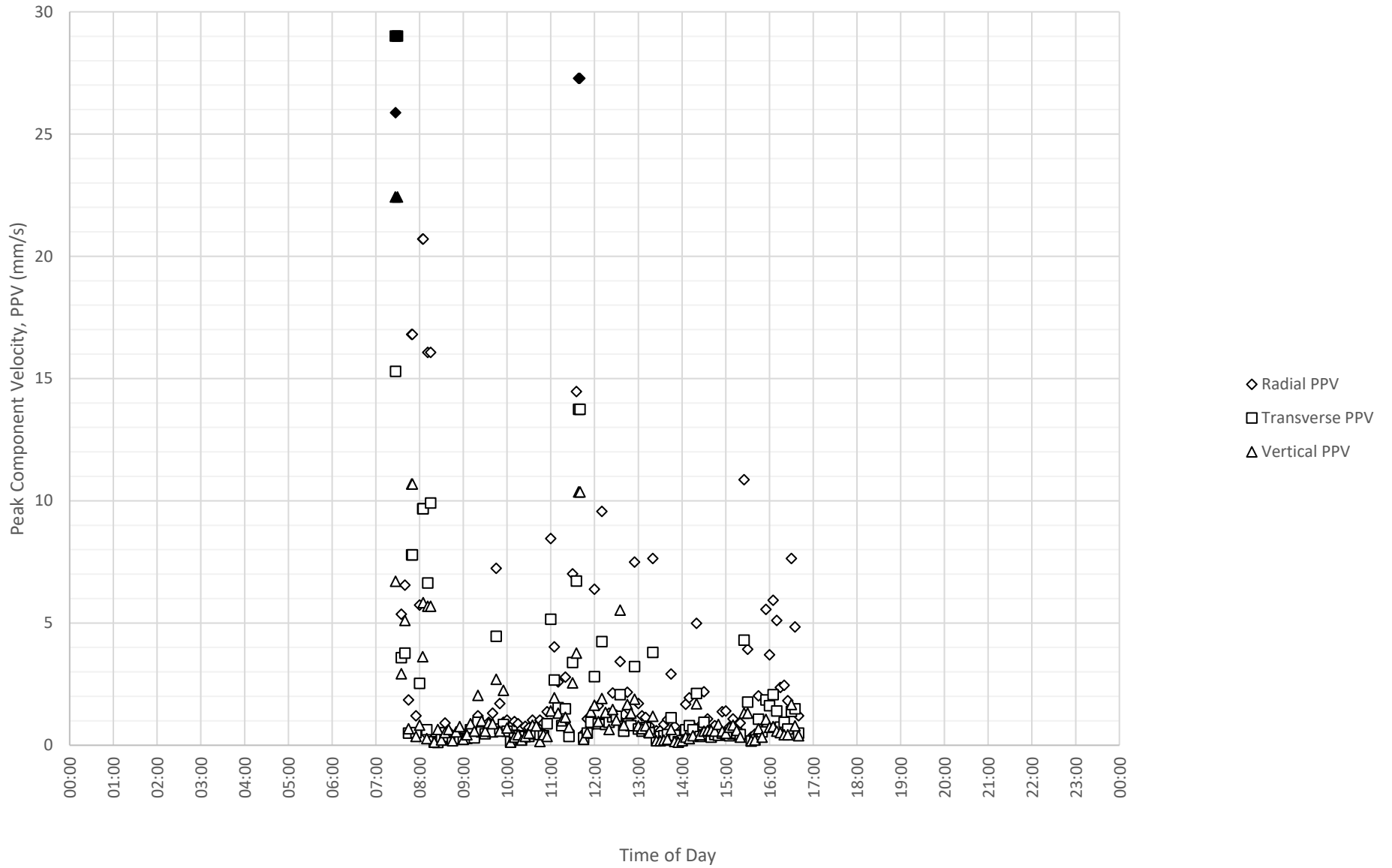
Daily Monitored Vibration Levels at Susan Wakil Health Building on 12-12-2023



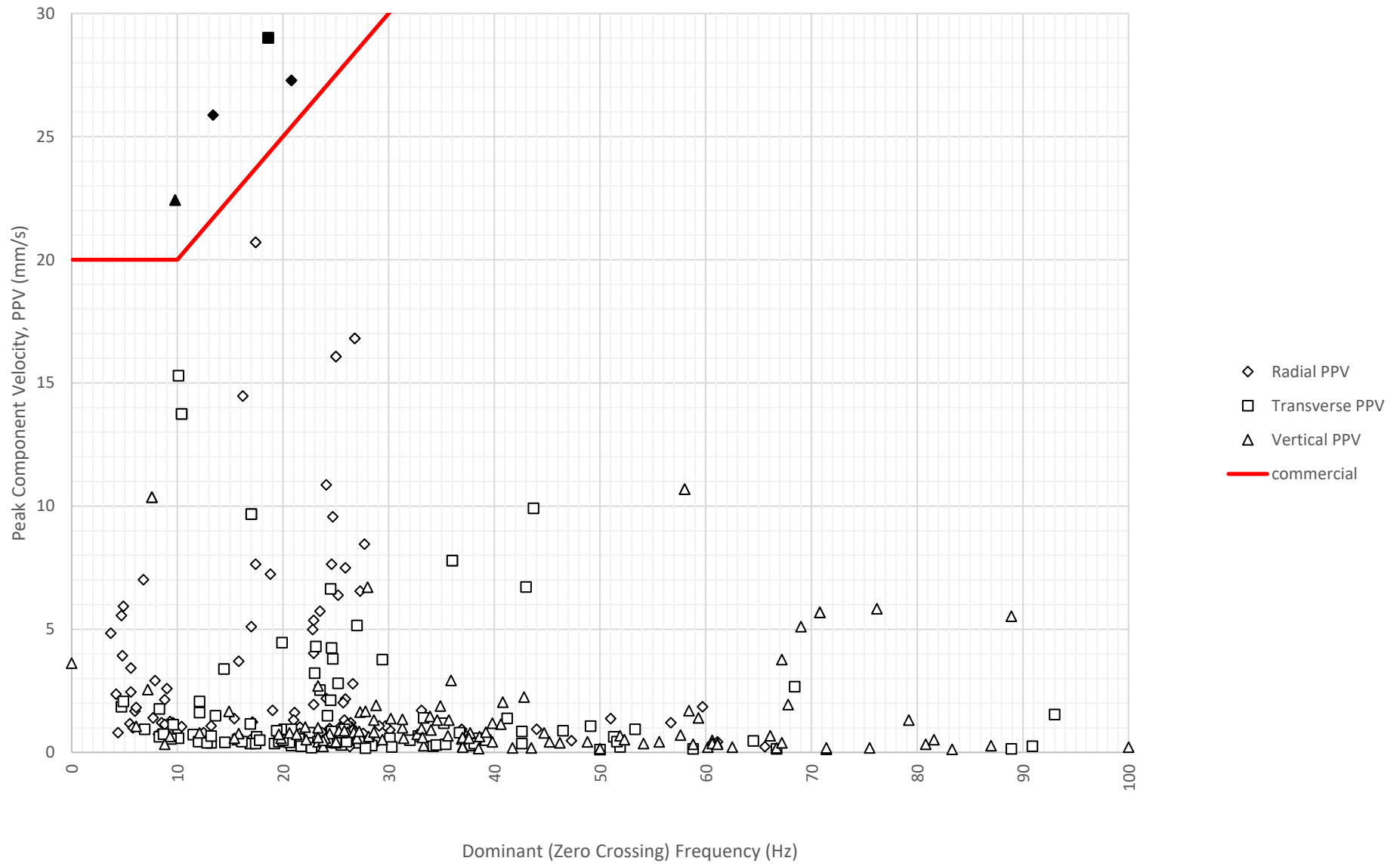
Frequency Content of Vibration Levels at Susan Wakil Health Building on 12-12-2023



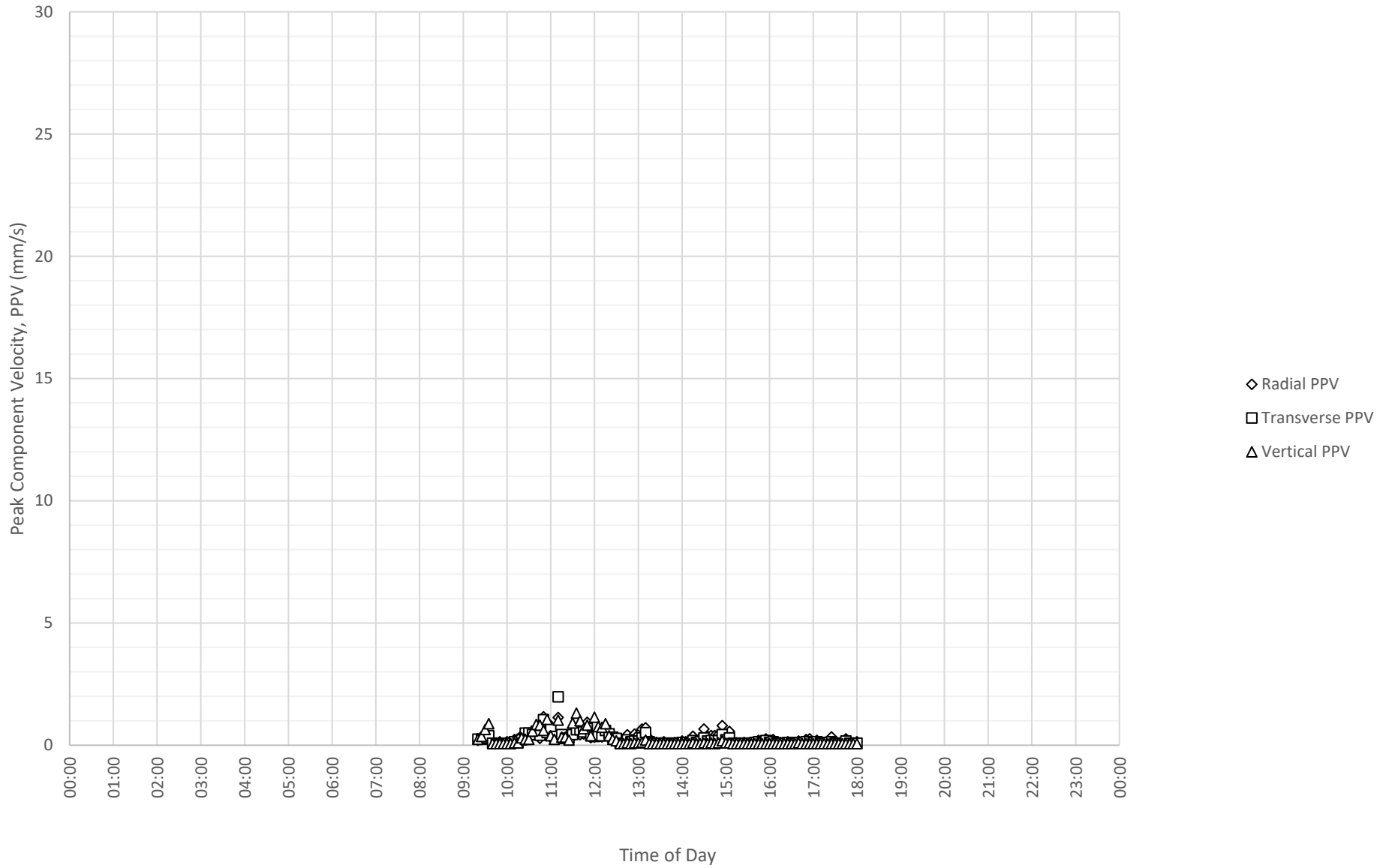
Daily Monitored Vibration Levels at Susan Wakil Health Building on 13-12-2023



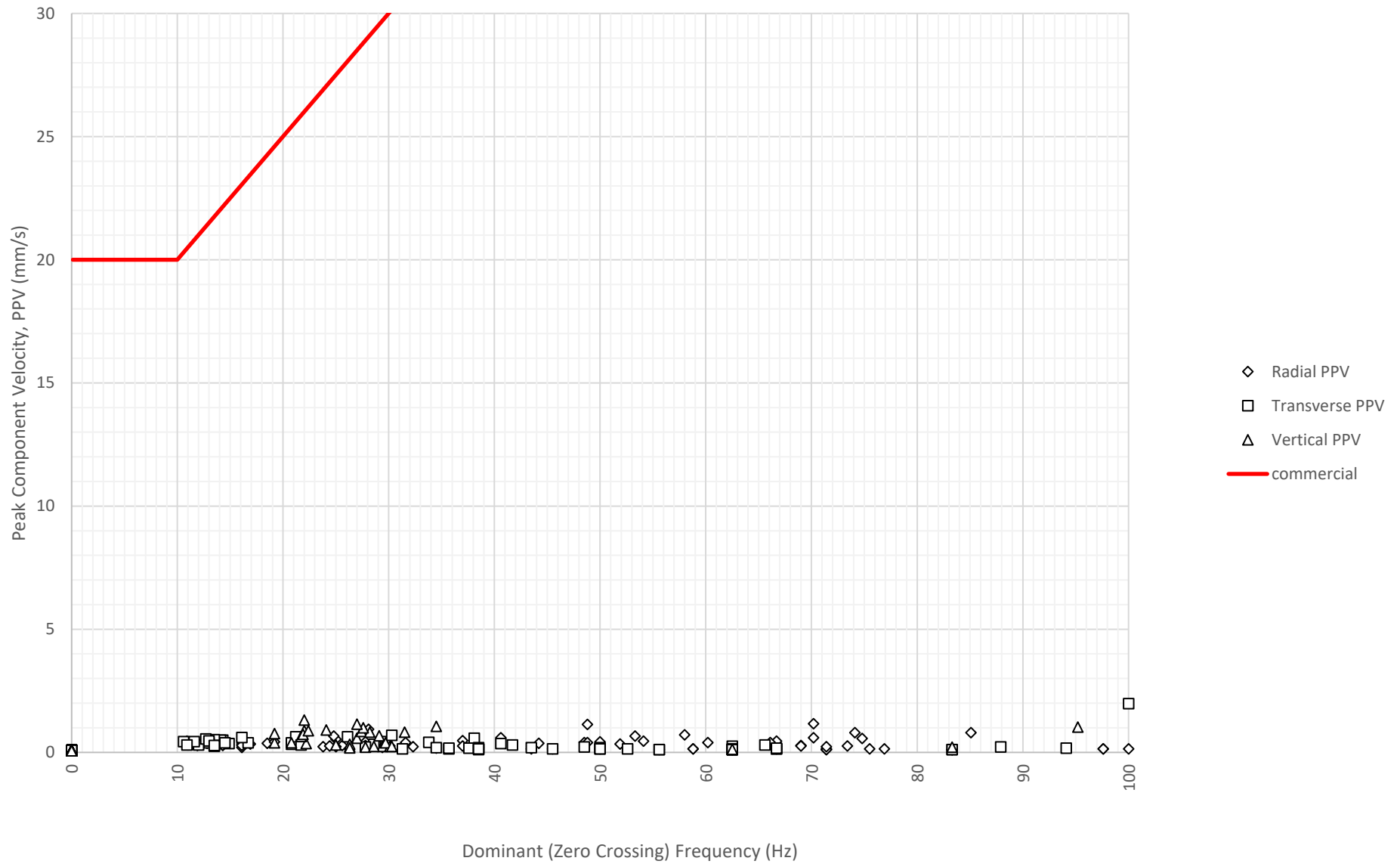
Frequency Content of Vibration Levels at Susan Wakil Health Building on 13-12-2023



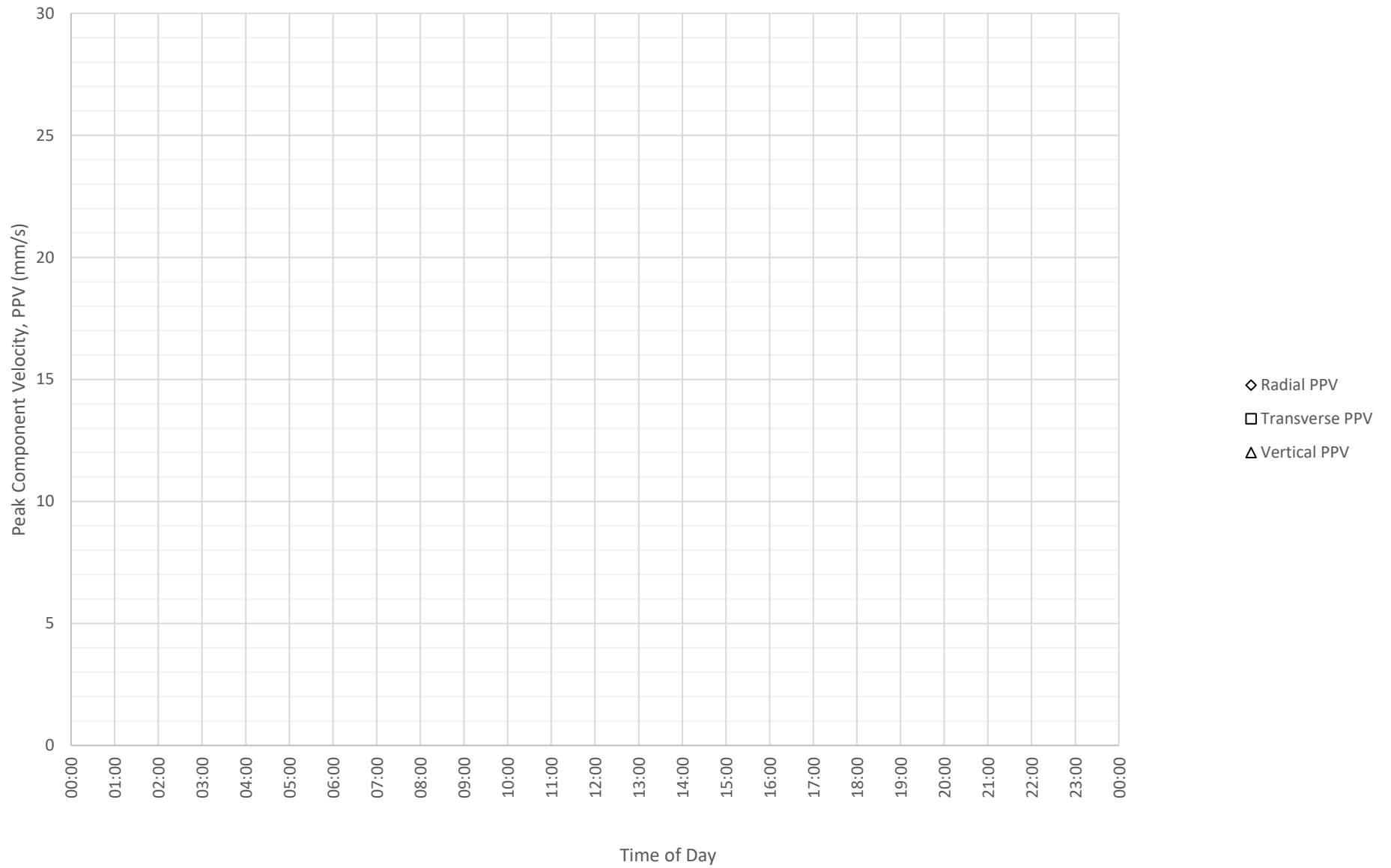
Daily Monitored Vibration Levels at Susan Wakil Health Building on 14-12-2023



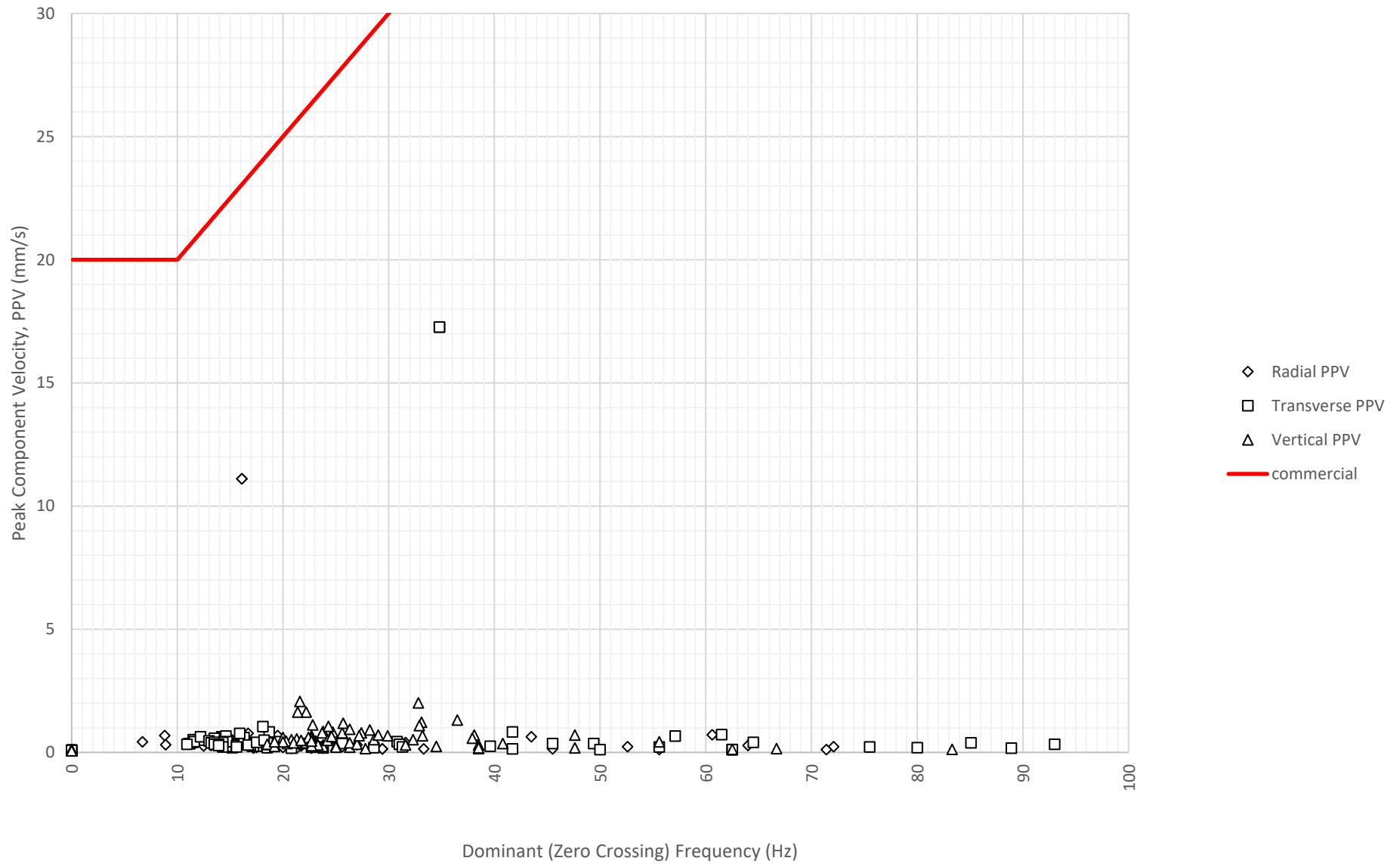
Frequency Content of Vibration Levels at Susan Wakil Health Building on 14-12-2023



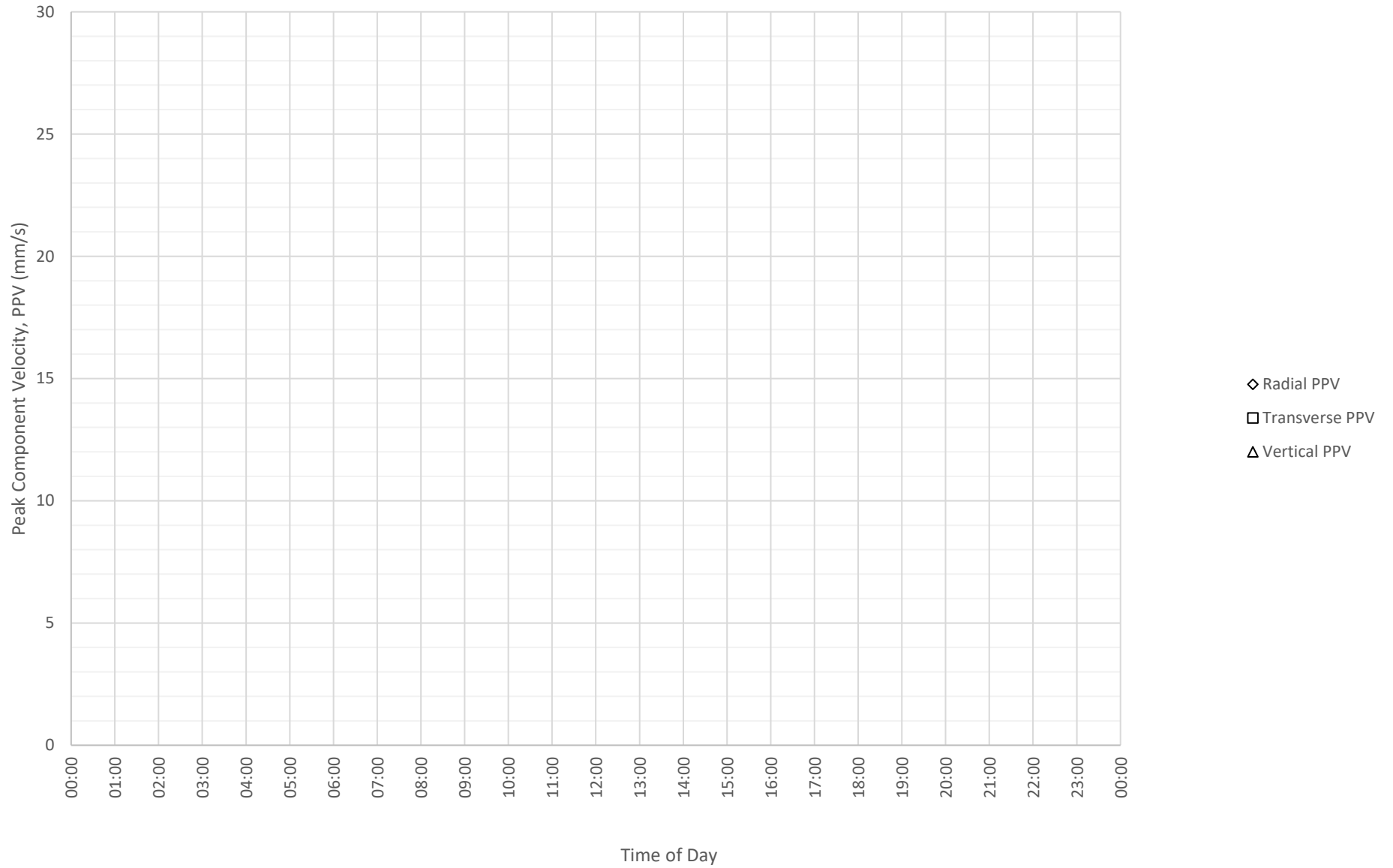
Daily Monitored Vibration Levels at Susan Wakil Health Building on 15-12-2023



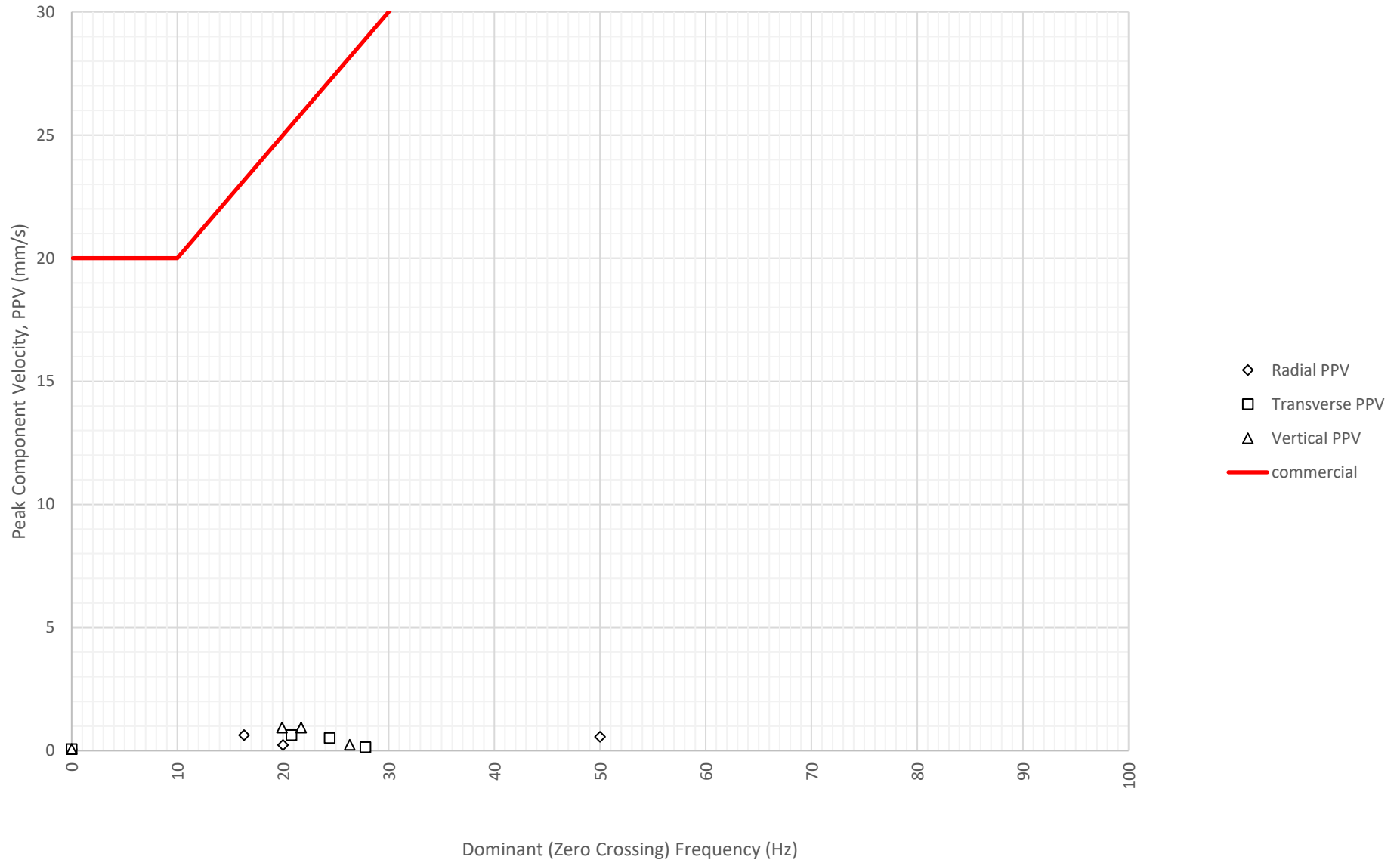
Frequency Content of Vibration Levels at Susan Wakil Health Building on 15-12-2023



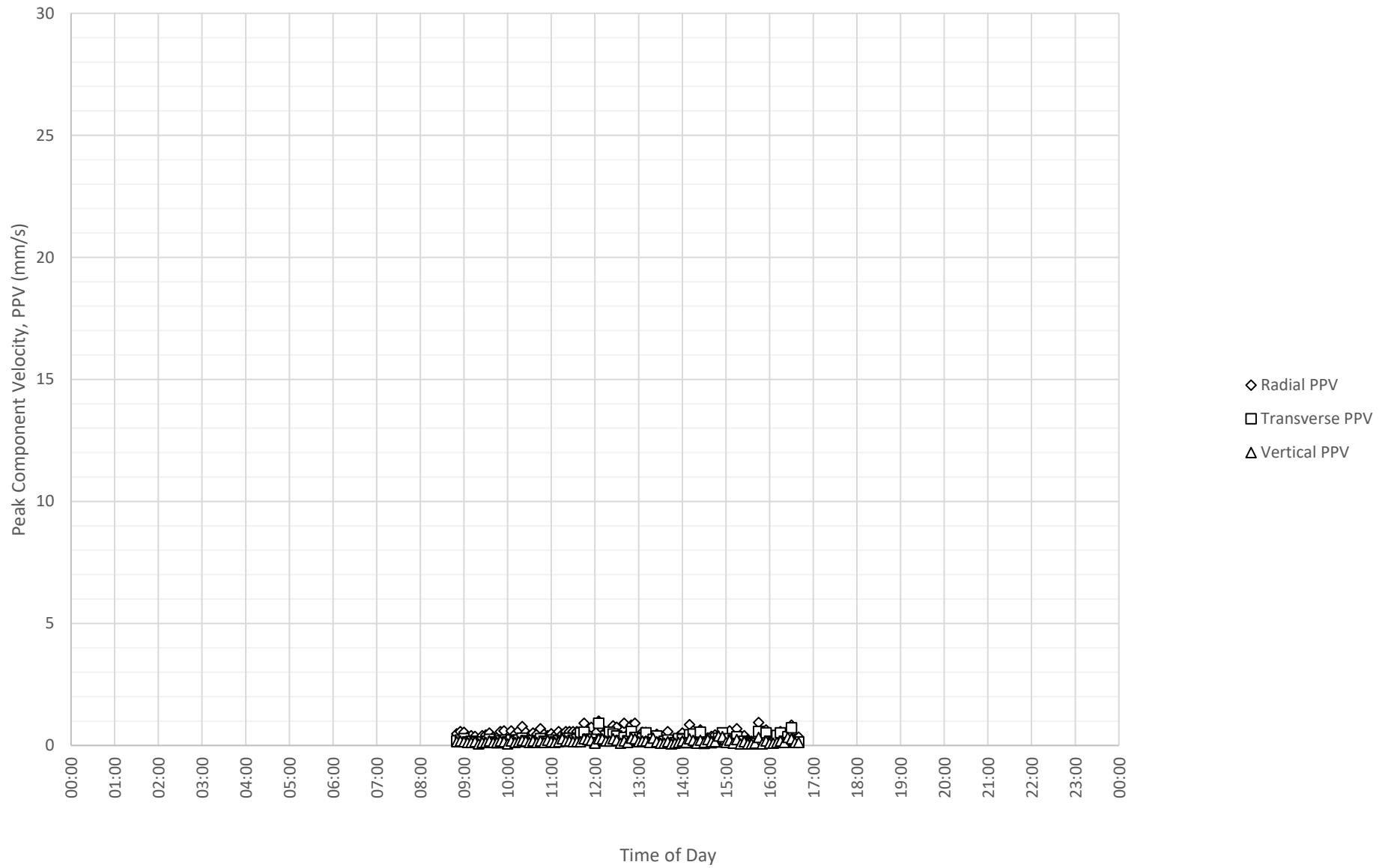
Daily Monitored Vibration Levels at Susan Wakil Health Building on 18-12-2023



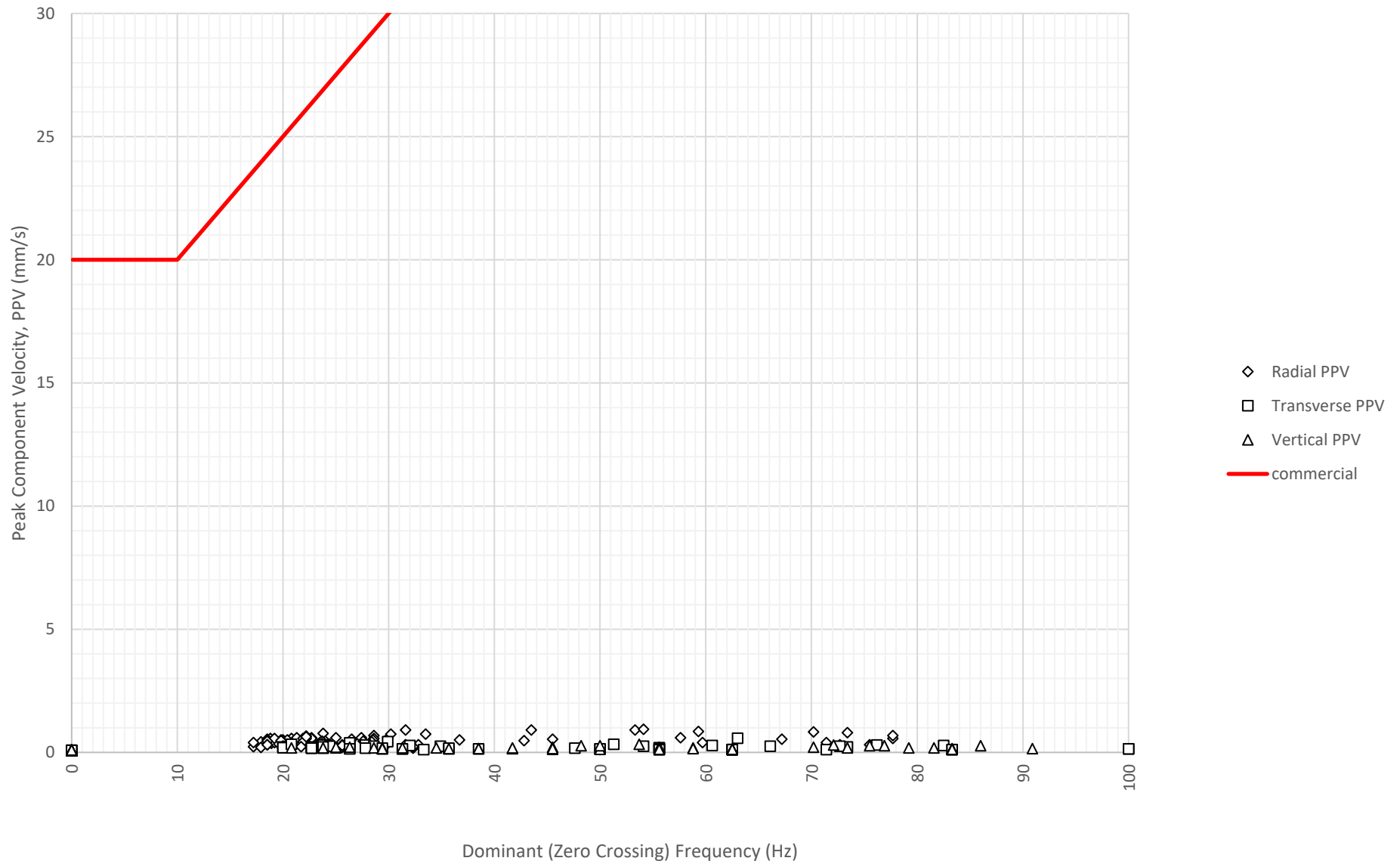
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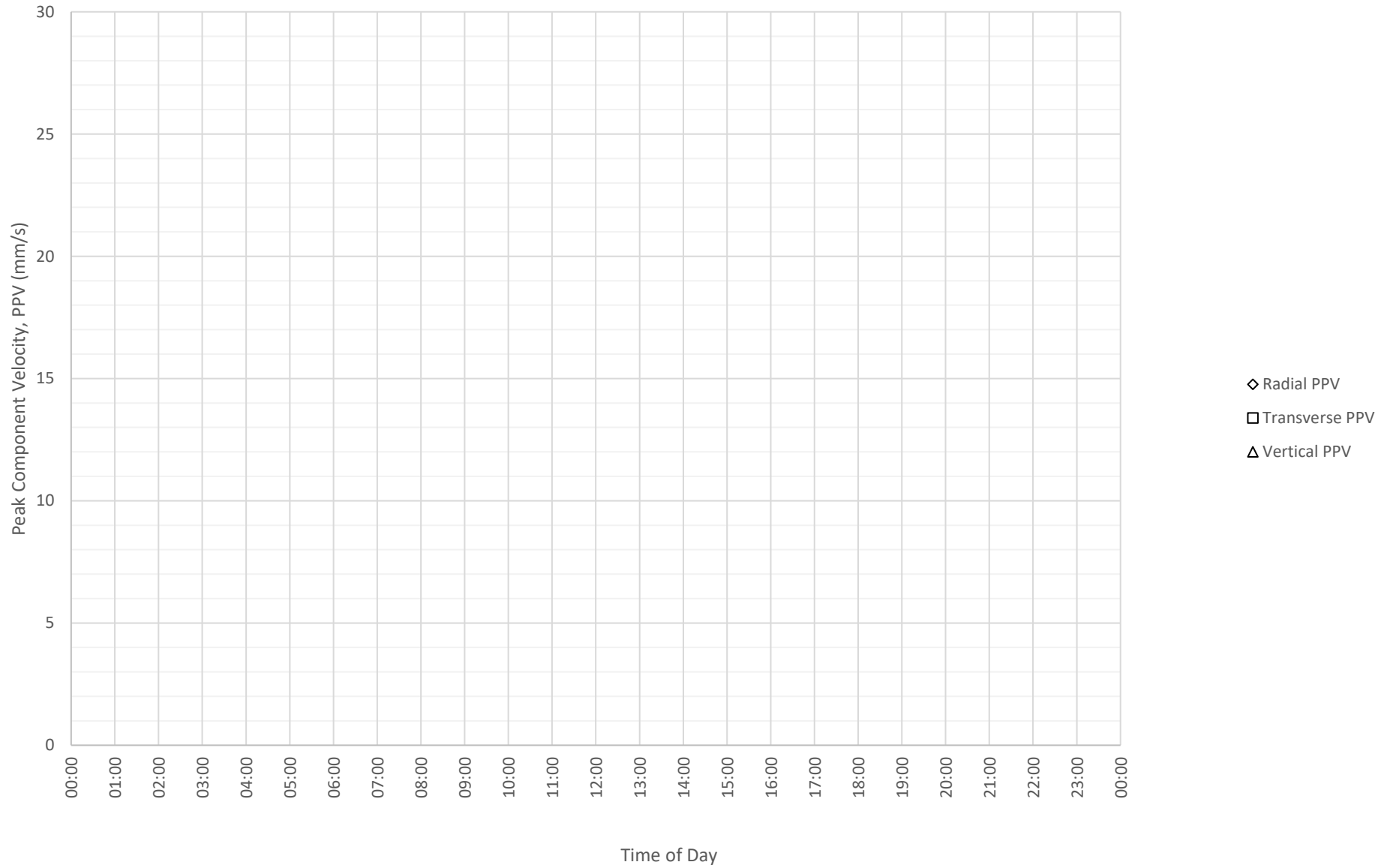
Daily Monitored Vibration Levels at Susan Wakil Health Building on 20-12-2023



Frequency Content of Vibration Levels at Susan Wakil Health Building on 20-12-2023



Daily Monitored Vibration Levels at Susan Wakil Health Building on 21-12-2023



Frequency Content of Vibration Levels at Susan Wakil Health Building on 21-12-2023

