

Royal Prince Alfred Hospital Redevelopment (RPAH  
Redevelopment)

Construction Noise and Vibration Monitoring Report 5

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Attention To	CPB Contractors Pty Limited

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## TABLE OF CONTENTS

1	INTRODUCTION .....	4
2	SITE DESCRIPTION .....	5
3	NOISE AND VIBRATION MANAGEMENT LEVELS.....	6
3.1	NOISE MANAGEMENT LEVELS .....	6
3.2	PROJECT VIBRATION CRITERIA.....	6
4	MONITORING EQUIPMENT AND LOCATIONS .....	7
4.1	NOISE MONITORING EQUIPMENT AND LOCATIONS.....	7
4.2	VIBRATION MONITORING EQUIPMENT AND LOCATIONS.....	7
5	RESULTS .....	8
5.1	NOISE MONITORING RESULTS DISCUSSION .....	8
5.2	VIBRATION MONITORING RESULTS DISCUSSION .....	10
6	CONCLUSION.....	15
	APPENDIX A – NOISE MONITORING RESULTS.....	16
	CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE) .....	16
	OUTSIDE SUSAN WAKIL HEALTH BUILDING .....	17
	APPENDIX B – VIBRATION MONITORING RESULTS.....	18
	CENTENARY INSTITUTE – LEVEL 1 LASER IMAGING ROOM .....	18
	CENTENARY INSTITUTE – LEVEL 3 FISH TANKS .....	19
	CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE) .....	20
	CENTENARY INSTITUTE – LEVEL 4 BATHROOM (NORTHERN FAÇADE) .....	21
	CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN CORRIDOR .....	22
	CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN WING OBSERVATION ROOM E.....	23
	RPA HOSPITAL MAIN BUILDING – LEVEL 03 NICU .....	24
	OUTSIDE SUSAN WAKIL HEALTH BUILDING .....	25

# 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 fifth fortnight since the beginning of construction monitoring, being between Monday 5<sup>th</sup> February, 2024 and Sunday 18<sup>th</sup> February, 2024.

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.

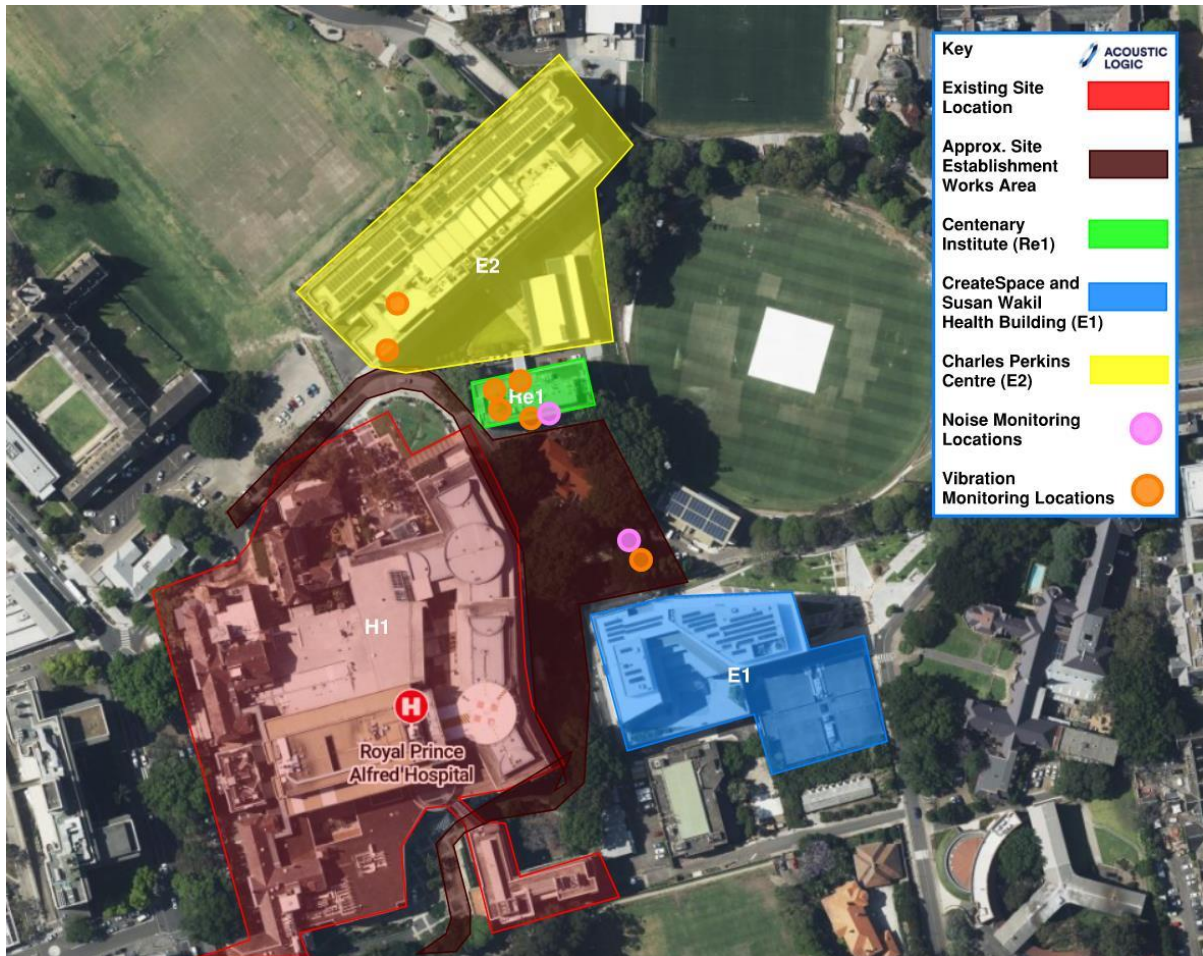
The works maintained within Early Works and Site Establishment pertain specifically to works along Lambie Dew Drive and John Hopkins Drive.

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
H1	RPA Hospital Main Building	Hospital
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 ( $\mu\text{ms}^{-1}$ )
Re1 Centenary Institute	L1 Laser Room	VC-B (ASHRAE Handbook) (25 $\mu\text{ms}^{-1}$ ) RMS Velocity
	L3 Fish Tank Room	400 $\mu\text{ms}^{-1}$ Peak Particle Velocity
	L4 – Animal Behaviour / Holding / Breeding Rooms	VC-A (ASHRAE Handbook) (50 $\mu\text{ms}^{-1}$ ) RMS Velocity
E1 Createspace and Susan Wakil Health Building	All spaces	DIN 4150-3 Type 1 Criteria (20,000 $\mu\text{ms}^{-1}$ / 20 $\text{mms}^{-1}$ ) Peak Particle Velocity
E2 Charles Perkins Centre	Imaging Equipment (Southern Wing Corridor)	VC-B (ASHRAE Handbook) (25 $\mu\text{ms}^{-1}$ ) RMS Velocity
	Animal Behaviour / Holding / Breeding Rooms	100 $\mu\text{ms}^{-1}$ Peak Particle Velocity

H1 RPA Hospital Main Building	Operating Theatres (Level 3)	100 $\mu\text{ms}^{-1}$ RMS Velocity
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## 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, five Bruel and Kjaer Type 4450 Vibration monitors have been installed surrounding the site at the following locations:

- Centenary Institute:
  - Level 1 Laser Imaging Room (Western façade electrical cupboard).
  - Level 4 Surgery (Southern Façade).
  - Level 4 Change Rooms (Northern Façade)
- Charles Perkins Centre Level B1, Southern Wing Corridor.
- RPA Hospital Main Building Level 3 NICU.

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 where exceedances occurred during 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.

#### For the Operating Room

- Measured noise levels were observed to be above the operating room noise management level on the following dates during periods of construction:
  - 05/02/2024.
  - 06/02/2024.
  - 07/02/2024.
  - 12/02/2024.
  - 14/02/2024.
  - 16/02/2024.
- Generally, measured noise levels above the noise management levels within the operating room were observed for short periods of time before returning to below the noise management level ( $\leq$  30 min). Within the monitoring period, there are three sustained periods of noise above the NML for longer than this that may have been caused by construction activity (45 mins, 1 hour, and 1 hour 15 min respectively).
- Investigation with respect to positioning of the NDD truck has been undertaken in order to reduce the noise levels measured within the Surgery Room. Relocation of the truck to an alternative location of the worksite resulted in lower noise levels being experienced at the Centenary Institute.
- Noise levels are continuing to be observed and monitored to ensure ongoing adherence with the requirements of Section 3.1.



### For the Holding, Breeding and Observation Rooms

- Measured noise levels were observed to be above the holding, breeding, and observation rooms noise management level on 06/02/2024.
- Noise levels were observed to be marginally above the noise management level ( $\leq 2$ dB), and were measured for a period of 45 min before returning to being below the noise management level.
- Acoustic Logic note that these measured noise levels are not indicative of construction noise due to the resultant noise levels, in conjunction with the short period of measurement when compared to levels surrounding the period, and are therefore more so representative of operational activity within the room with the monitor.
- Measured noise levels are maintained below the noise management levels for the remainder of the available data within the monitoring period.

### For the Susan Wakil Health Building

- The monitor located outside of the Susan Wakil Health Building is within the demolition site boundary and approximately 15m closer to the area of the works than the façade of the Susan Wakil Health Building.
- Noting this increased distance attenuation, in conjunction with the transmission loss experienced through the inoperable façade of the Susan Wakil Health Building when comparing internal and external noise levels, Acoustic Logic expect that, at minimum, there is a 30dB reduction between the measured noise levels by the monitor, when compared with the resultant internal noise levels within the receiver.
- This reduction is considered conservative due to the distance between the monitor and the building, and hence, the noise impacts would be further reduced than what is outlined below in reality.
- Notwithstanding, and based on this reduction, measured noise levels which have been attributed to construction activity were observed to be above the noise management level on the following dates:
  - 05/02/2024.
  - 07/02/2024.
  - 12/02/2024.
  - 13/02/2024.
  - 15/02/2024.
  - 16/02/2024.
- Generally, noise levels were observed to be above noise management levels for short periods ( $\leq 1$  hour) before reducing to be in line with internal noise objectives.
- Noise levels impacting Susan Wakil will be continued to be monitored throughout the early works construction to assess the impact of this receiver.

## 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.
- Data has only been provided for days in which exceedances attributed to vibration works have been experienced at the monitoring station.
- The following matrix presents the dates and times within the monitoring period whereby exceedances have been recorded concurrently by multiple monitoring stations surrounding the construction area. Note that the vibration monitor at Susan Wakil Health Building has been excluded from the matrix, due to the much higher vibration criteria when compared with all other vibration monitoring locations:

**Table 4 – Measured Correlated Vibration Exceedances**

Date of Correlated Exceedance Event	Time of Correlated Exceedance Event	Measured Maximum Exceedance?							
		Centenary Institute				Charles Perkins Centre		RPA Hospital Main Building	
		L1 Laser Room (Electrical Cupborad)	L3 Fish Tanks	L4 Surgery (South)	L4 Bathroom (North)	Southern Wing Corridor (Imaging)	Southern Wing Observation Room E (Animals)	NICU	
06/02/2024	9.05am	29µms <sup>-1</sup> @ 20Hz*	No	No	No	31 µms <sup>-1</sup> @ 20Hz	No	No	
09/02/2024	2.22pm	85µms <sup>-1</sup> @ 25Hz				95µms <sup>-1</sup> @ 31.5Hz			
12/02/2024	9:03am	75µms <sup>-1</sup> @ 25Hz				26 µms <sup>-1</sup> @ 20Hz*			
	2.35pm	73µms <sup>-1</sup> @ 12.5Hz				27 µms <sup>-1</sup> @ 20Hz*			
13/02/2024	7.29am	63µms <sup>-1</sup> @ 31.5Hz				40 µms <sup>-1</sup> @ 12.5Hz			
	1.51pm	86µms <sup>-1</sup> @ 40Hz				26 µms <sup>-1</sup> @ 20Hz*			
14/02/2024	12.35pm	60µms <sup>-1</sup> @ 20Hz				26 µms <sup>-1</sup> @ 20Hz*			
16/02/2024	11.57pm	31µms <sup>-1</sup> @ 20Hz				No			125 µms <sup>-1</sup> @ 20Hz
	12.35pm	79µms <sup>-1</sup> @ 25Hz				35 µms <sup>-1</sup> @ 20Hz			108 µms <sup>-1</sup> @ 20Hz*
	1.47pm	33µms <sup>-1</sup> @ 20Hz				No			142 µms <sup>-1</sup> @ 20Hz
	2.15pm	37µms <sup>-1</sup> @ 20Hz	27 µms <sup>-1</sup> @ 20Hz*	No					

\*This measured level considered to be a marginal exceedance of criteria (≤20% above criteria at respective frequency).

- Incidents which are shown to result in exceedances of criteria at multiple monitoring locations currently would be considered to be caused by extraneous vibration generating activity, such as construction works.
- Through correlating exceedance events and the construction activity on site, it was established during this monitoring period that the tracking of an excavator on the suspended slab of pathology was resulting in exceedances within the L1 Laser room within CPC.
- Alternative construction methodologies have been explored, and reductions in generated vibration levels have been observed since this alternative construction methodology has been implemented.
- In conjunction to the above dates, the following dates have had exceedances observed at individual monitoring locations:
- Centenary Institute:
  - Level 1 – Laser Imaging Room (Electrical Cupboard):
    - Supplementary to the measurements presented within Table 4, exceedances of L1 VC-B criteria which display characteristics consistent with construction activity were observed at the monitoring station on the following dates:
      - 05/02/2024 – 9.00am.
      - 06/02/2024 – 12.00pm, 4.30pm.
      - 07/02/2024 – 9.30am, 5.00pm.
      - 09/02/2024 – 10.15am.
      - 12/02/2024 – 4.00pm.
      - 16/02/2024 – 10.30am.
    - Acoustic Logic note that works were undertaken within the electrical cupboard during the morning of the 16/02 (Up to 7.30am) and measured exceedances are not reflective of construction impacts.
    - Exceedances due to construction activity are generally observed to result at up to a maximum of 200% of the VC-B criteria at a given frequency (Approximately measured at  $75\mu\text{ms}^{-1}$ ). The maximum level measured during the monitoring period attributed to construction activity was  $95\mu\text{ms}^{-1}$  at 31.5Hz on 09/02/2024.
    - With regards to the vibration impacts on this area, we note the following:
      - Precision imaging equipment such as the laser scanning apparatus investigated by this monitoring station are impacted by vibration through impacts on output results.
      - This would hence be observed by operators of the equipment, whereby the system would not be operating correctly/results of the system would be impacted.
      - To the knowledge of this office, no impacts on the results output of the equipment have been reported by Centenary Institute throughout the early works construction period.
      - Further, and based upon onsite inspections and testing, AL note that the Laser room is subject to various sources of ambient vibration from the operation of the facility which contribute to the levels measured during construction, inclusive of refrigerant plant maintained within the basement of the facility.
      - Where any changes to the operation / results of the laser scanning apparatus are observed by the operators of the equipment, this is to be relayed to this office

for investigation and alignment with construction activity to appropriately assess and mitigate impacts.

- Level 3 – Fish Tanks:
  - No exceedances of criteria were observed within the monitoring period which have been attributed to construction activity.
  - The geophone was relocated by staff of the Centenary Institute on 08/02 at approximately 3.30pm, and re-installed by this office on the 09/02, resulting in spikes within the measured levels.
  - Further, the Fish Tank area was flooded on 12/02 night / 13/02 morning and the monitor had to be removed from site to be dried and re-calibrated. The fish tank area flooding is due to a safety mechanism within the tank apparatus and was not a result of any construction impacts.
  - Hence, no data was collated for the remainder of the monitoring period, and the monitor was re-installed on the 19/02.
- Level 4 – Surgery Room (Southern Façade) and Bathroom (Northern Façade):
  - Two individual exceedances were measured by these monitors during the monitoring period, specifically on 13/02 at 12.30pm within the Surgery Room, and 14/02 at 3.00pm in the bathroom respectively.
  - Neither of these exceedance events correlated with triggered events on any of the other monitors surrounding the site and are hence unlikely to be caused by construction activity.
  - Further, both of the measured exceedances were marginal, whereby  $51 \mu\text{ms}^{-1}$  was measured within the surgery room and  $59 \mu\text{ms}^{-1}$  was measured within the bathroom.
  - Based on this, the measured levels on Level 4 during the monitoring period are considered acceptable.
- Charles Perkins Centre:
  - Southern Corridor (Imaging):
    - Supplementary to the measurements presented within Table 4, exceedances of B2 VC-B criteria which display characteristics consistent with construction activity were observed at the monitoring station on the following dates:
      - 05/02/2024 – 7.30am, 9.00am.
      - 08/02/2024 – 10.00am, 11.00am.
      - 13/02/2024 – 9.45am, 5.15pm.
      - 14/02/2024 – 10.30am, 12.00pm, 1.30pm.
      - 15/02/2024 – 12.30pm, 1.15pm.
    - Exceedances due to construction activity are generally observed to result at up to a maximum of 200% of the VC-B criteria at a given frequency (Approximately measured at  $75 \mu\text{ms}^{-1}$ ). The maximum level measured during the monitoring period was  $78 \mu\text{ms}^{-1}$  at 12.5Hz on 09/02/2024.
    - Exceedances are generally observed at 12.5Hz, likely to be the natural frequency of the CPC suspended slab. Exceedances at frequencies exclusive of 12.5Hz and 20Hz are rarely observed.

- With regards to the monitoring period within the CPC Basement, we note the following:
    - For most of the observed exceedances throughout the monitoring period, measured levels within the CPC basement southern wing exceed those measured by the monitors within Centenary Institute, noting that many non-marginal exceedances of criteria within the CPC B2 Southern Corridor occur at times where no trigger is observed within the Centenary Institute monitors.
    - Many of the correlated events within the period result in marginal exceedances of vibration criteria within CPC. There is only one event within the monitoring period (09/02 at 2.22pm) whereby there was a correlated exceedance that was measured to be higher at CPC than at Centenary Institute.
    - Throughout the monitoring period, works have been generally restricted to two main areas:
      - Demolition within the pathology demolition area, and
      - Detailed excavation undertaken within the park to the north of the labour ward at the existing hospital.
    - It is expected that any works undertaken within the pathology demolition area would be measured to be higher at monitors installed within Centenary Institute than at CPC, noting that these works are being undertaken close to the Centenary boundary.
    - Whilst works maintained within the park north of the labour ward are closer to CPC (Approx. 25m away) than Centenary L1 (Approx. 40m away,) Detailed excavation is generally not considered to be high vibration generating work, and due to the distance between the works and receiver, as well as the construction methodologies employed on site, are not expected to result in repeated exceedances as observed within the results.
    - Whilst B2 is maintained on suspended slab, it is possible that very significant amplification of the vibration impacts from these works is occurring and resulting in exceedances at the monitoring location.
    - However, it is unlikely that the spikes within measured levels would only be observed within the results of the CPC Imaging monitor, and not within the Centenary Institute L1 Laser room monitor.
    - Also, it is prudent to note that CPC is undergoing a façade refurbishment exclusive to the scope of the construction activity assessed within this report, and it is likely that these works attributed to some of the exceedances observed throughout the period.
  - Observation Room E:
    - No exceedances of the relevant vibration criteria were observed during the monitoring period.
    - Note that as per correspondence on 22/02 between CPC and AL, vibration criteria will be increased to VC-A criteria ( $50 \mu\text{s}^{-1}$ ) in subsequent assessment.

- RPA Hospital Main Building:
  - Level 03 NICU:
    - Supplementary to the measurements presented within Table 4, exceedances of L3 VC-A criteria which display characteristics consistent with construction activity were observed at the monitoring station on 14/02/2024 (once) and 16/02/2024 (twice) at 11.15am, 12.00pm and 2.30pm respectively.
    - Exceedances due to construction activity are generally observed to result at up to a maximum of 45% of the criteria at a given frequency (Approximately measured at  $145\mu\text{ms}^{-1}$ ). The maximum level measured during the monitoring period was  $147\mu\text{ms}^{-1}$  at 20Hz on 14/02/2024.
    - Exceedances were correlated to sawcutting and excavator activity at the boundary of the hospital, and this is continuing to be monitored throughout the demolition period.
- Susan Wakil Health Building:
  - No exceedances of the relevant imposed vibration 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 Monday 5<sup>th</sup> February, 2024 and Sunday 18<sup>th</sup> February, 2024.

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

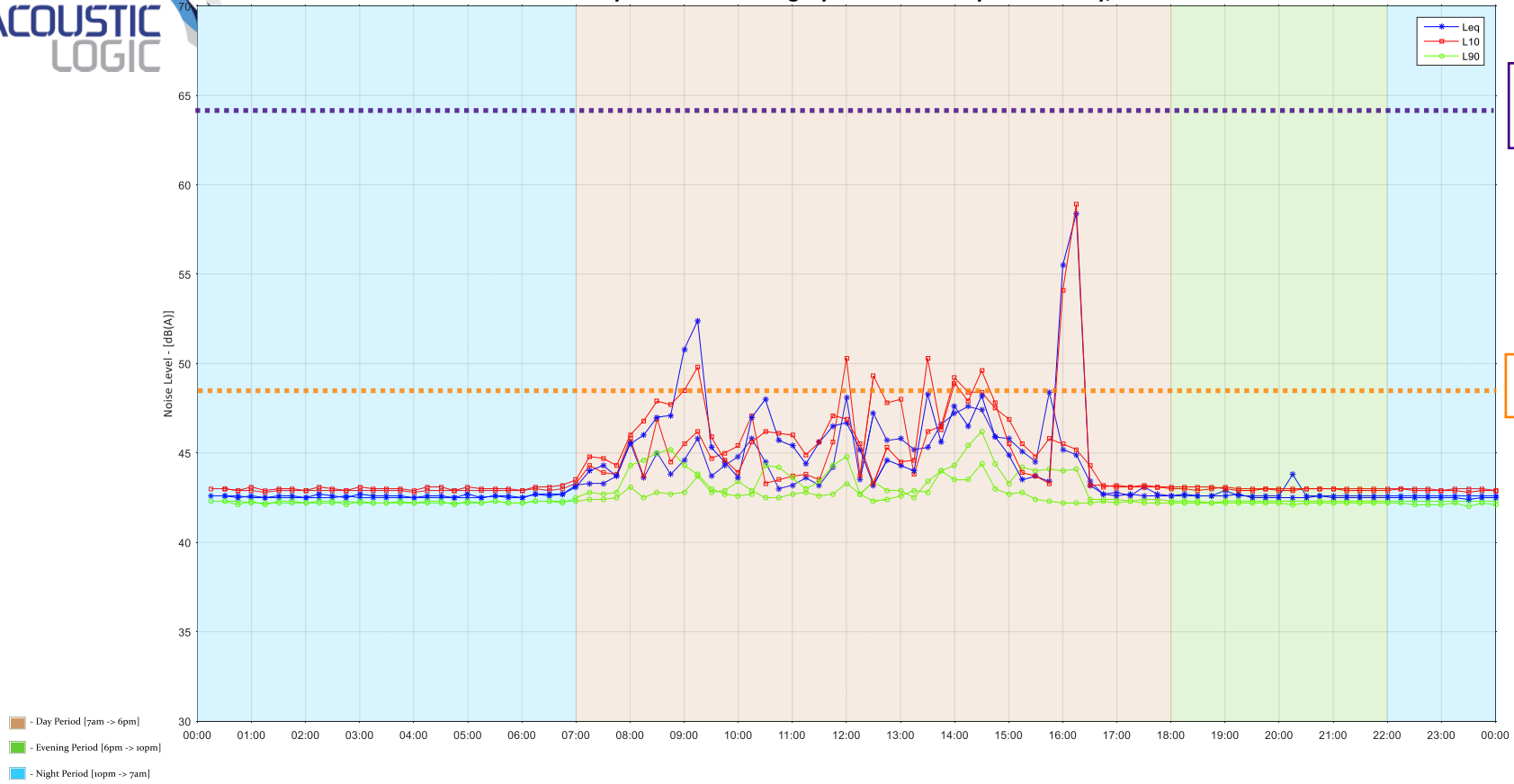
## **APPENDIX A – NOISE MONITORING RESULTS**

### **CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE)**





### Centenary Institute - L4 Surgery Room: Monday 05 February, 2024

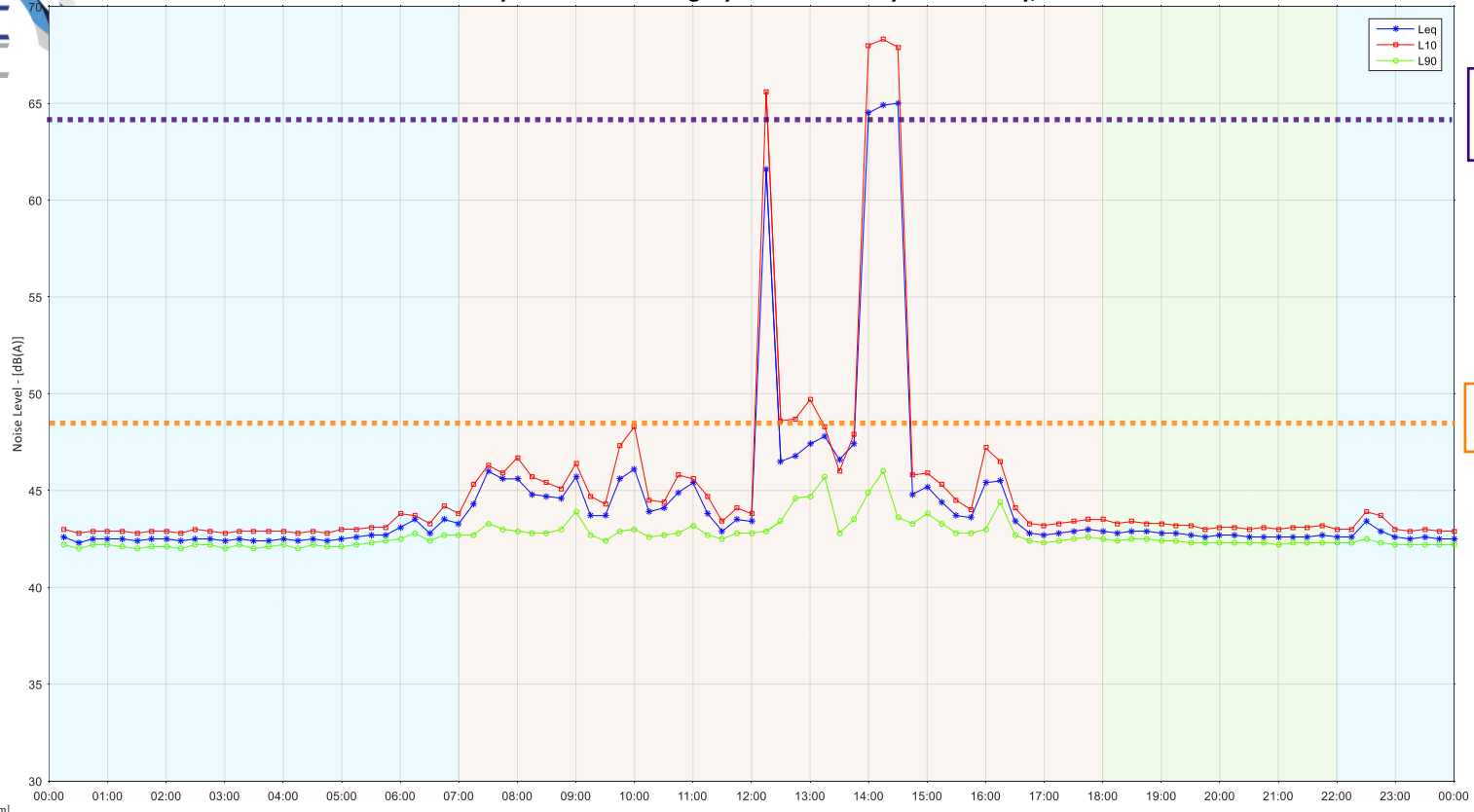


Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$



### Centenary Institute - L4 Surgery Room: Tuesday 06 February, 2024



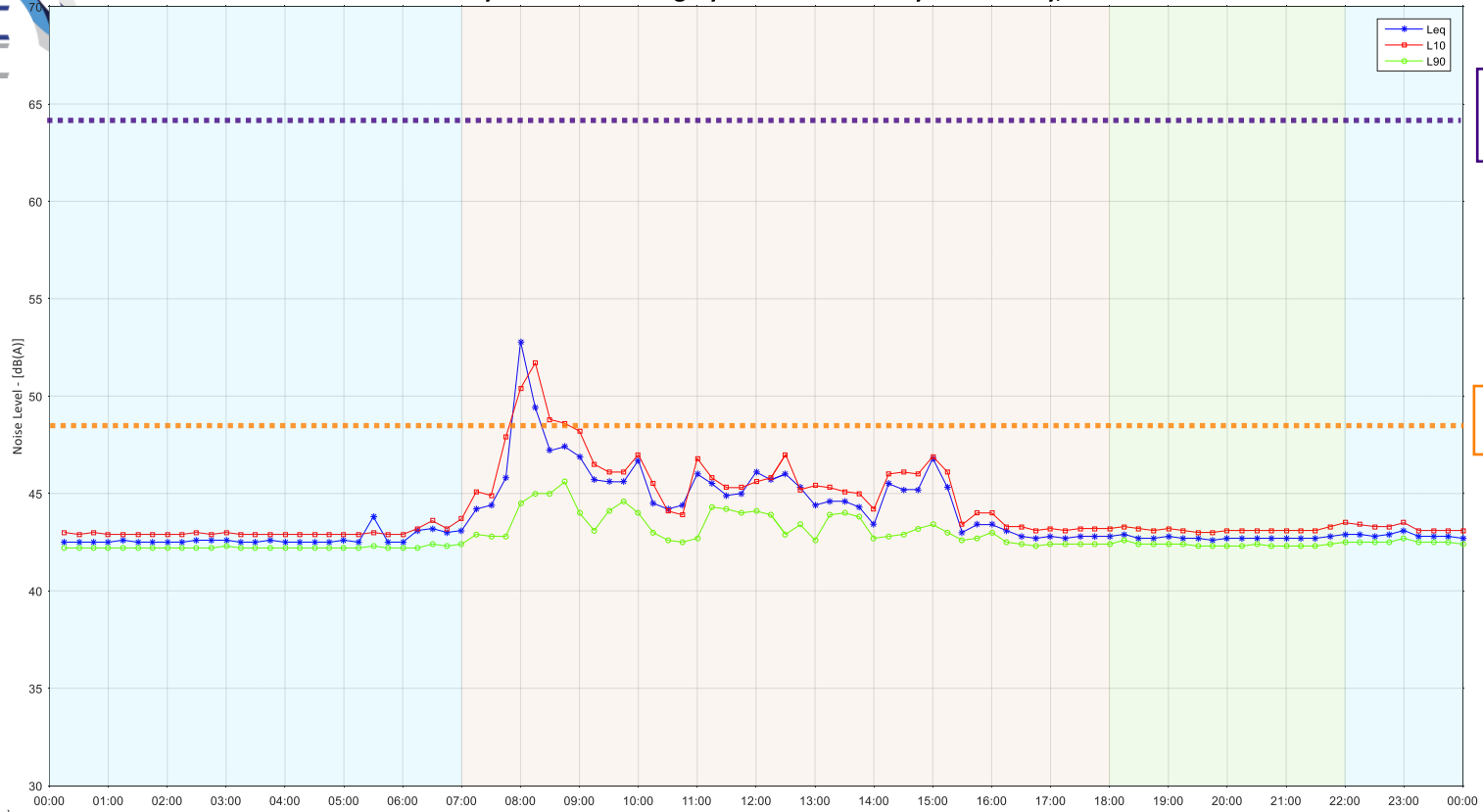
**Animal Housing / Breeding / Observation Room NML**  
≤ 64dB(A)<sub>L<sub>eq</sub></sub>

**Animal Operating Room NML**  
≤ 48dB(A)<sub>L<sub>eq</sub></sub>

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]



### Centenary Institute - L4 Surgery Room: Wednesday 07 February, 2024



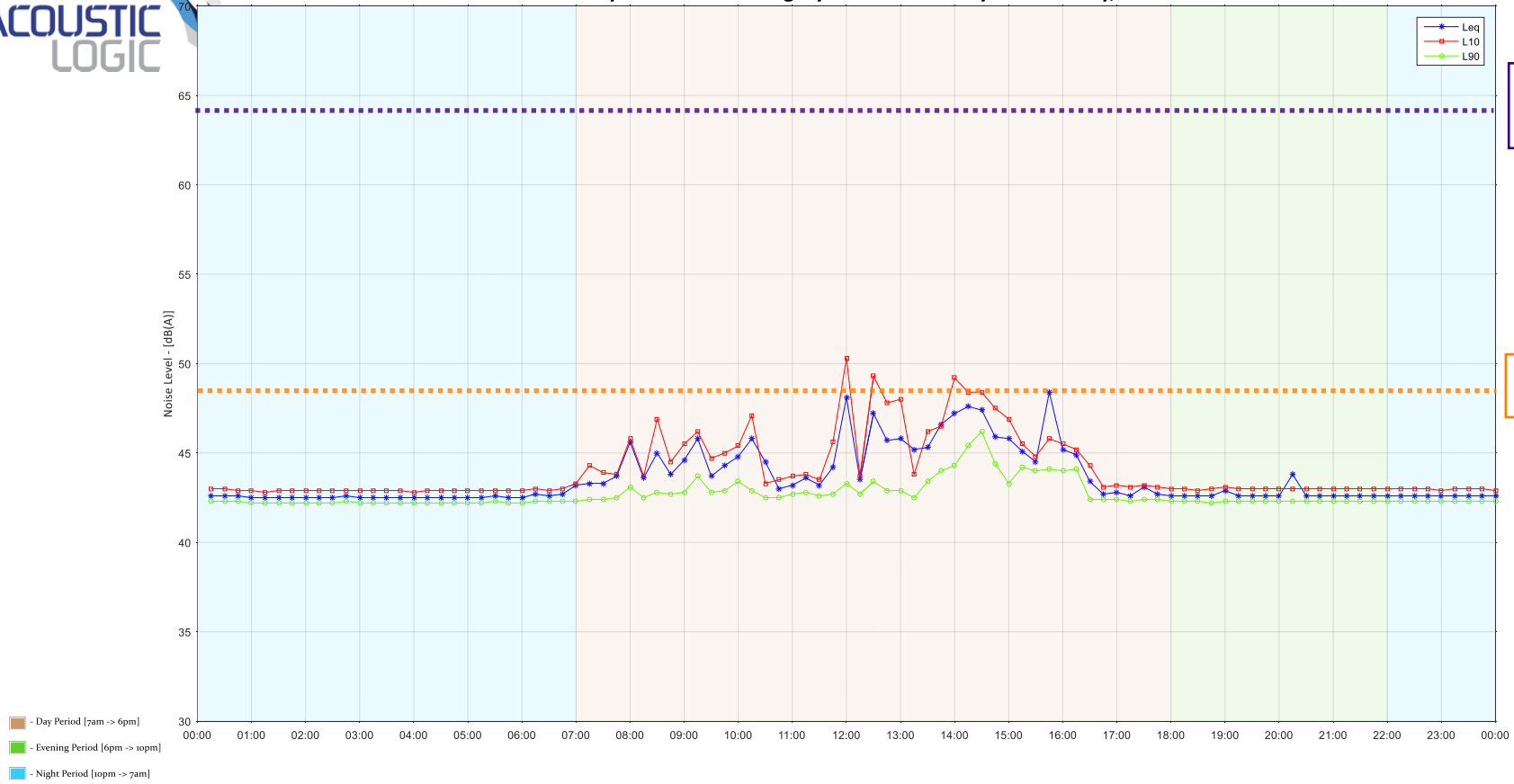
Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]



### Centenary Institute - L4 Surgery Room: Thursday 08 February, 2024

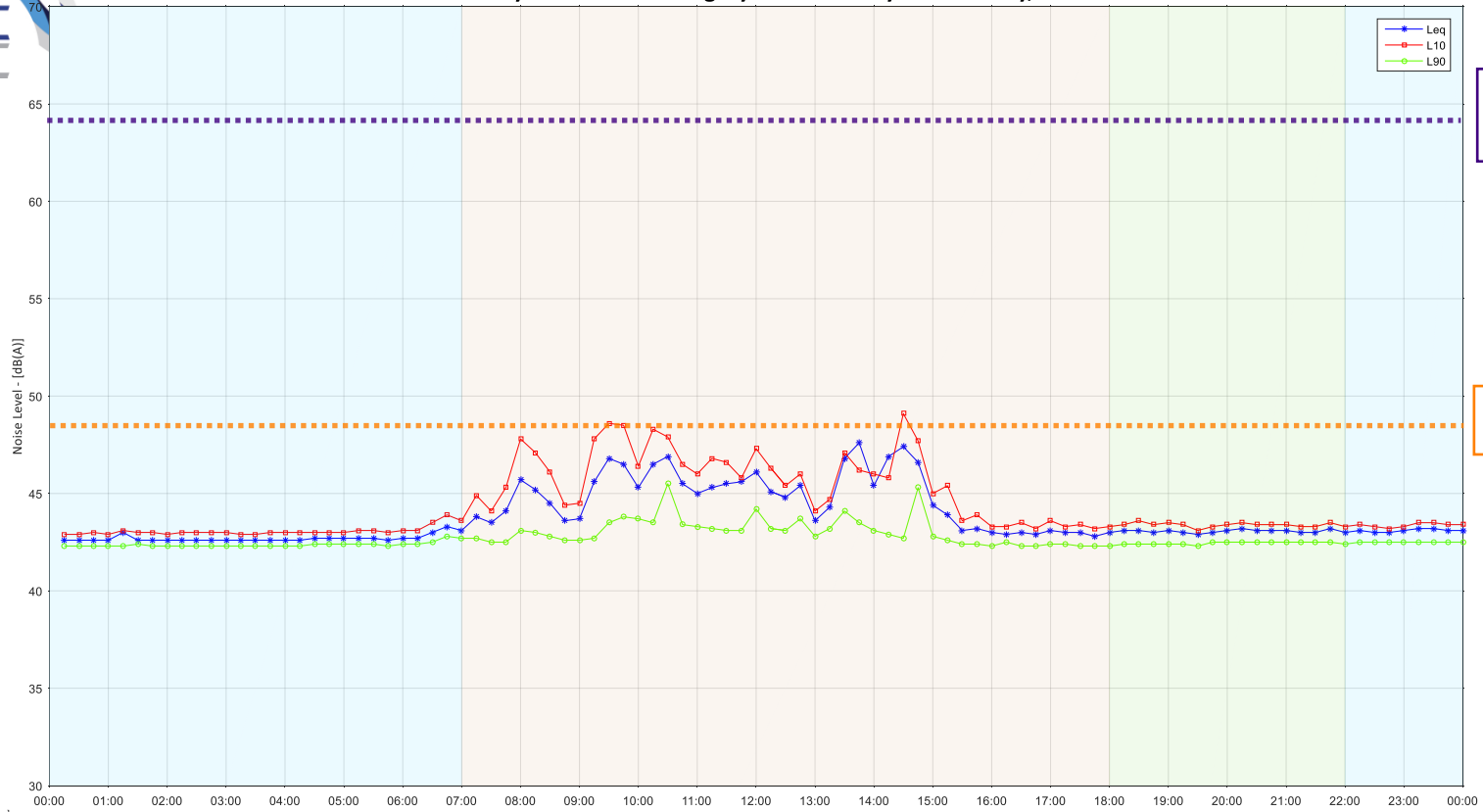


**Animal Housing / Breeding / Observation Room NML**  
 $\leq 64\text{dB(A)}L_{\text{eq}}$

**Animal Operating Room NML**  
 $\leq 48\text{dB(A)}L_{\text{eq}}$



### Centenary Institute - L4 Surgery Room: Friday 09 February, 2024



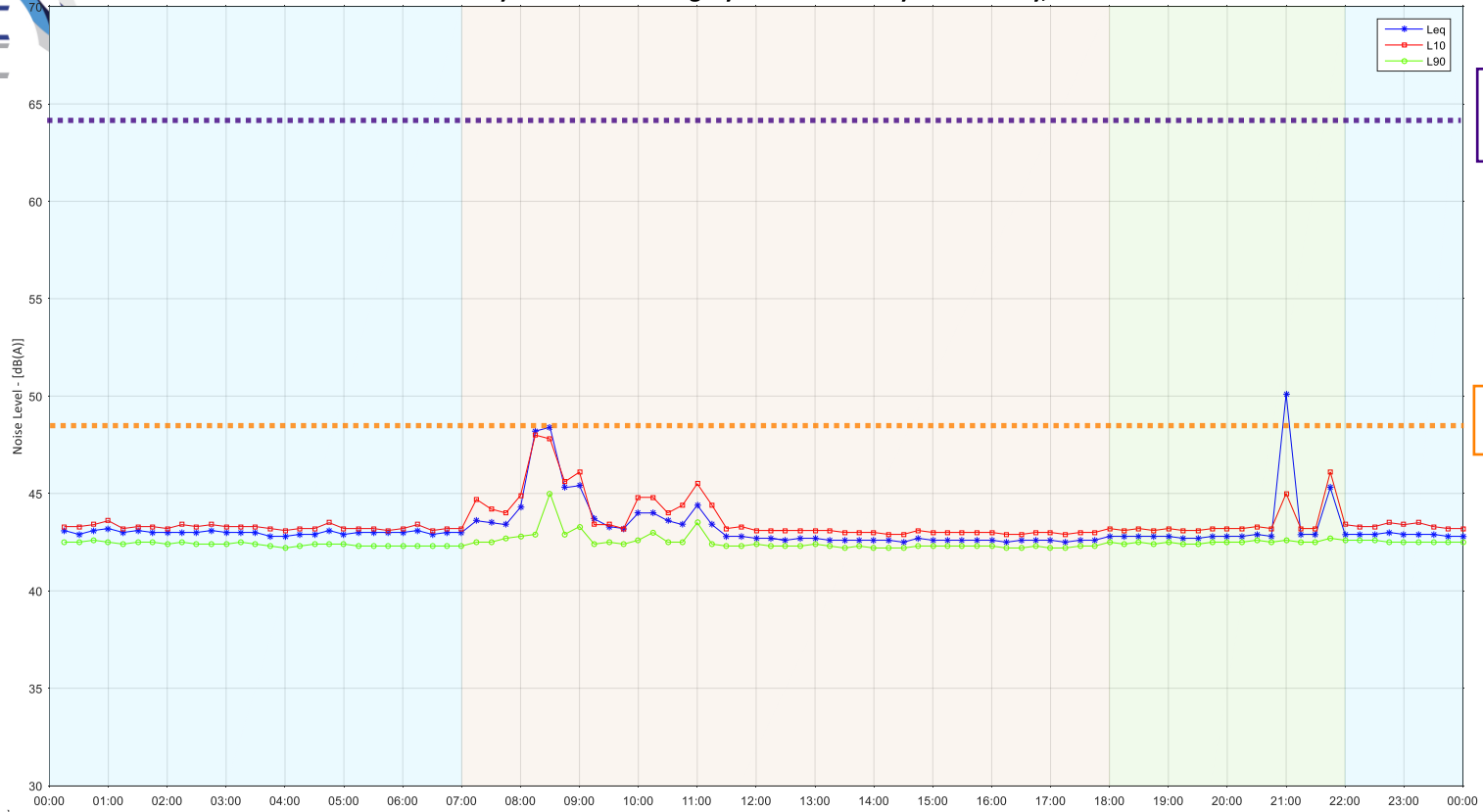
Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]



### Centenary Institute - L4 Surgery Room: Saturday 10 February, 2024



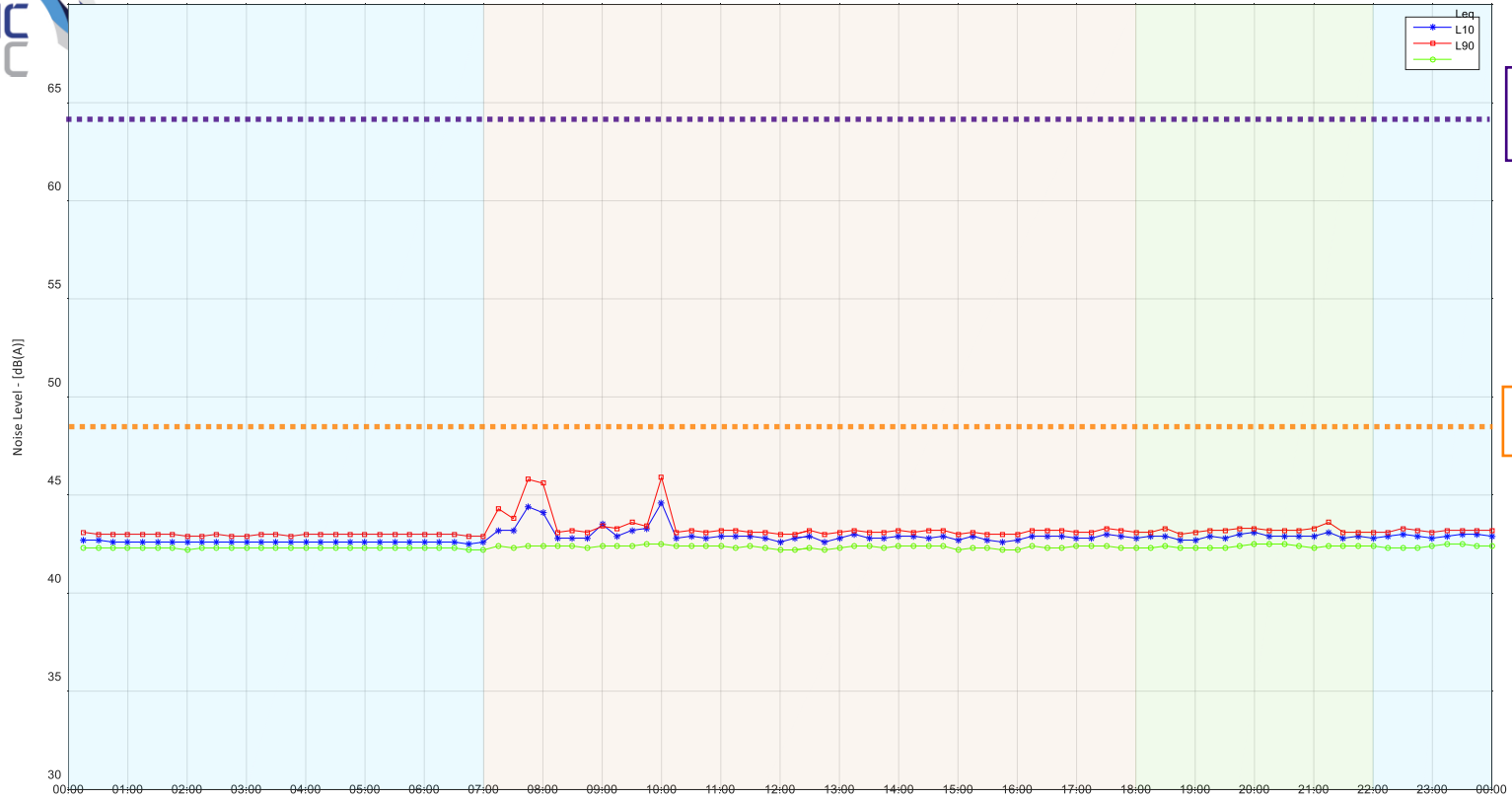
**Animal Housing / Breeding / Observation Room NML**  
 $\leq 64\text{dB(A)}_{L_{eq}}$

**Animal Operating Room NML**  
 $\leq 48\text{dB(A)}_{L_{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]



### Centenary Institute - L4 Surgery Room: Sunday 11 February, 2024



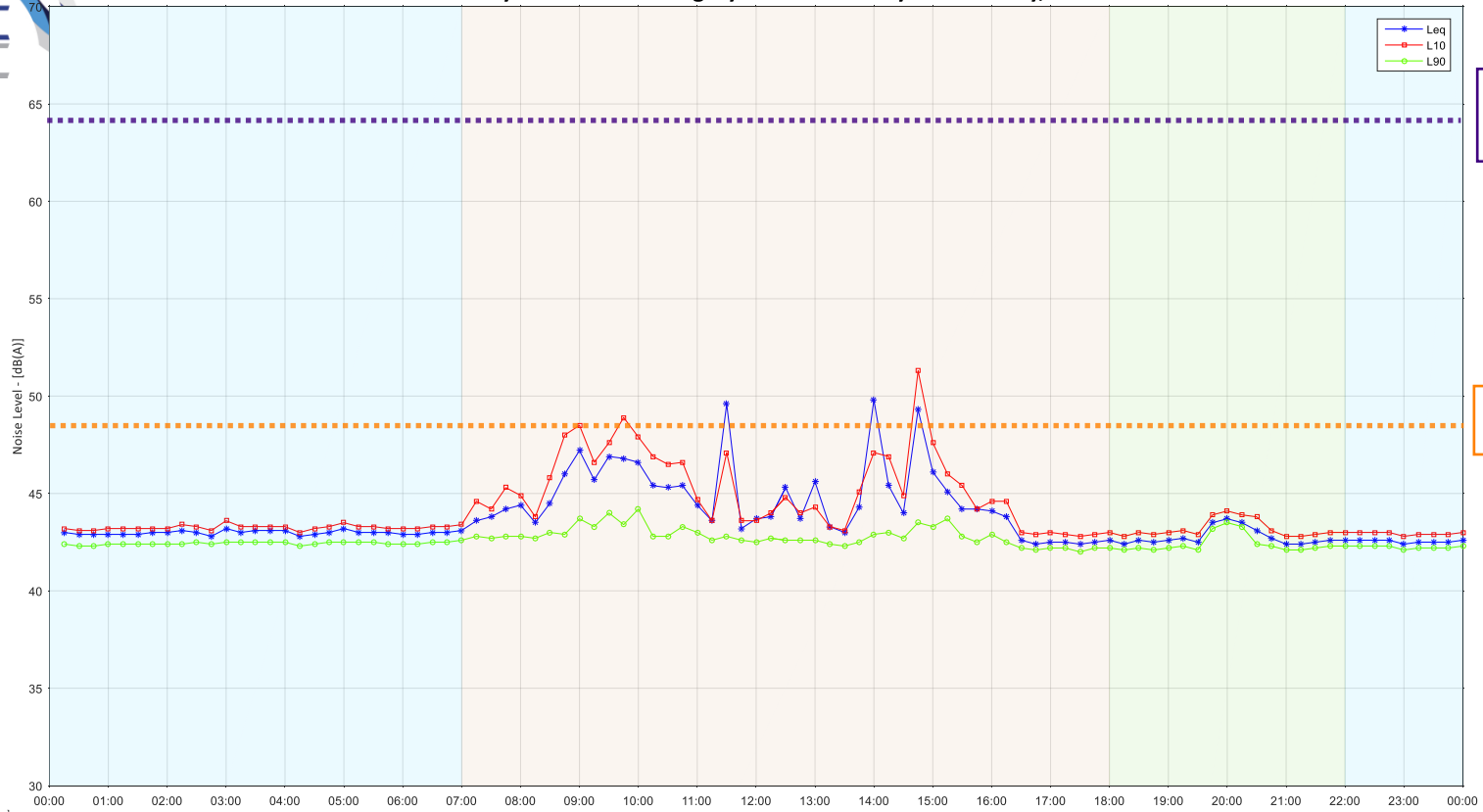
Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}_{L_{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}_{L_{eq}}$





### Centenary Institute - L4 Surgery Room: Monday 12 February, 2024



Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

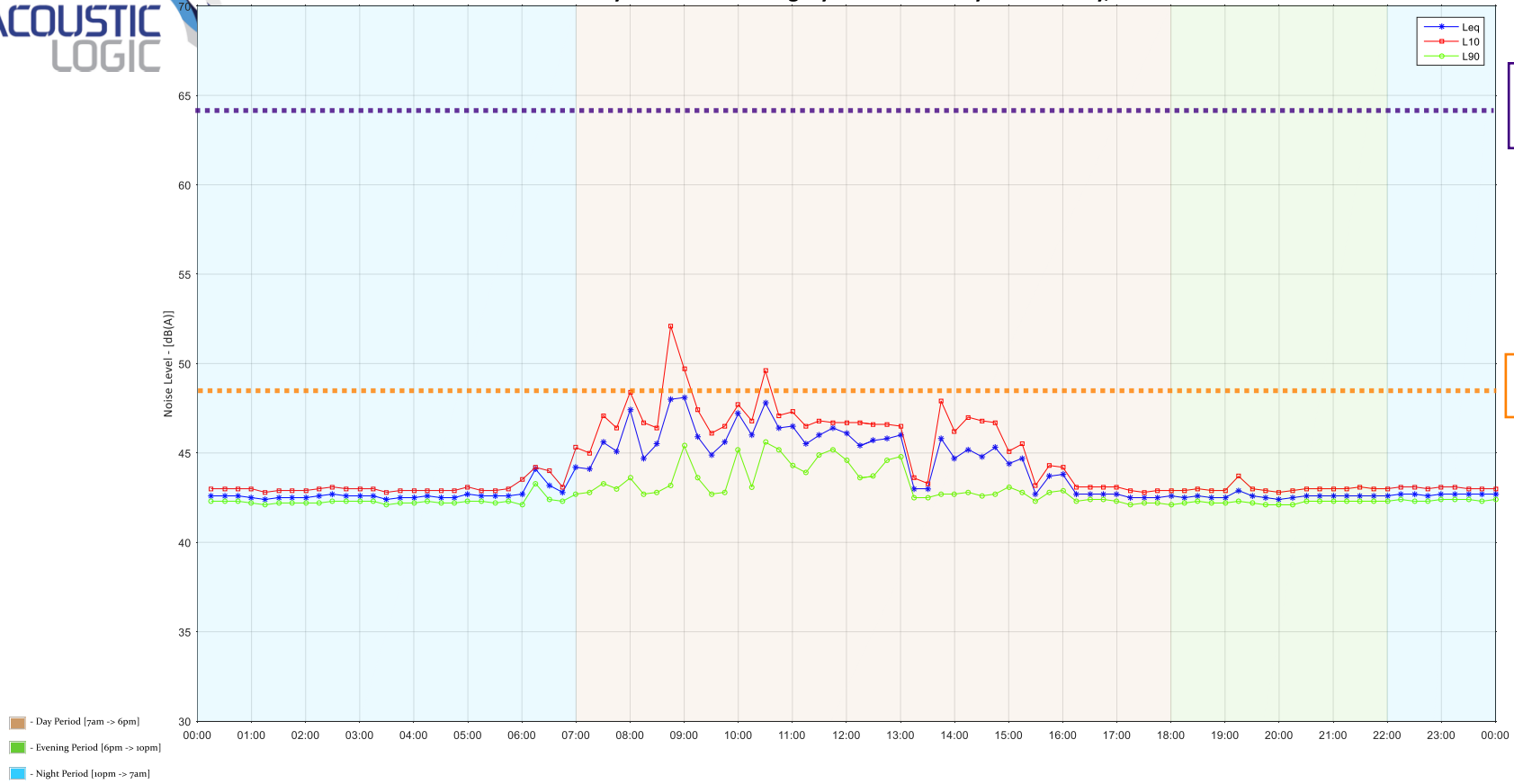
Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]





### Centenary Institute - L4 Surgery Room: Tuesday 13 February, 2024

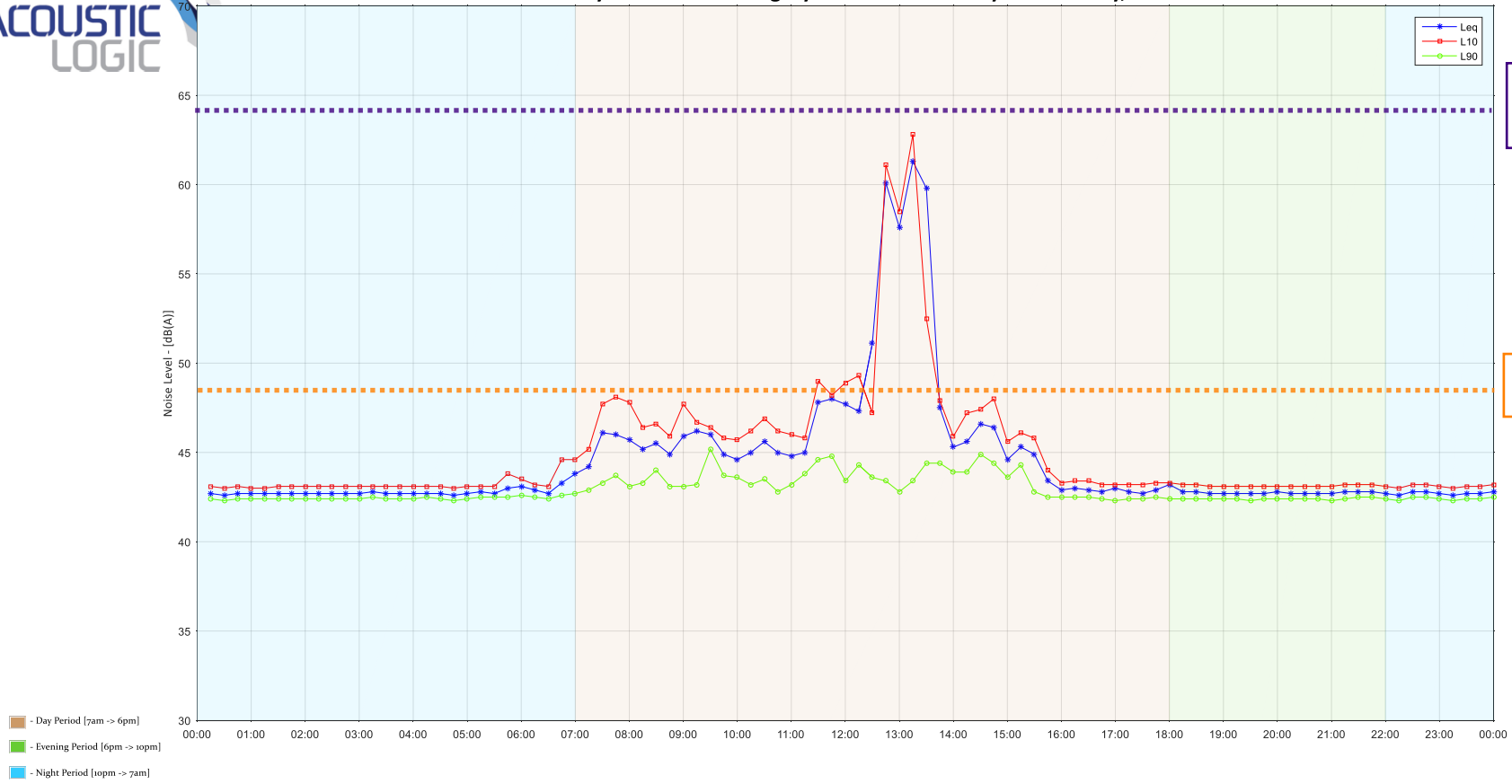


Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$



### Centenary Institute - L4 Surgery Room: Wednesday 14 February, 2024

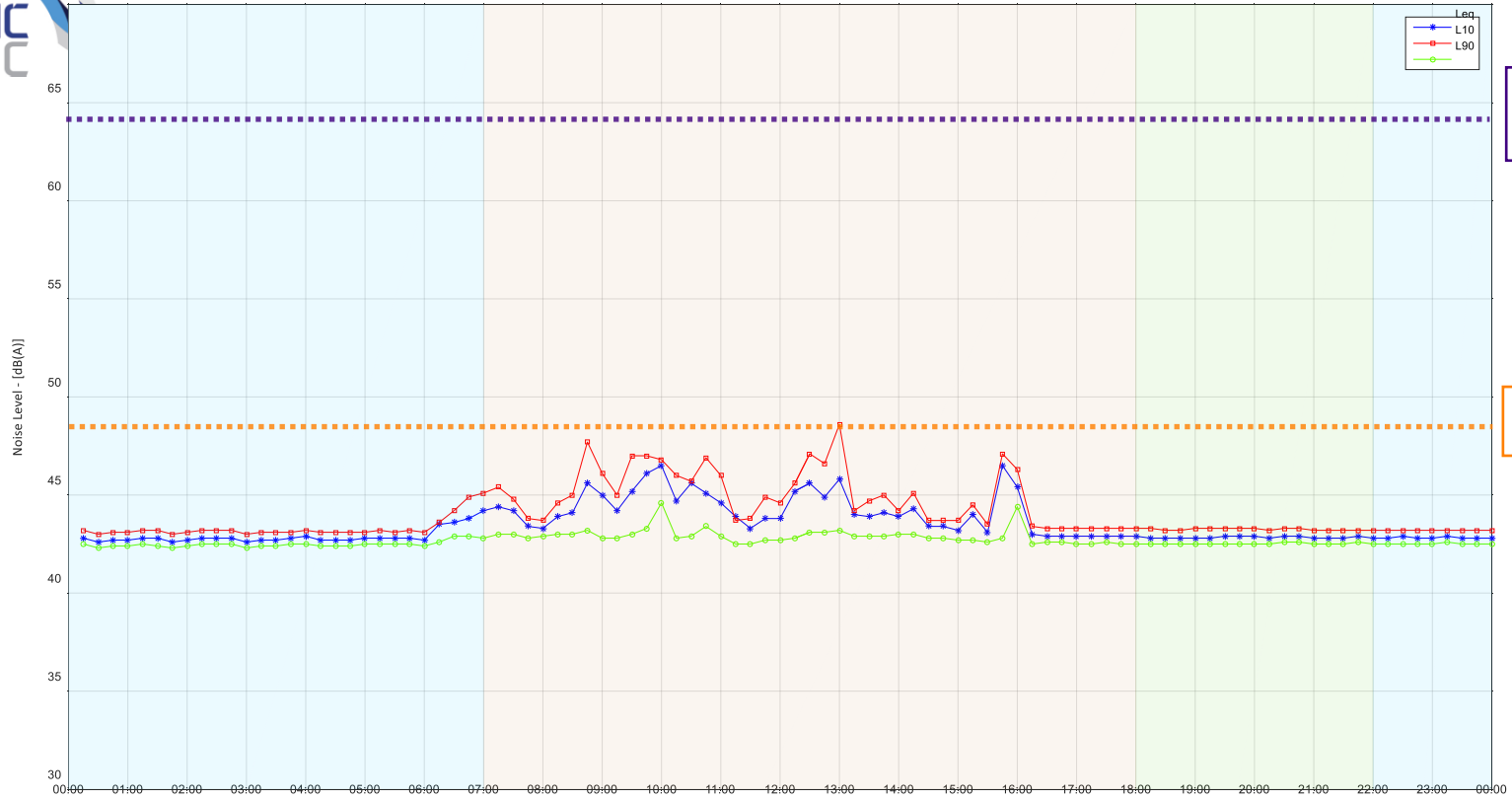


Animal Housing / Breeding /  
Observation Room NML  
≤ 64dB(A)<sub>L<sub>eq</sub></sub>

Animal Operating Room NML  
≤ 48dB(A)<sub>L<sub>eq</sub></sub>



### Centenary Institute - L4 Surgery Room: Thursday 15 February, 2024



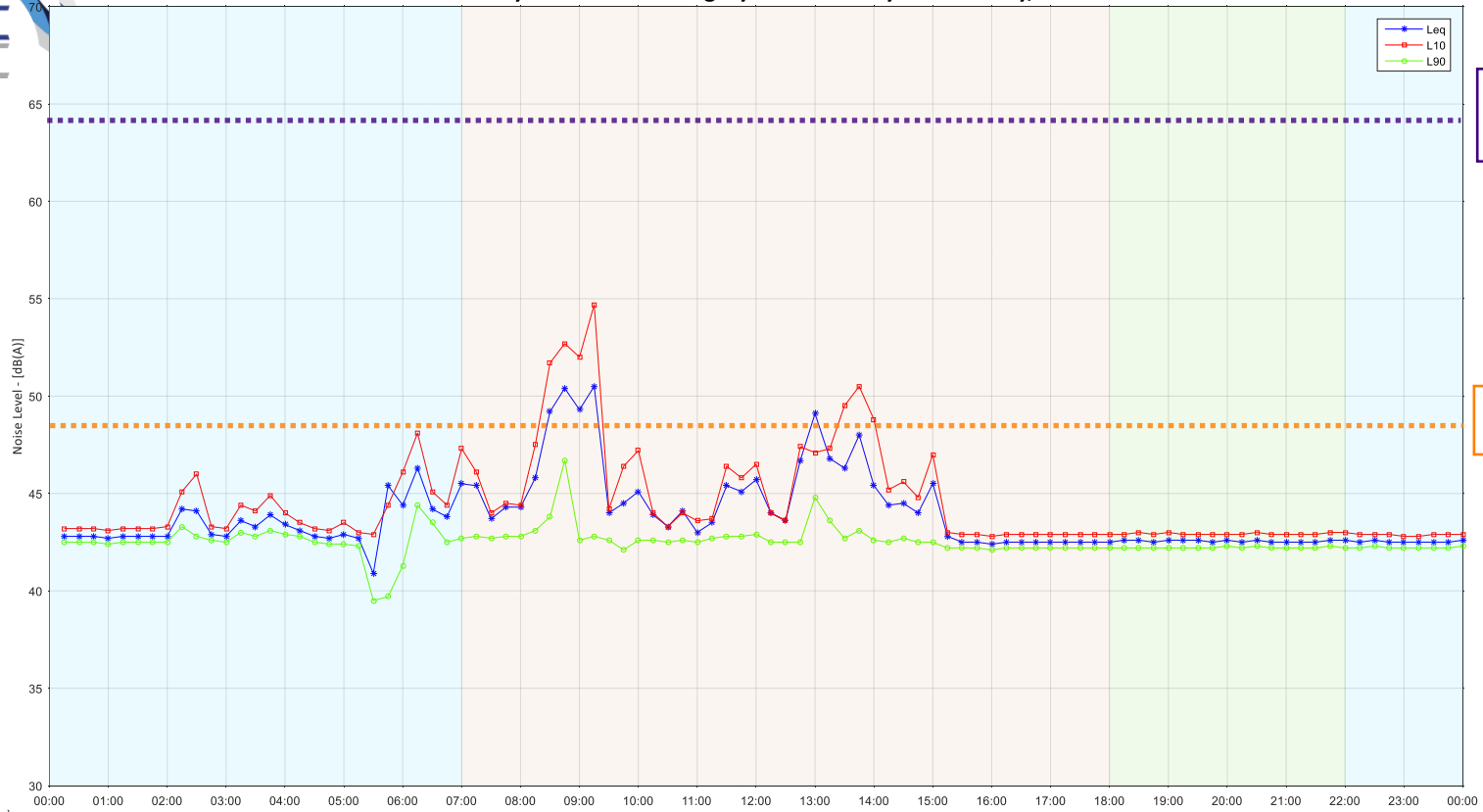
Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$





### Centenary Institute - L4 Surgery Room: Friday 16 February, 2024



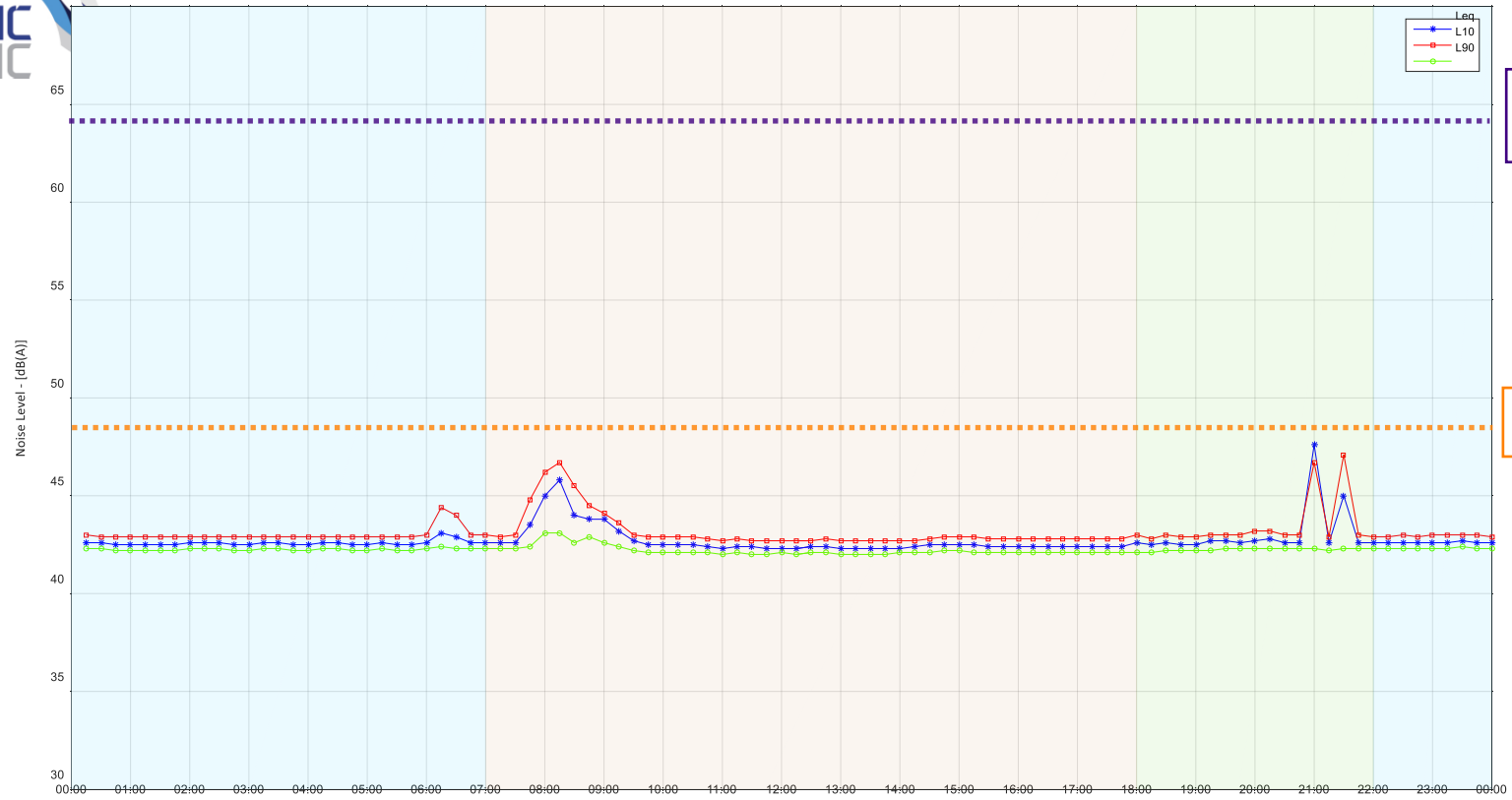
Animal Housing / Breeding / Observation Room NML  $\leq 64\text{dB(A)}L_{\text{eq}}$

Animal Operating Room NML  $\leq 48\text{dB(A)}L_{\text{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]



### Centenary Institute - L4 Surgery Room: Saturday 17 February, 2024



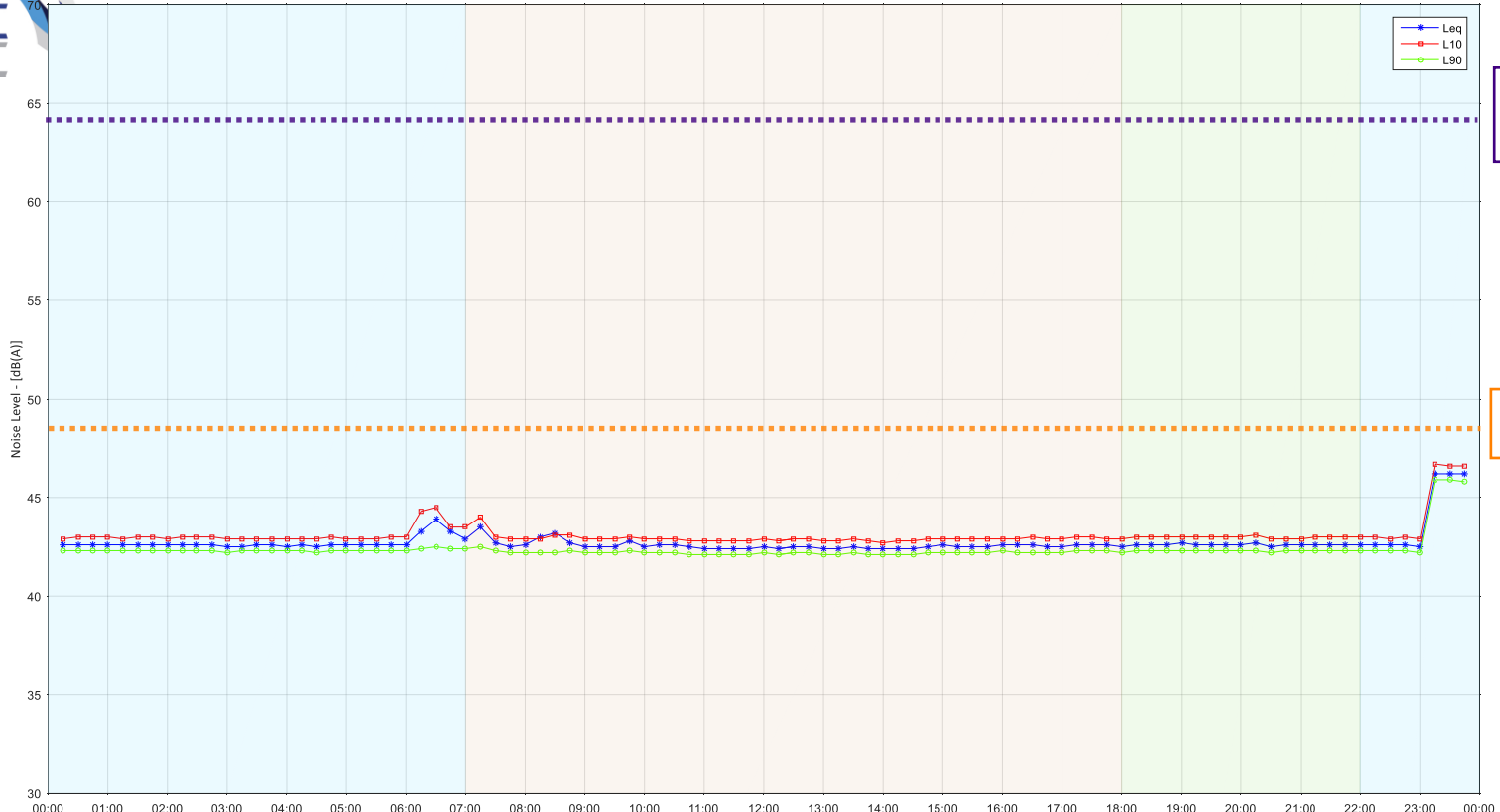
Animal Housing / Breeding / Observation Room NML ≤ 64dB(A)<sub>Leq</sub>

Animal Operating Room NML ≤ 48dB(A)<sub>Leq</sub>





### Centenary Institute - L4 Surgery Room: Sunday 18 February, 2024



**Animal Housing / Breeding / Observation Room NML**  
 $\leq 64\text{dB(A)}_{L_{eq}}$

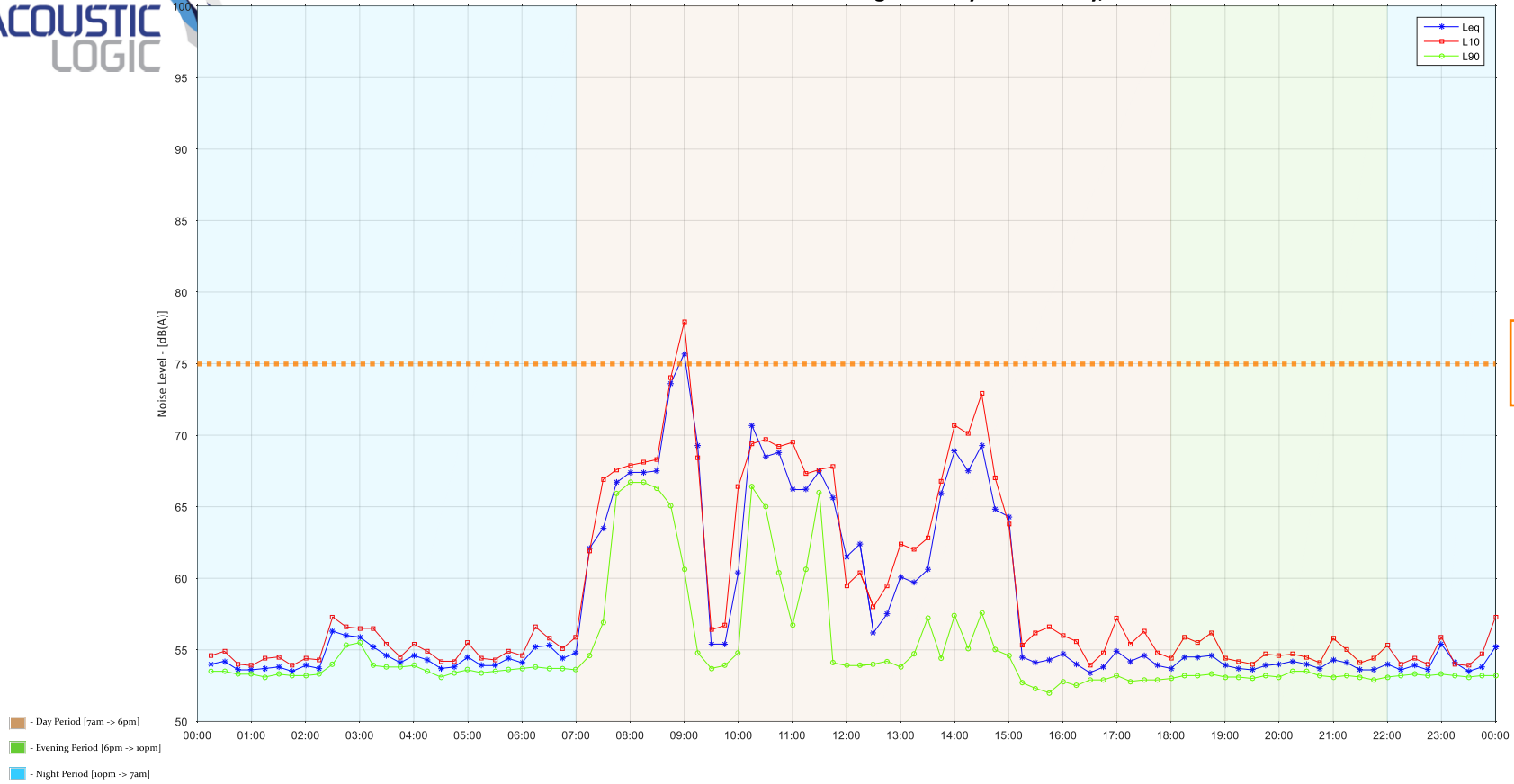
**Animal Operating Room NML**  
 $\leq 48\text{dB(A)}_{L_{eq}}$

- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

## OUTSIDE SUSAN WAKIL HEALTH BUILDING



### Outside Susan Wakil Health Building: Monday 05 February, 2024

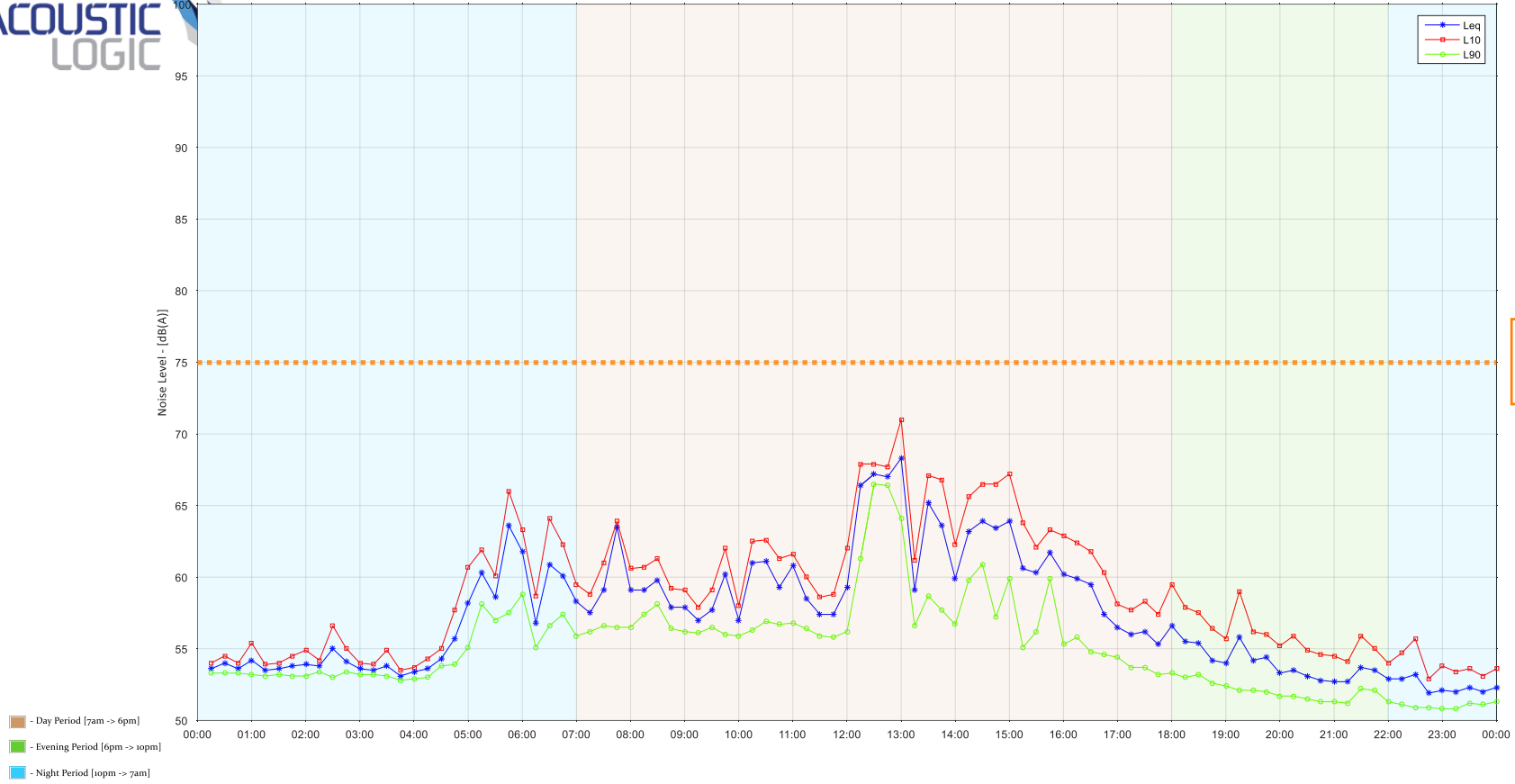


Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}L_{\text{eq}}$





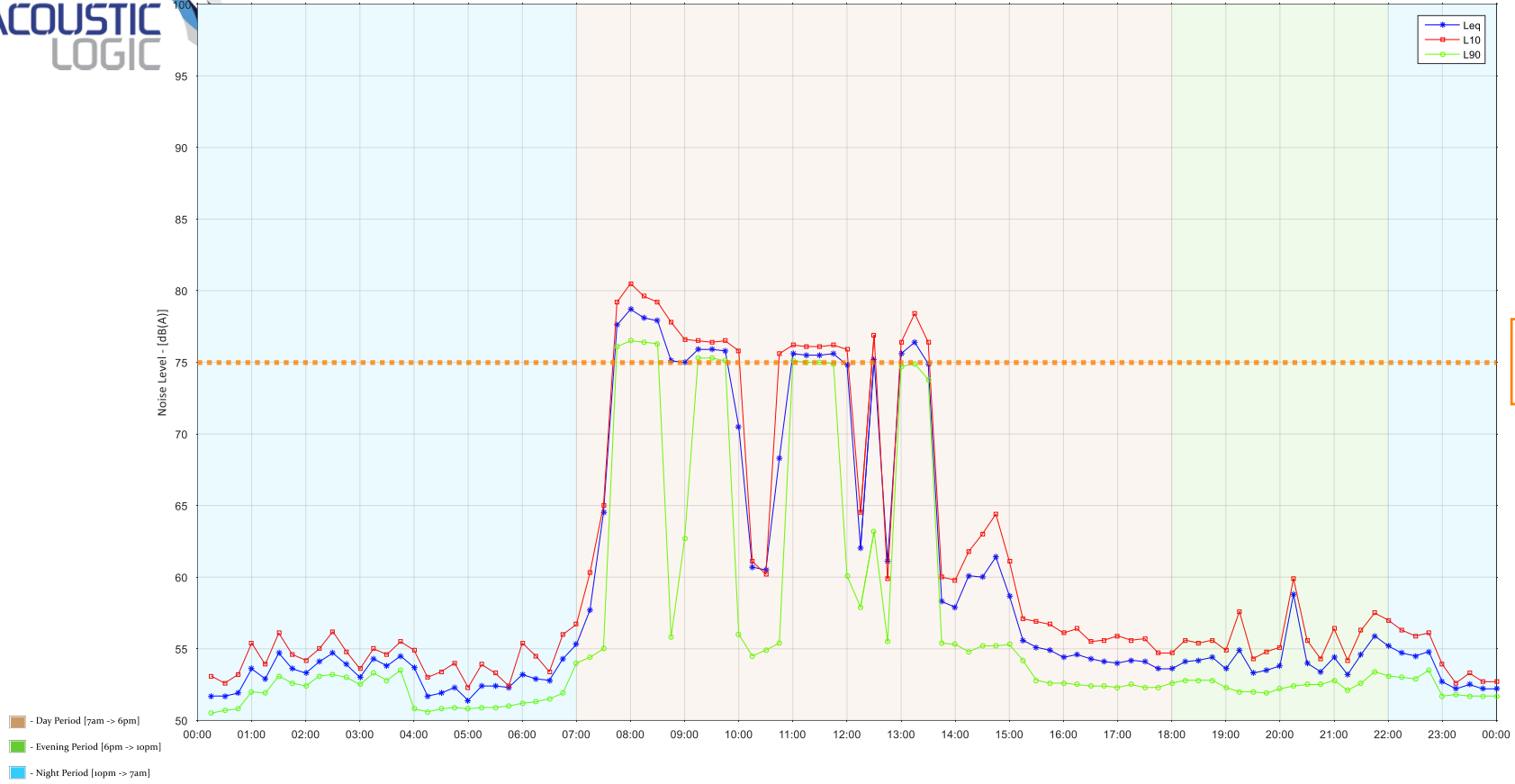
### Outside Susan Wakil Health Building: Tuesday 06 February, 2024



**Education NML**  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



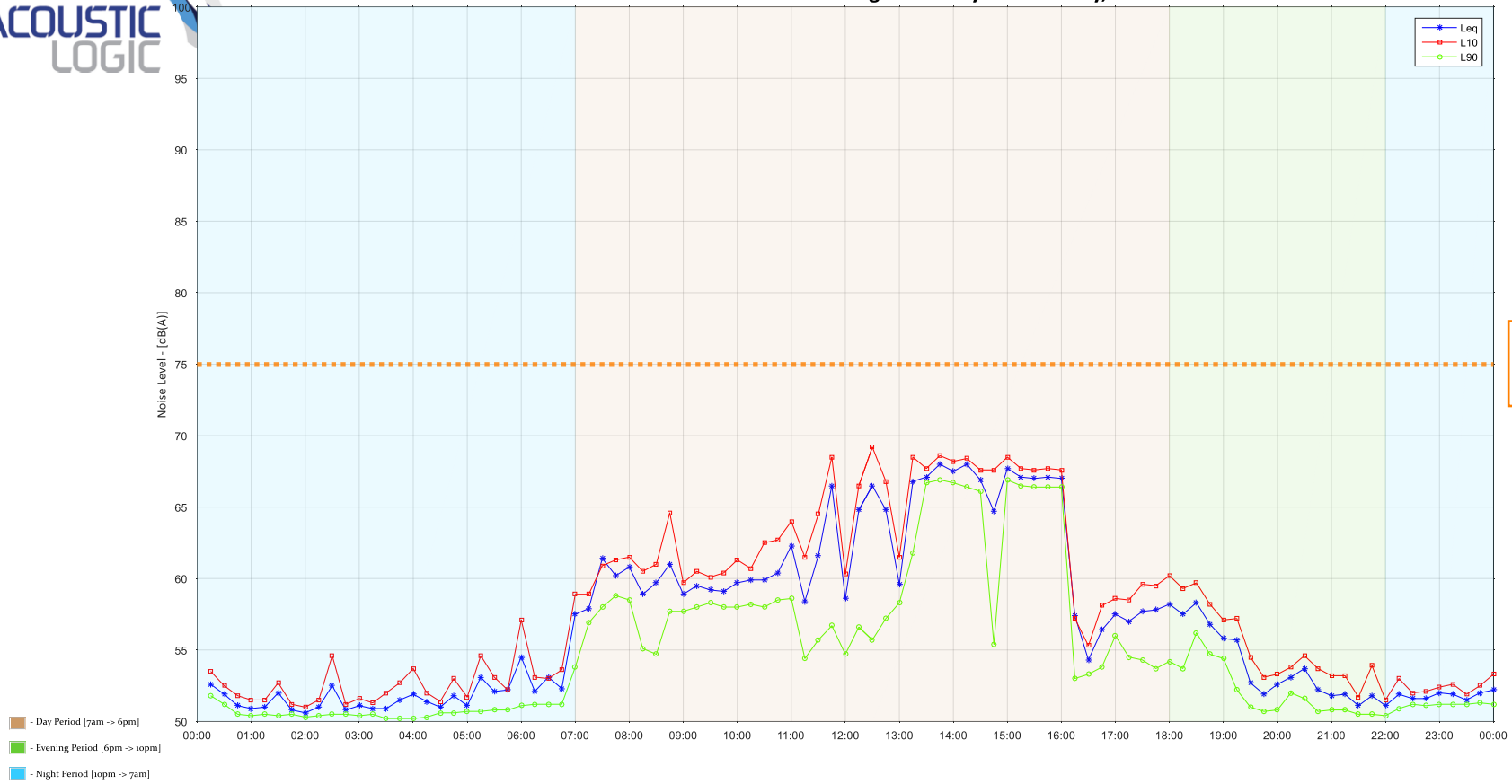
### Outside Susan Wakil Health Building: Wednesday 07 February, 2024



Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



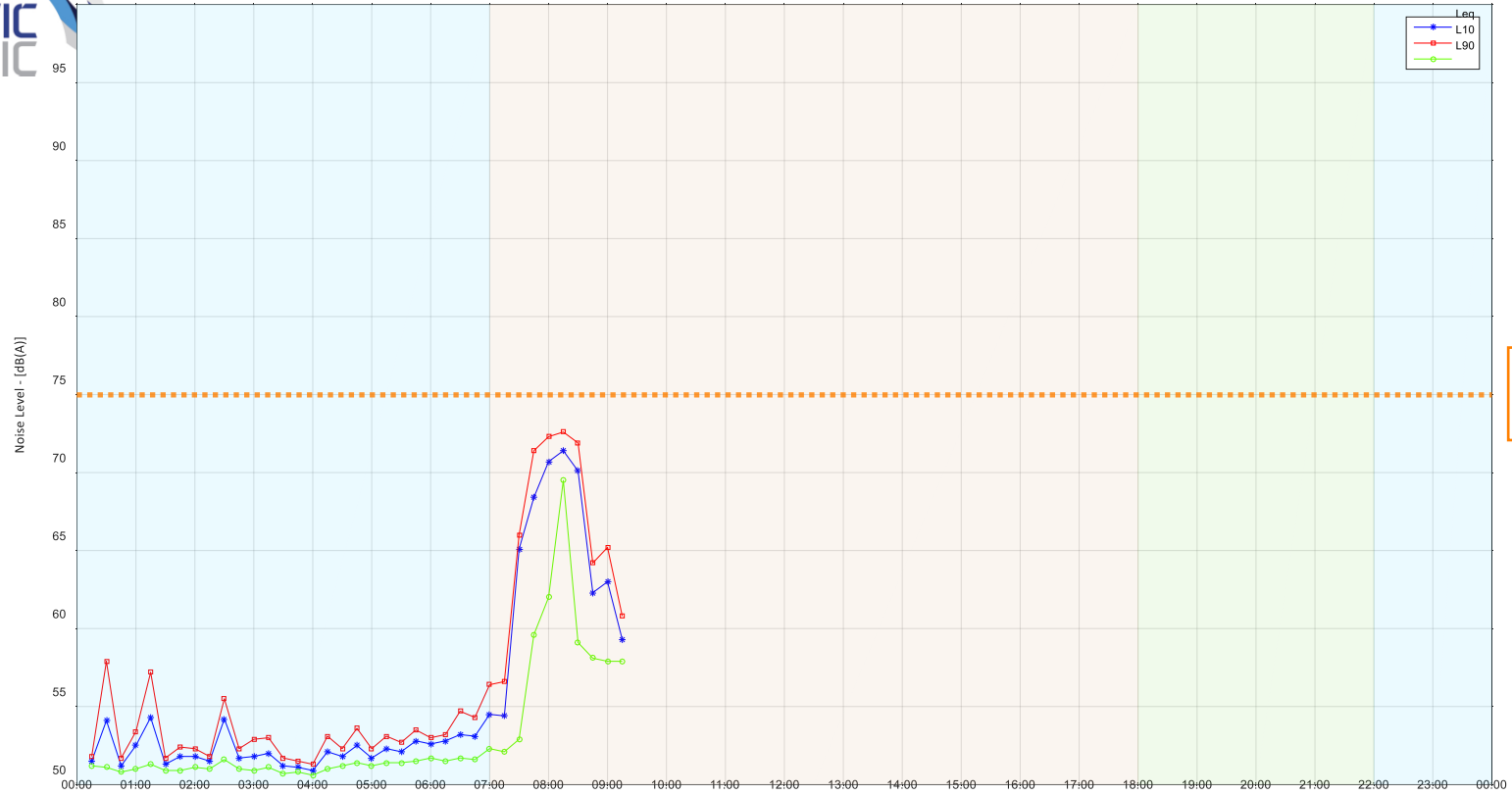
### Outside Susan Wakil Health Building: Thursday 08 February, 2024



**Education NML**  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



### Outside Susan Wakil Health Building: Friday 09 February, 2024

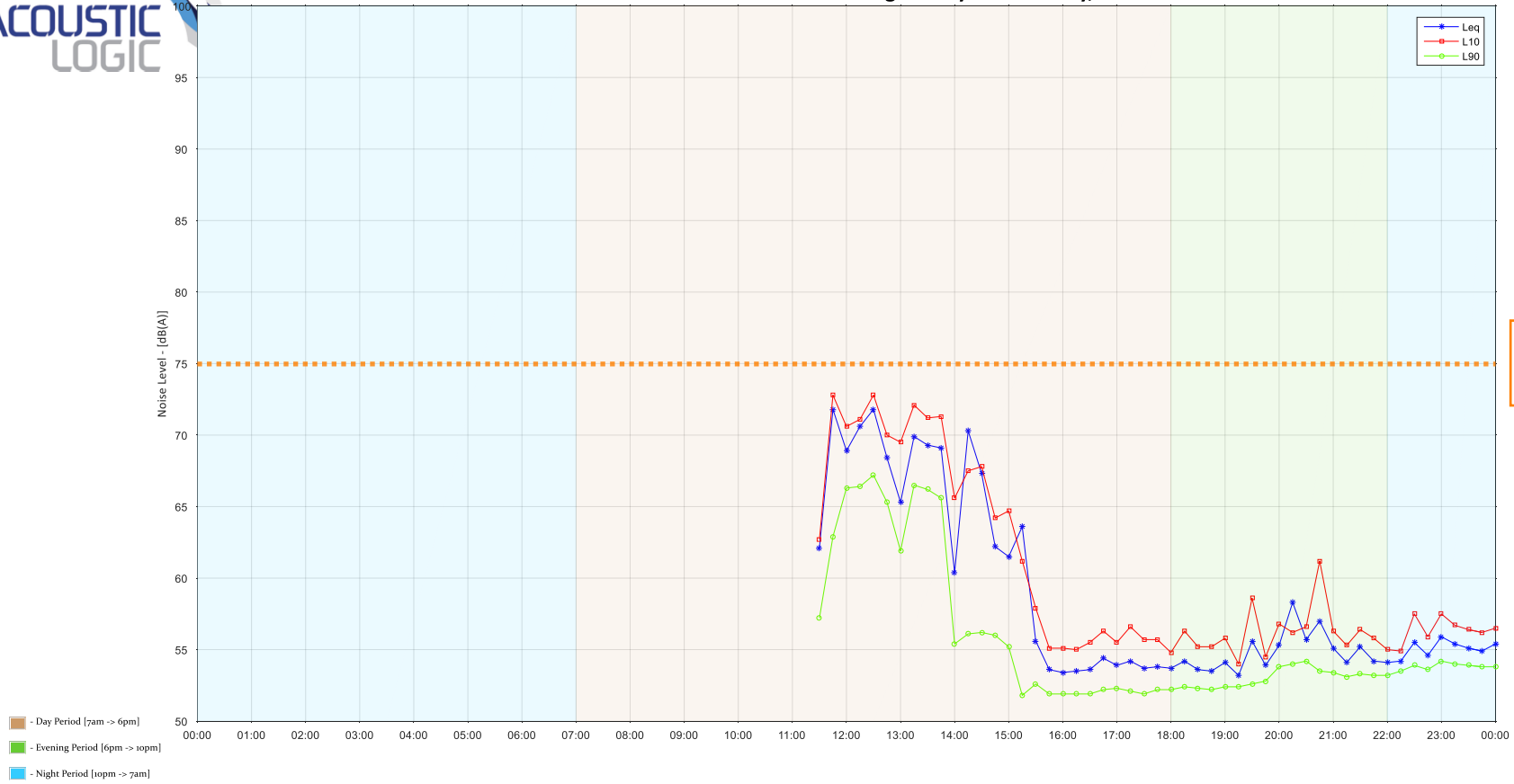


**Education NML**  
**(Including correction)**  
**≤ 75dB(A)<sub>Leq</sub>**





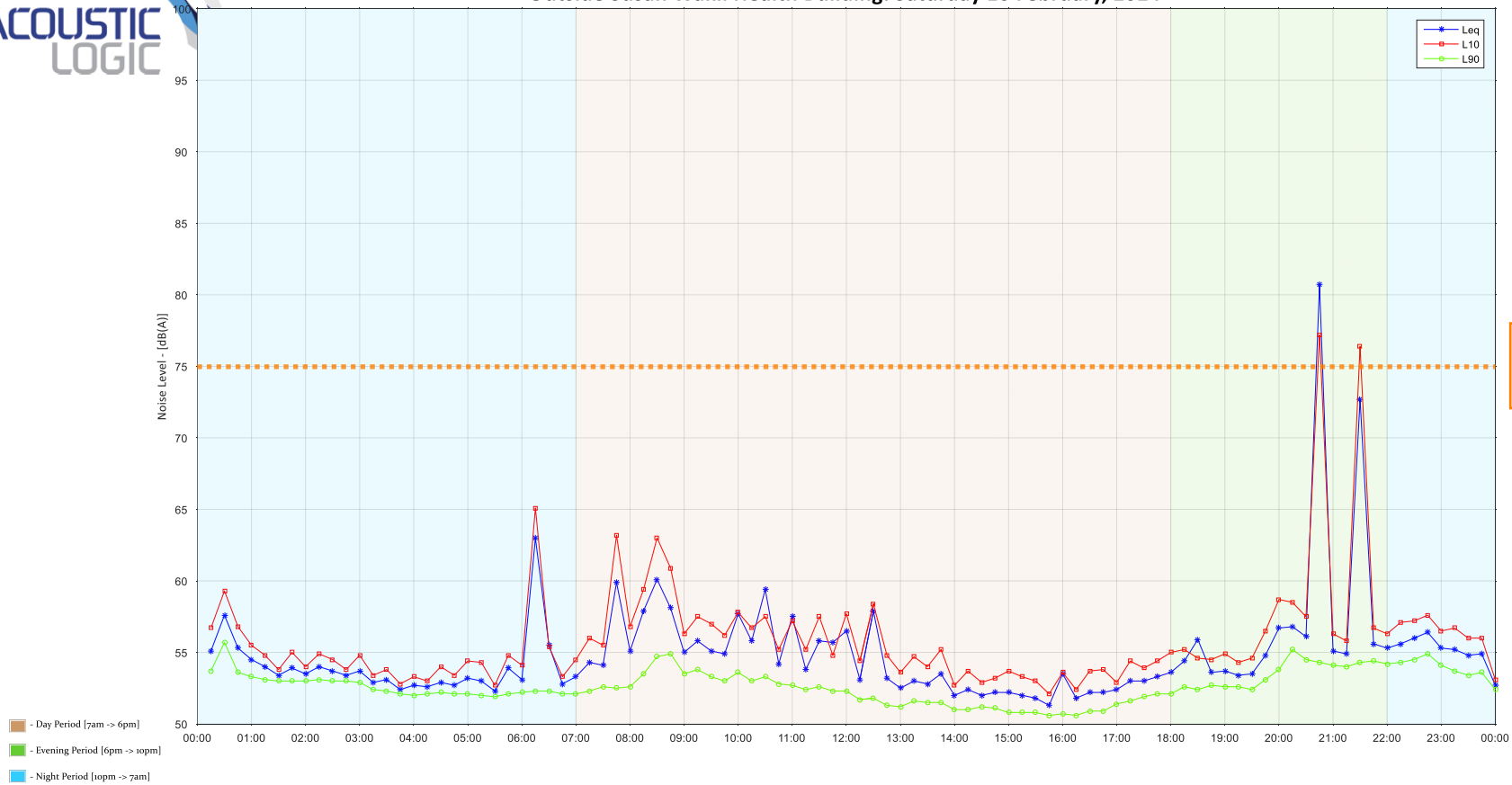
### Outside Susan Wakil Health Building: Friday 09 February, 2024



**Education NML**  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



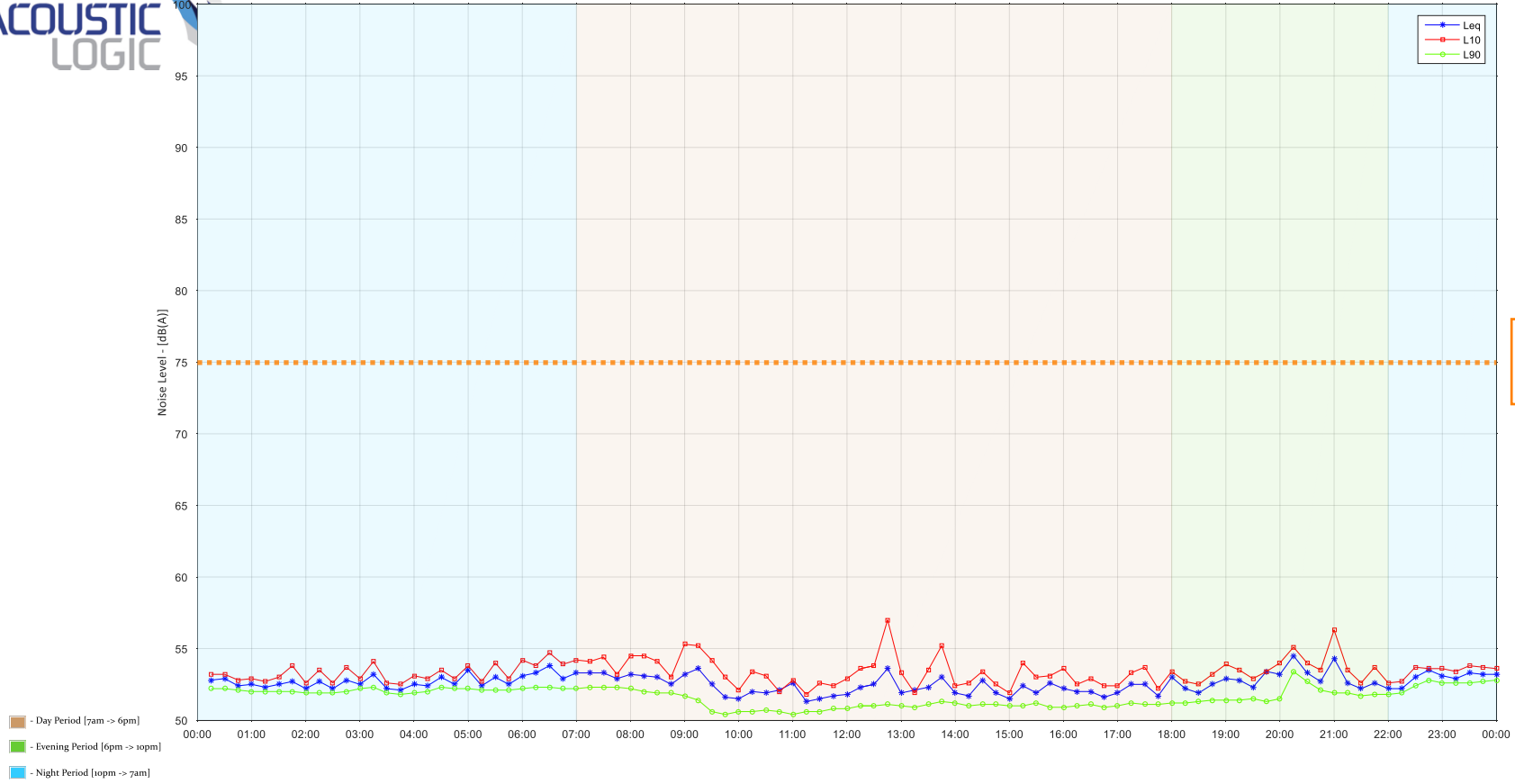
### Outside Susan Wakil Health Building: Saturday 10 February, 2024



Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



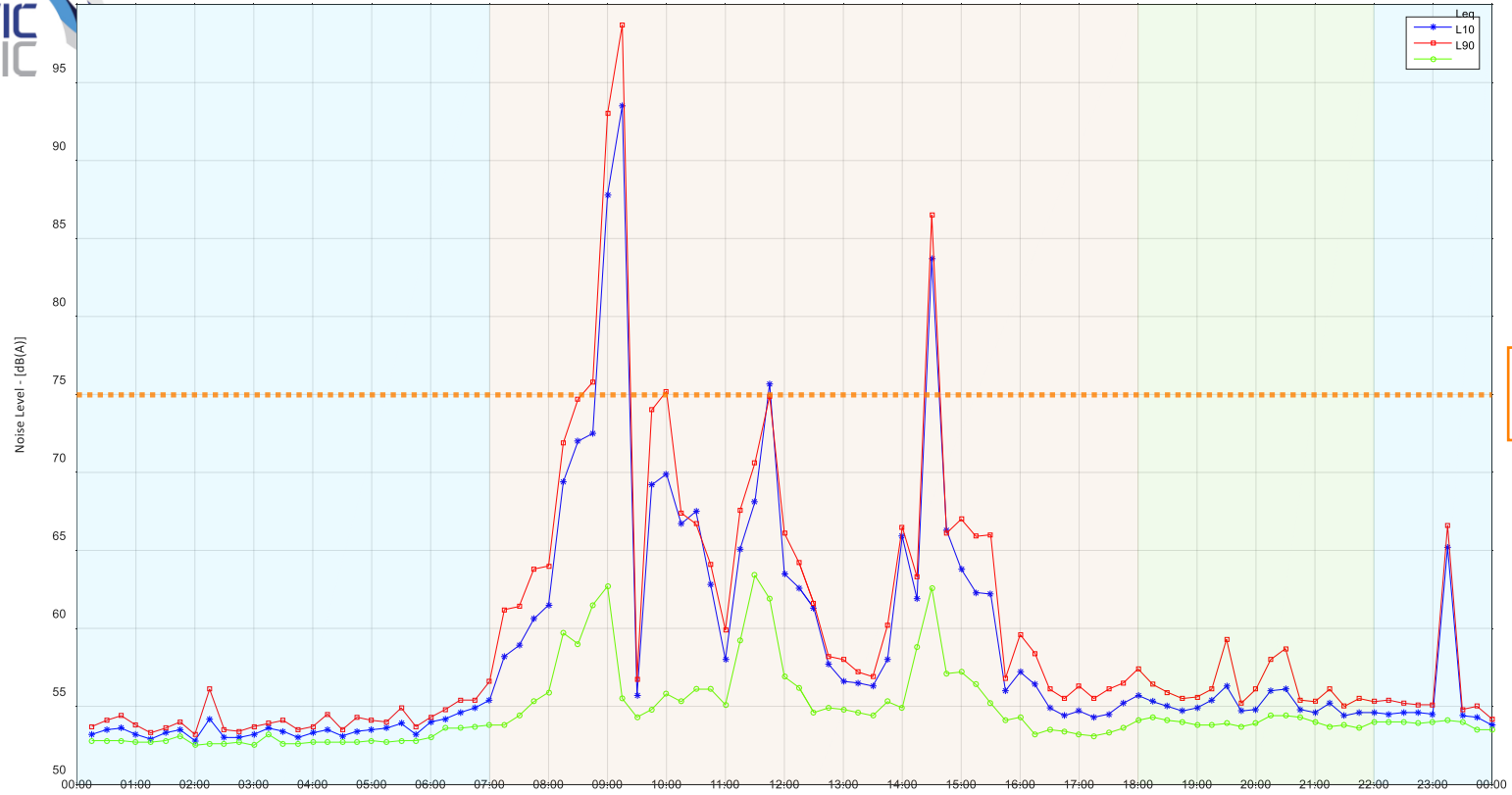
### Outside Susan Wakil Health Building: Sunday 11 February, 2024



**Education NML**  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



### Outside Susan Wakil Health Building: Monday 12 February, 2024



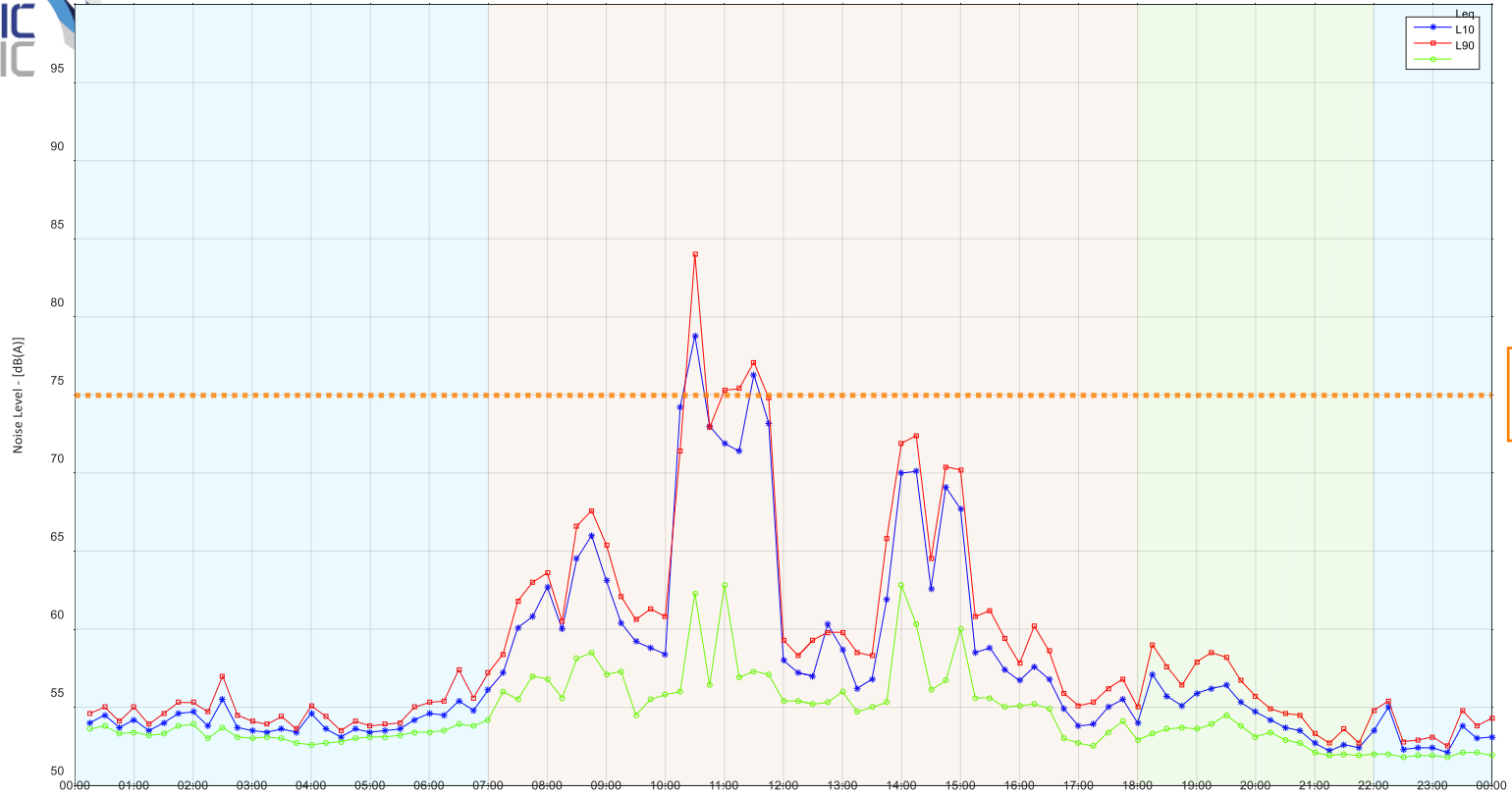
Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$







### Outside Susan Wakil Health Building: Tuesday 13 February, 2024

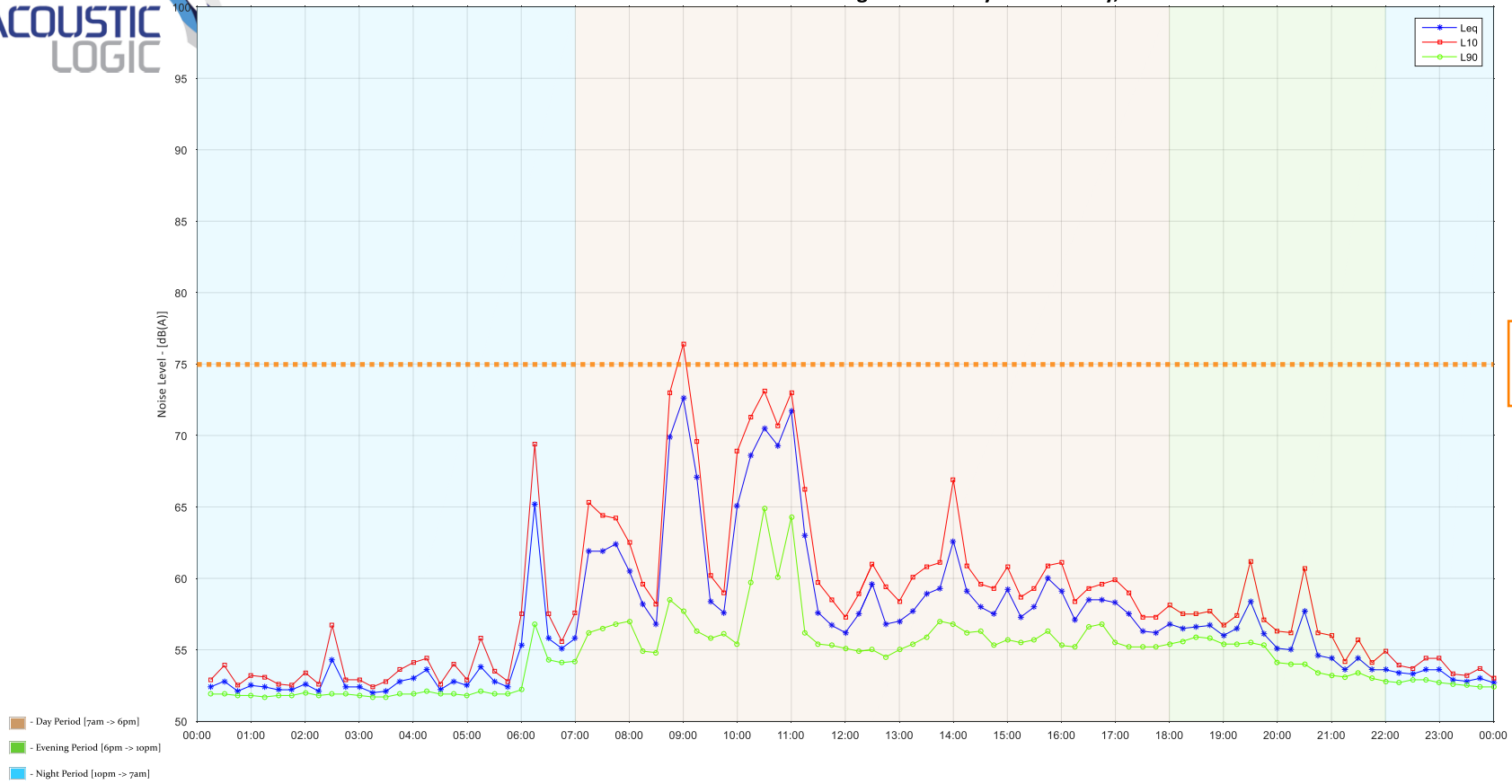


Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}L_{eq}$





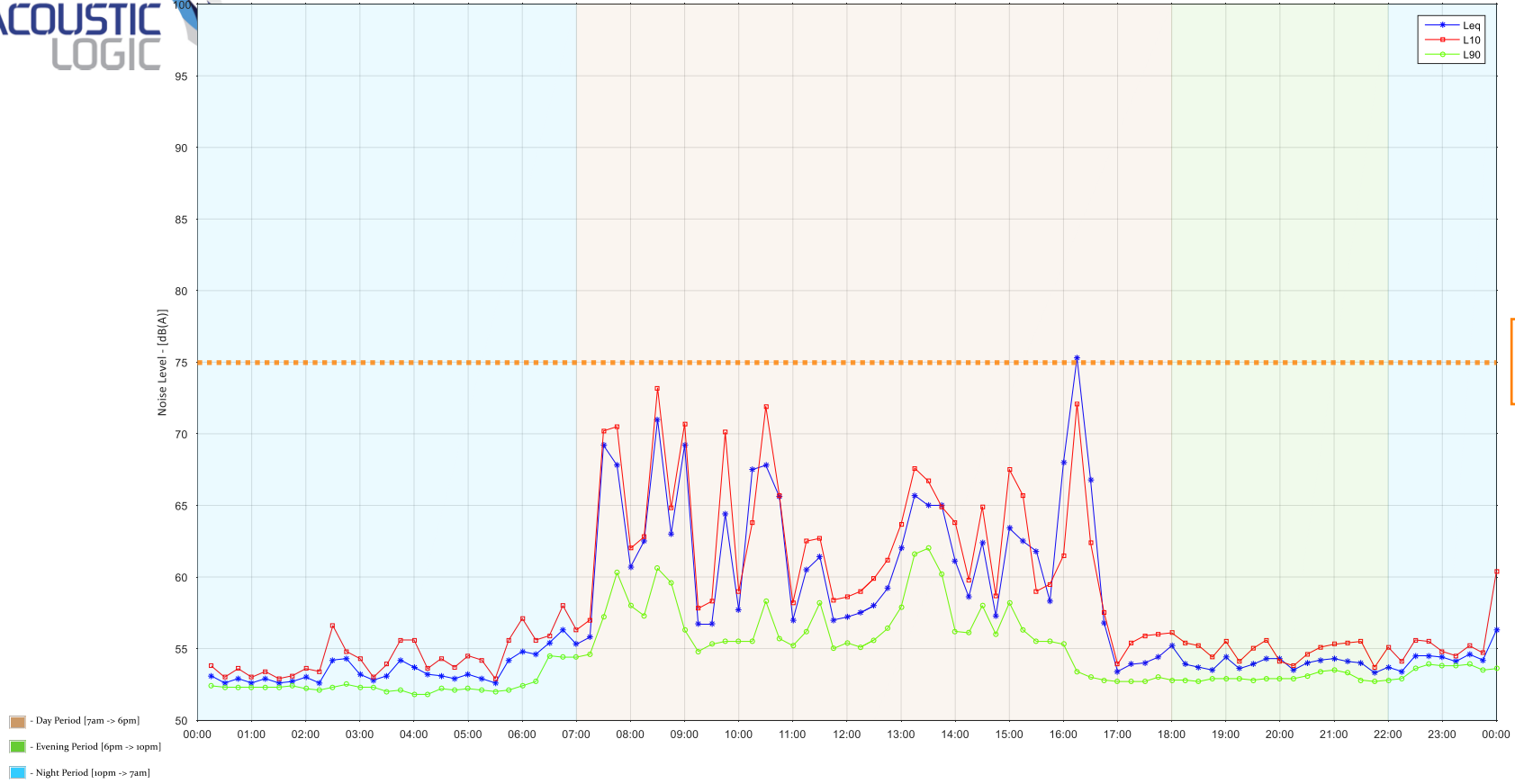
### Outside Susan Wakil Health Building: Wednesday 14 February, 2024



Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



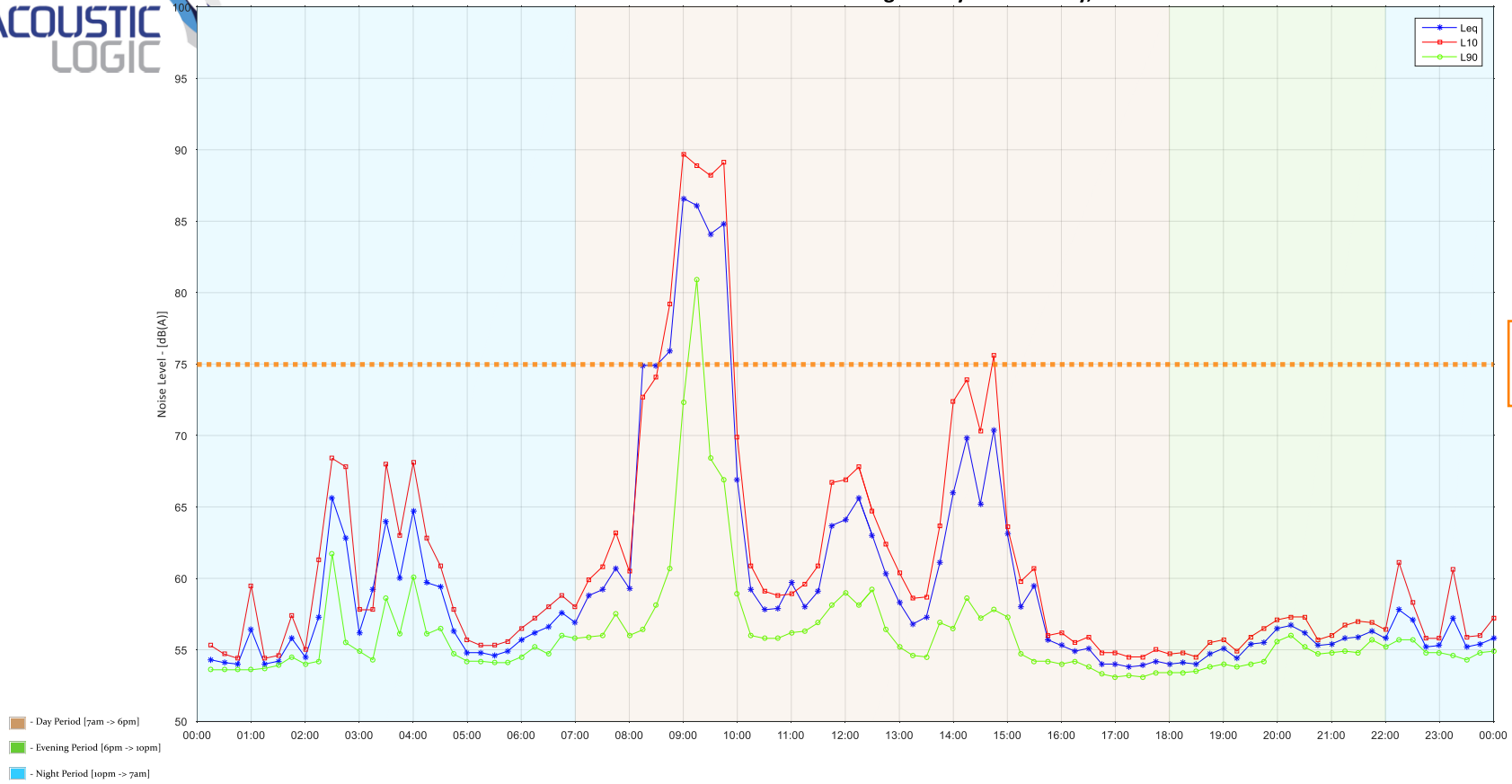
### Outside Susan Wakil Health Building: Thursday 15 February, 2024



Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



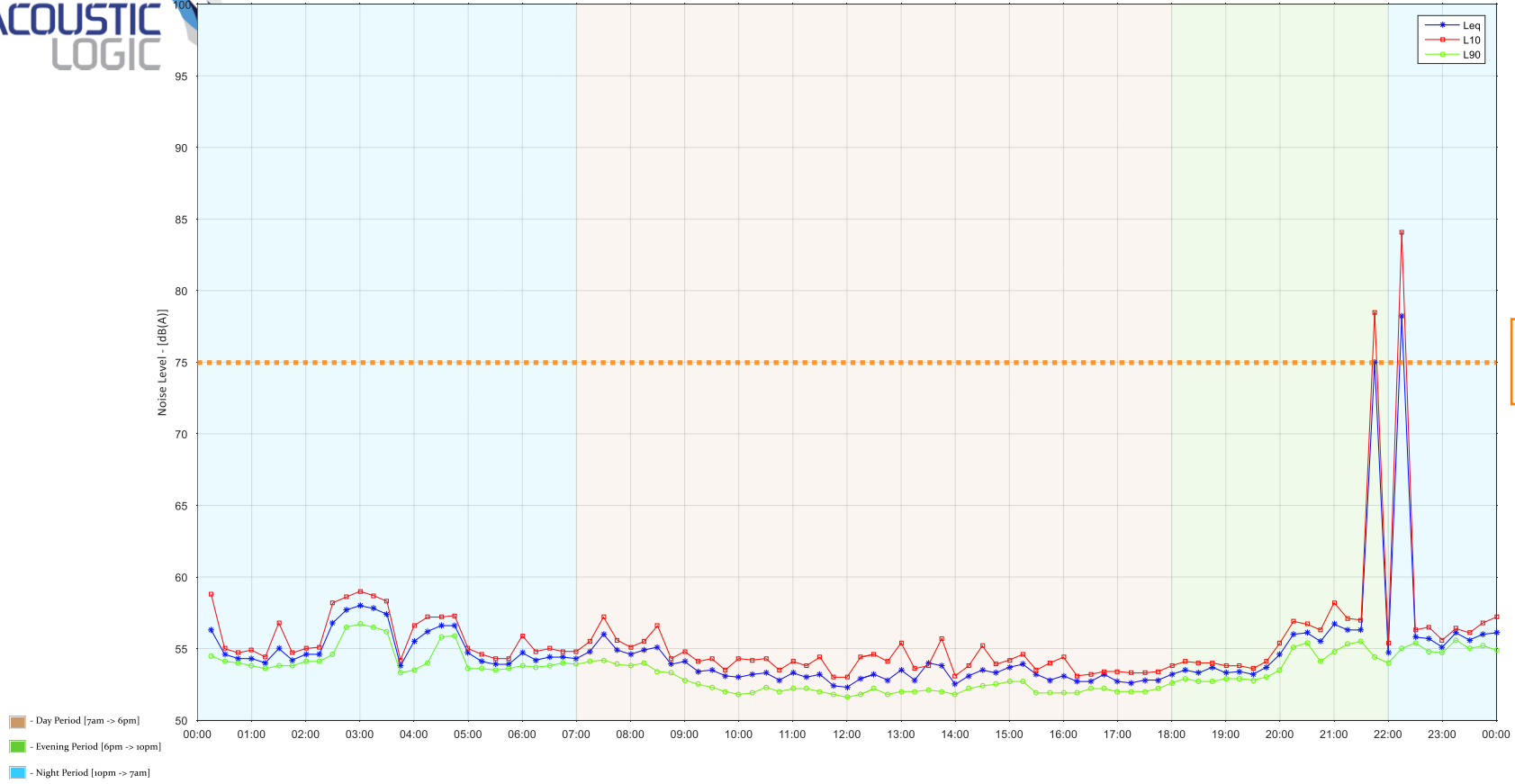
### Outside Susan Wakil Health Building: Friday 16 February, 2024



Education NML  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$



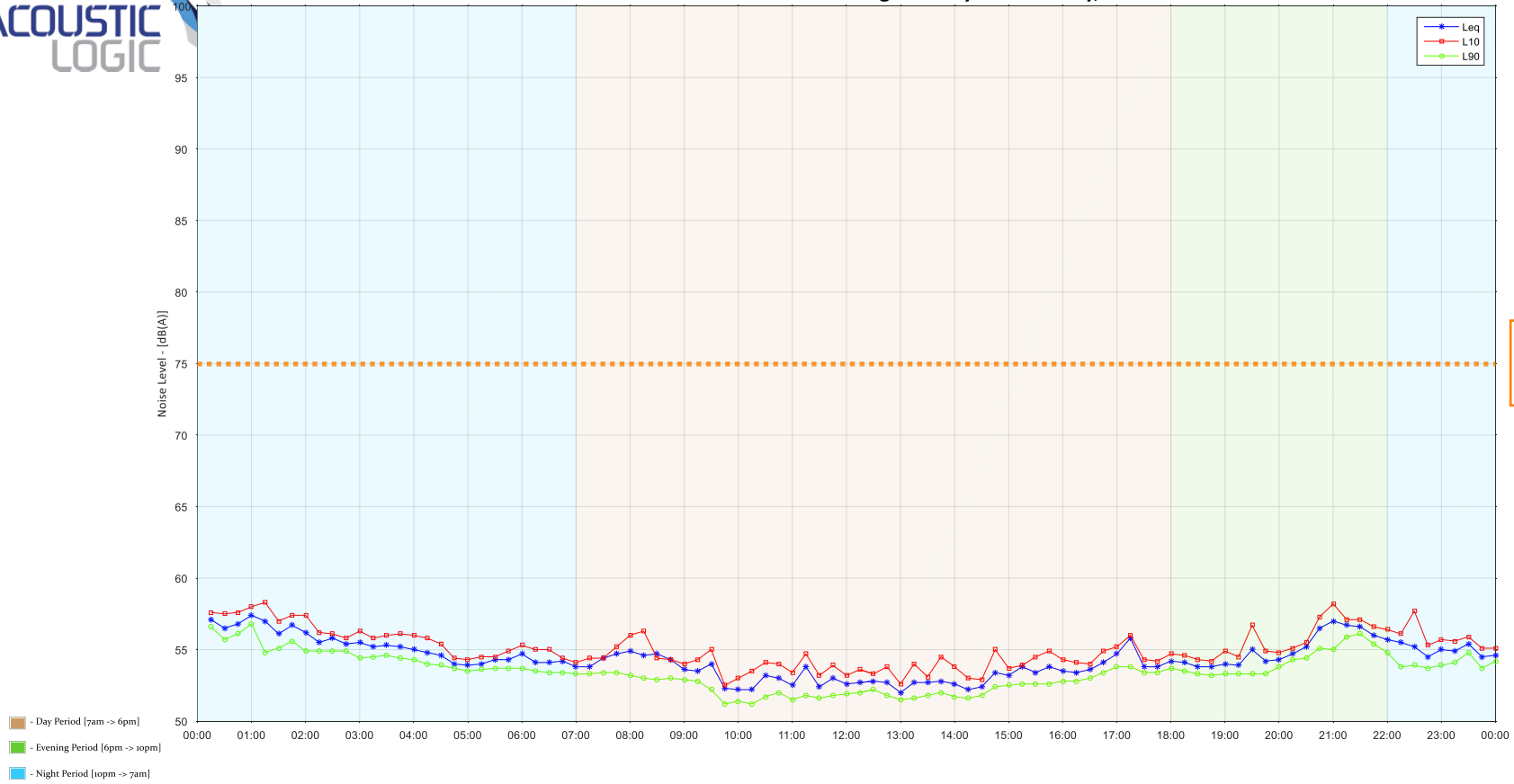
### Outside Susan Wakil Health Building: Saturday 17 February, 2024



**Education NML  
(Including correction)  
≤ 75dB(A)<sub>Leq</sub>**



### Outside Susan Wakil Health Building: Sunday 18 February, 2024



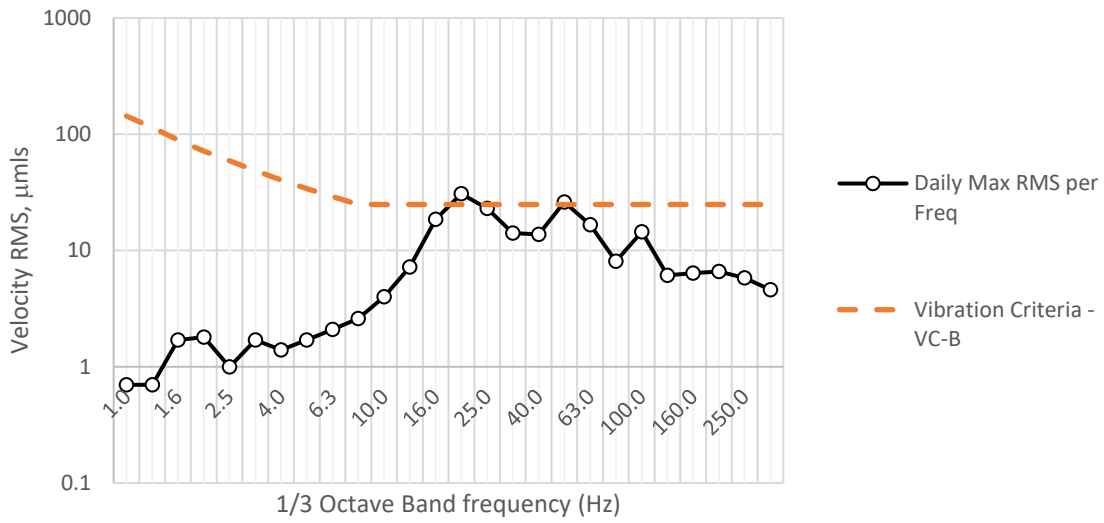
**Education NML**  
(Including correction)  
 $\leq 75\text{dB(A)}_{L_{eq}}$

## **APPENDIX B – VIBRATION MONITORING RESULTS**

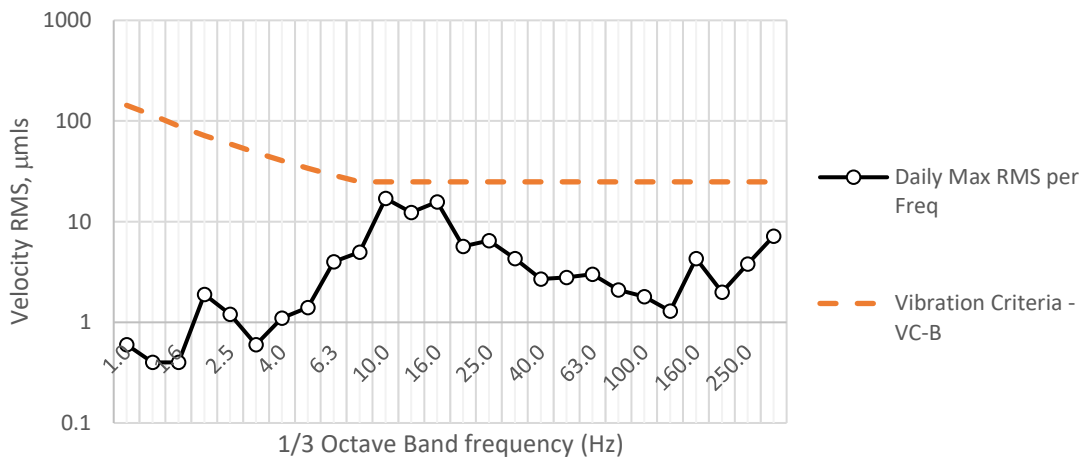
Note that only dates where exceedances of events were experienced have been provided as per discussion with relevant stakeholders.

### **CENTENARY INSTITUTE – LEVEL 1 LASER IMAGING ROOM**

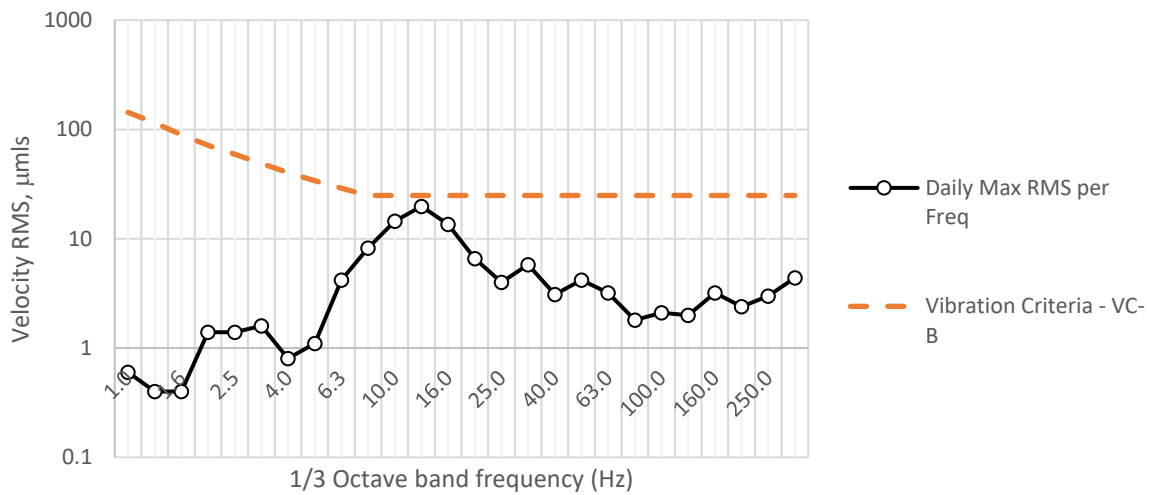
### Vertical Vibration



### FwdBackwd Vibration

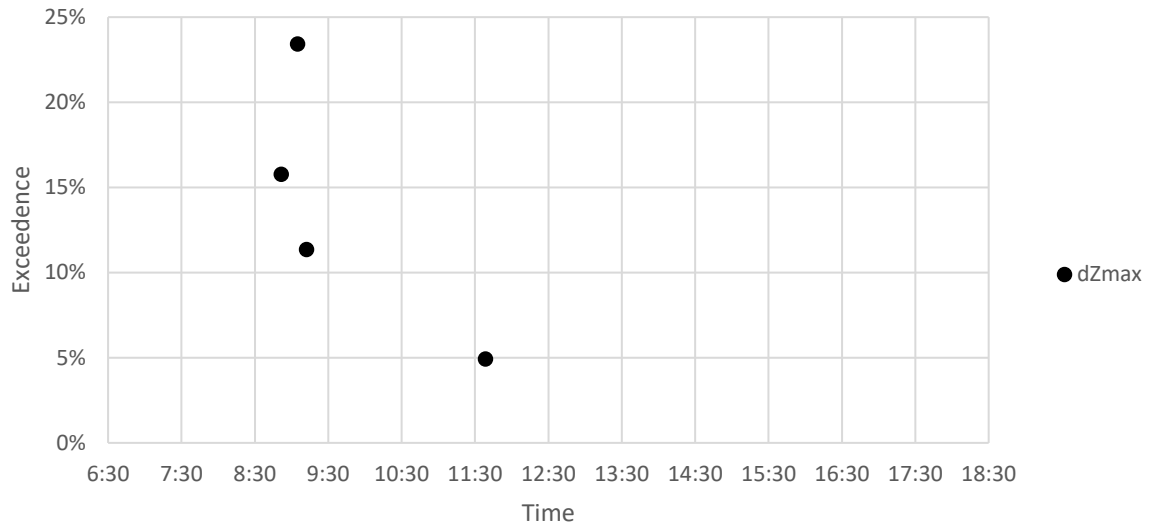


### Sideways Vibration

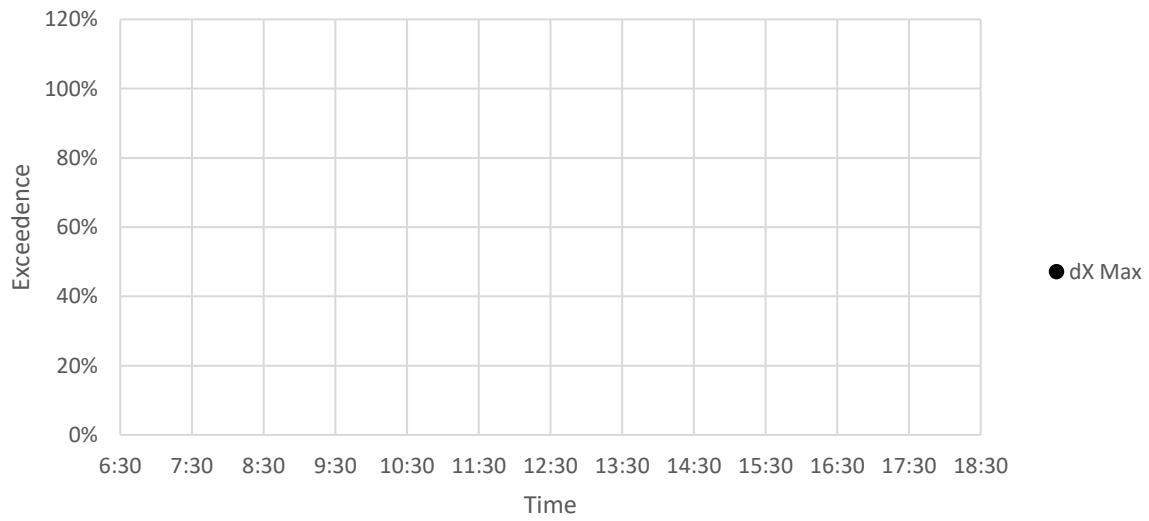




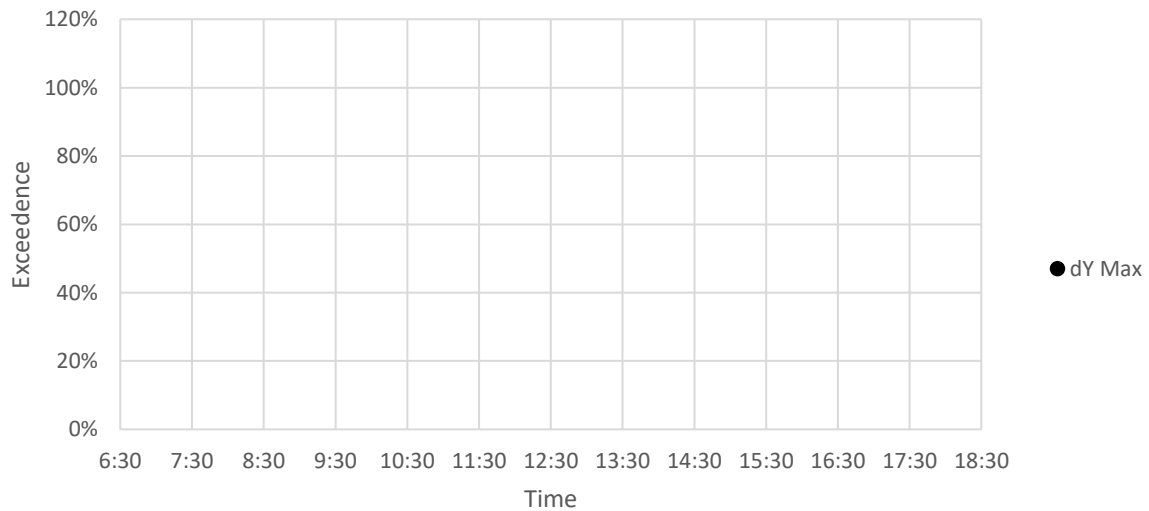
### Vertical



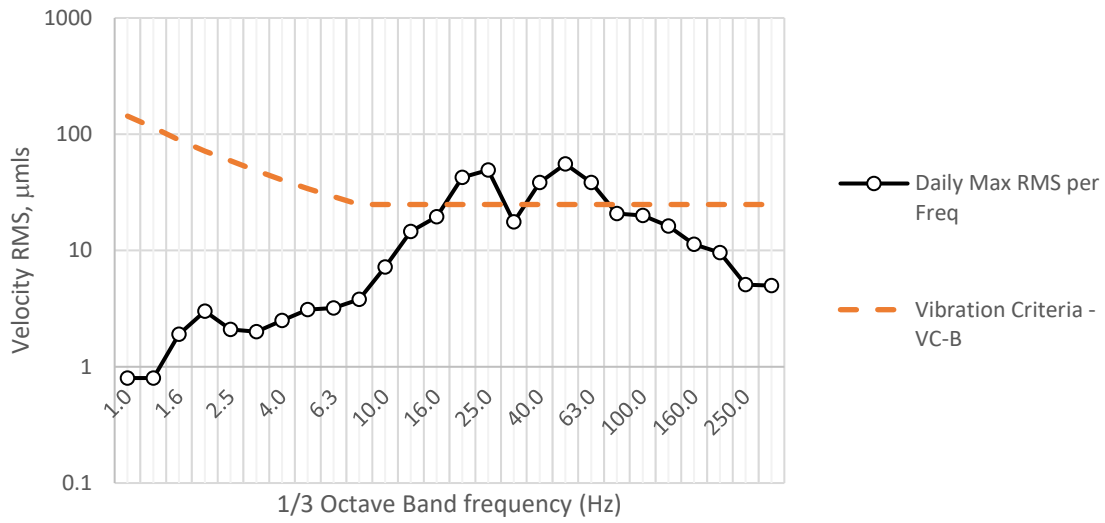
### Fwd/Backwards



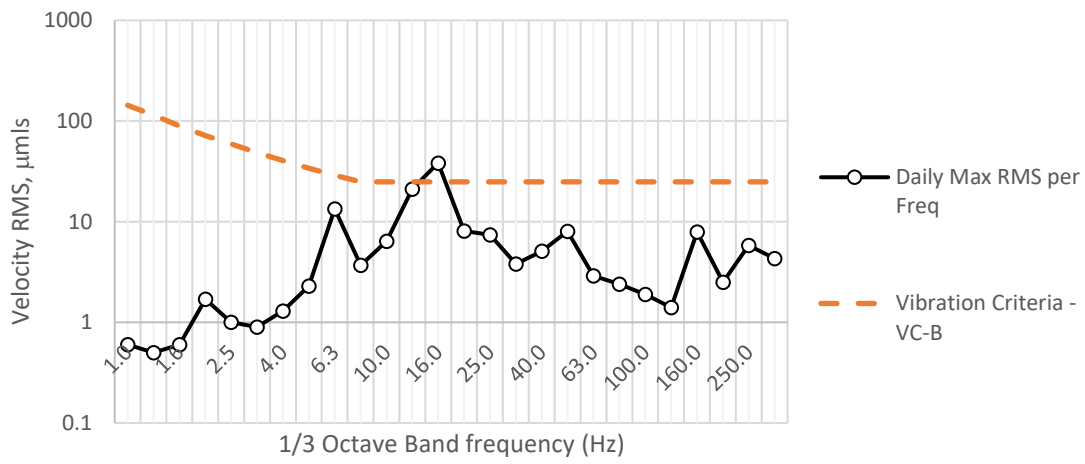
### Sideways



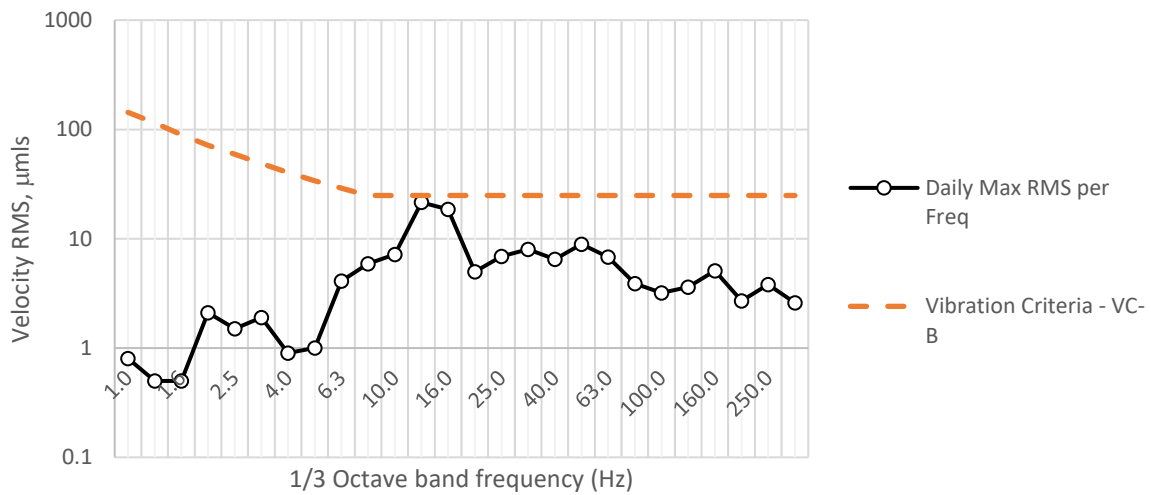
### Vertical Vibration

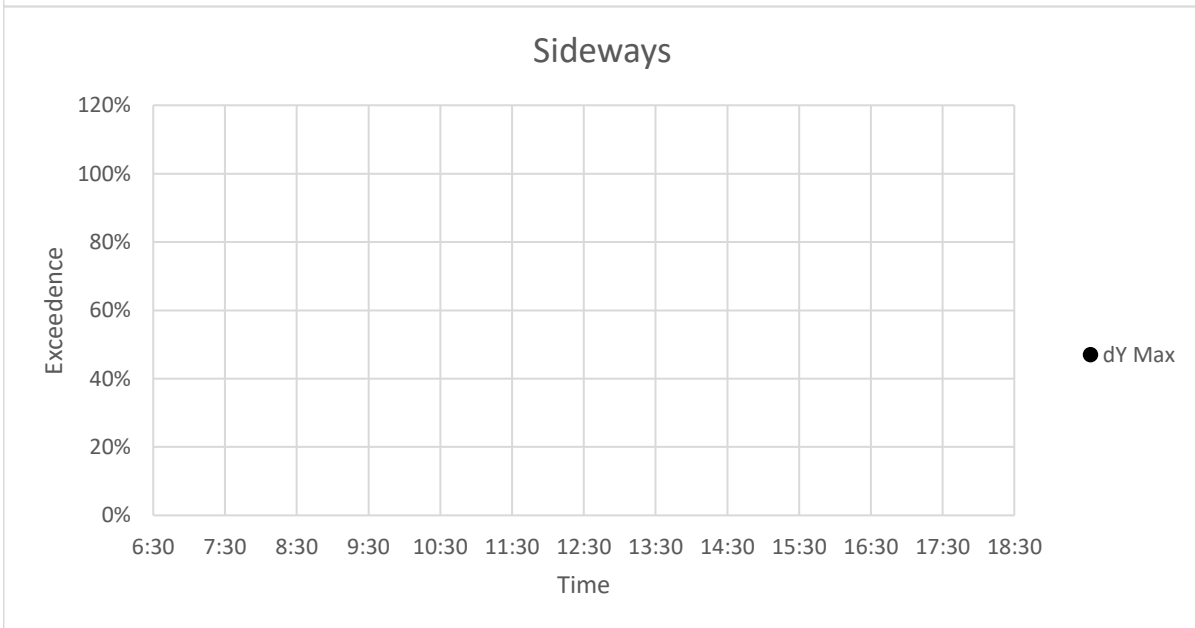
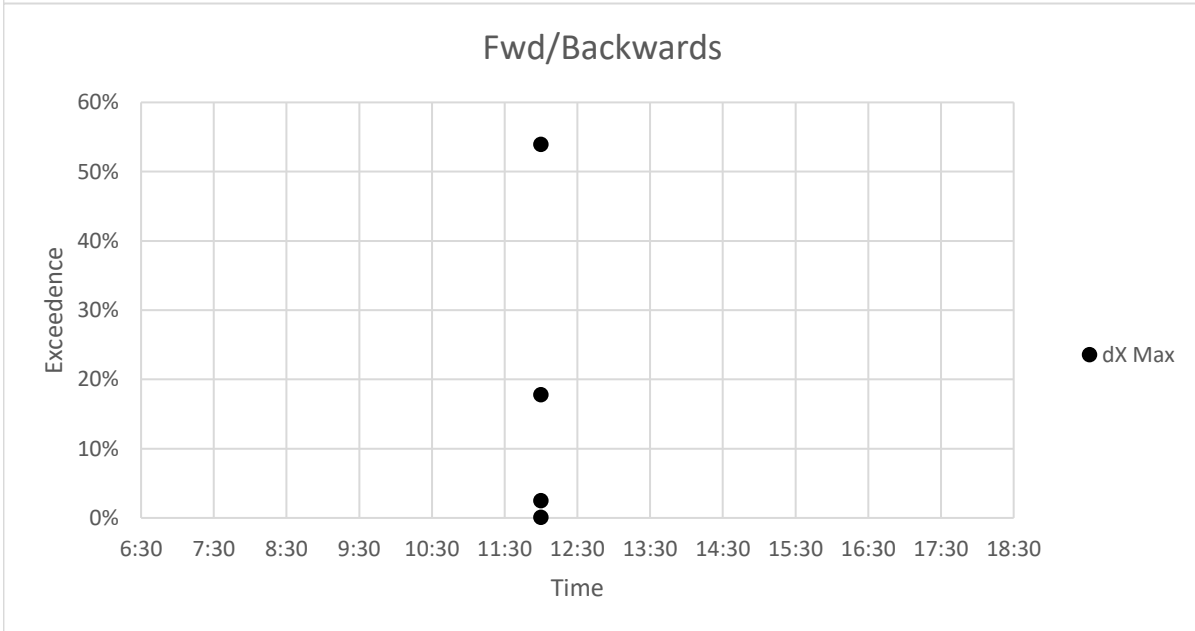
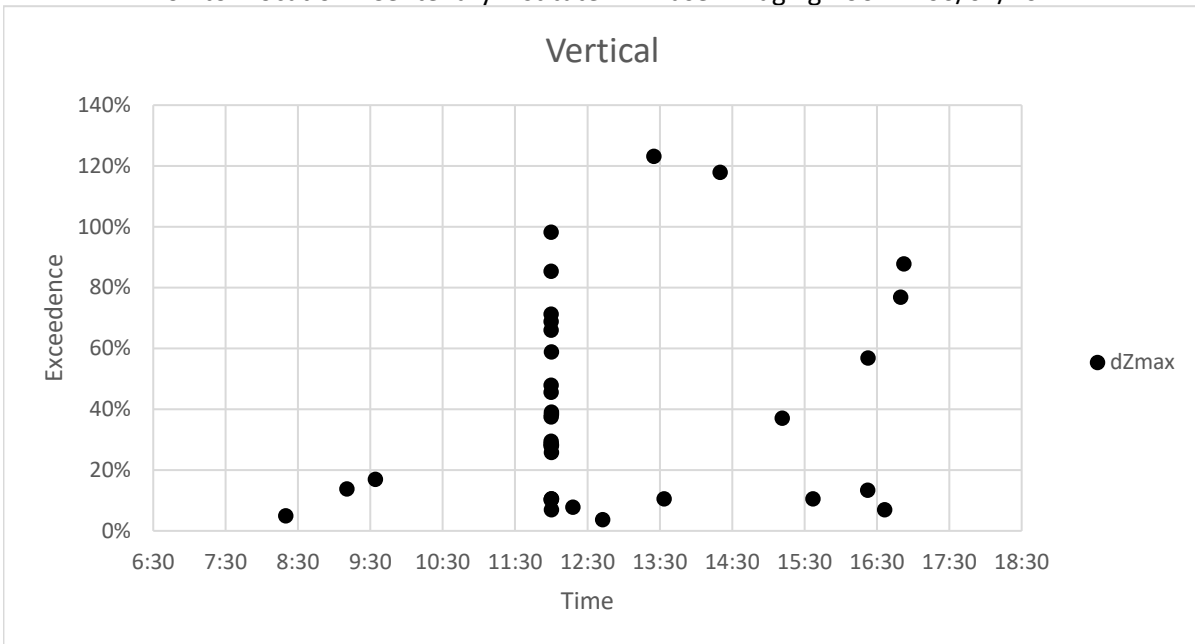


### FwdBackwd Vibration

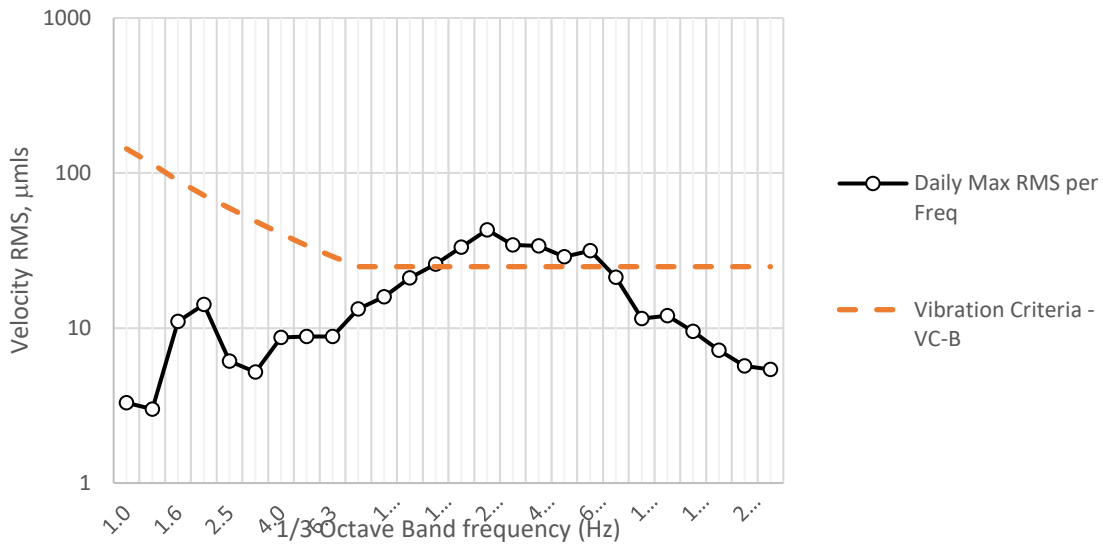


### Sideways Vibration

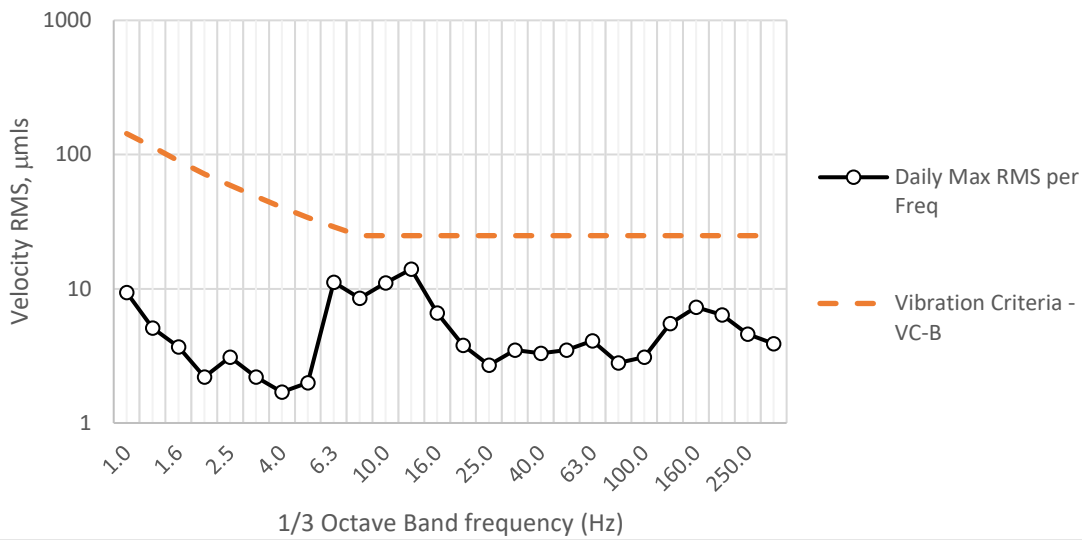




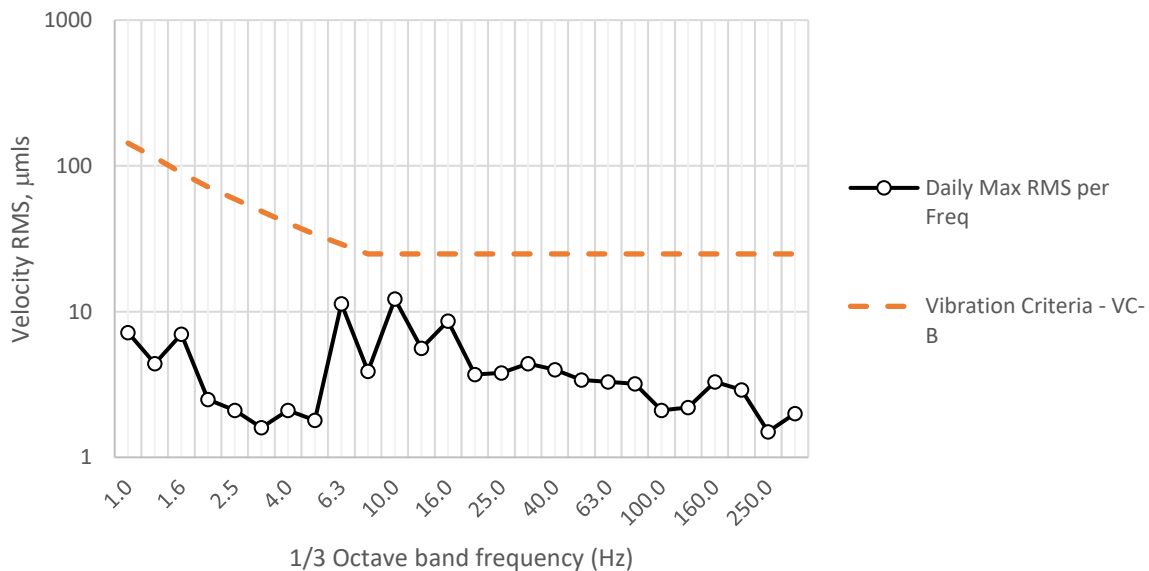
### Vertical Vibration



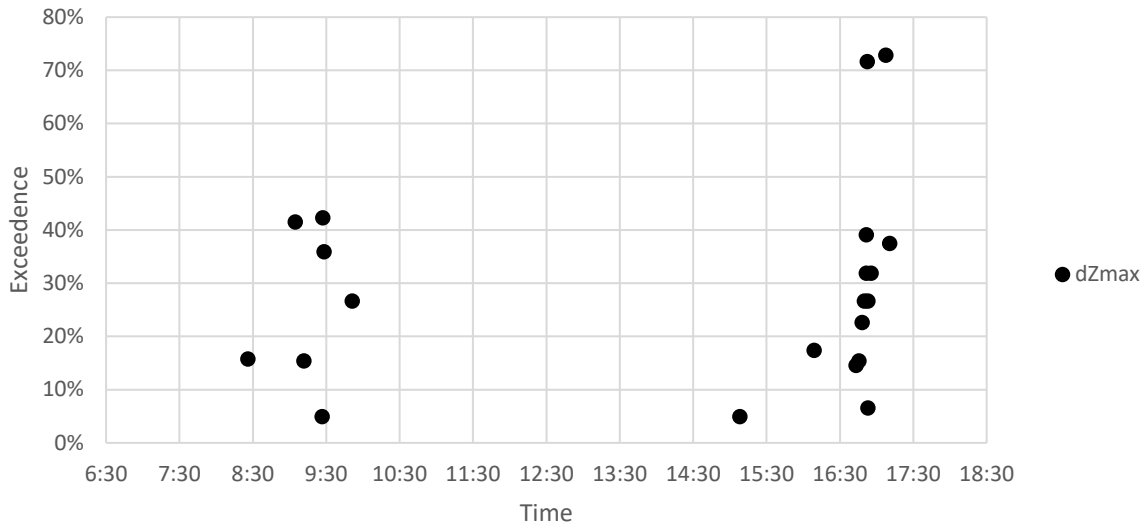
### FwdBackwd Vibration



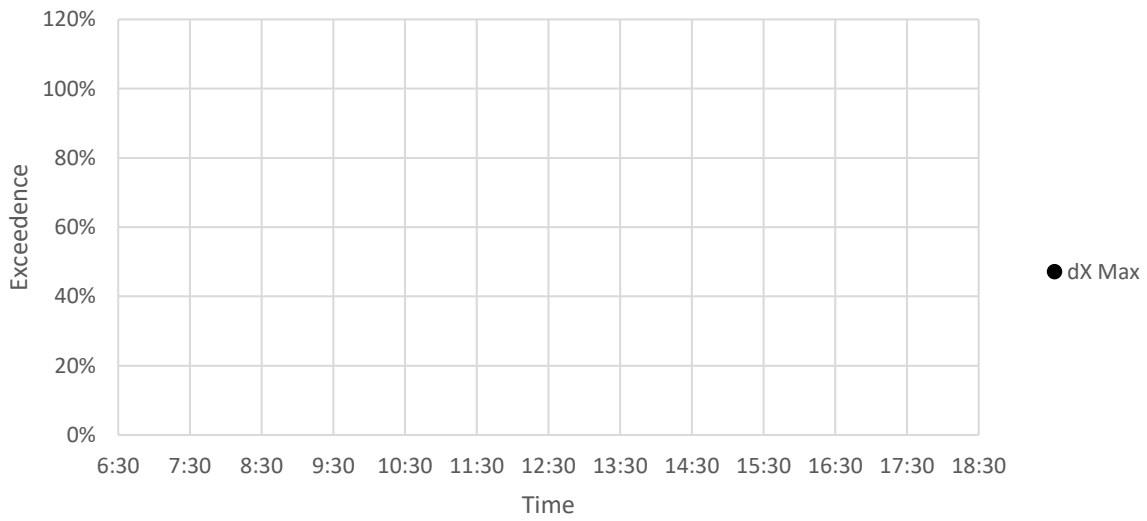
### Sideways Vibration



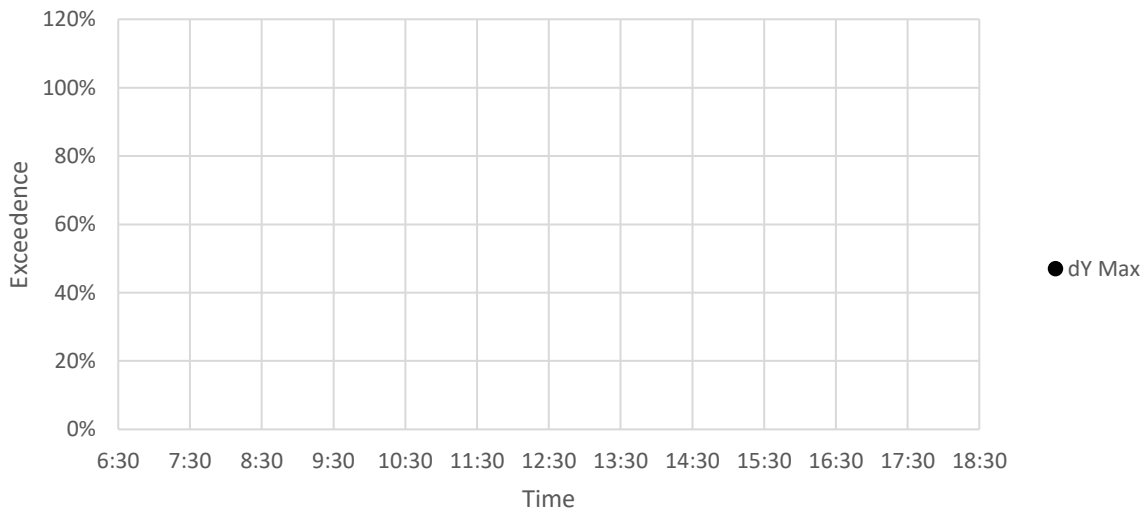
### Vertical



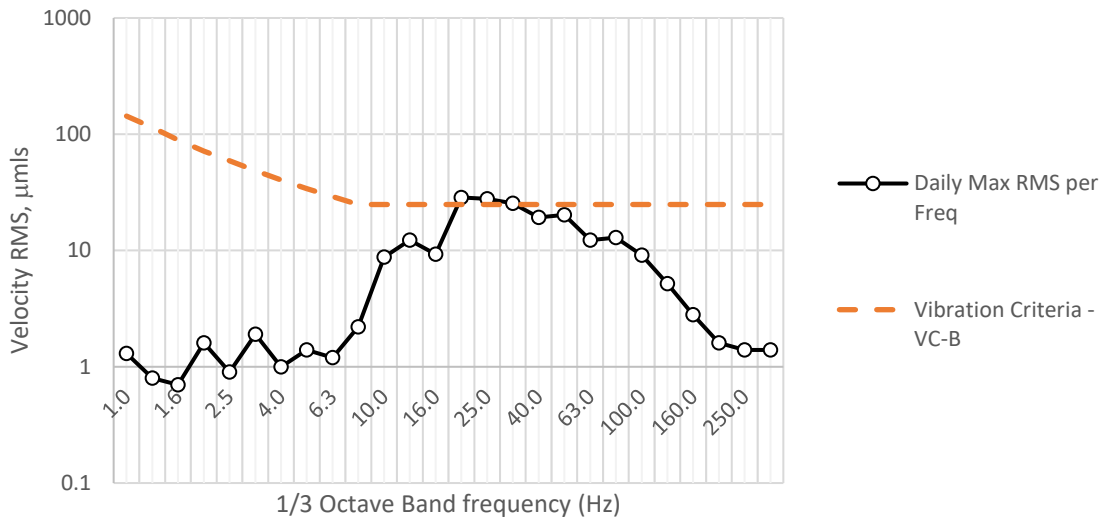
### Fwd/Backwards



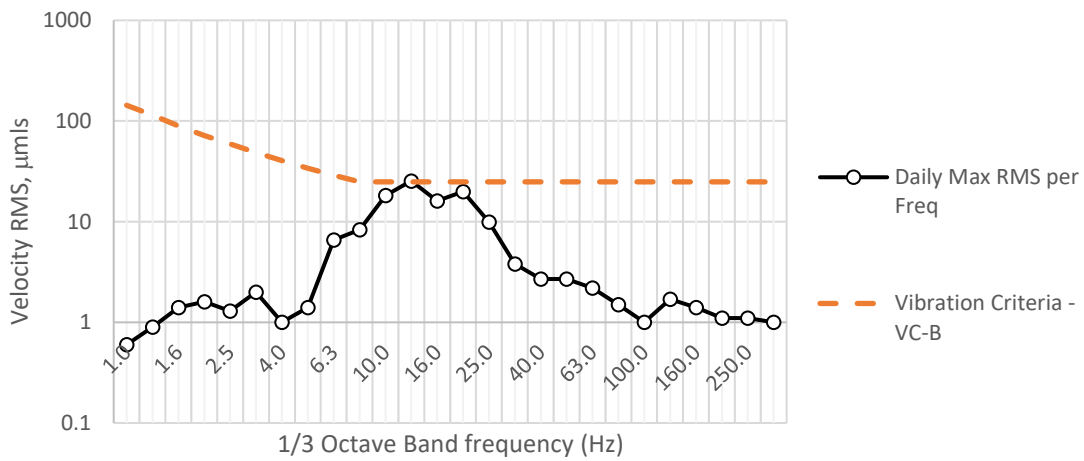
### Sideways



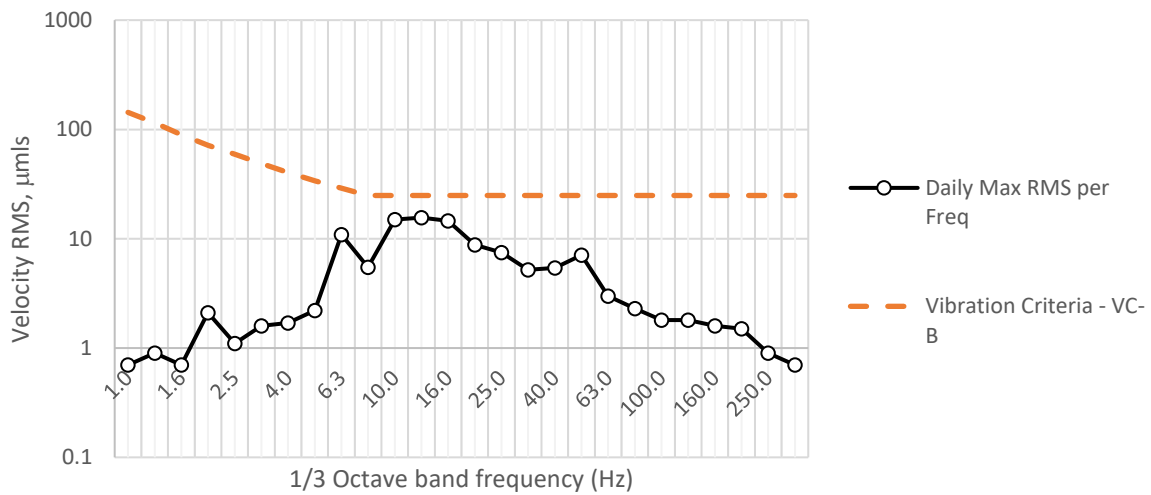
### Vertical Vibration



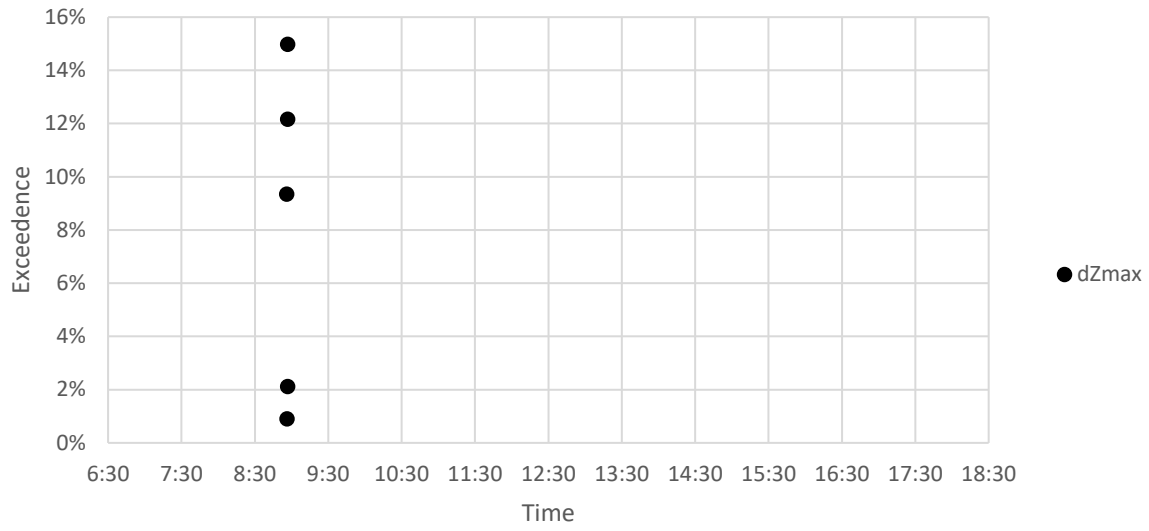
### FwdBackwd Vibration



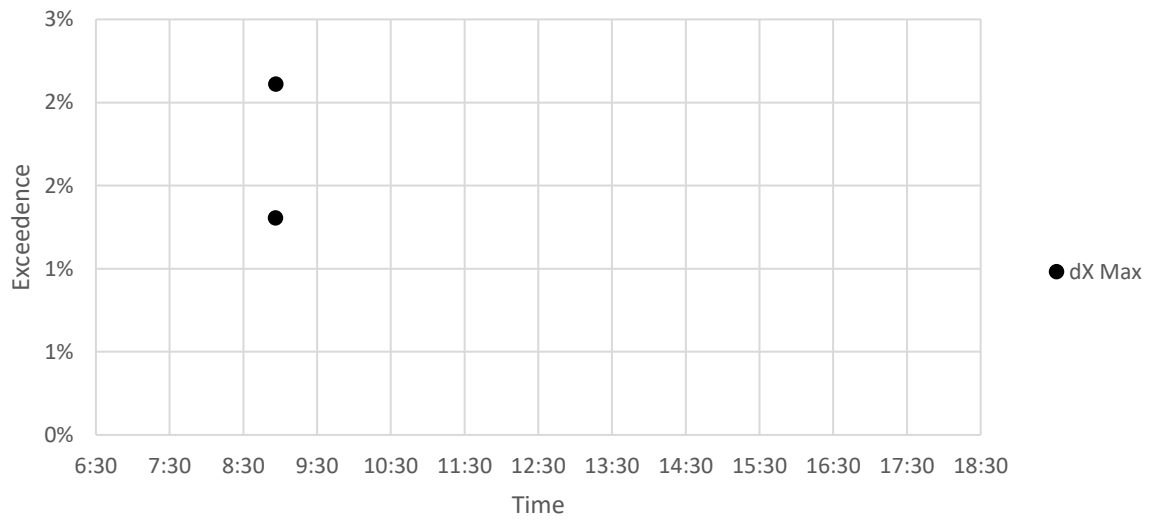
### Sideways Vibration



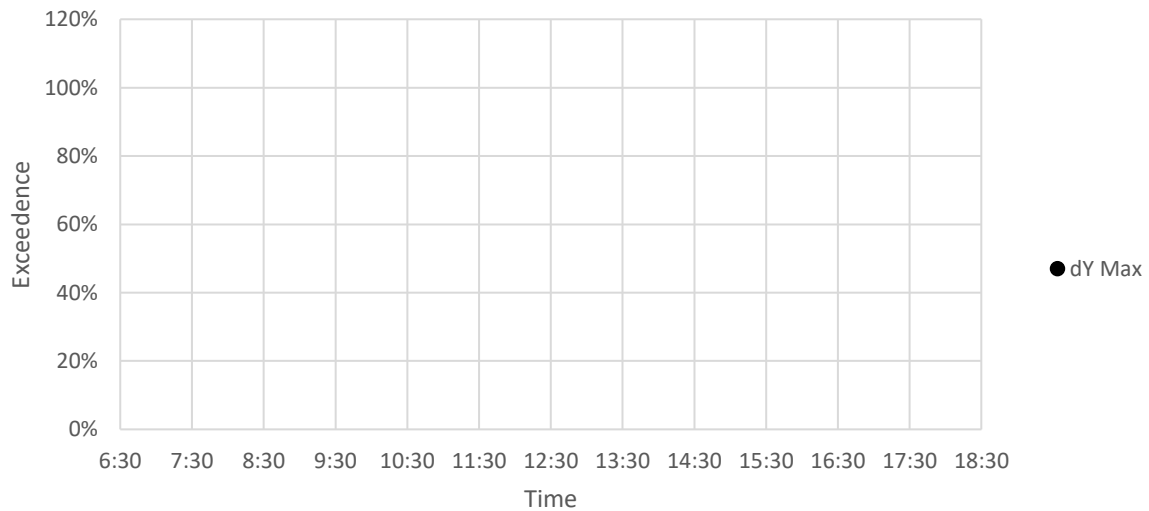
### Vertical



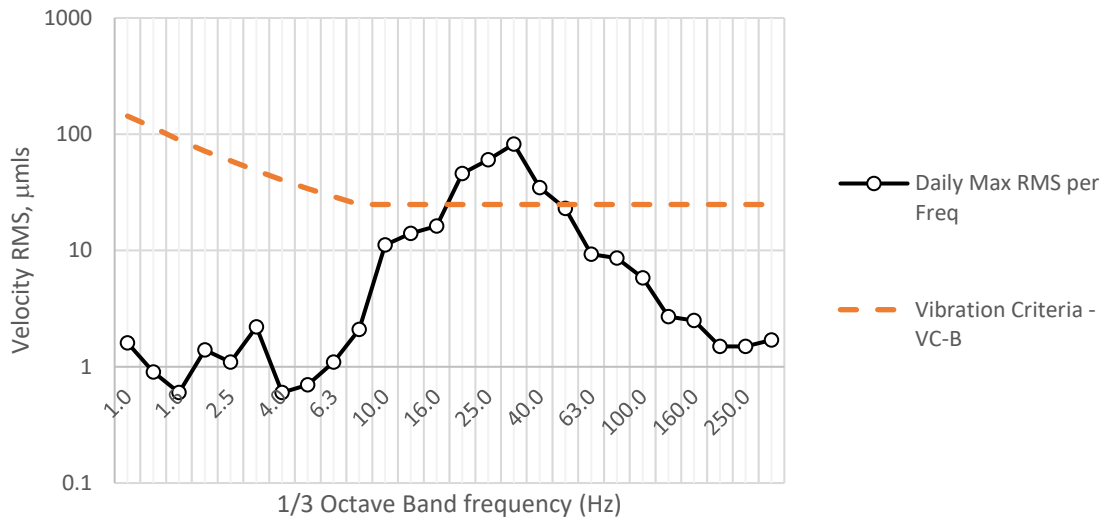
### Fwd/Backwards



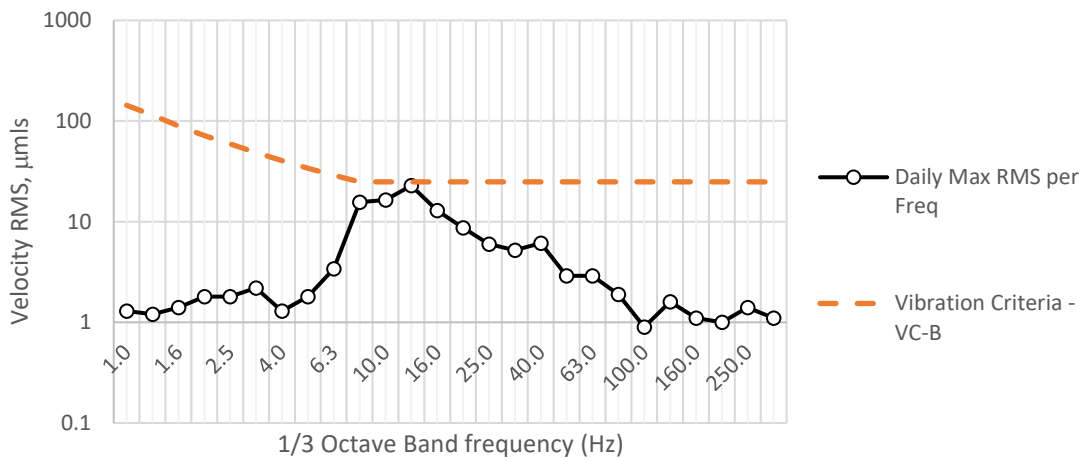
### Sideways



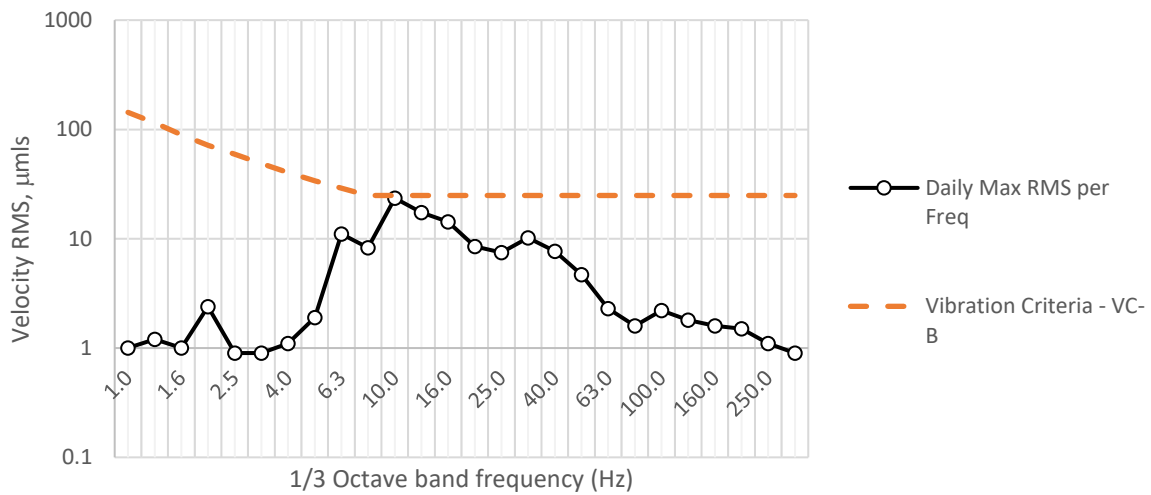
### Vertical Vibration



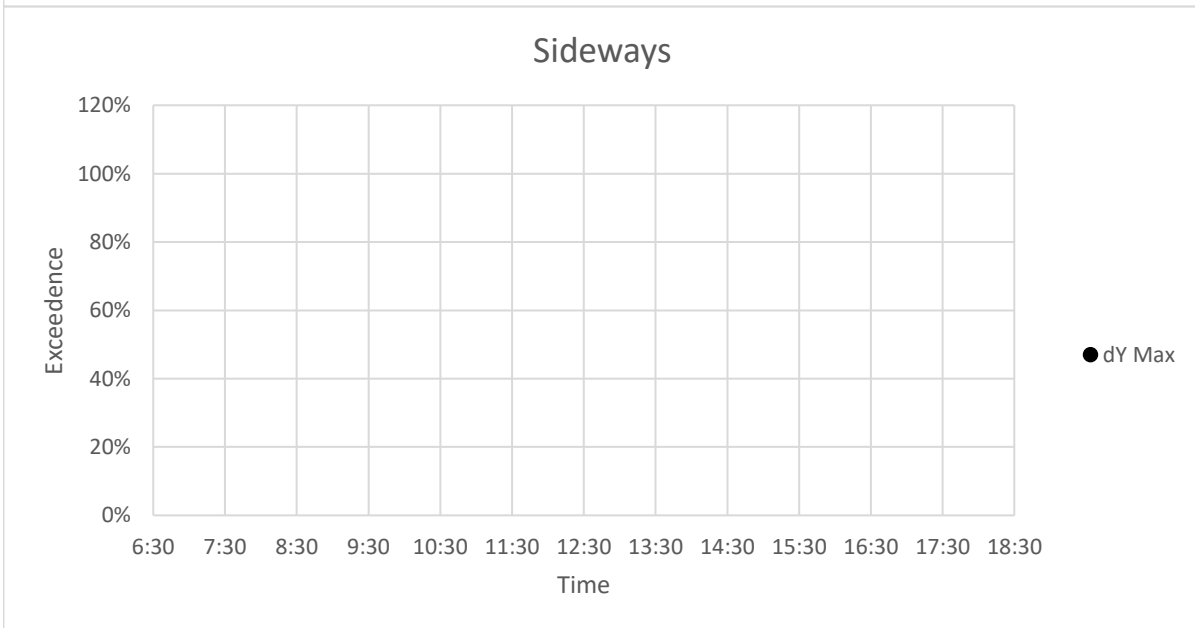
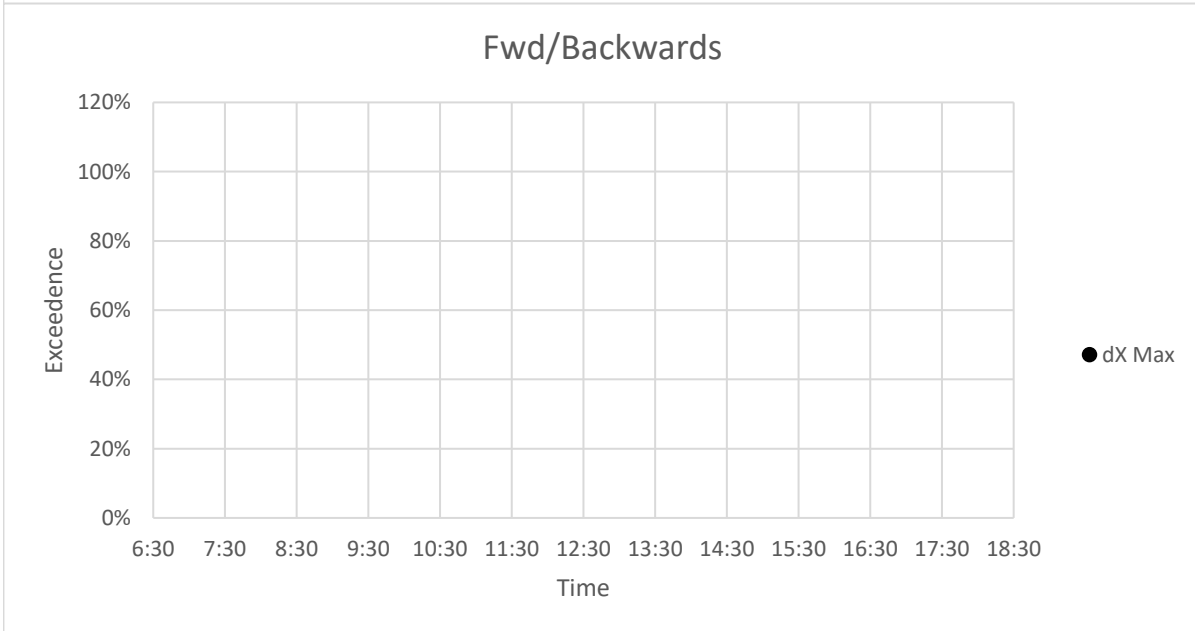
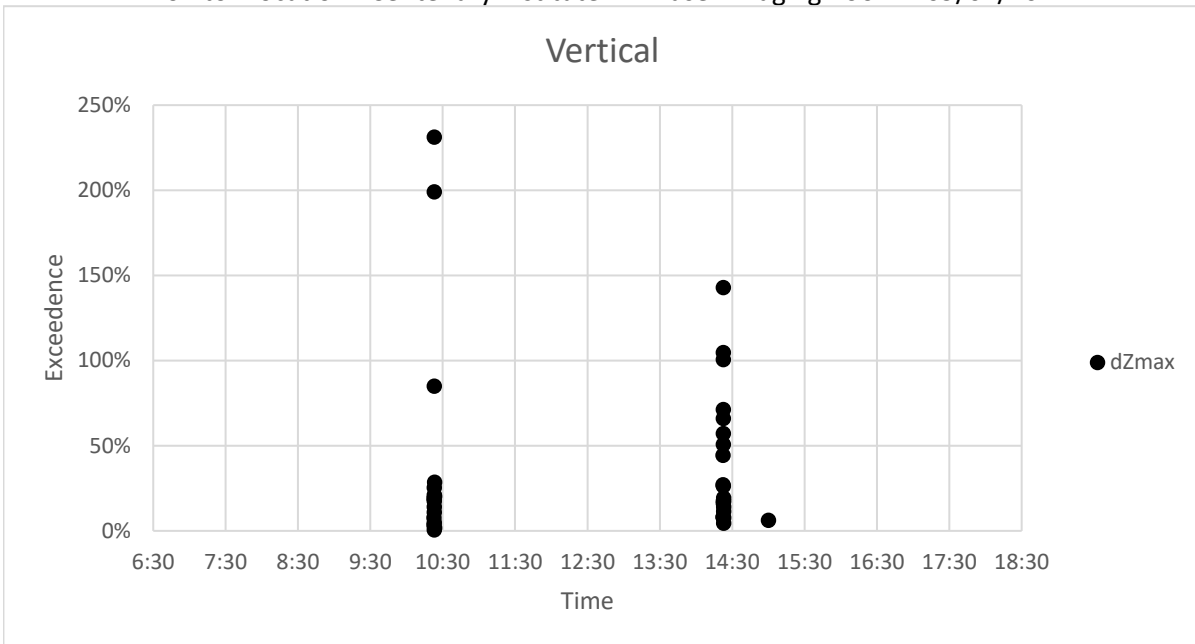
### FwdBackwd Vibration



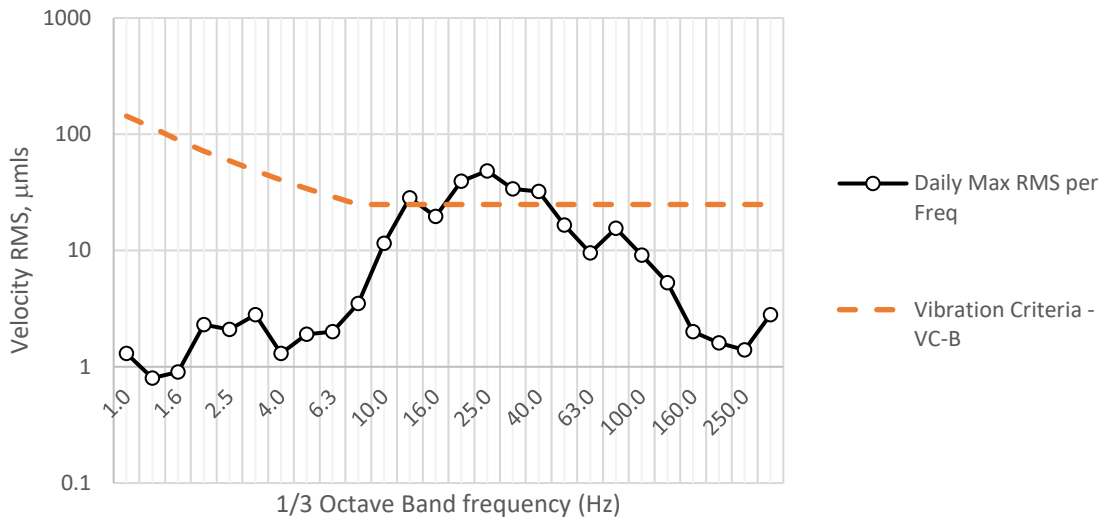
### Sideways Vibration



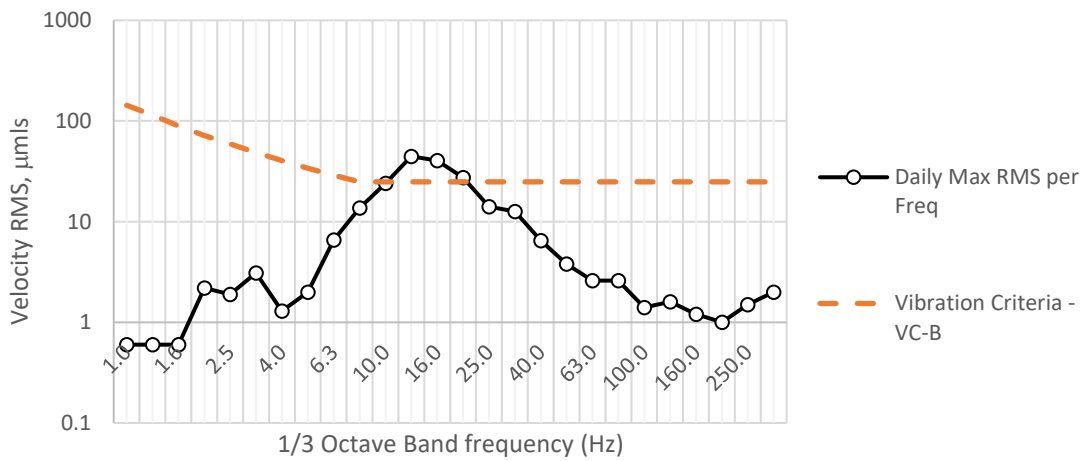




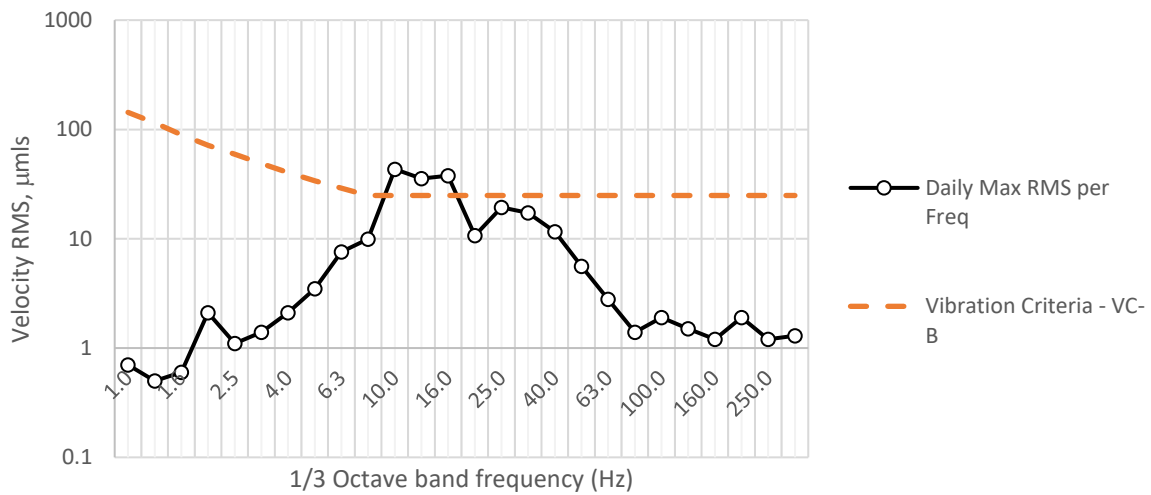
### Vertical Vibration



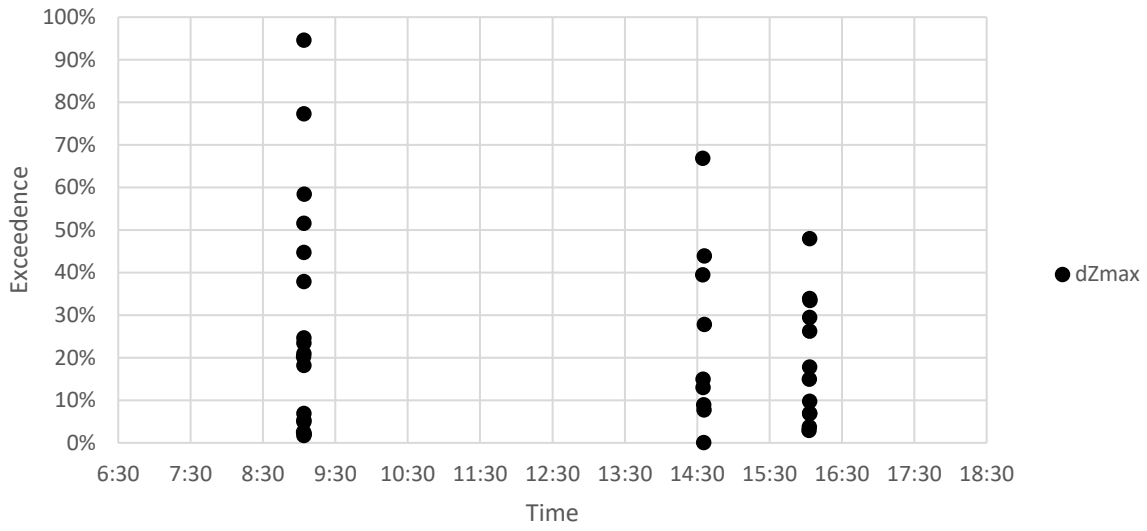
### FwdBackwd Vibration



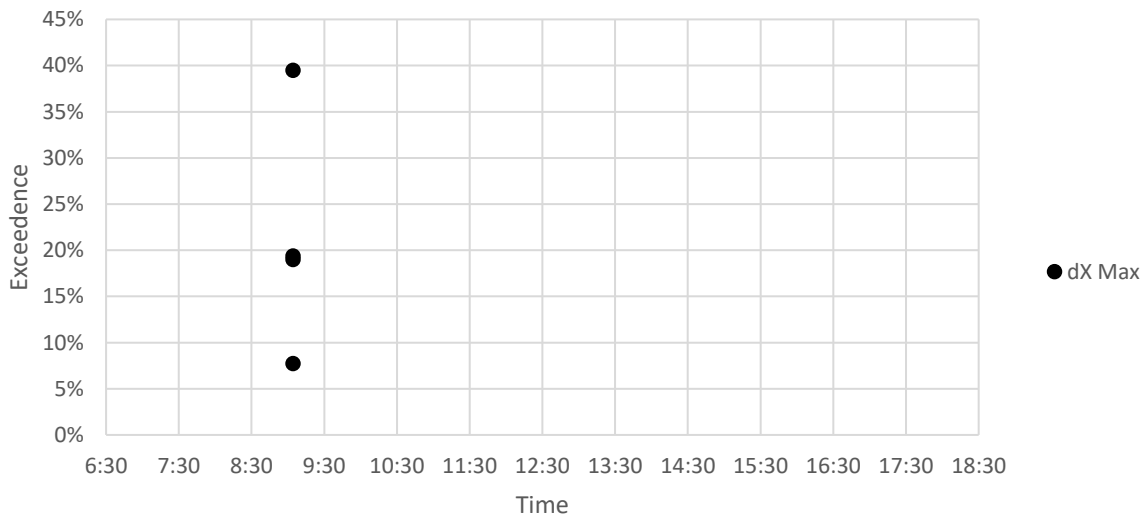
### Sideways Vibration



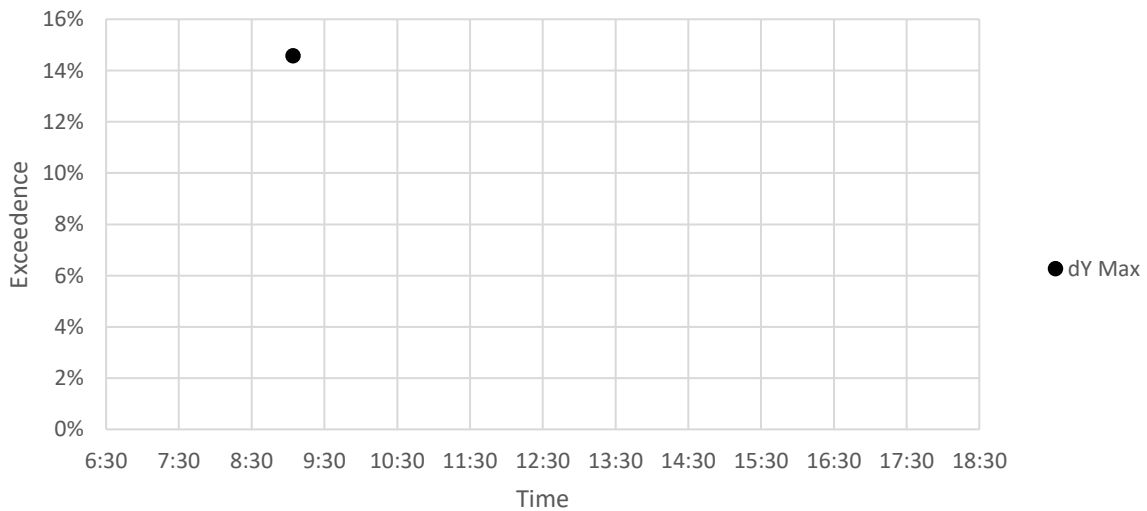
### Vertical



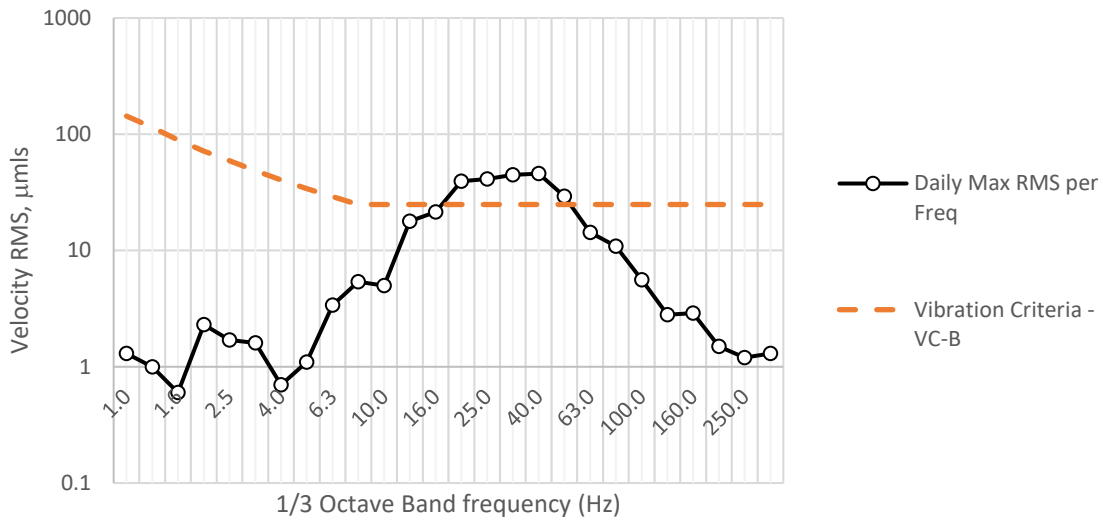
### Fwd/Backwards



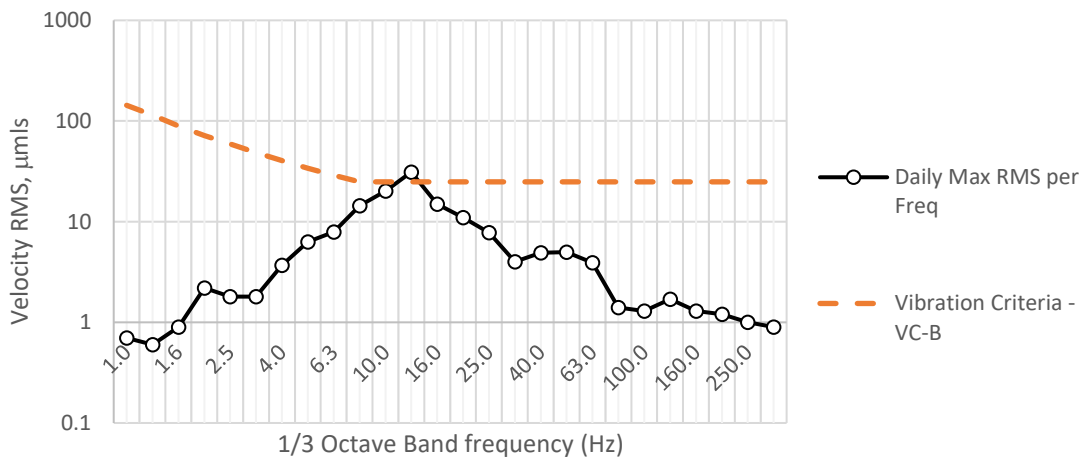
### Sideways



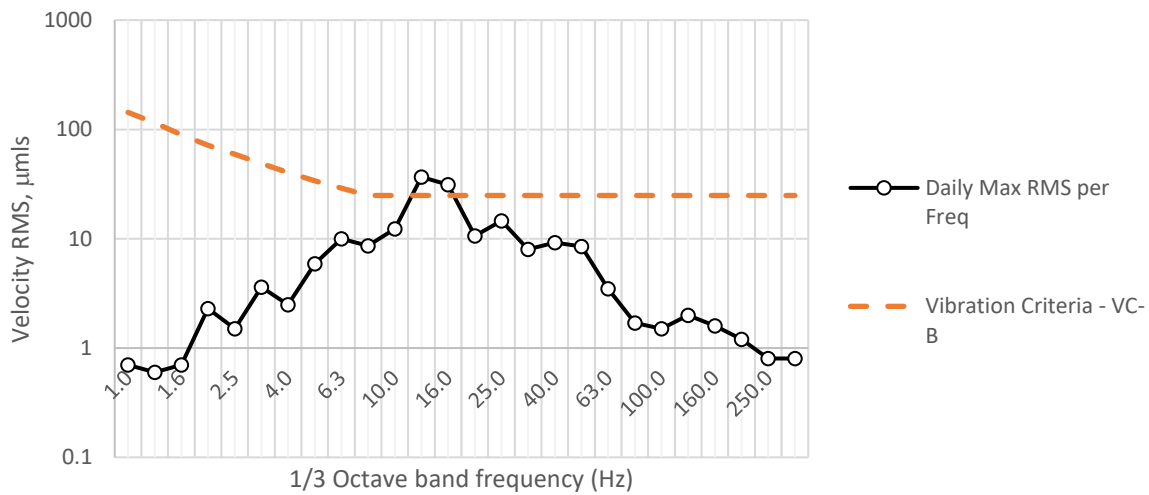
### Vertical Vibration



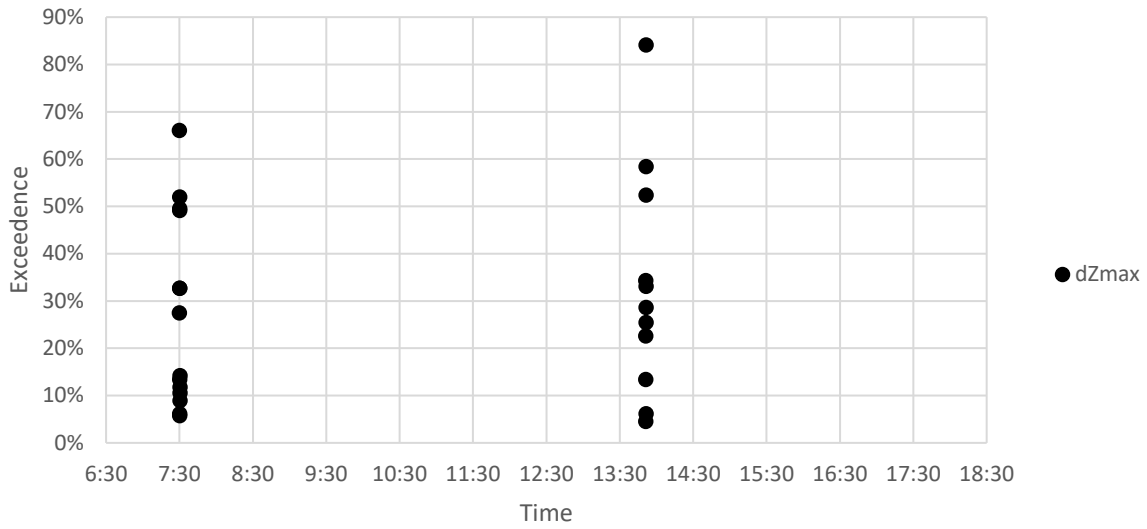
### FwdBackwd Vibration



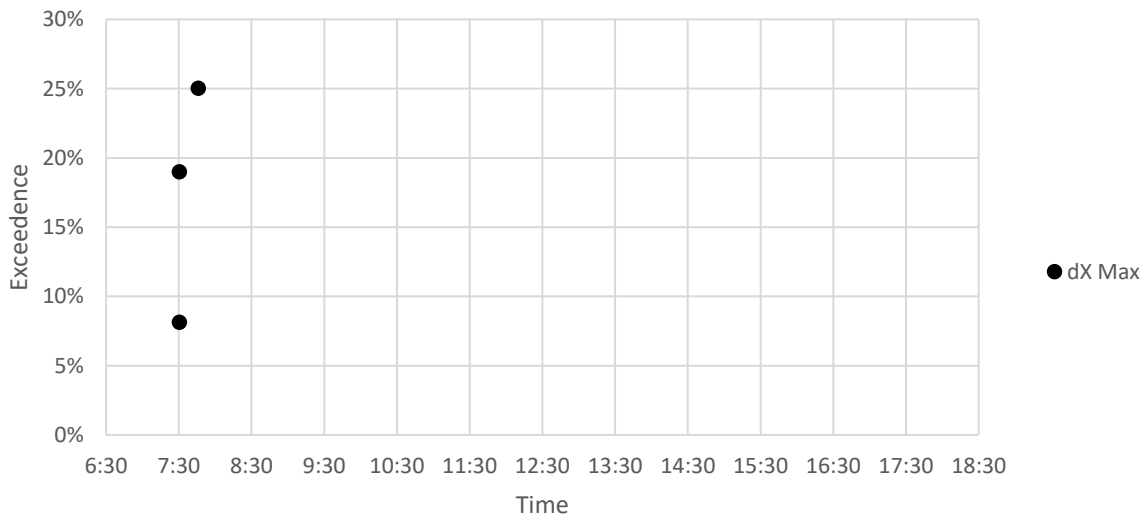
### Sideways Vibration



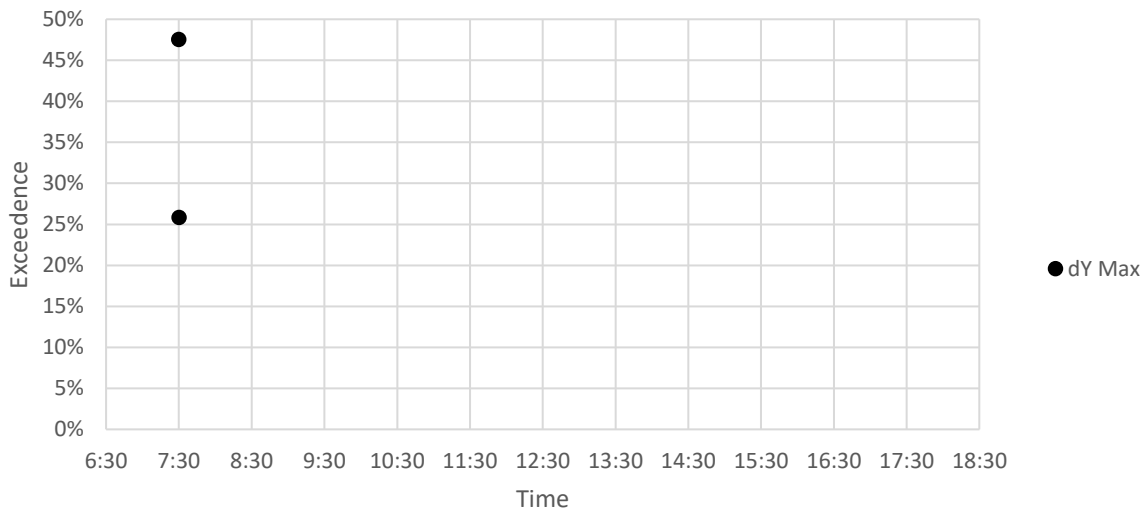
### Vertical



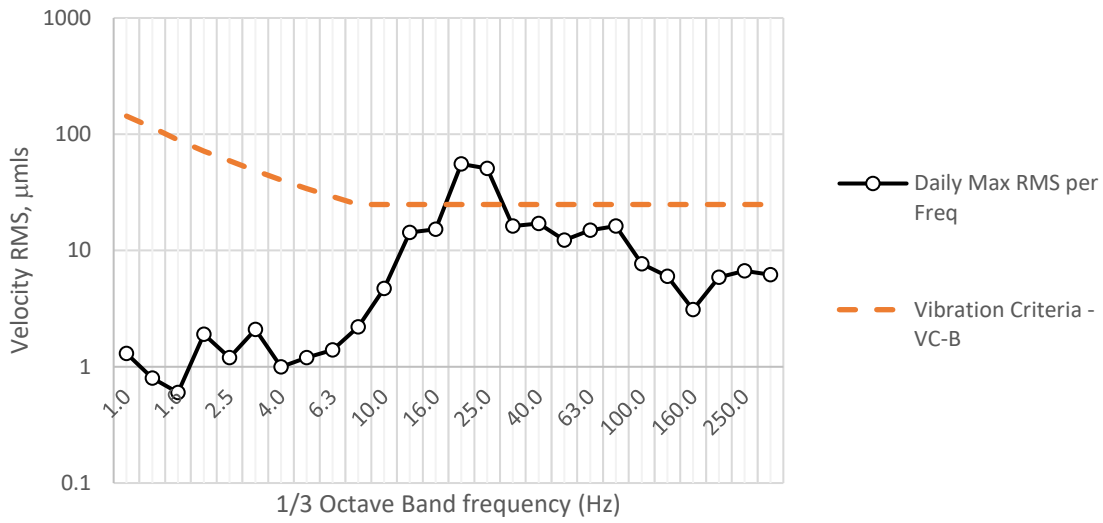
### Fwd/Backwards



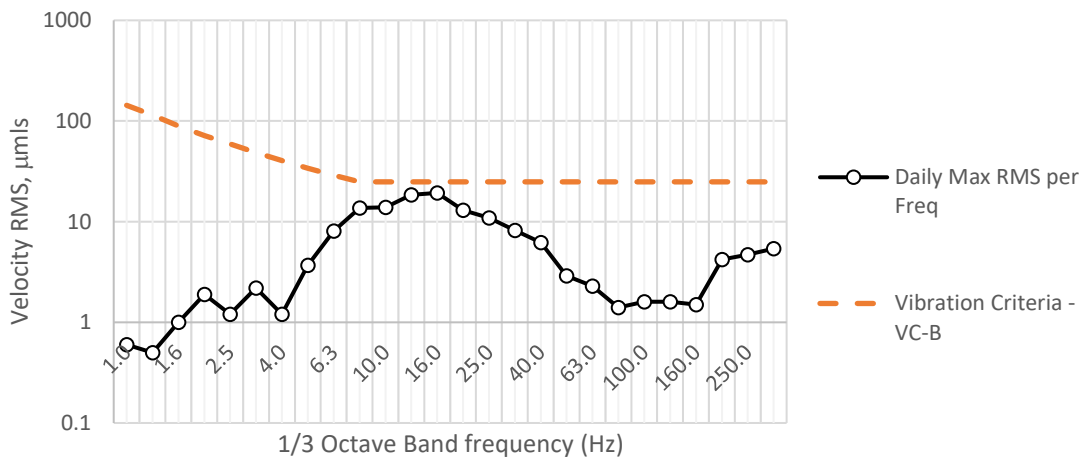
### Sideways



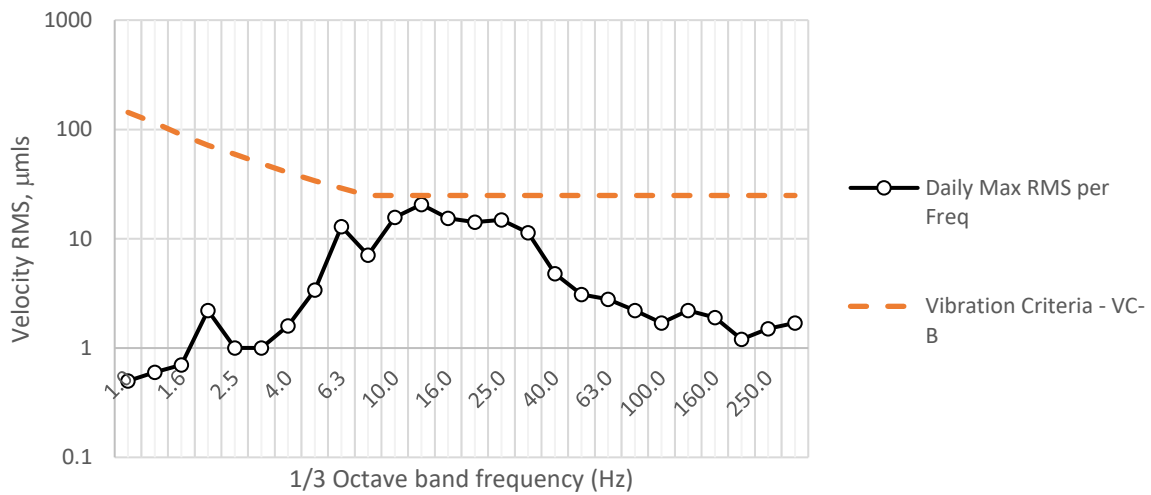
### Vertical Vibration



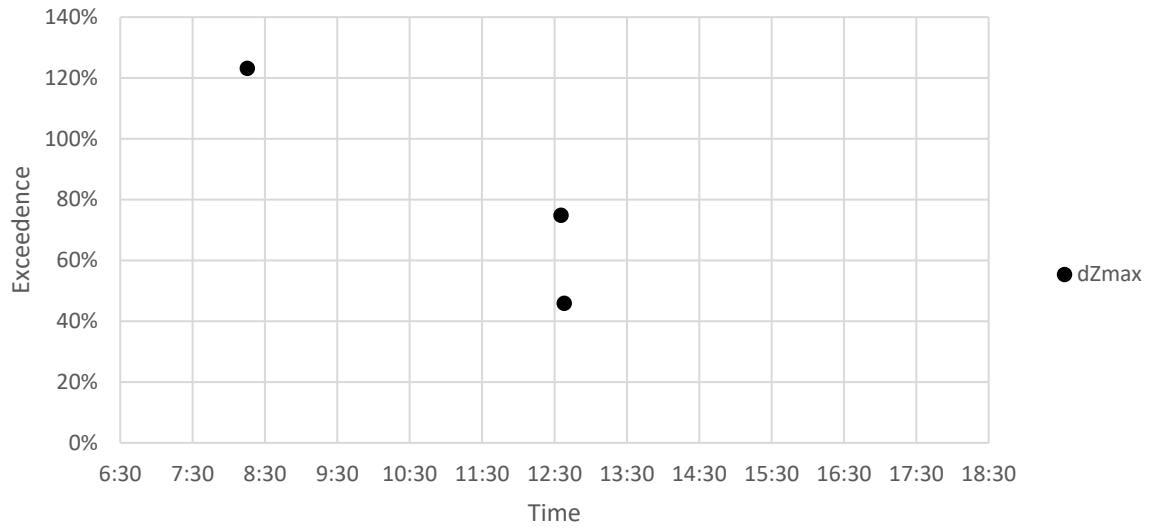
### FwdBackwd Vibration



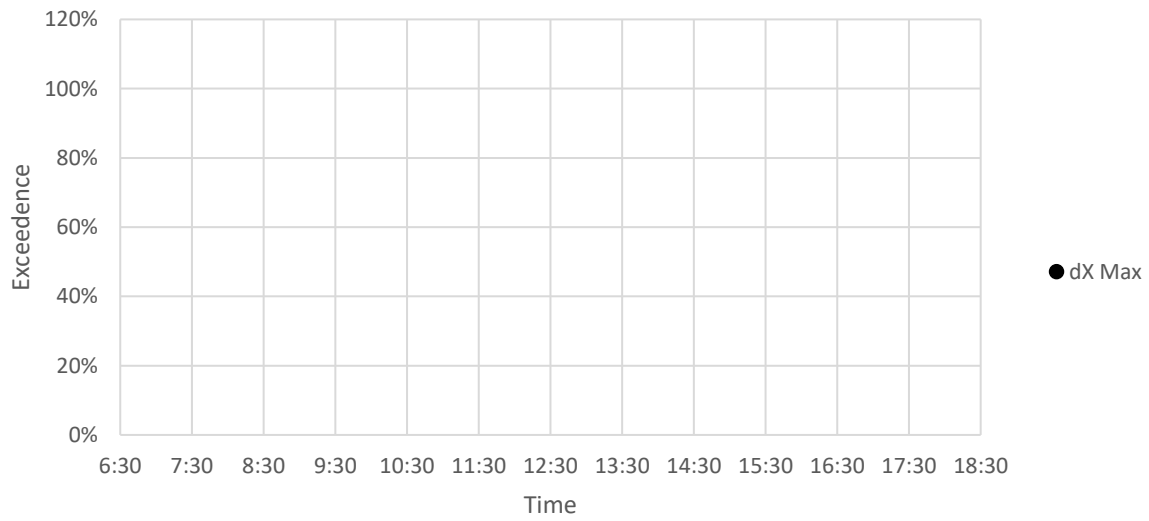
### Sideways Vibration



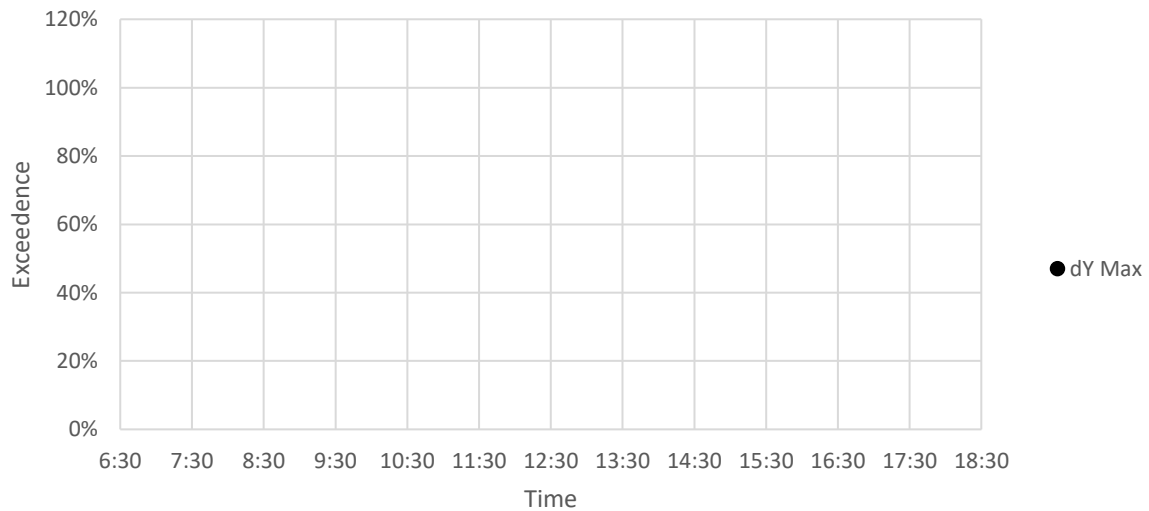
### Vertical



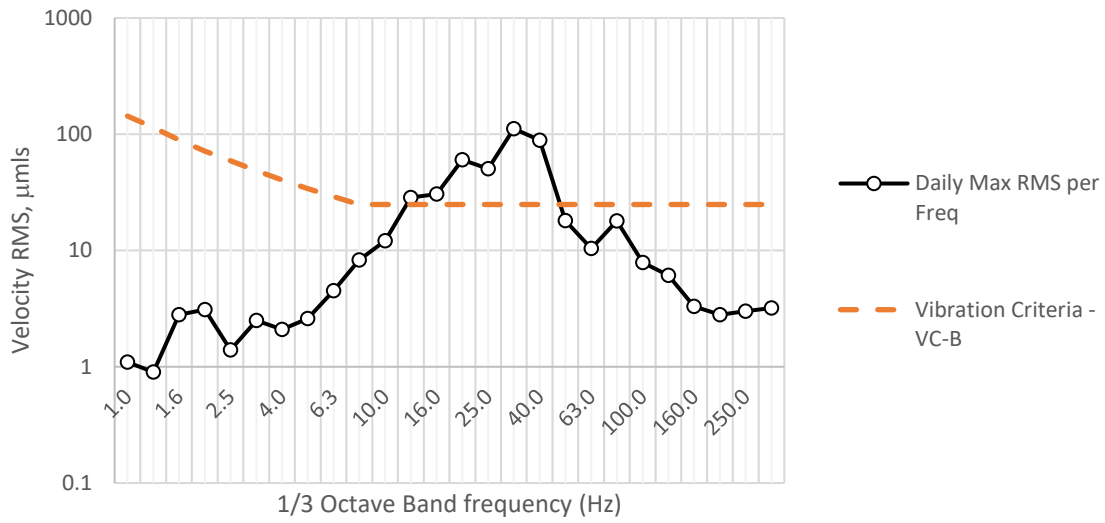
### Fwd/Backwards



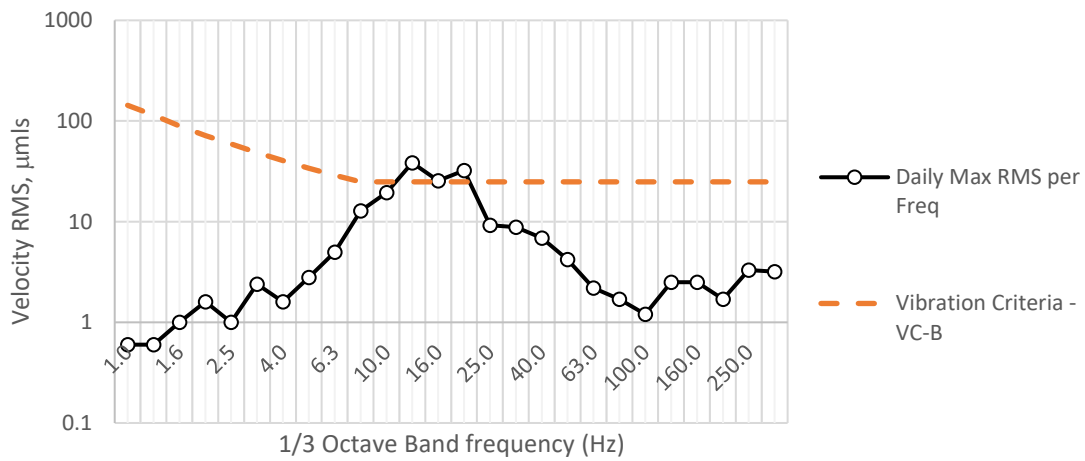
### Sideways



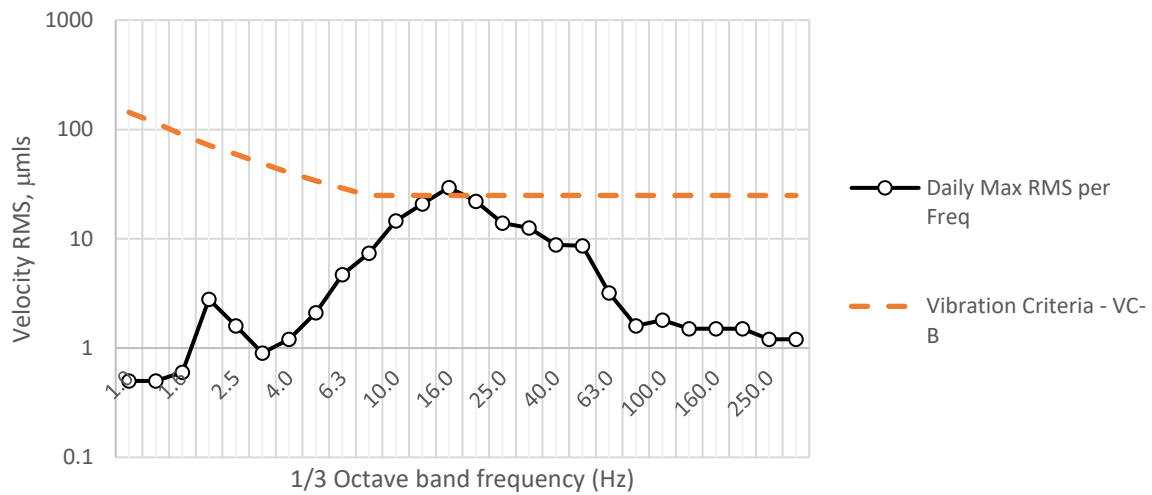
### Vertical Vibration



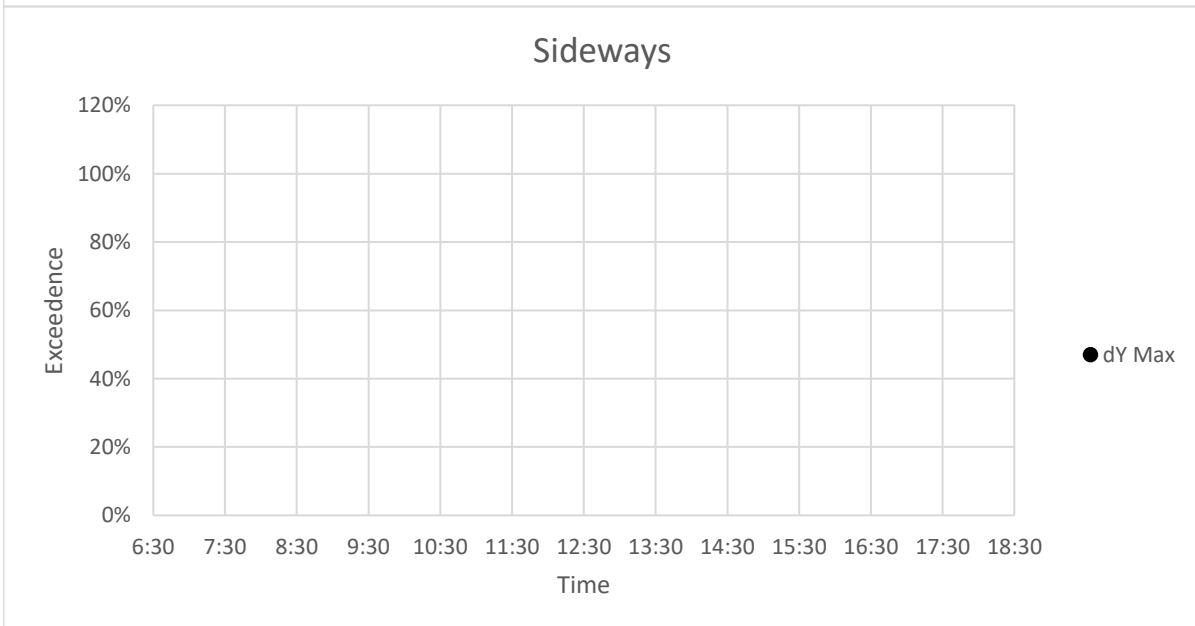
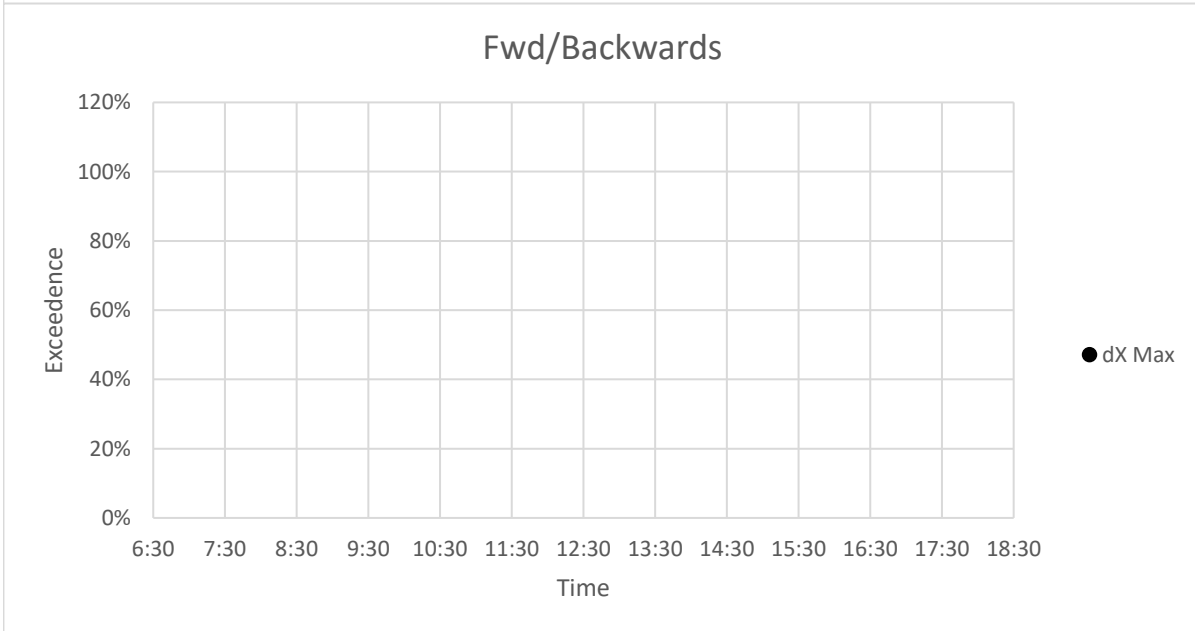
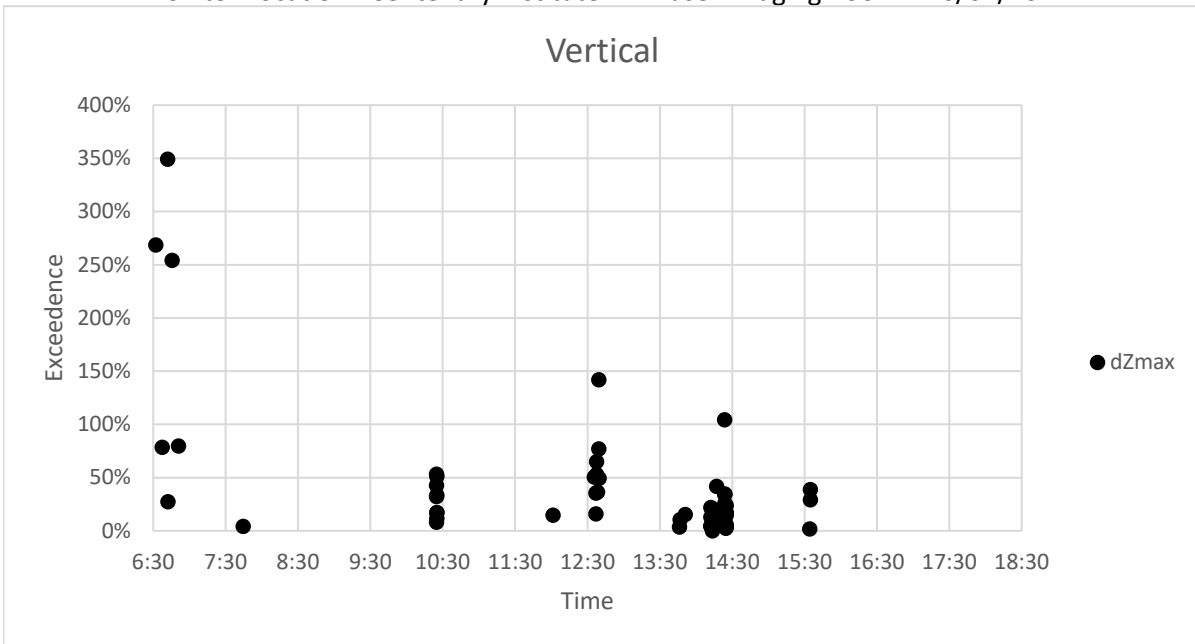
### FwdBackwd Vibration



### Sideways Vibration





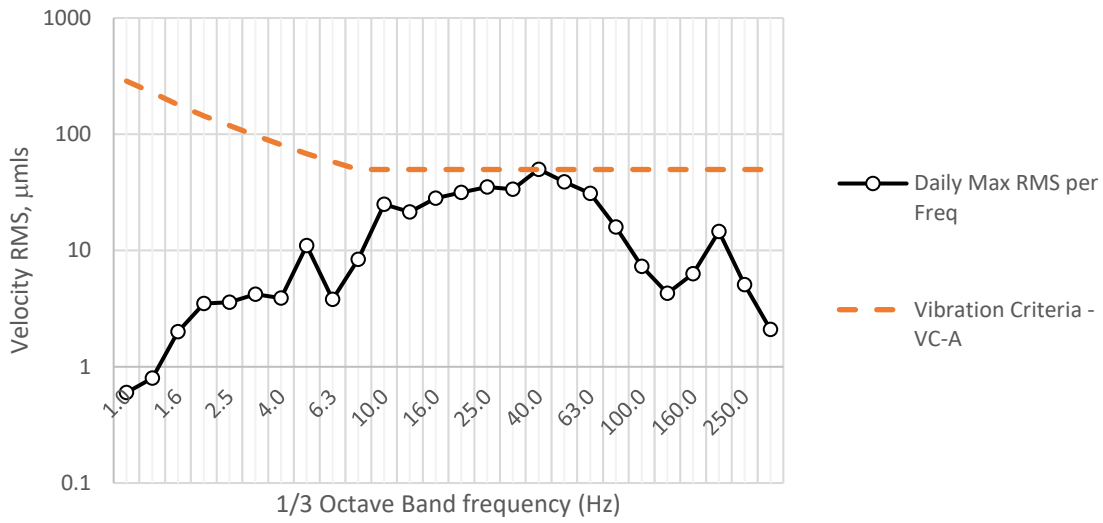


## **CENTENARY INSTITUTE – LEVEL 3 FISH TANKS**

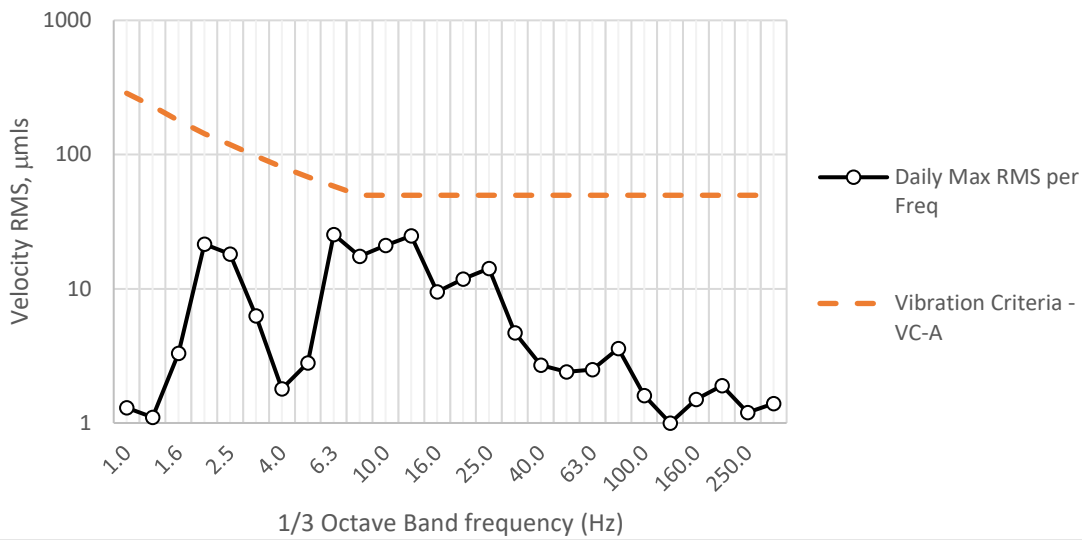
No exceedances occurred during the monitoring period.

## CENTENARY INSTITUTE – LEVEL 4 SURGERY ROOM (SOUTHERN FAÇADE)

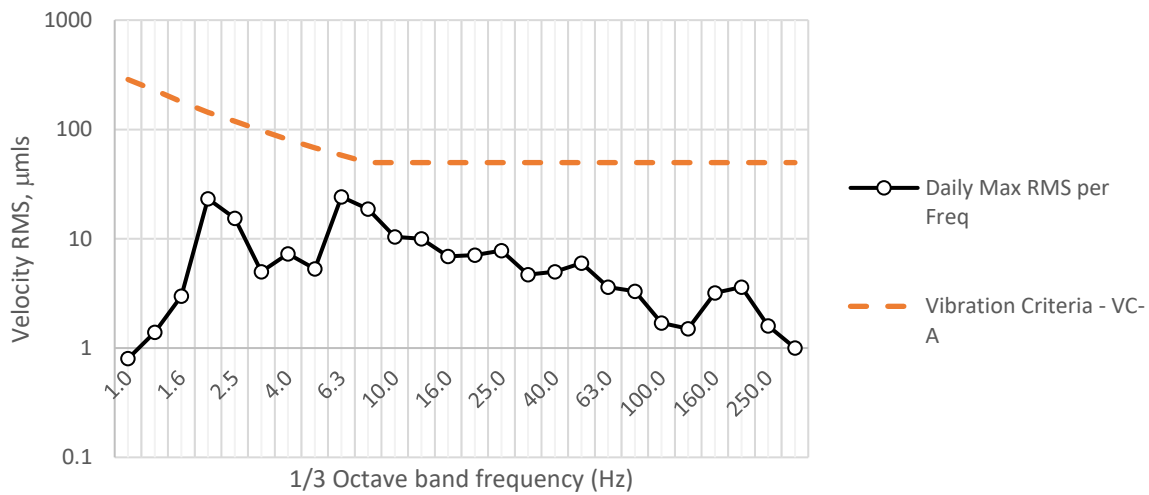
### Vertical Vibration



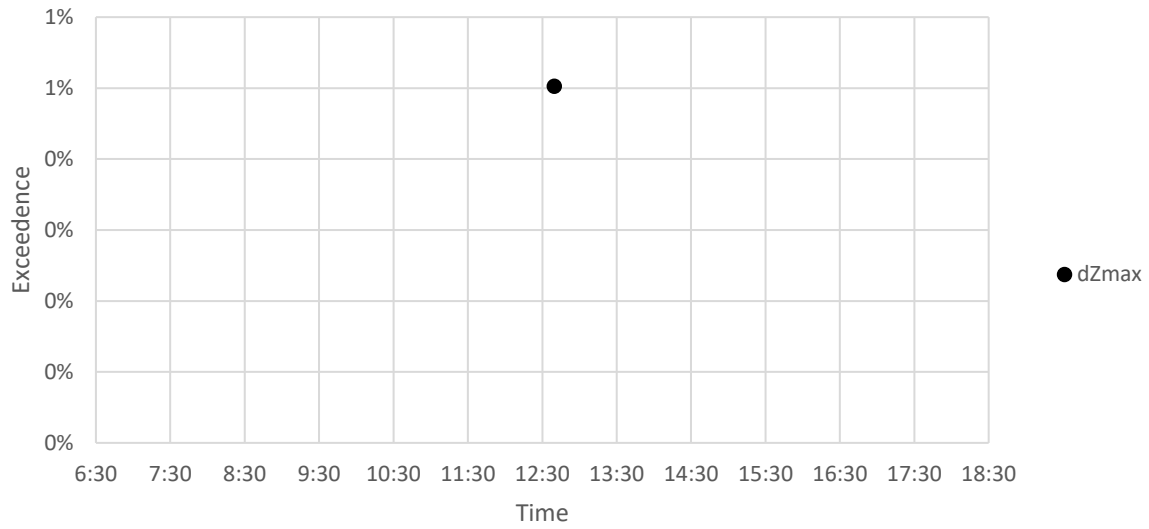
### FwdBackwd Vibration



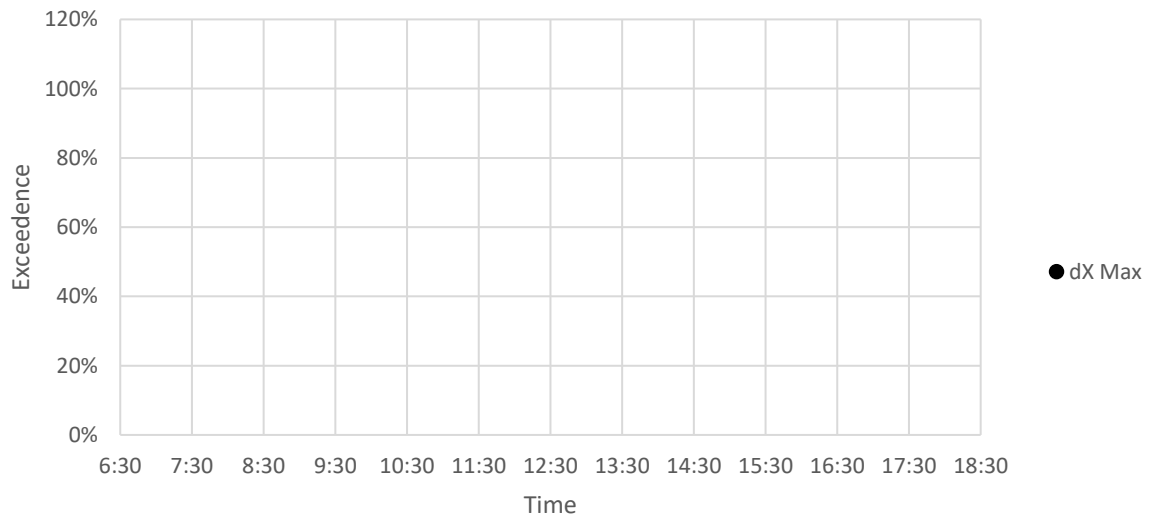
### Sideways Vibration



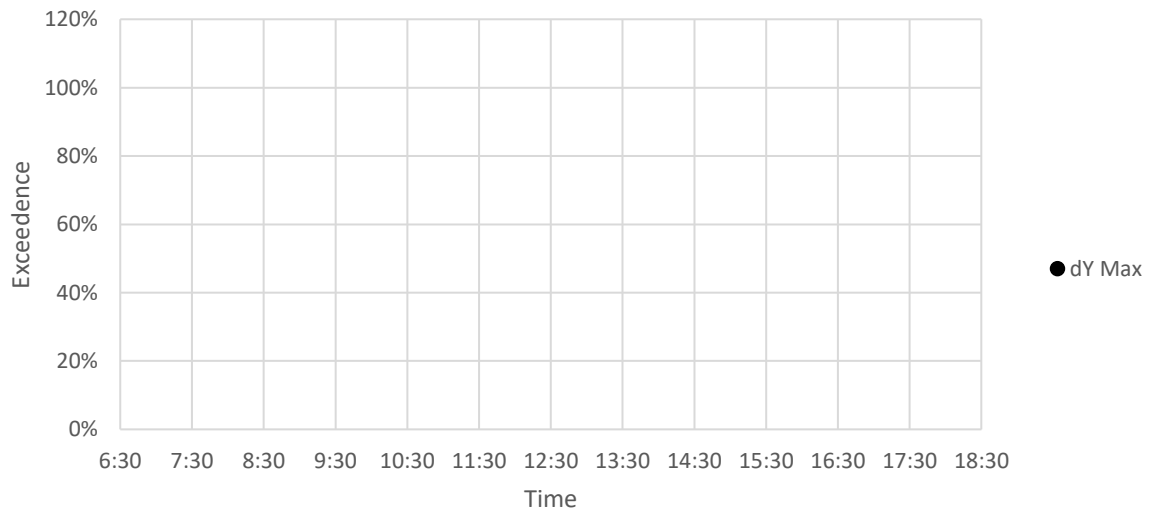
### Vertical



### Fwd/Backwards

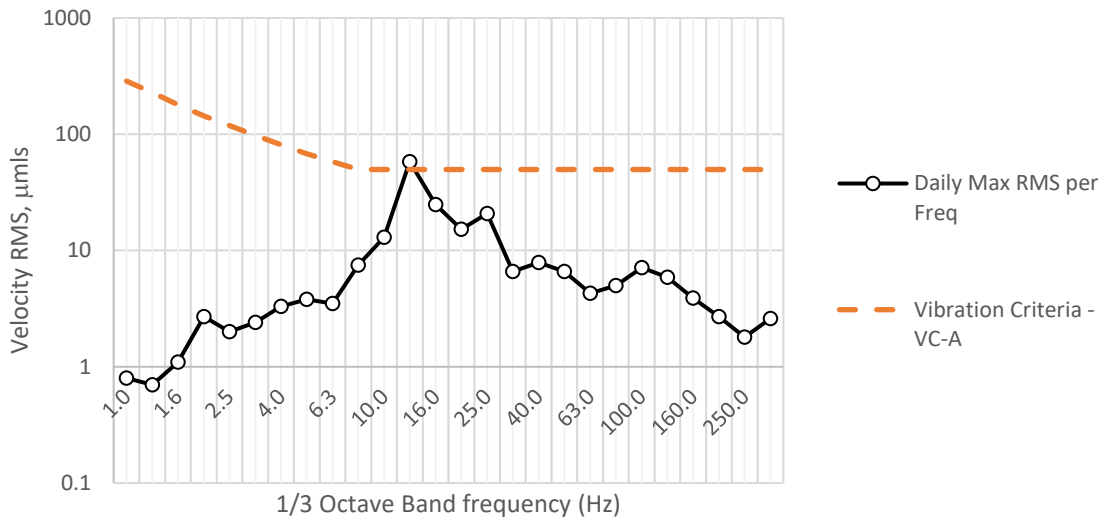


### Sideways

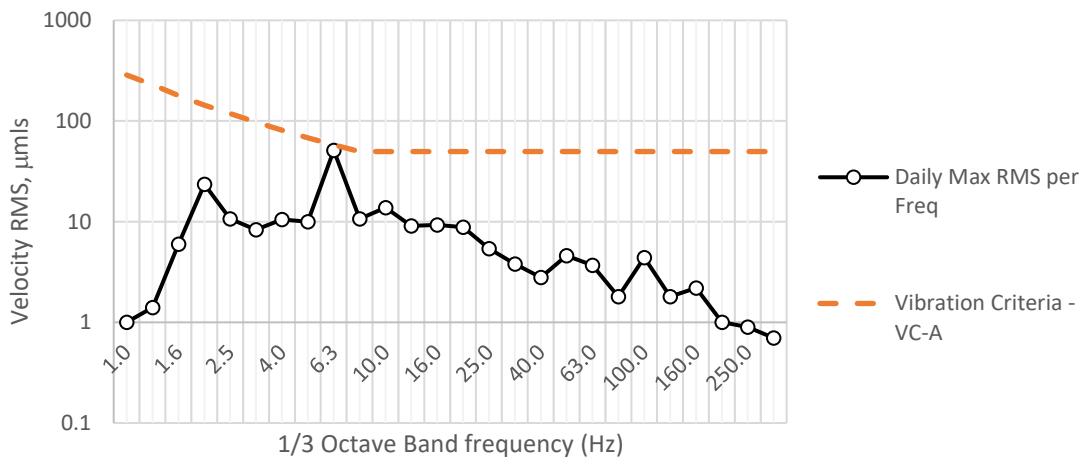


## CENTENARY INSTITUTE – LEVEL 4 BATHROOM (NORTHERN FAÇADE)

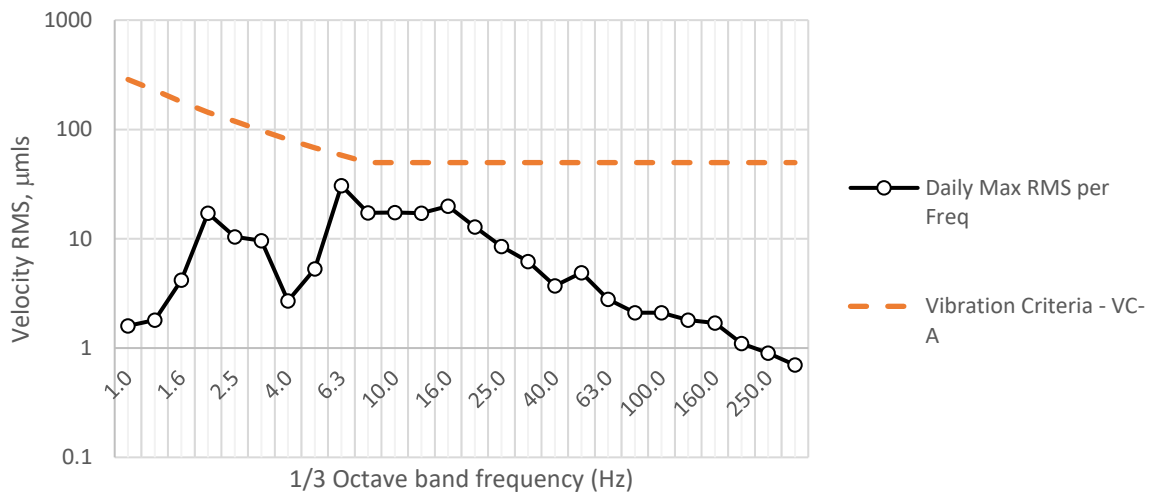
### Vertical Vibration



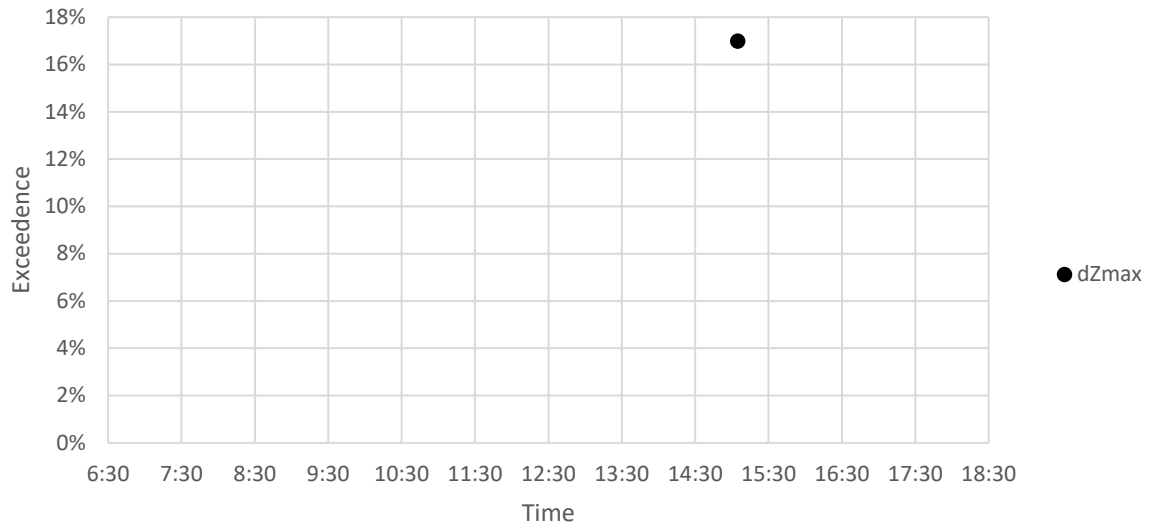
### FwdBackwd Vibration



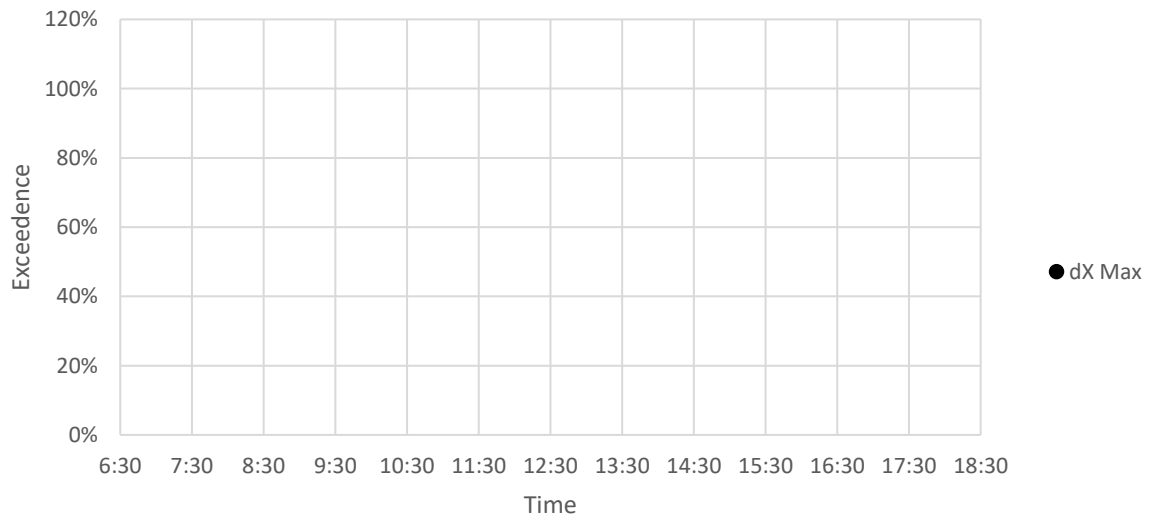
### Sideways Vibration



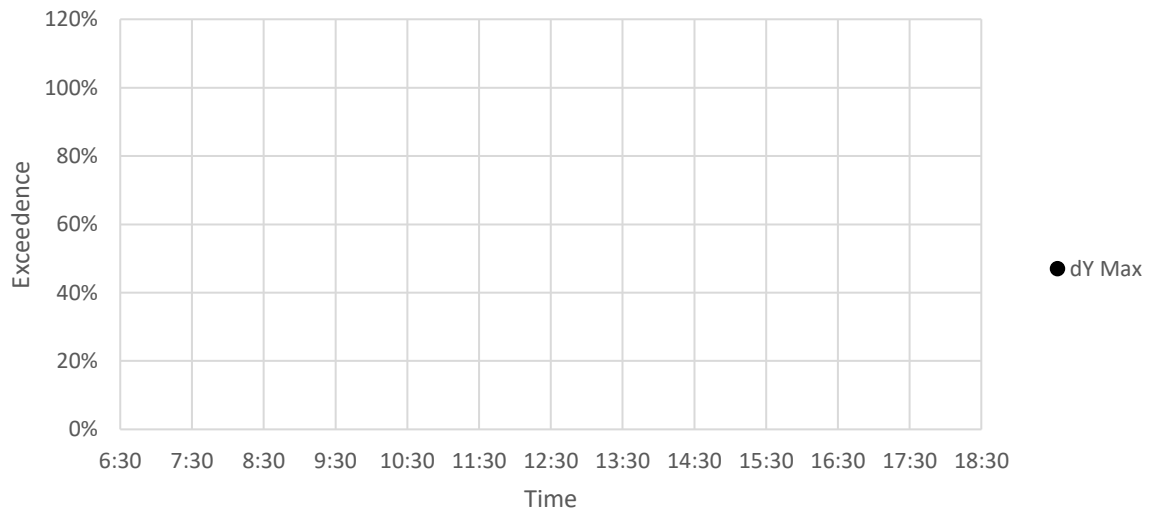
### Vertical



### Fwd/Backwards



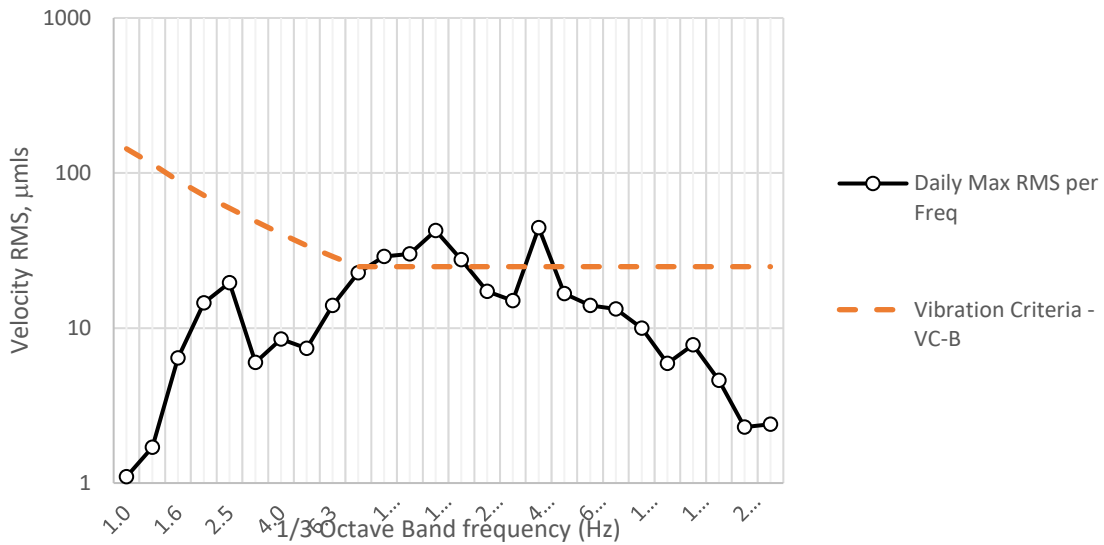
### Sideways



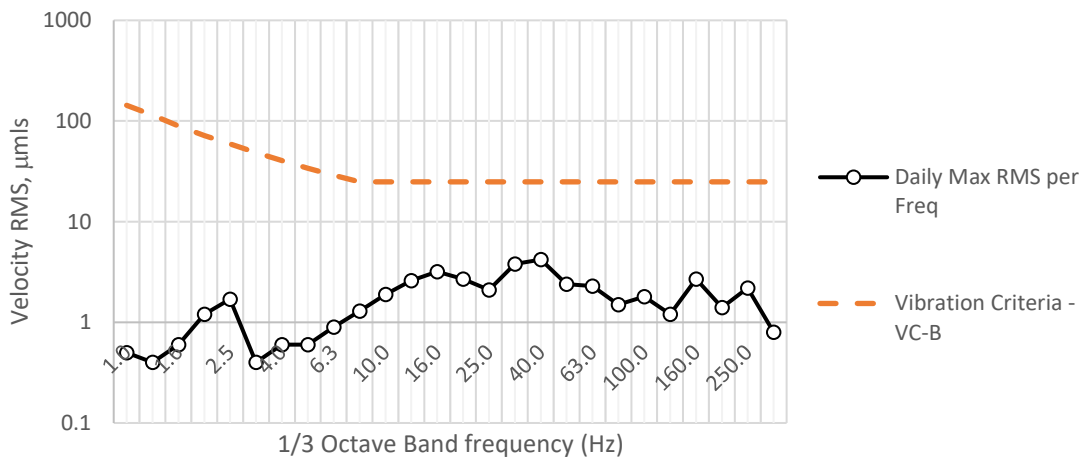


## CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN CORRIDOR

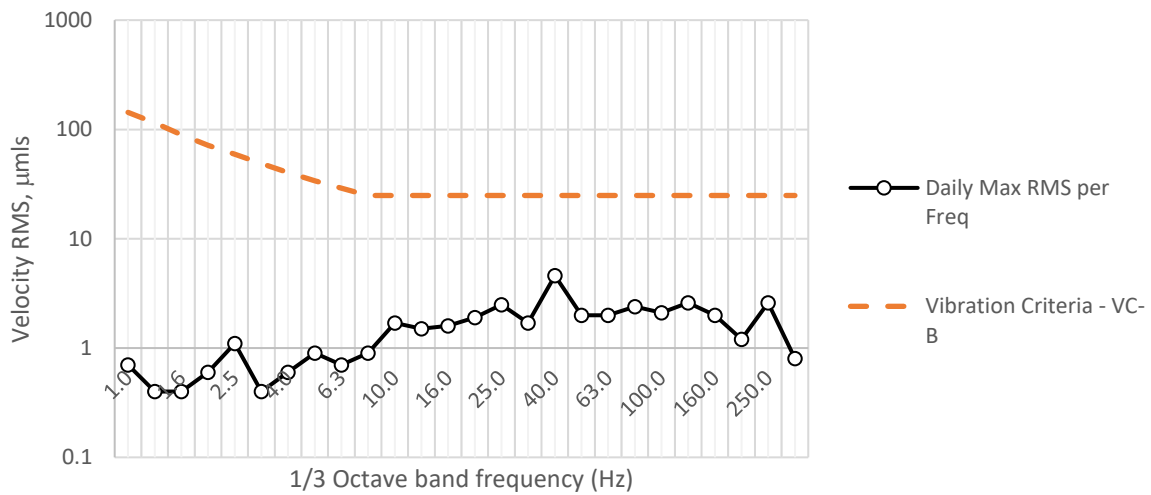
### Vertical Vibration



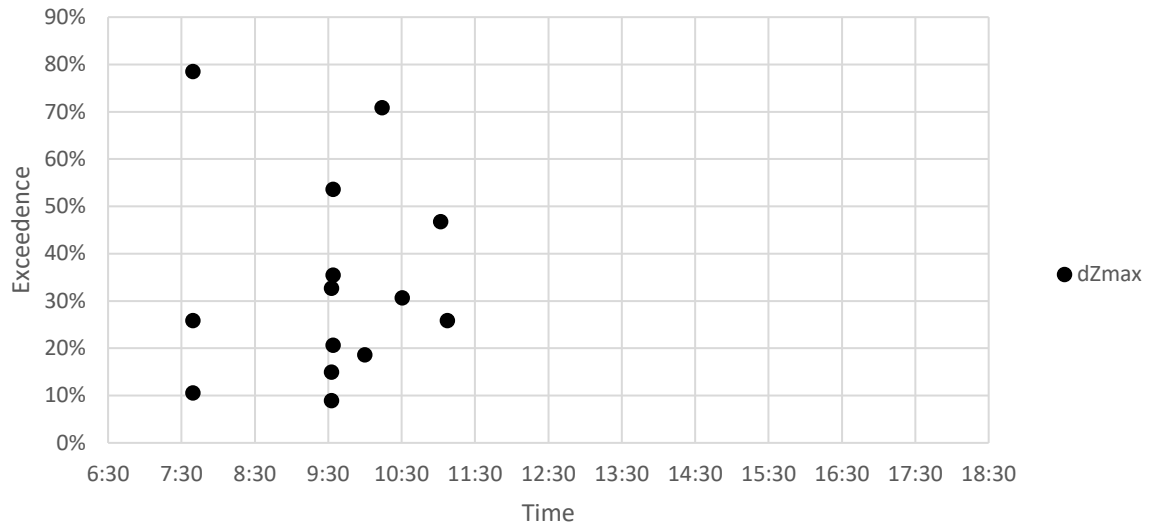
### FwdBackwd Vibration



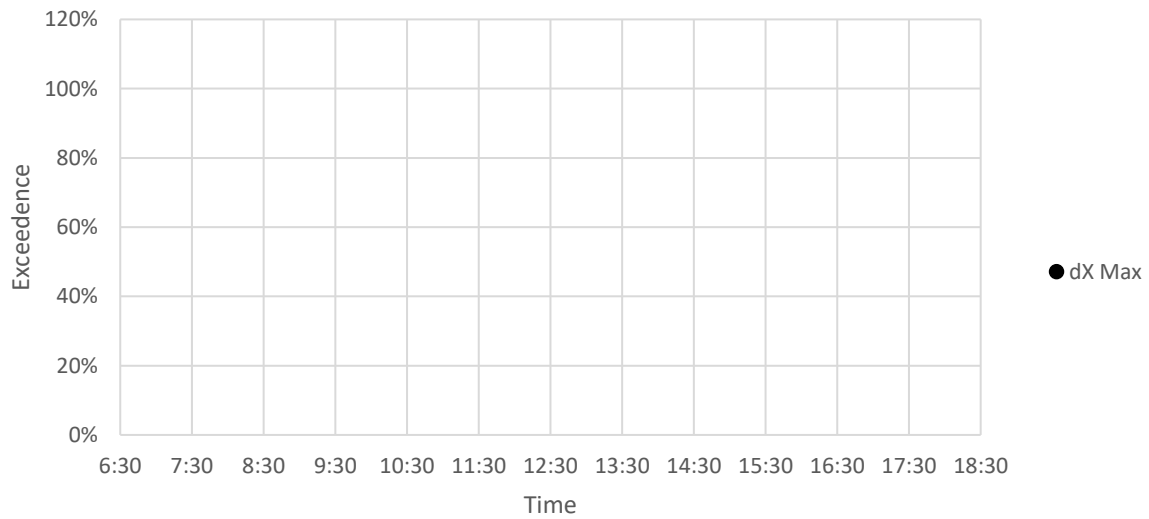
### Sideways Vibration



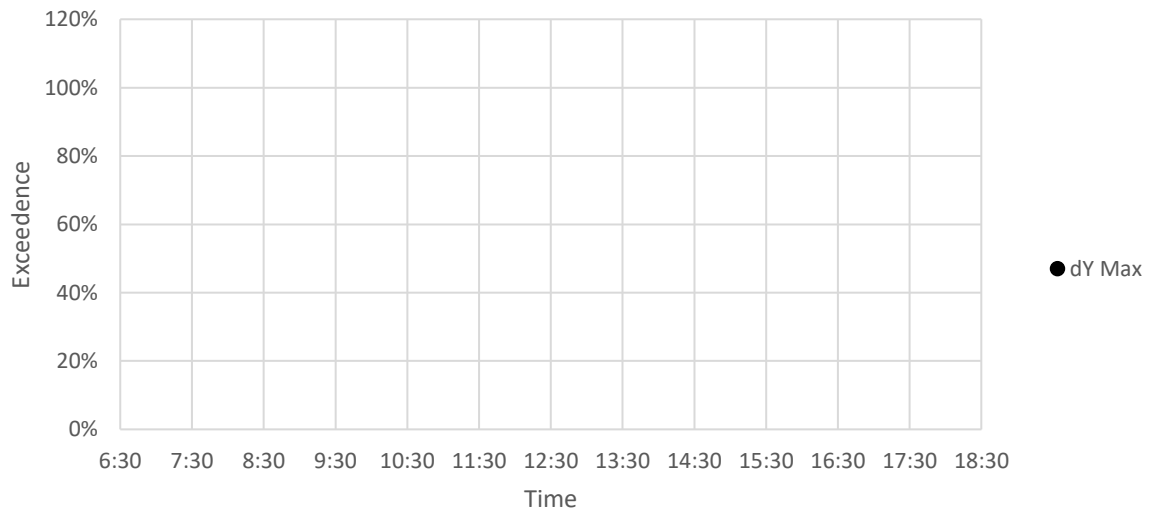
### Vertical



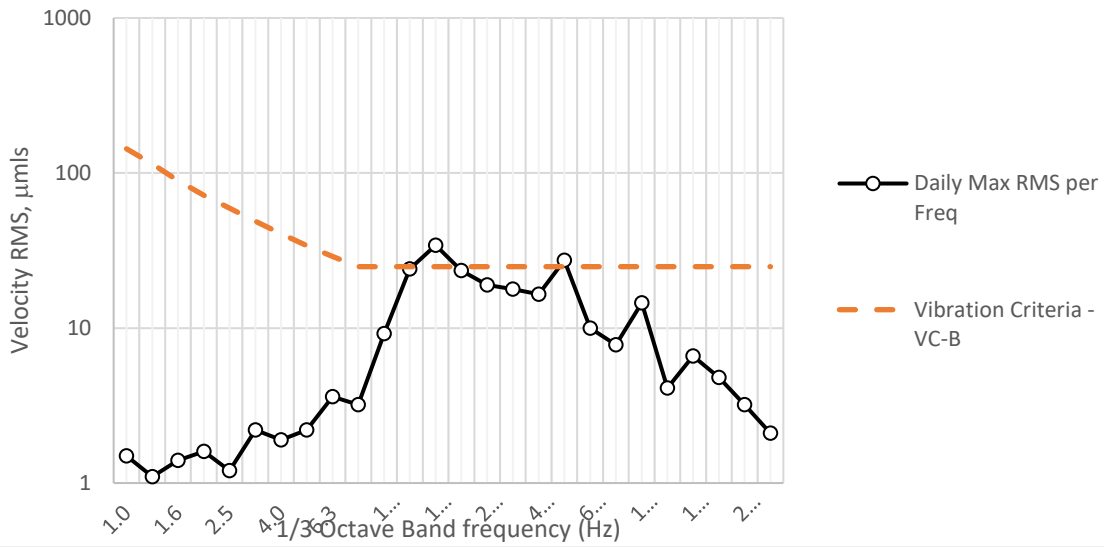
### Fwd/Backwards



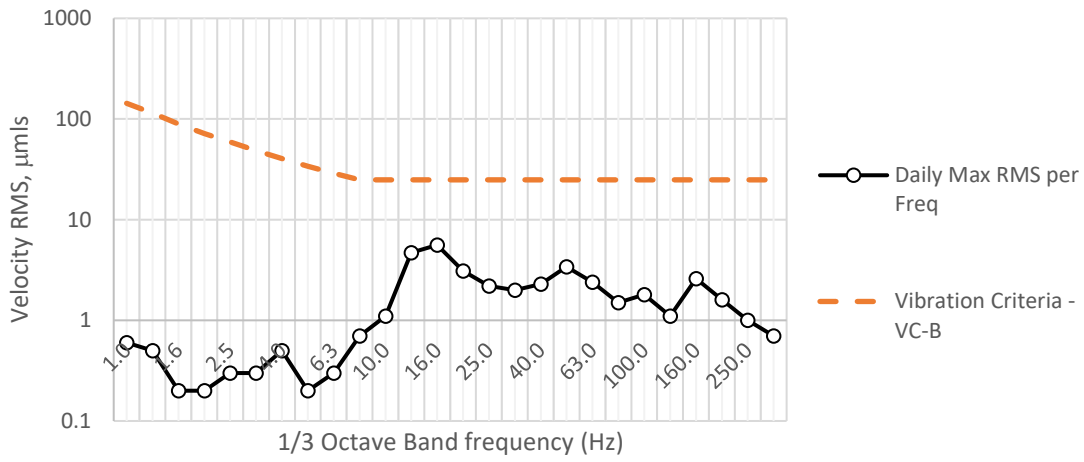
### Sideways



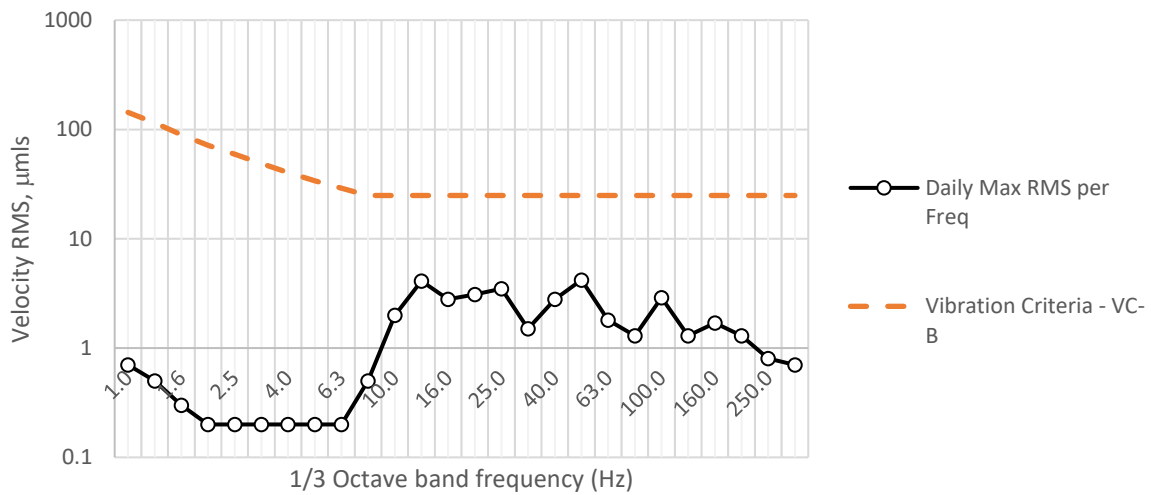
### Vertical Vibration



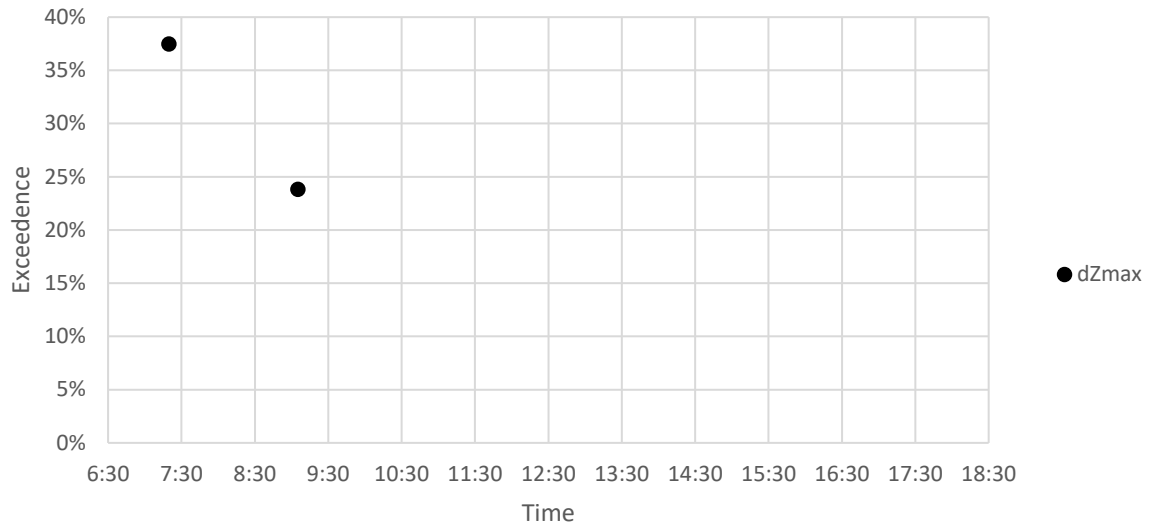
### FwdBackwd Vibration



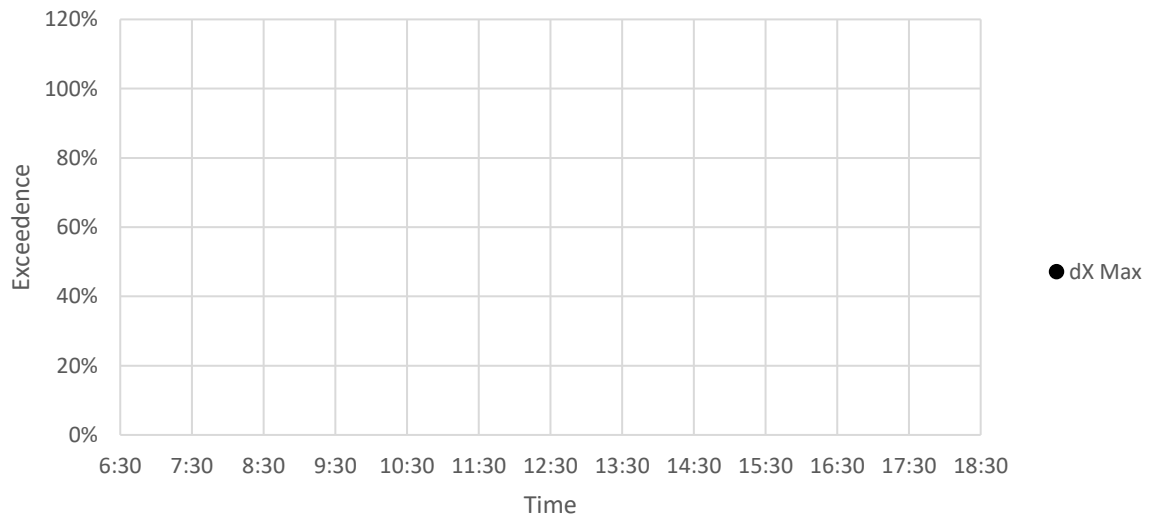
### Sideways Vibration



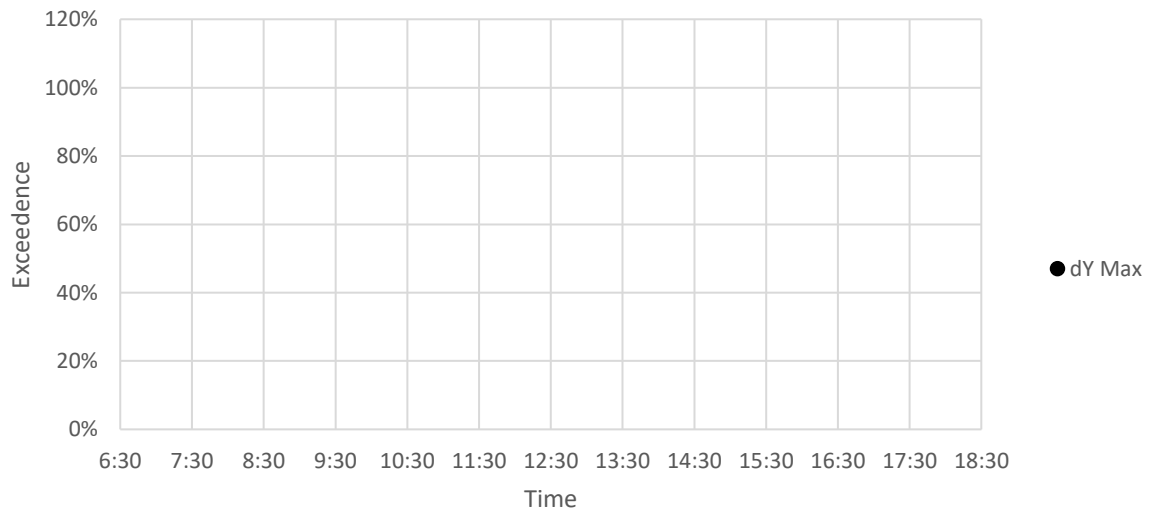
### Vertical



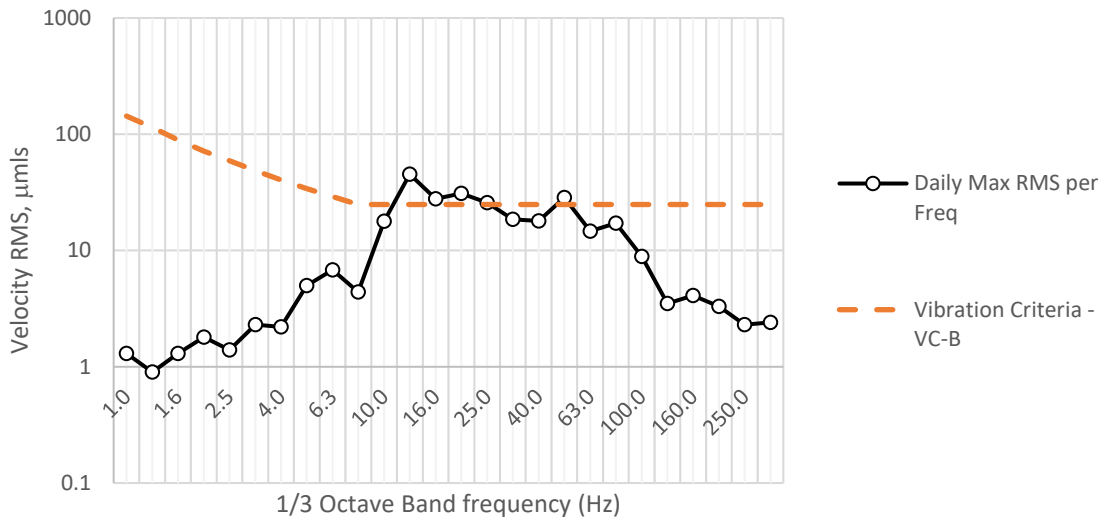
### Fwd/Backwards



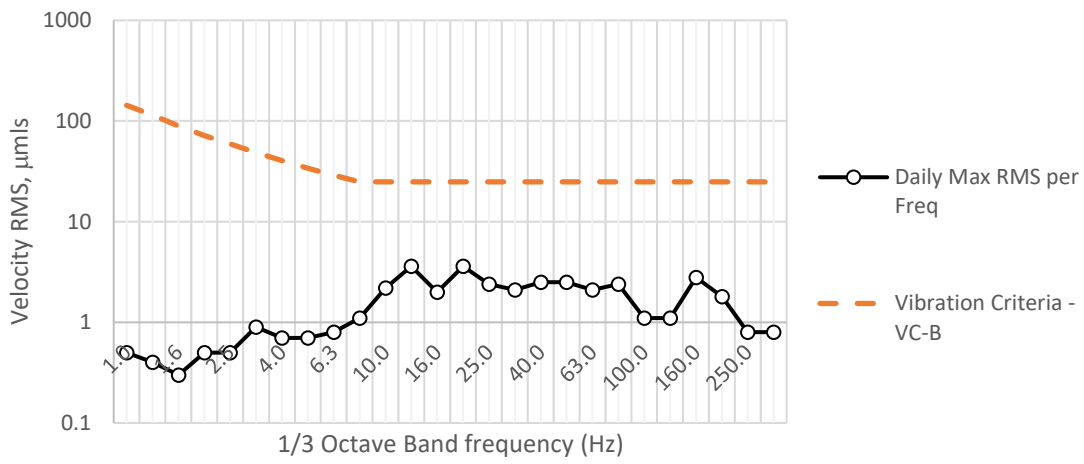
### Sideways



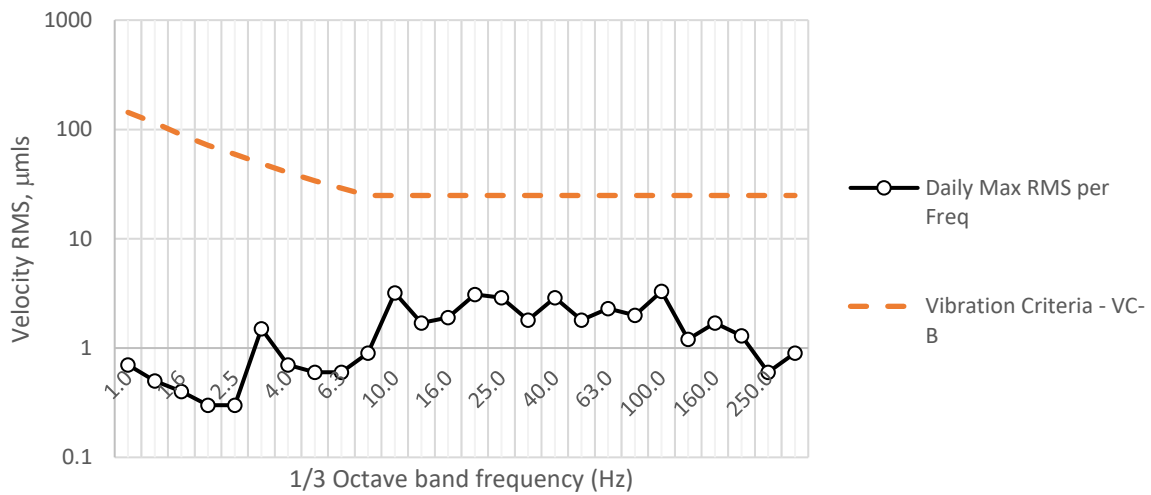
### Vertical Vibration



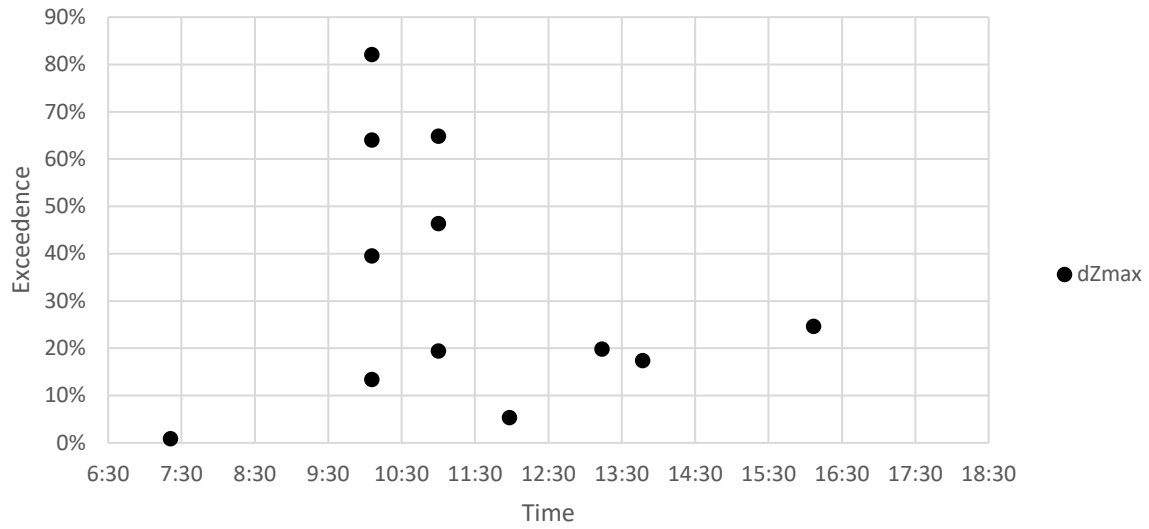
### FwdBackwd Vibration



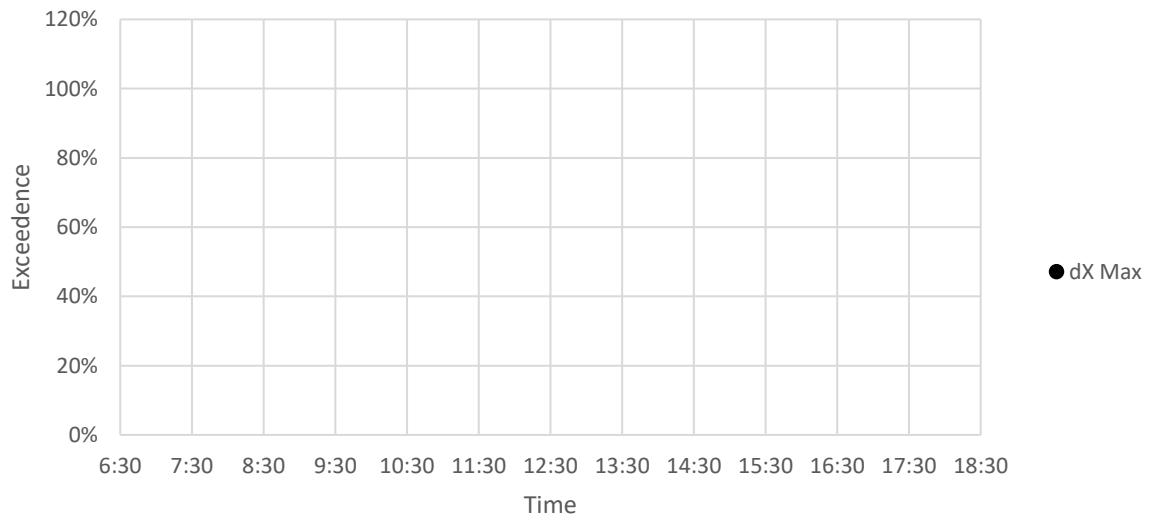
### Sideways Vibration



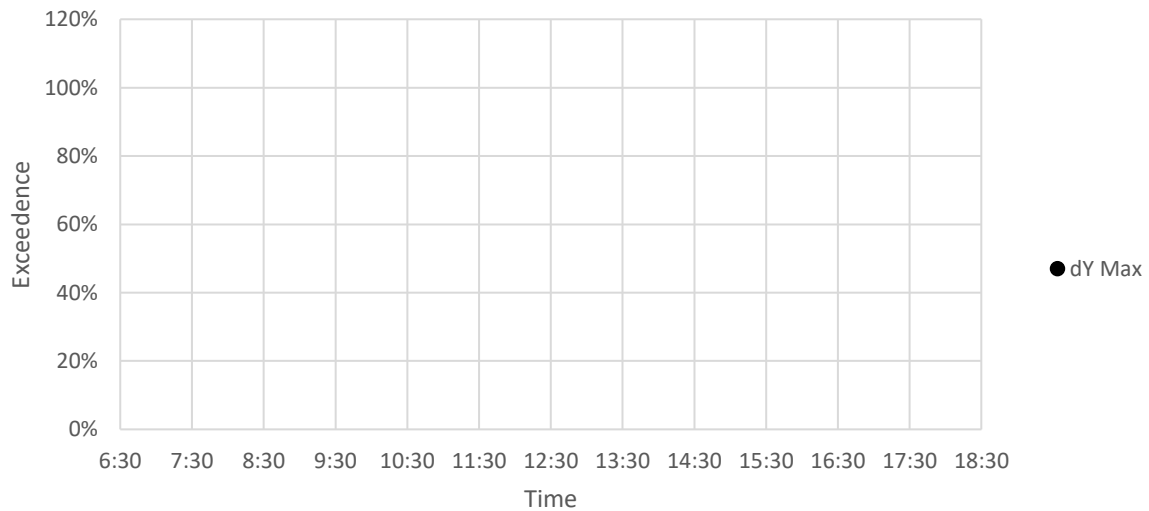
### Vertical



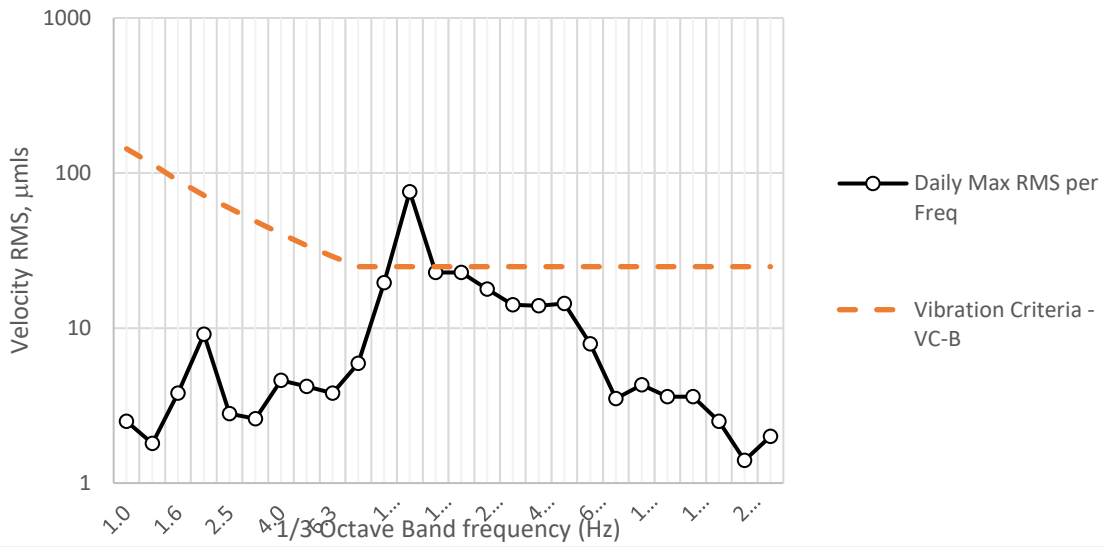
### Fwd/Backwards



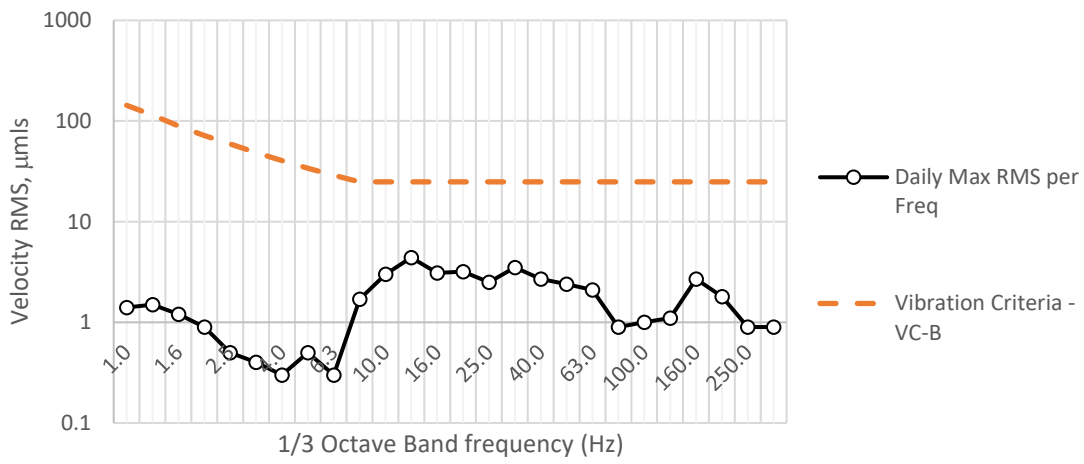
### Sideways



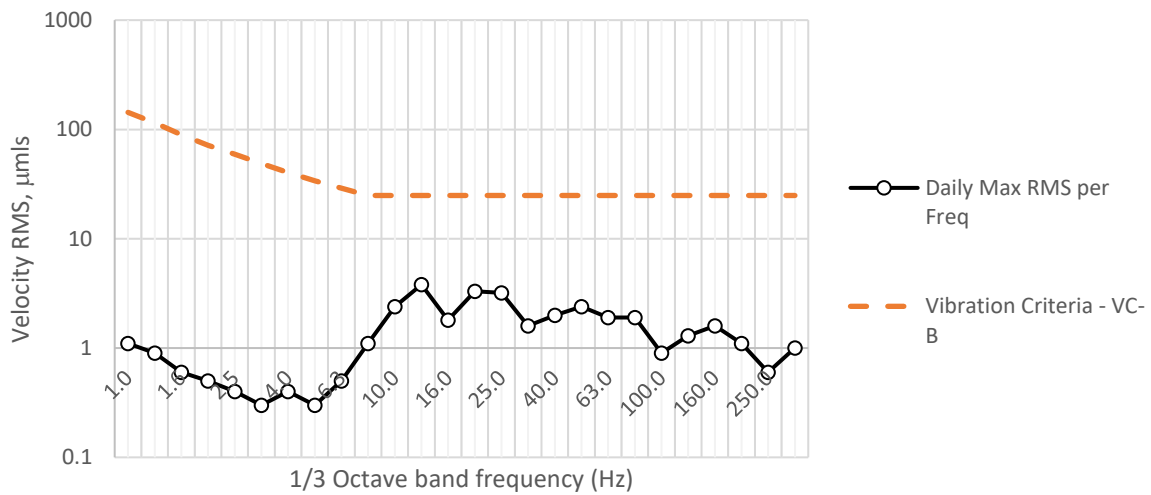
### Vertical Vibration



### FwdBackwd Vibration

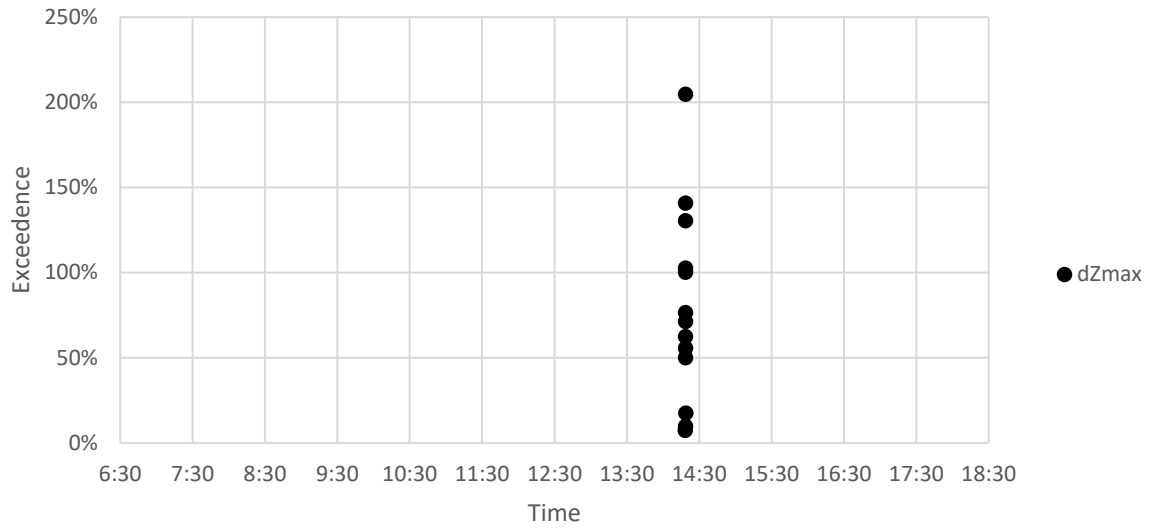


### Sideways Vibration

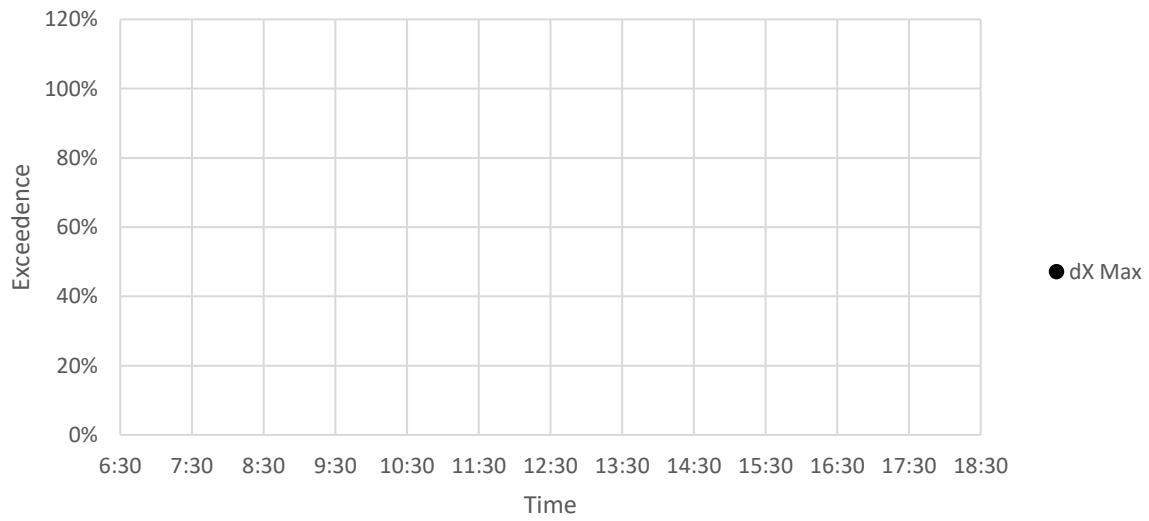




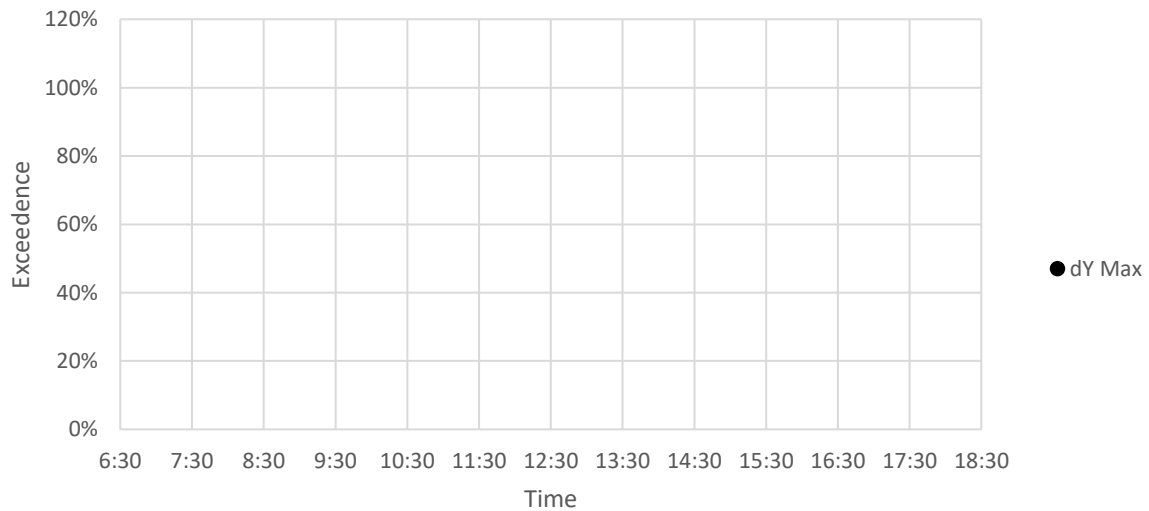
### Vertical



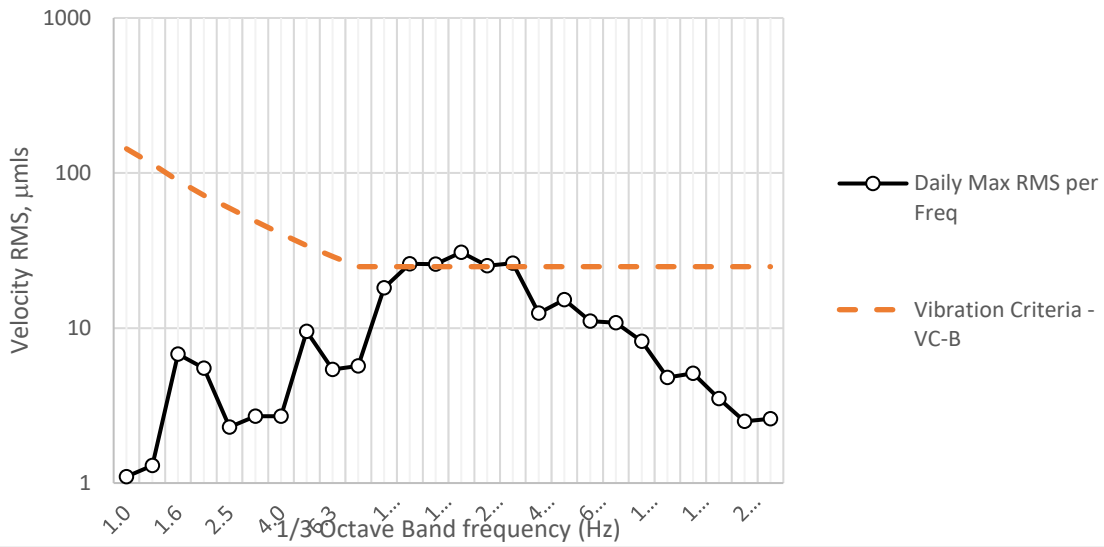
### Fwd/Backwards



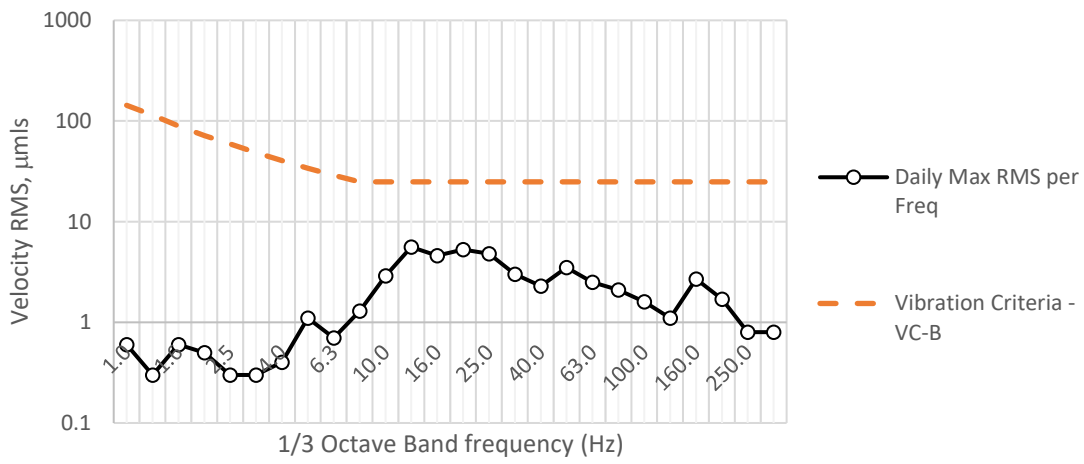
### Sideways



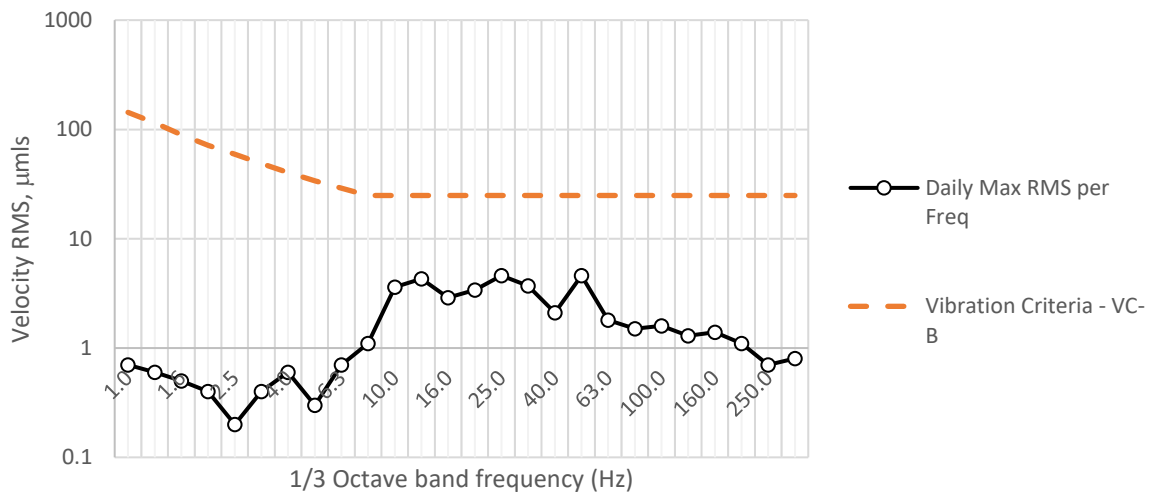
### Vertical Vibration



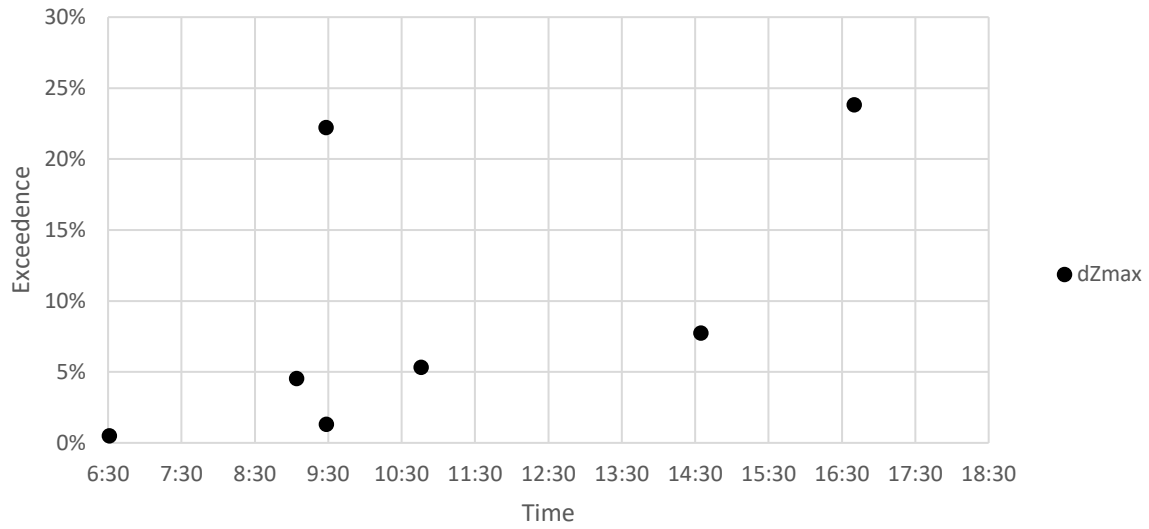
### FwdBackwd Vibration



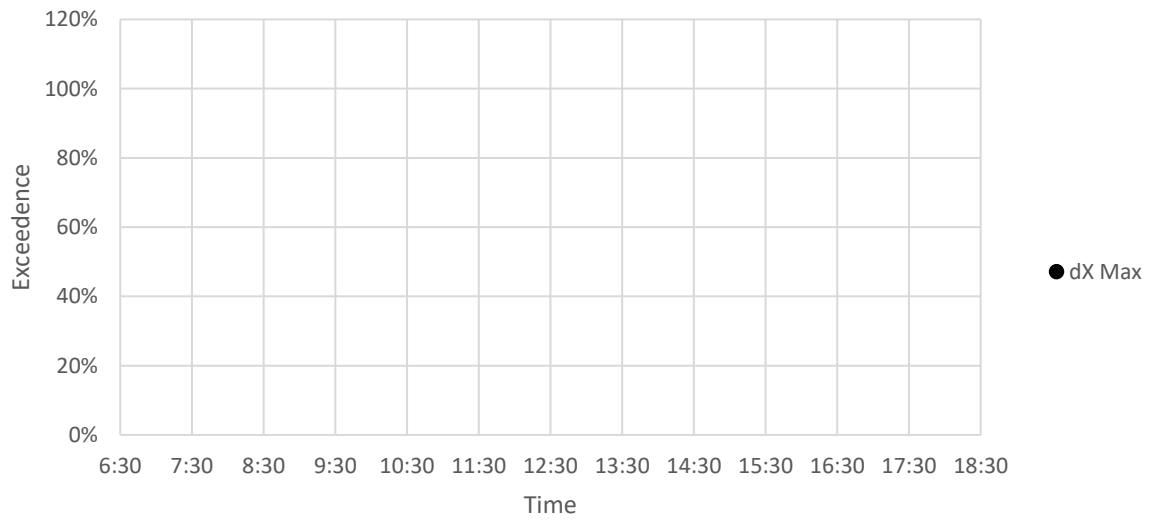
### Sideways Vibration



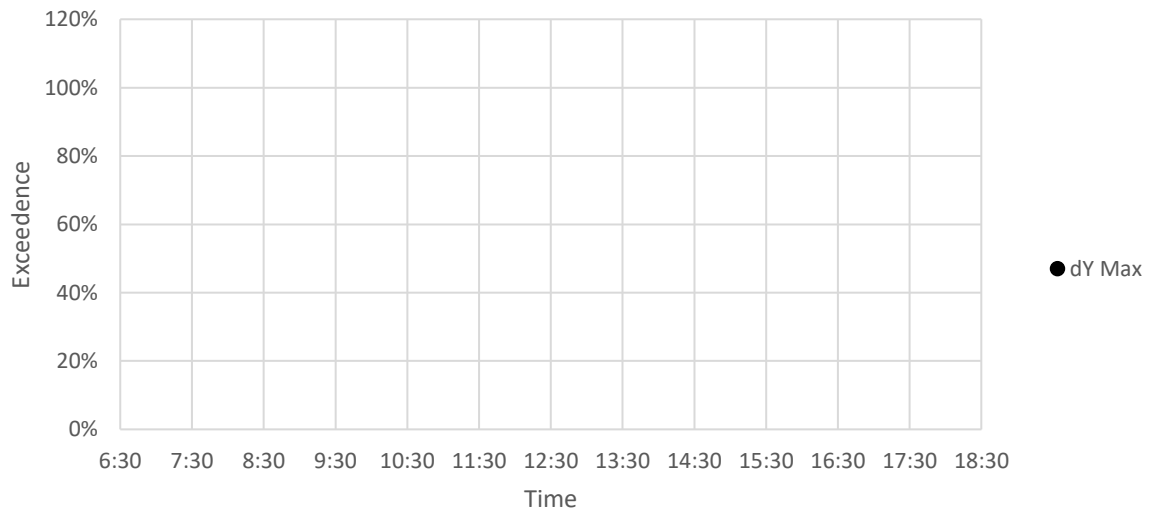
### Vertical



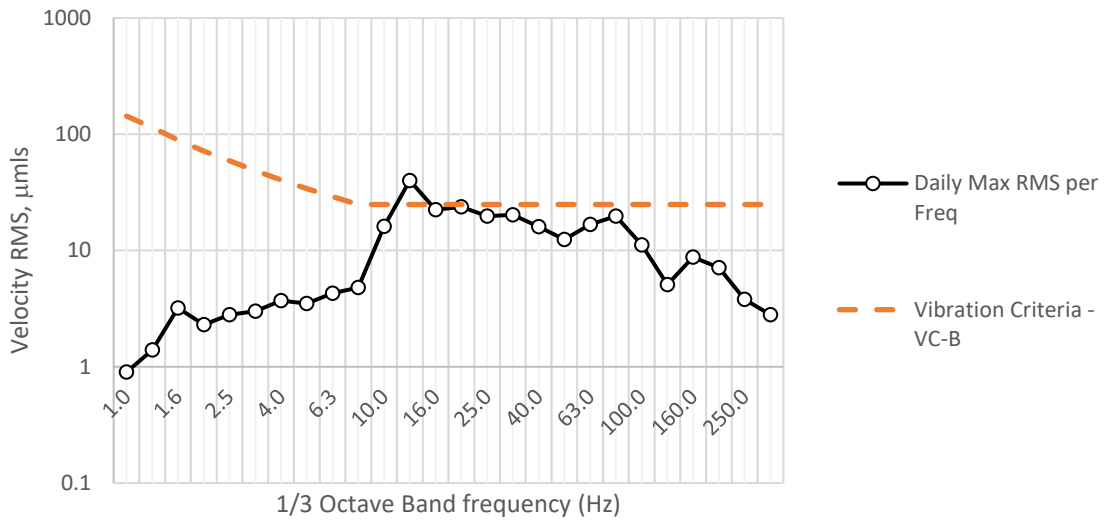
### Fwd/Backwards



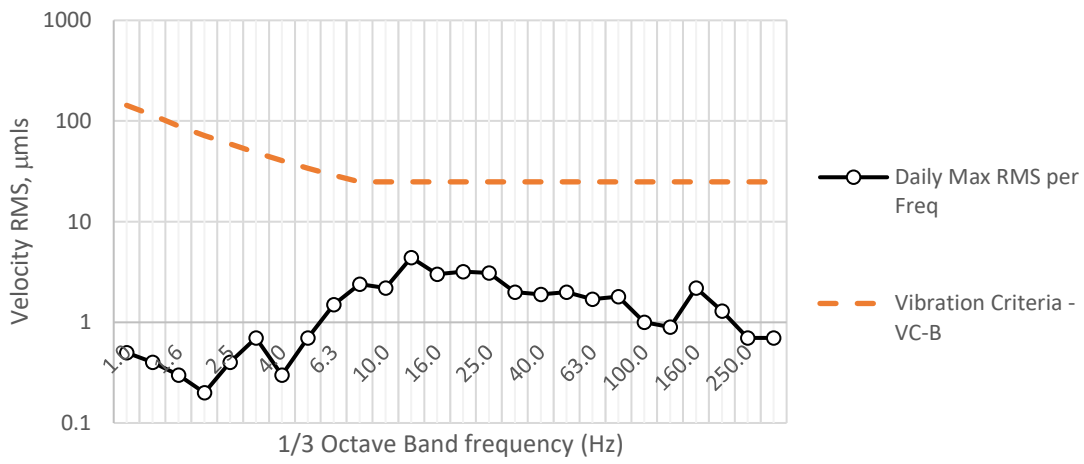
### Sideways



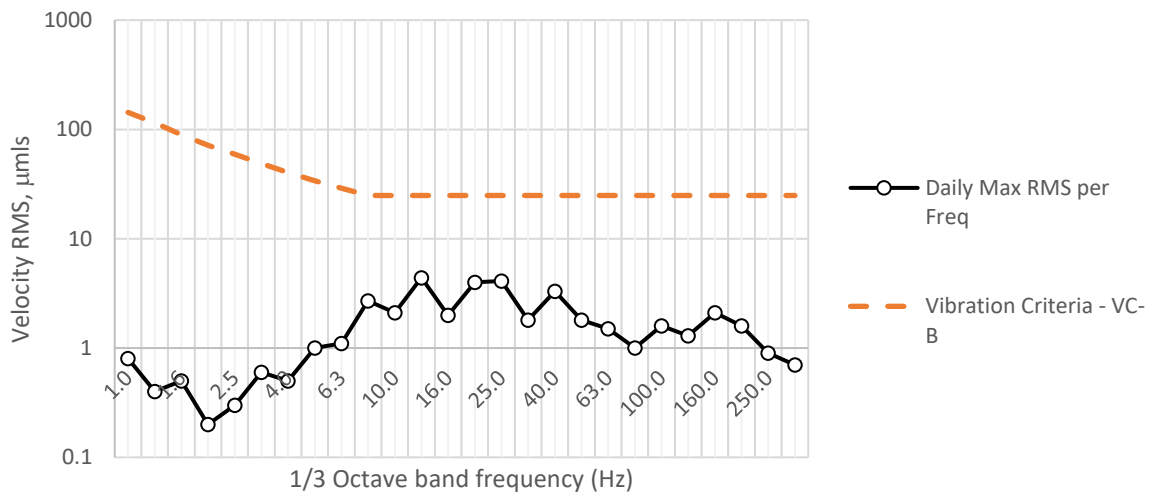
### Vertical Vibration



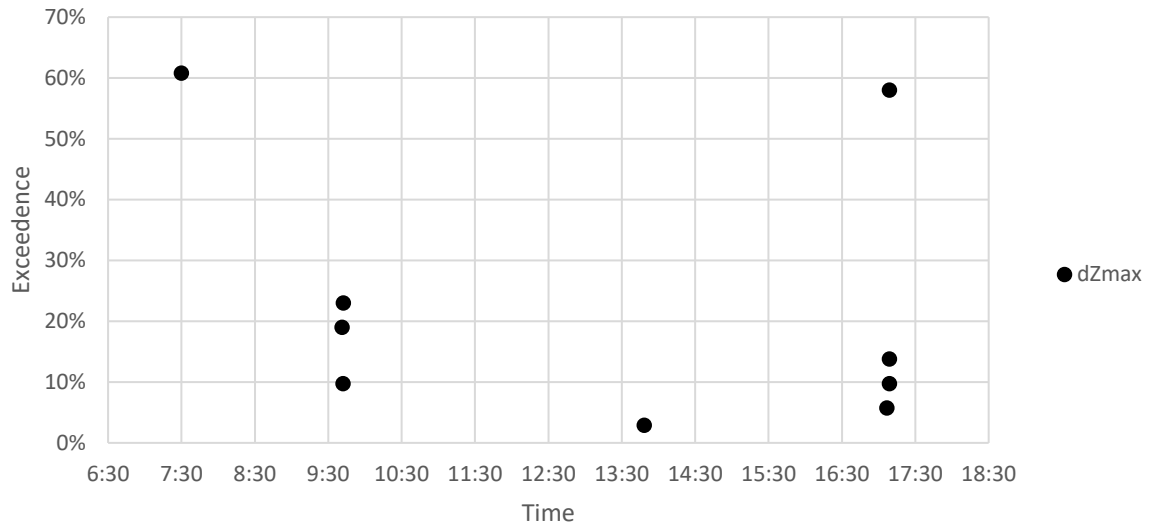
### FwdBackwd Vibration



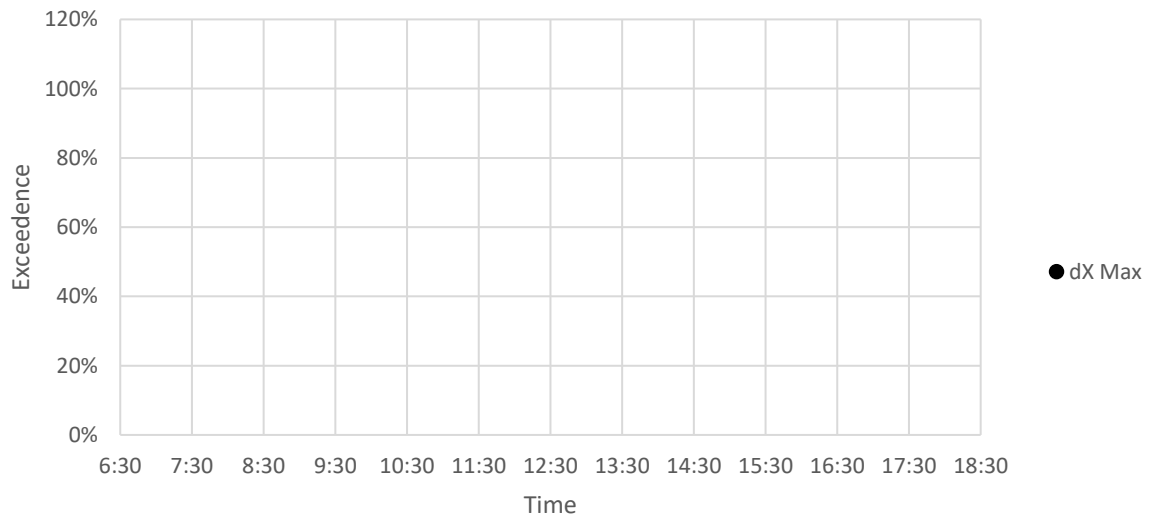
### Sideways Vibration



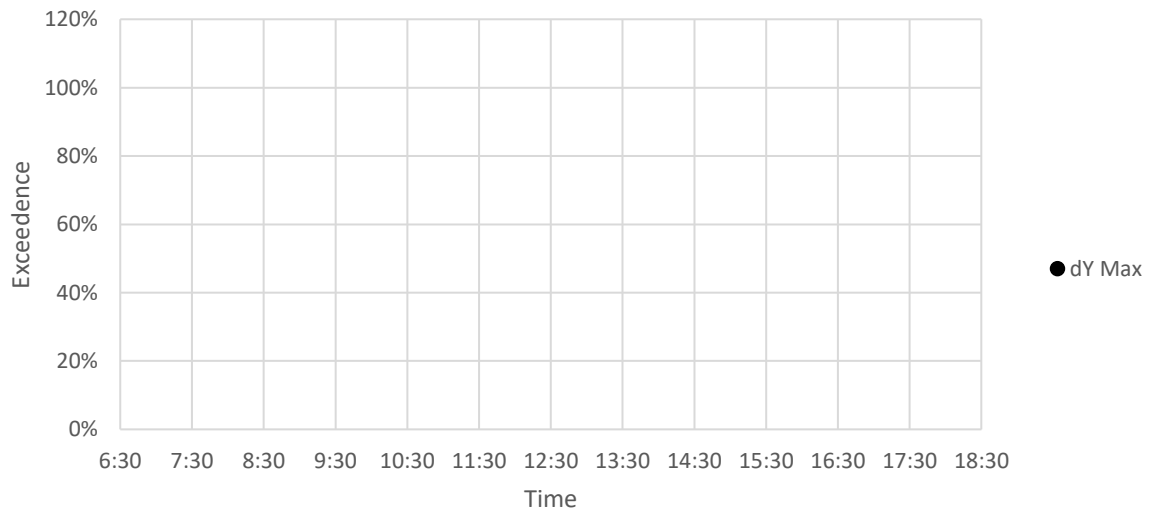
### Vertical



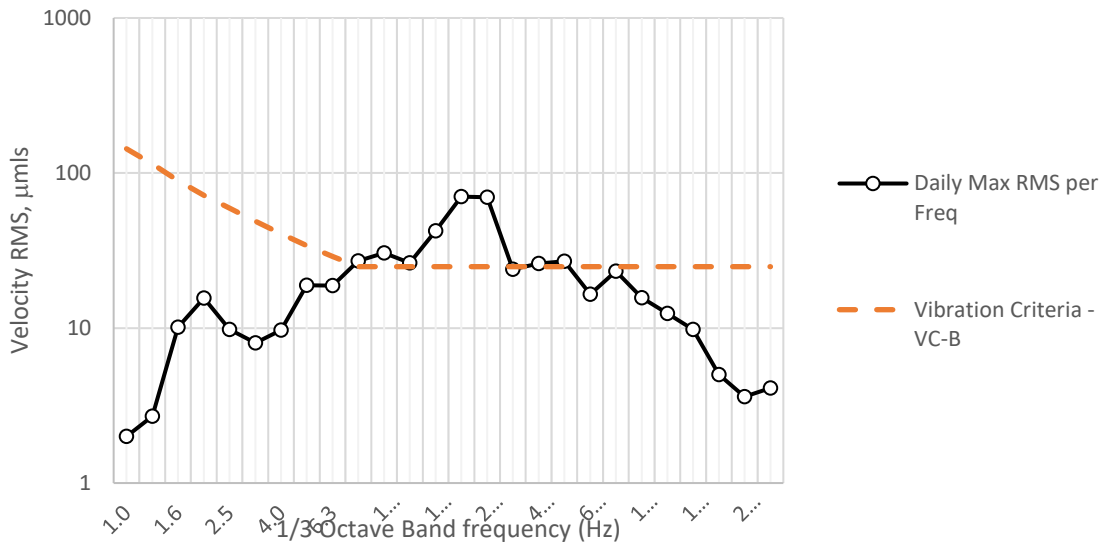
### Fwd/Backwards



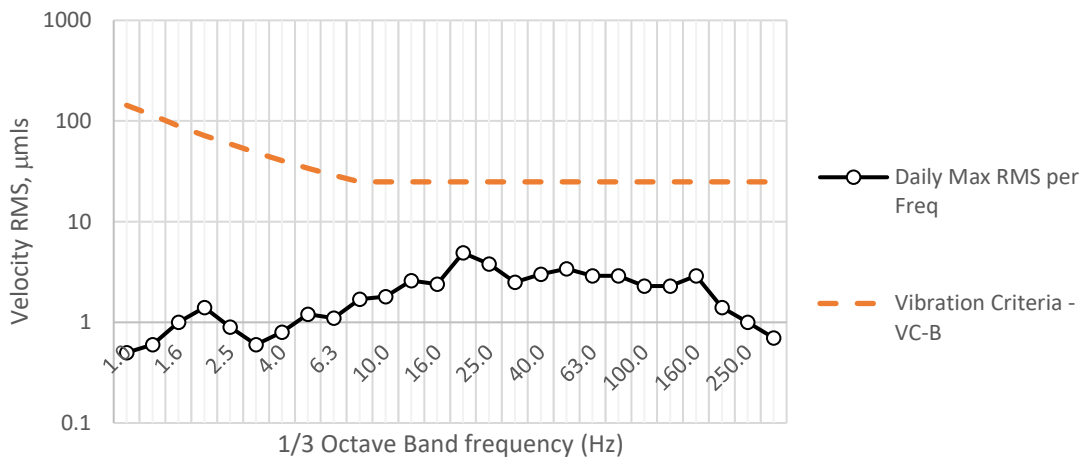
### Sideways



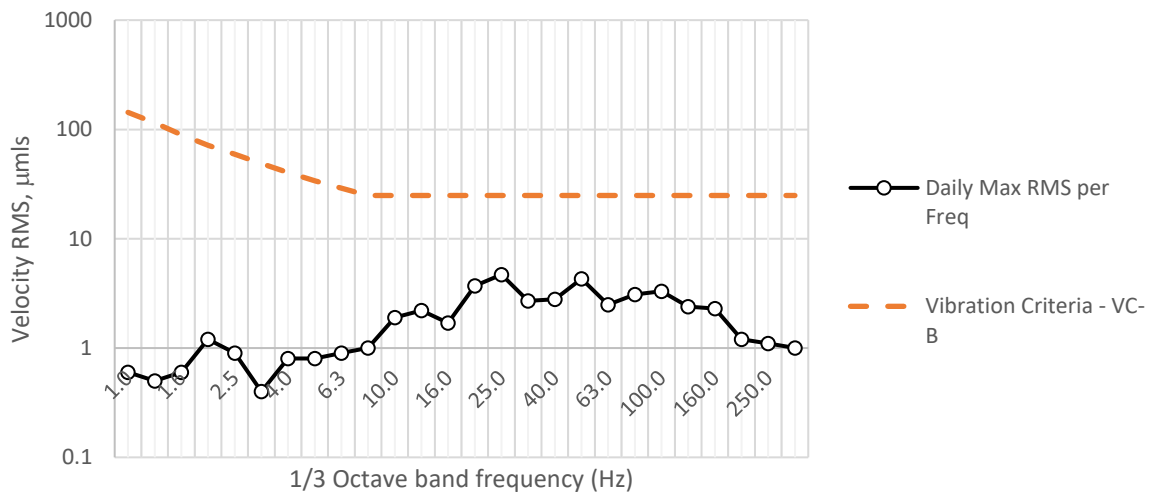
### Vertical Vibration

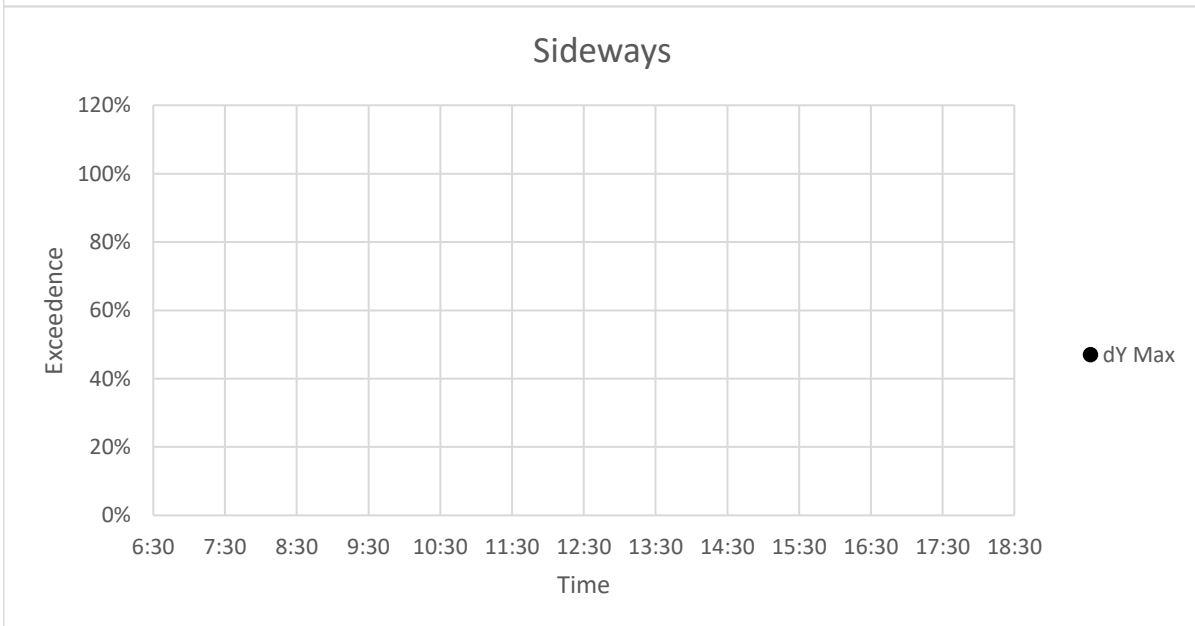
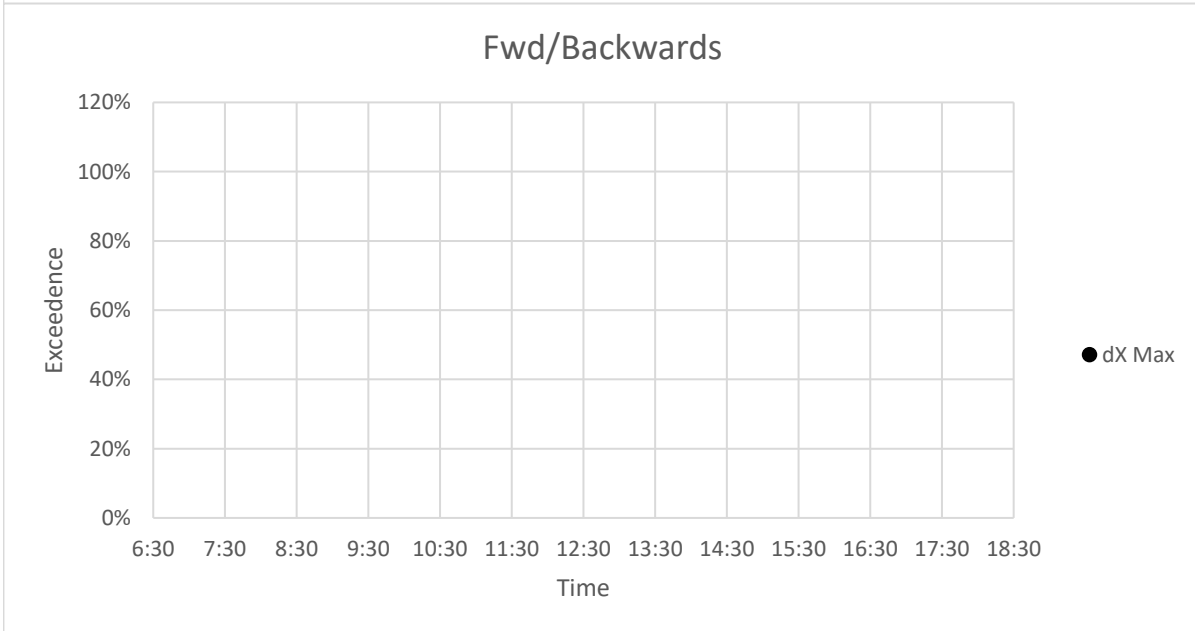
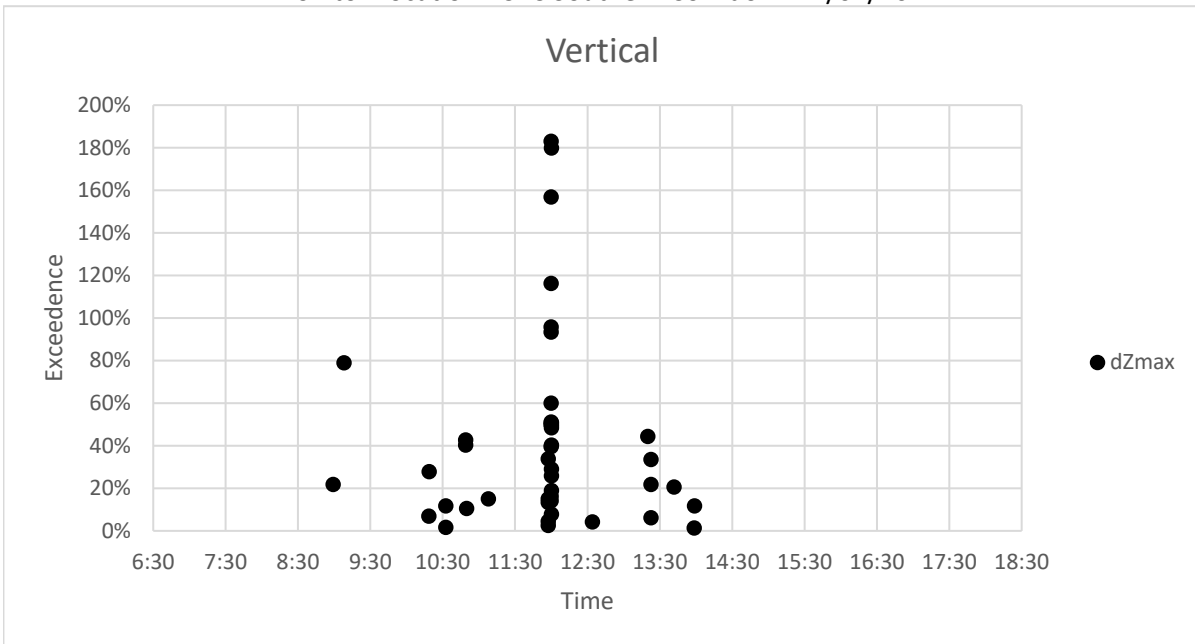


### FwdBackwd Vibration

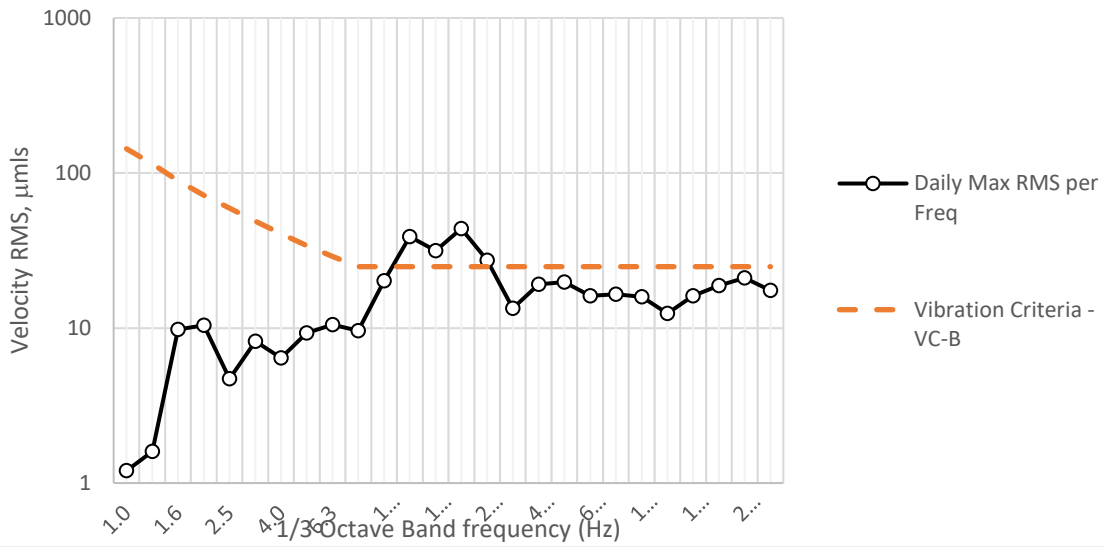


### Sideways Vibration

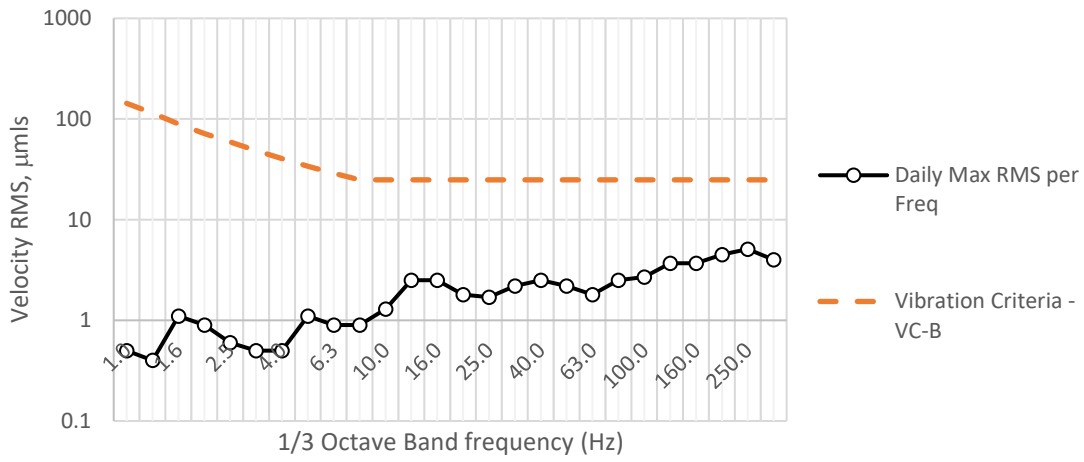




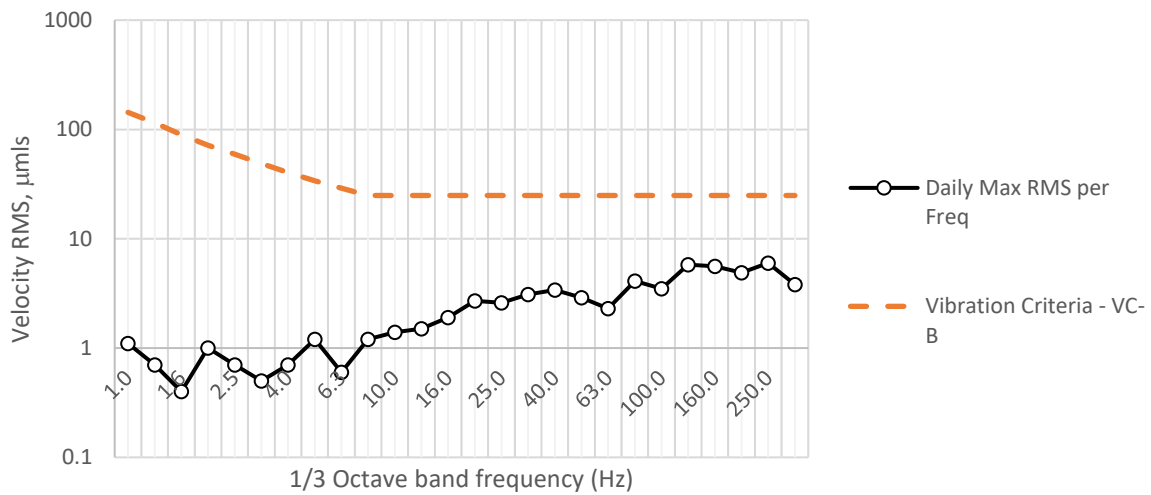
### Vertical Vibration



### FwdBackwd Vibration

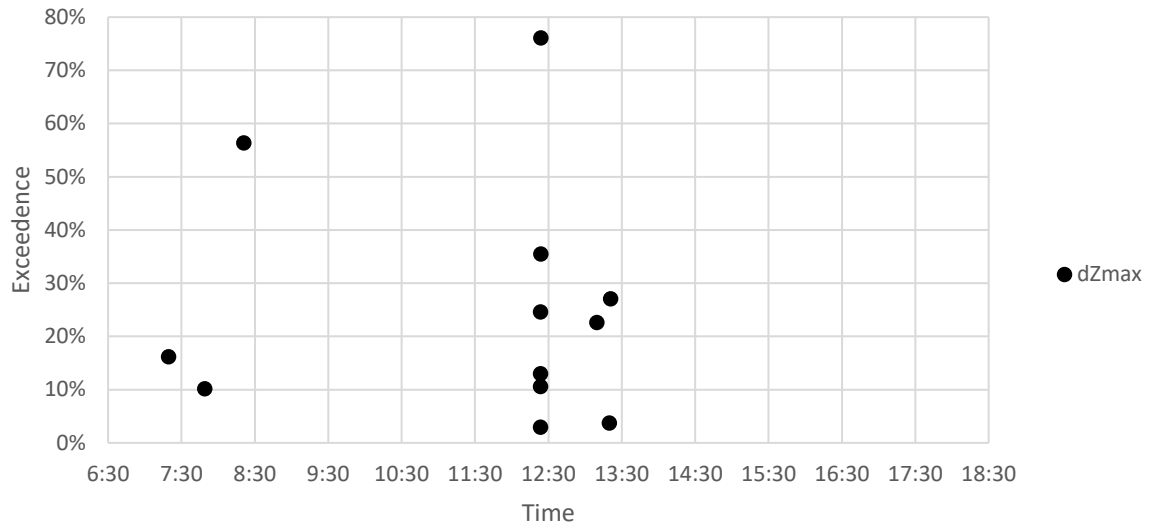


### Sideways Vibration

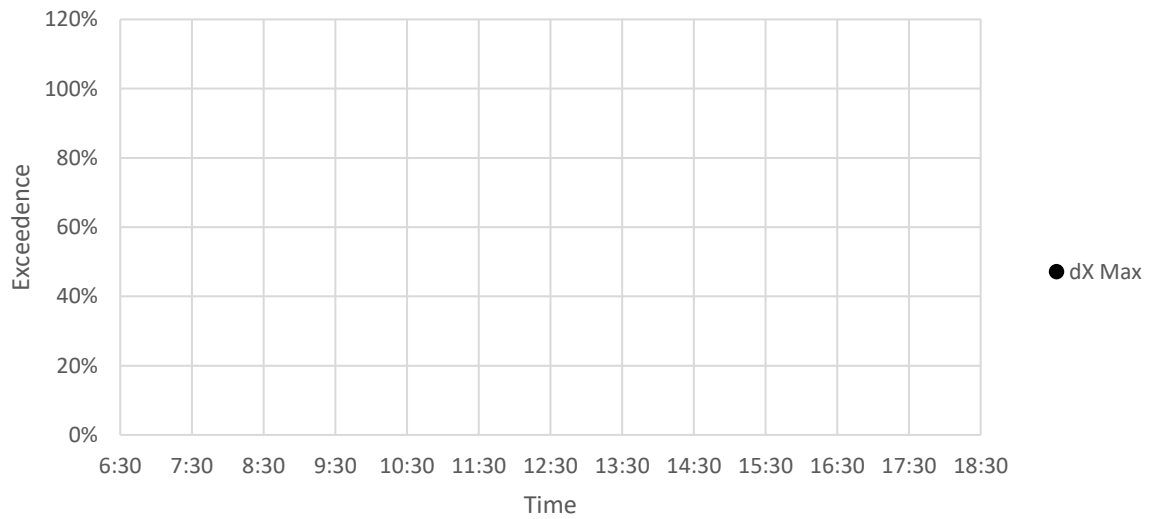




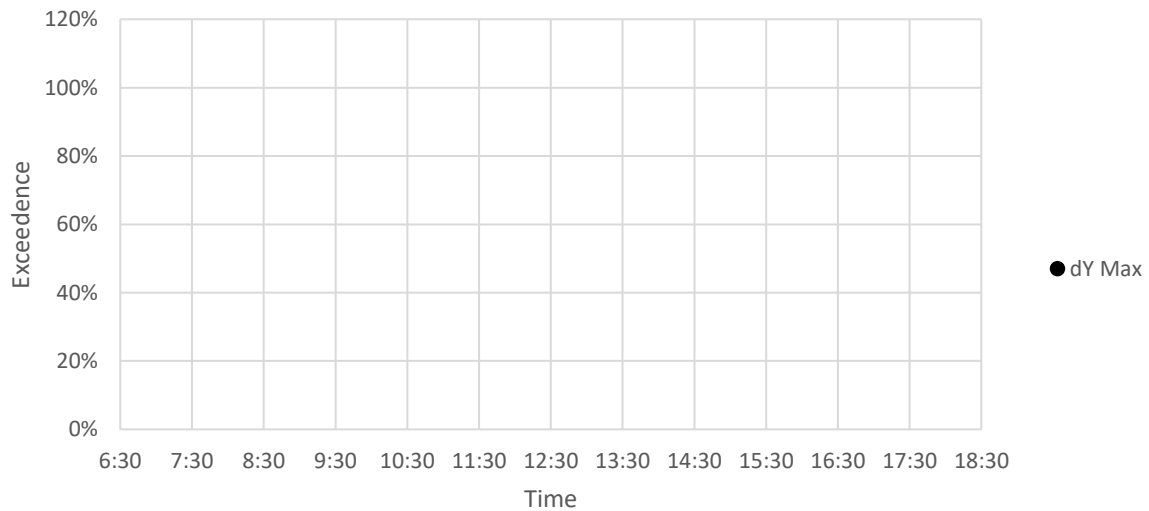
### Vertical



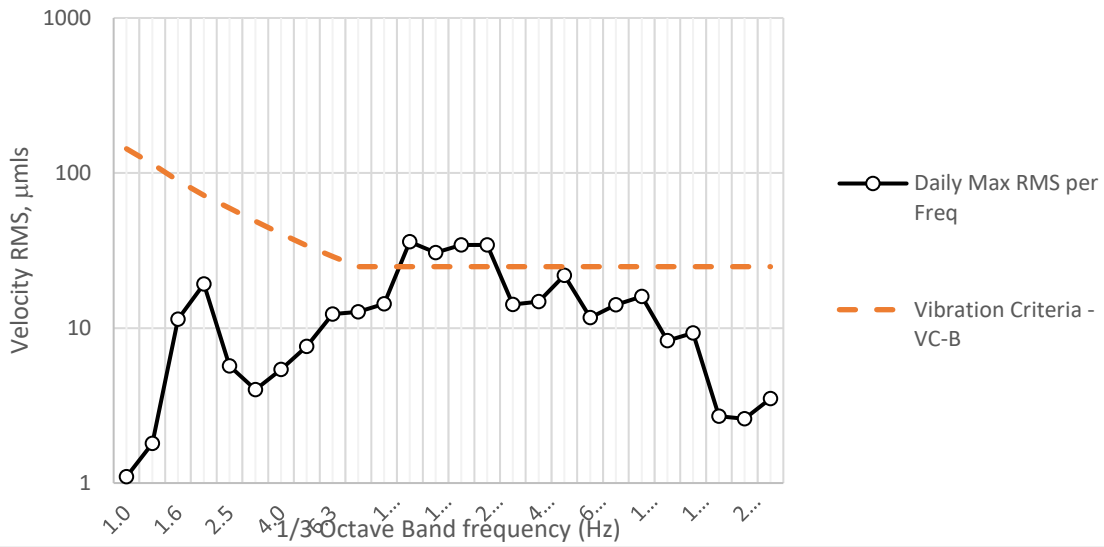
### Fwd/Backwards



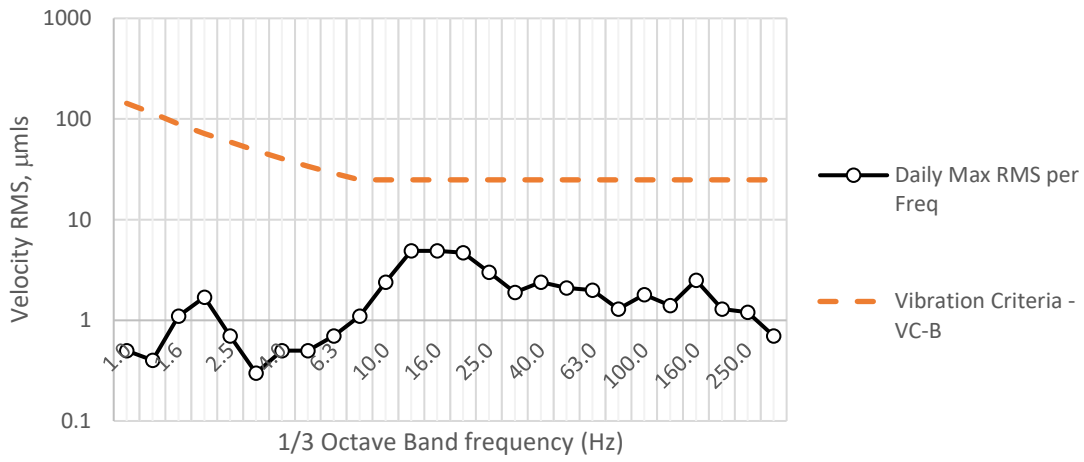
### Sideways



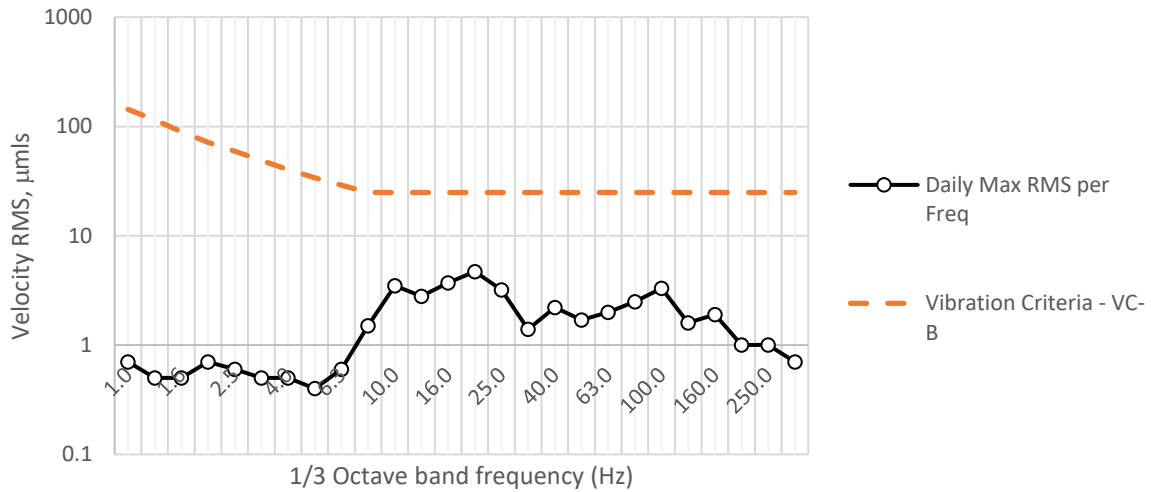
### Vertical Vibration



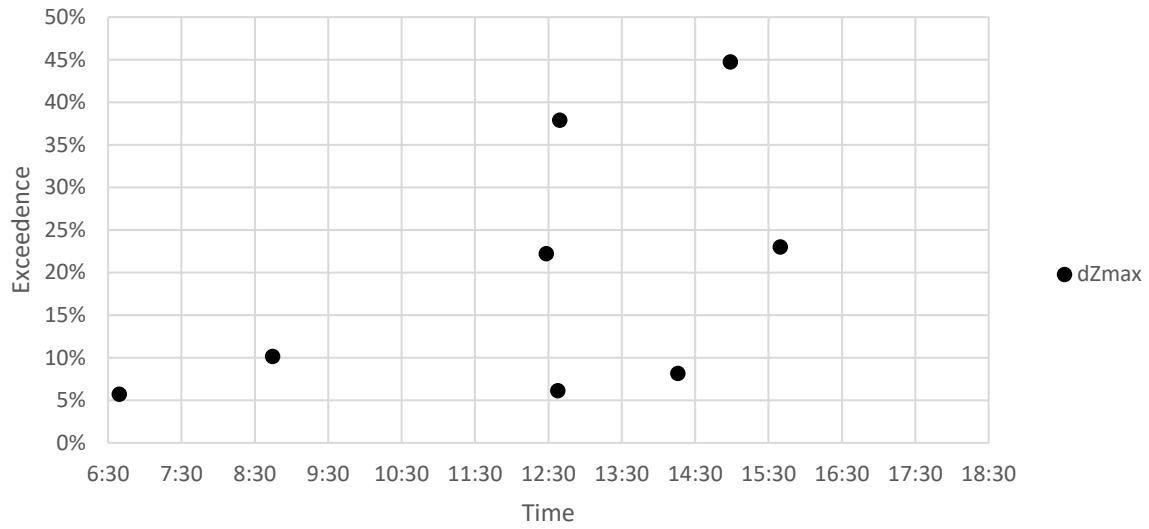
### FwdBackwd Vibration



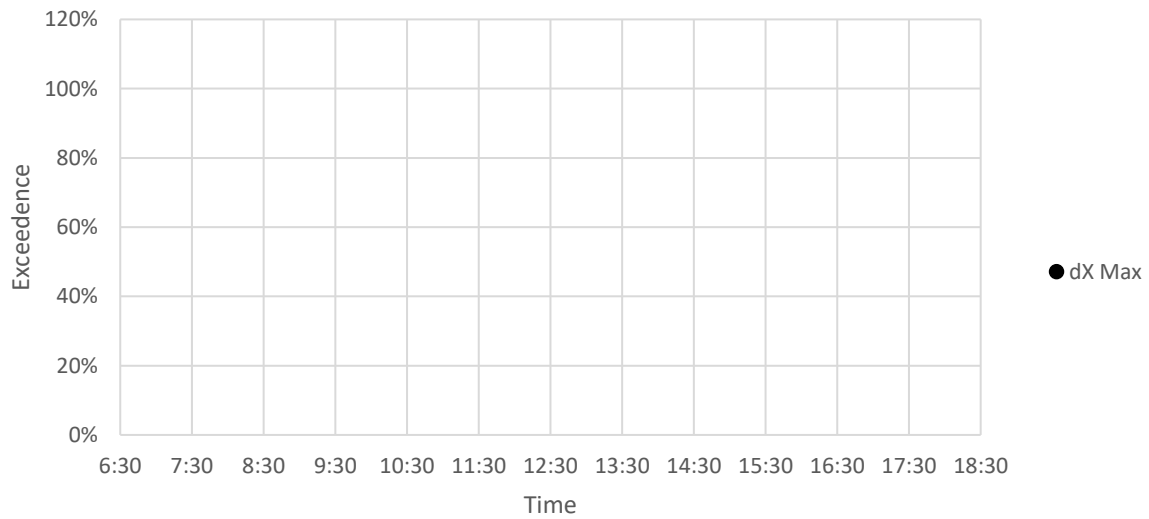
### Sideways Vibration



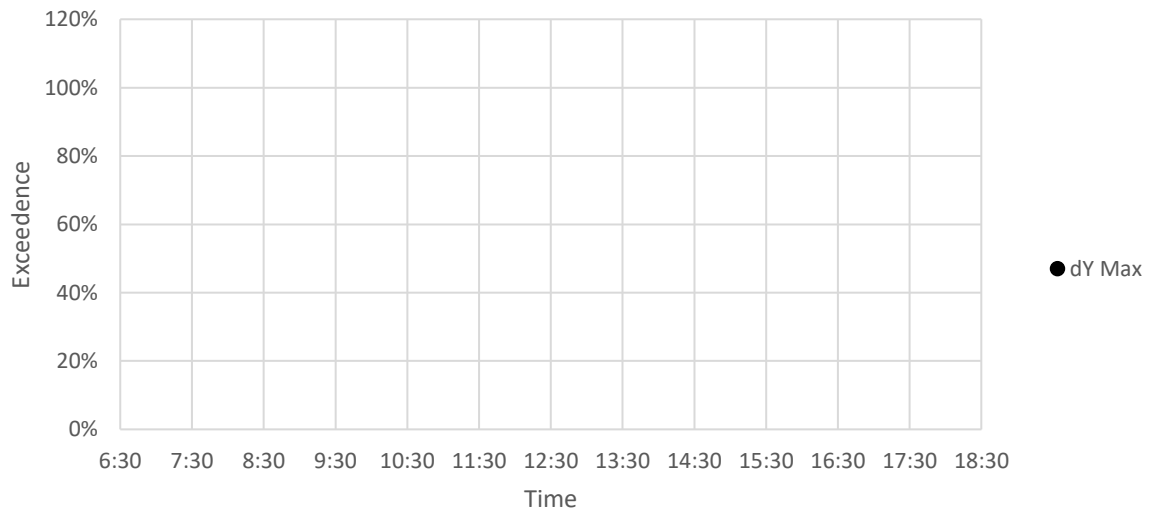
### Vertical



### Fwd/Backwards



### Sideways

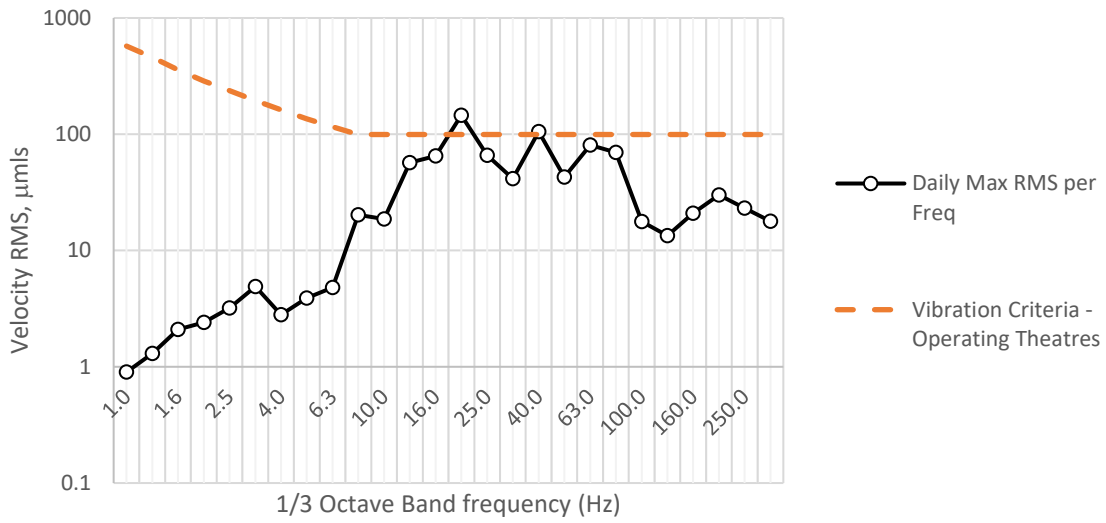


## **CHARLES PERKINS CENTRE – LEVEL B1 SOUTHERN WING OBSERVATION ROOM E**

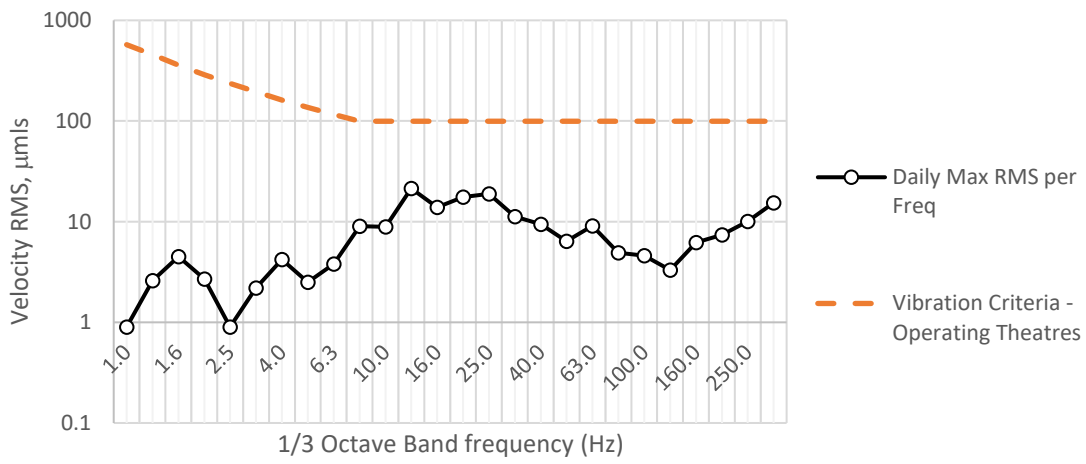
No exceedances occurred during the monitoring period.

## RPA HOSPITAL MAIN BUILDING – LEVEL 03 NICU

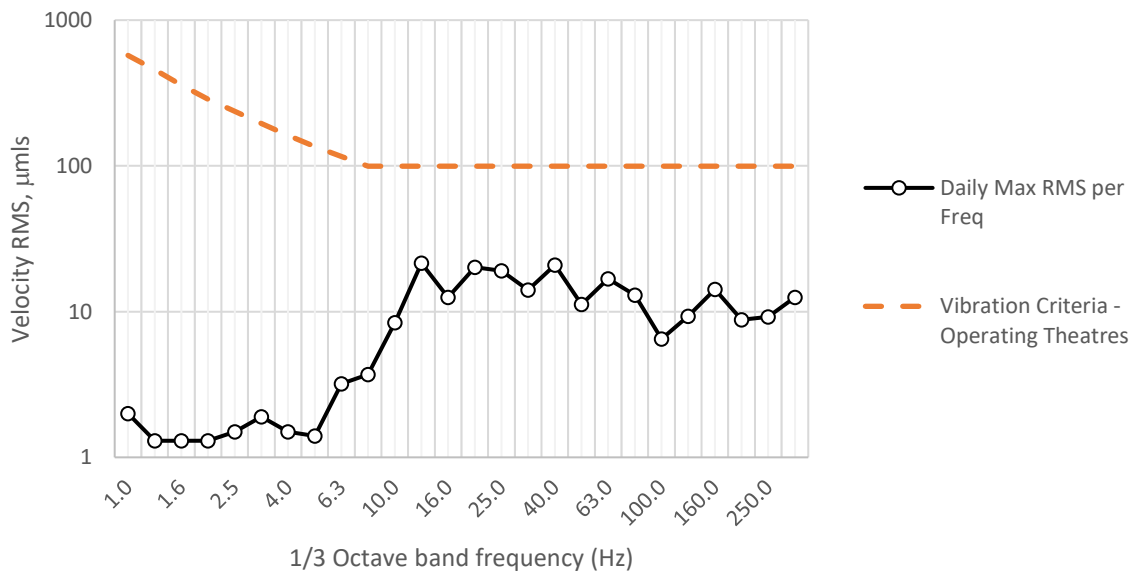
### Vertical Vibration



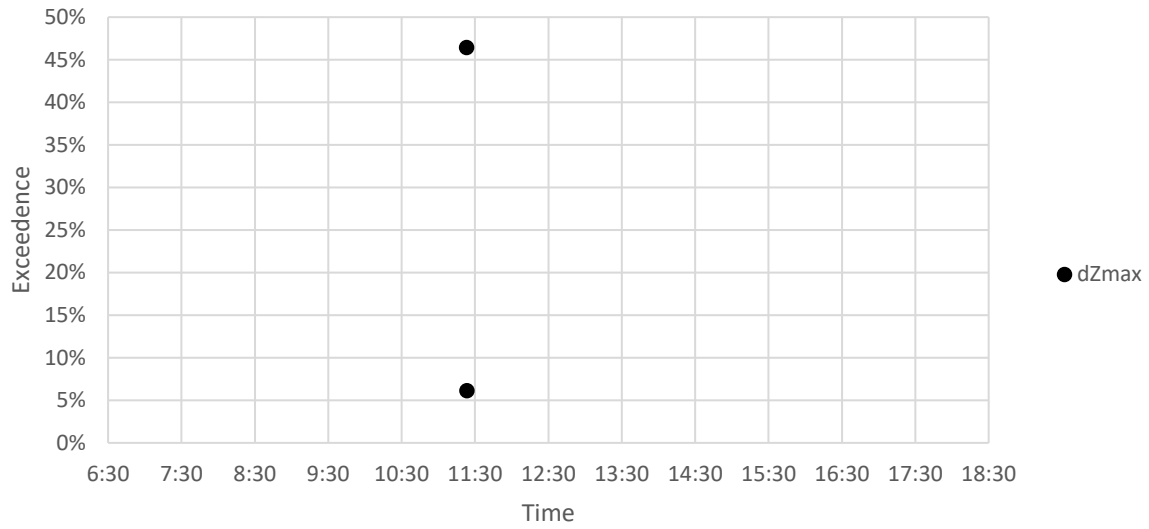
### FwdBackwd Vibration



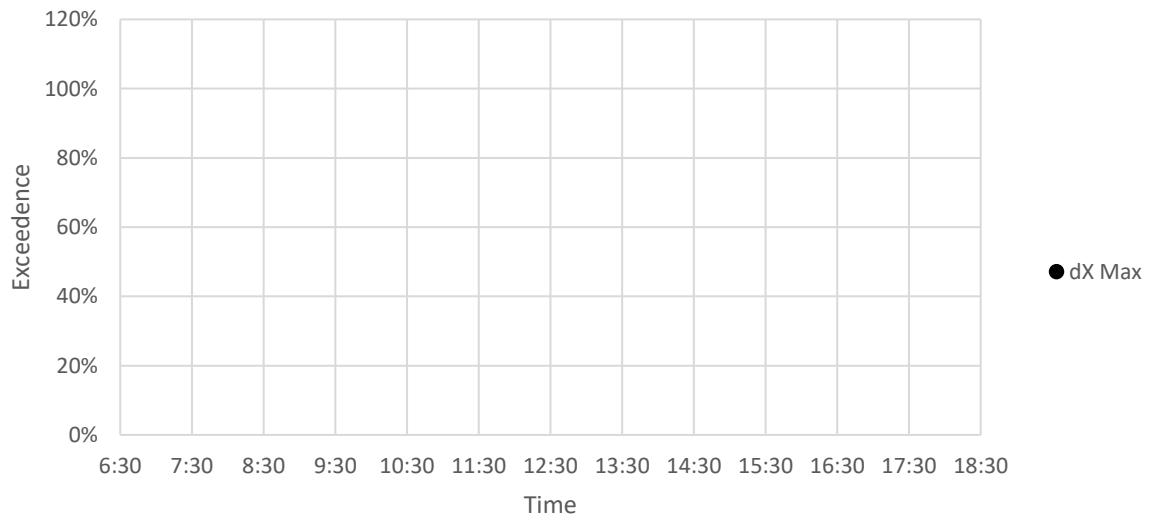
### Sideways Vibration



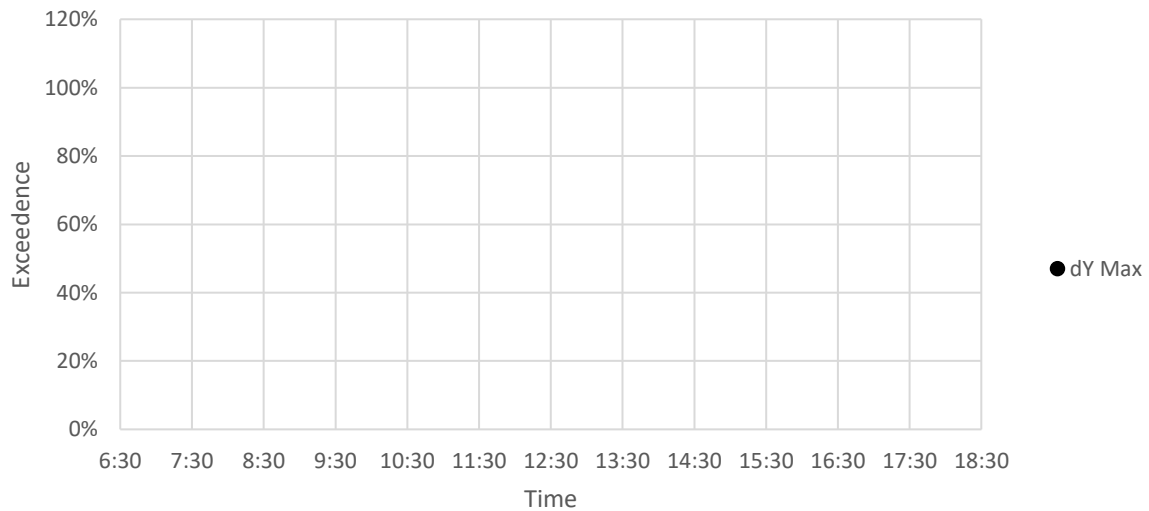
### Vertical



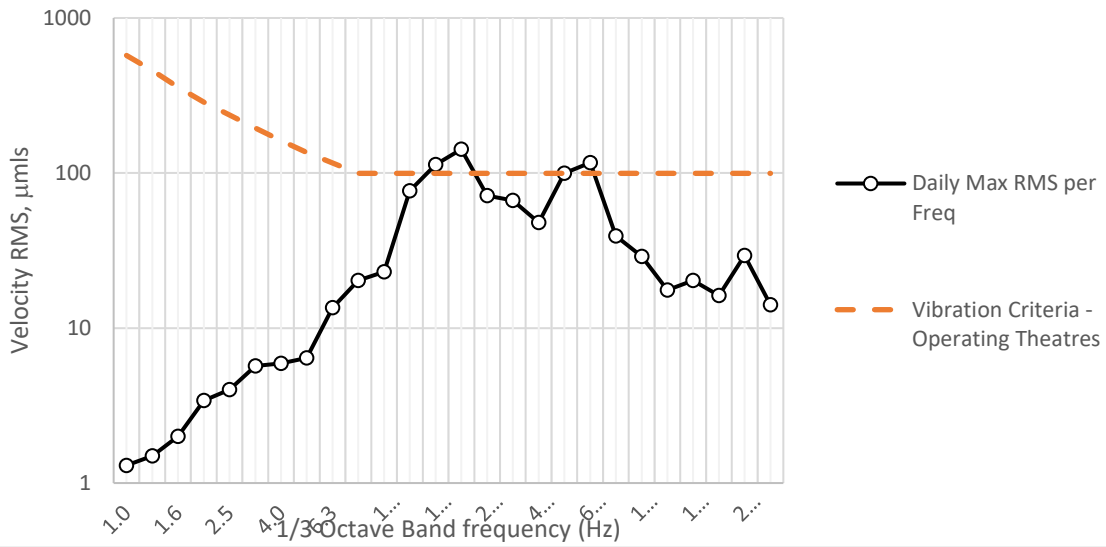
### Fwd/Backwards



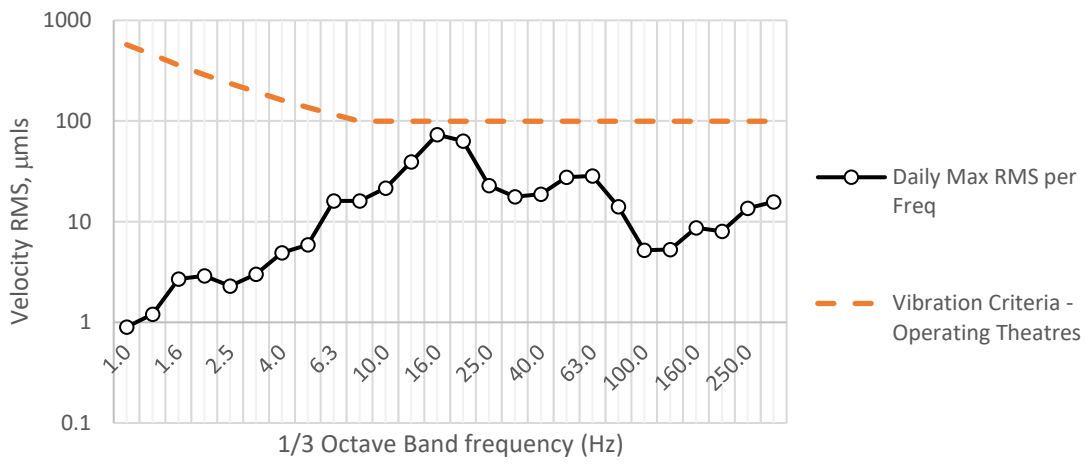
### Sideways



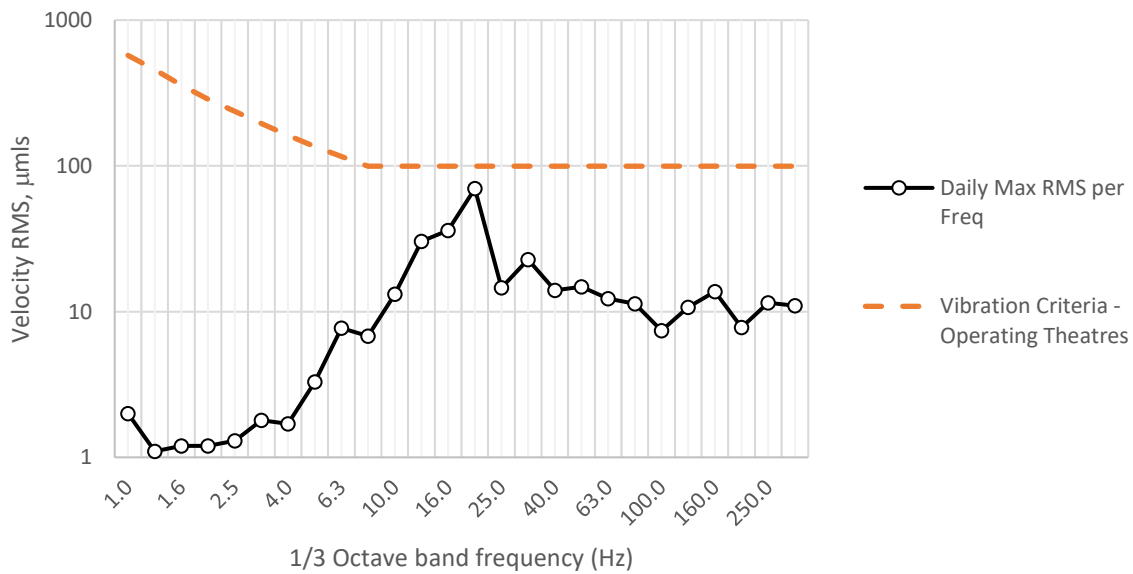
### Vertical Vibration



### FwdBackwd Vibration

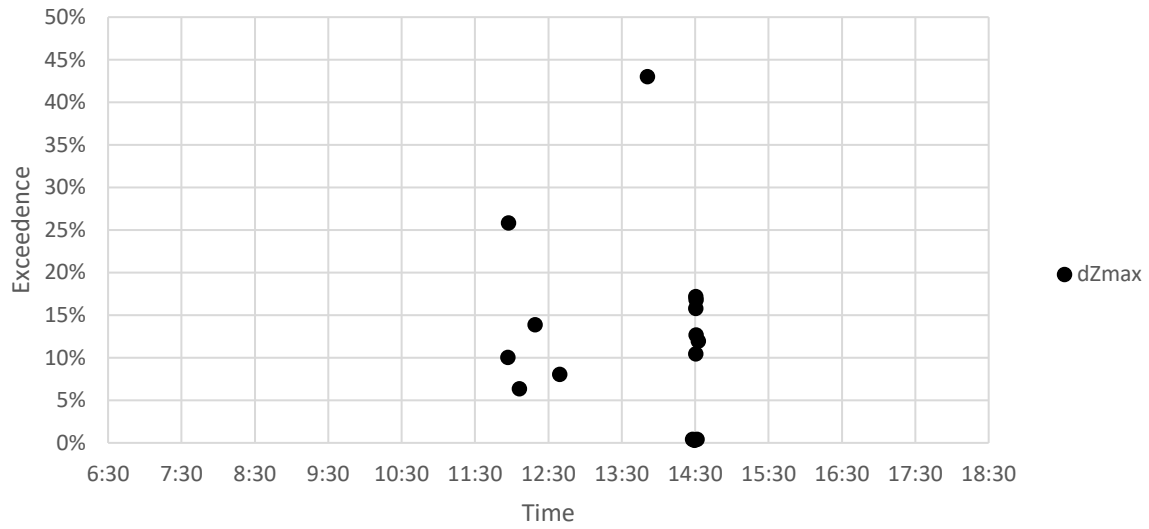


### Sideways Vibration

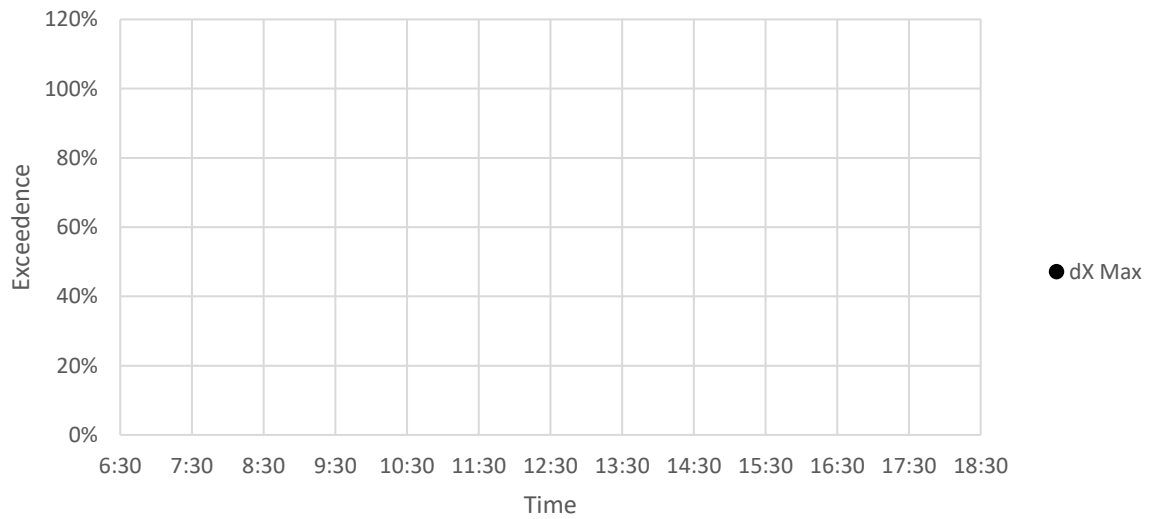




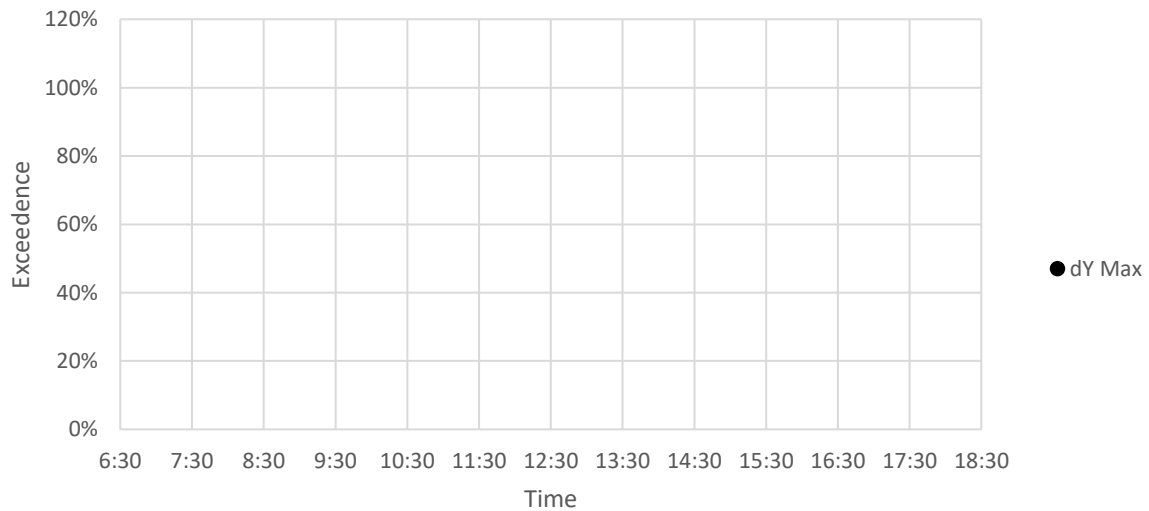
### Vertical



### Fwd/Backwards



### Sideways



## **OUTSIDE SUSAN WAKIL HEALTH BUILDING**

No exceedances occurred during the monitoring period.