

Shoalhaven Hospital Redevelopment

Noise and Vibration Monitoring Report 21

February 2025

Project ID	20230220.7
Document Title	Noise and Vibration Monitoring Report 21
Attention To	John Holland Group Pty Ltd

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	5/03/2025	20230220.7/0503A/R0/HD	HD		TB

TABLE OF CONTENTS

1	INTRODUCTION	4
2	SITE DESCRIPTION	4
2.1.1	Surrounding Receivers.....	4
3	MONITORING LOCATIONS AND DESCRIPTION	6
3.1	MONITORING PERIOD	8
3.2	MONITORING EQUIPMENT	8
4	NOISE AND VIBRATION OBJECTIVES.....	8
4.1	PROJECT DOCUMENTATION	8
4.1.1	Noise Management Levels (NML).....	8
4.1.2	Vibration Management Levels.....	9
5	MEASUREMENT RESULTS.....	10
5.1	NOISE MONITORING RESULTS.....	10
5.1.1	East Boundary Facing Shoalhaven Street (Monitor HEX-000171).....	11
5.1.2	North Boundary Near Block A and B (Monitor HEX-000130).....	12
5.2	VIBRATION MONITORING RESULTS.....	14
5.2.1	East Boundary Opposite Shoalhaven Street (Monitor ETM7326)	14
5.2.2	North Boundary Near Block A and B (Monitor ETM7687)	15
5.3	DISCUSSION	17
5.3.1	Noise	17
5.3.2	Vibration.....	18
5.3.3	General Notes:.....	19
6	CONCLUSION.....	20
APPENDIX A – NOISE MONITORING GRAPHS		21
APPENDIX B – VIBRATION MONITORING GRAPHS		22

1 INTRODUCTION

This report presents the results of noise and vibration monitoring conducted by Acoustic Logic for the Shoalhaven Hospital Redevelopment project site. Details presented in this report include monitoring locations, relevant noise and vibration objectives, measured levels over the monitoring period and discussion of results.

This report presents the results of monitoring for the month of February between 1/2/2025 and 28/2/2025. Monitoring has been ongoing since 29th May 2023.

This report should be read in conjunction with the Construction Noise and Vibration Management Sub Plan prepared by this office (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

2 SITE DESCRIPTION

The project site is located at Shoalhaven Hospital Redevelopment. Site works are at building construction stage.

2.1.1 Surrounding Receivers

Based on site investigations, the following developments surround the site:

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Detached dwellings to south of North Street, and residences and St Michaels Catholic Church and school to the east.
R2	Residential	Detached dwellings to north east, opposite Shoalhaven Street with some health and commercial and recreational uses.
PS	School	Shoalhaven Community Pre-School (future relocated site).
CC	Hospital	Cancer Centre overnight accommodation (part of the greater hospital site).

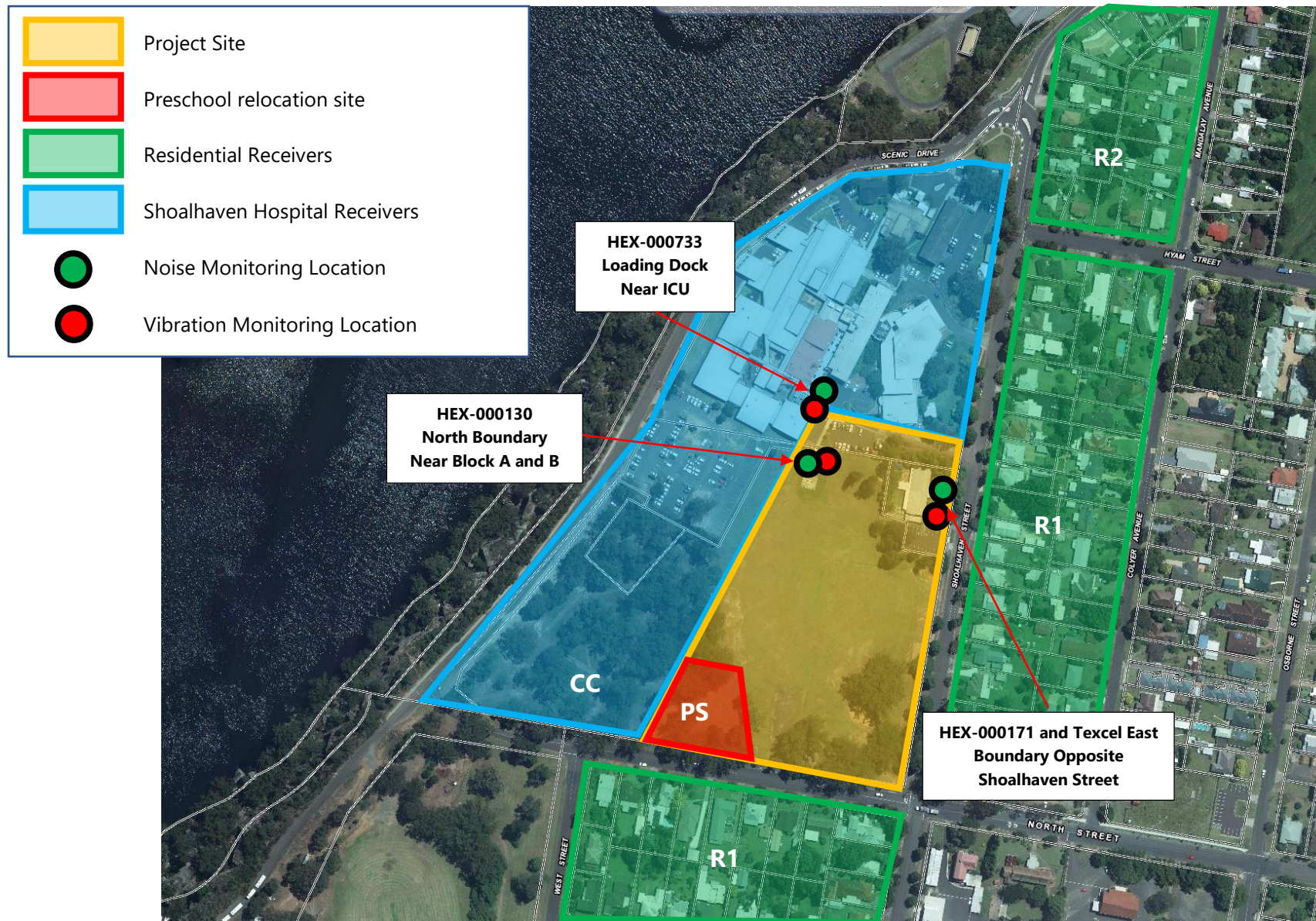


Figure 1 – Site Map. Monitoring Locations and Surrounding Receivers

3 MONITORING LOCATIONS AND DESCRIPTION

Refer to Figure 1 and photos below for monitoring locations.

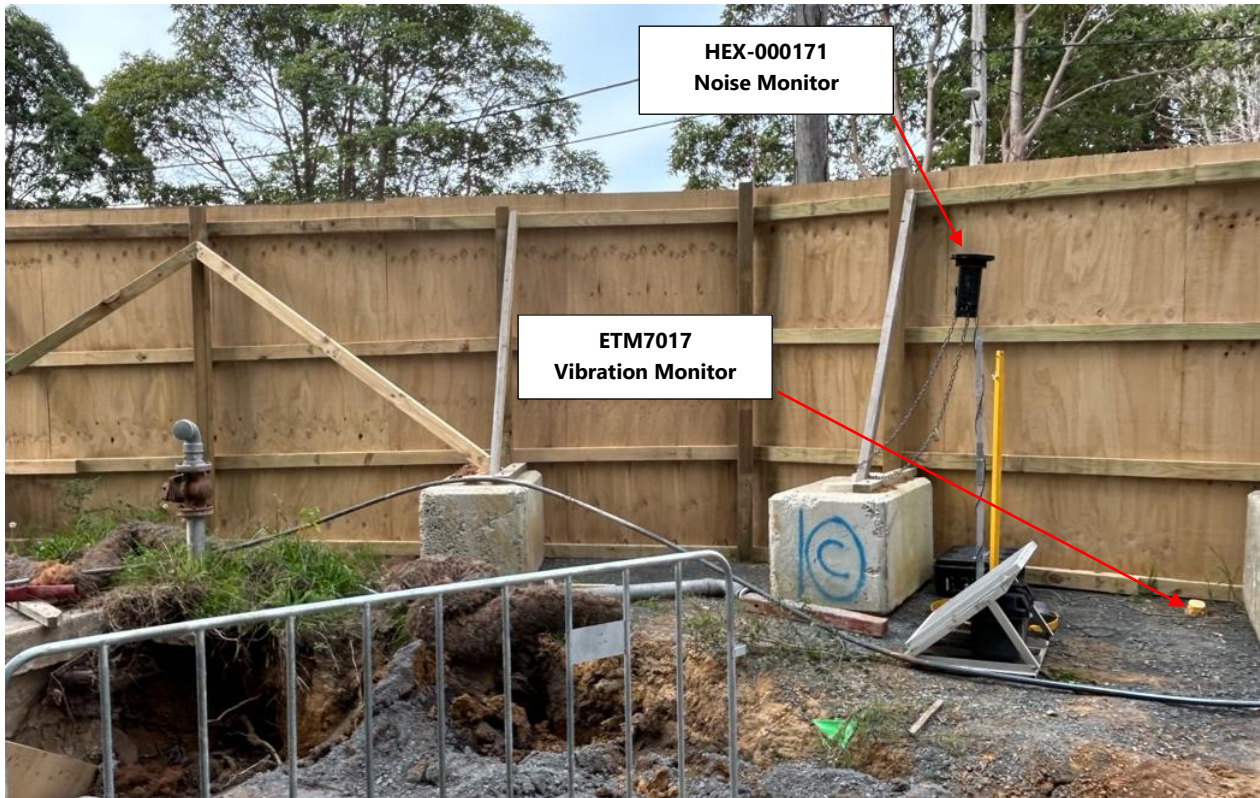


Figure 2 – Noise and Vibration Monitor at East Boundary Opposite Shoalhaven Street



Figure 3 – Noise and Vibration Monitor at North Boundary Near Block A and B



Figure 4 – Noise and Vibration Monitor Near ICU and Loading Dock

3.1 MONITORING PERIOD

This report presents the results of monitoring between 1/2/2025 and 28/2/2025.

Monitoring has been ongoing since 29th May 2023.

3.2 MONITORING EQUIPMENT

Noise

Noise monitoring was conducted using SiteHive Hexanode monitors. Monitors are programmed to continuously store noise data over every 15-minute period, along with any 'triggered' events that occur throughout the monitoring period.

Vibration

Vibration monitoring was conducted using Texcel ETM vibration monitors with external Tri-axial Geophones. The vibration monitors are programmed to store statistical vibration data over every 5-minute period, along with any 'triggered' events that occur throughout the monitoring period. Texcel monitors are equipped with the ability to send SMS alarm messages to site operators and project managers.

4 NOISE AND VIBRATION OBJECTIVES

4.1 PROJECT DOCUMENTATION

Construction impacts to nearby development have been determined in the Construction Noise, Dust and Vibration Management Sub Plan (ref: 20230220.1/0506A/R1/VF, dated 05/06/2023)

4.1.1 Noise Management Levels (NML)

The project specific NML's for the most impacted receivers are summarised from the Sub-Plan and are reproduced as follows:

Table 2 – Noise Management Levels for Most Impacted Receivers

Location/Receiver	RBL dB(A) L₉₀	NML dB(A) L_{eq}	HANML dB(A) L_{eq}
Residents Surrounding the Project Site	35	45 (Standard Construction Hours) 40 (OOSH)	75
Cancer Centre Overnight Stay	N/A	65	N/A
Hospital Wards and Operating Theatres (internal)	N/A	45 internal* 65 external	N/A

* An external noise level of 65 dB(A) would result in an internal noise level of 45 dB(A) assuming a typical 20 dB(A) reduction for a standard façade. Therefore, compliance with the external NML will also result in compliance with the internal NML.

4.1.2 Vibration Management Levels

German Standard DIN 4150-3 (2016) provides a guideline for acceptable levels of vibration velocity in building foundations, to assess the effects of vibration on structures. The table give guidance on the maximum accepted values of velocity at the foundation and in the plane of the highest floor of various types of buildings, to prevent any structural damage.

The table below lists the peak particle velocity, which is the maximum absolute value of the velocity signals for the three orthogonal components. This is measured as a maximum value of any of the three orthogonal component particle velocities when measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

It is noted that if measured vibration levels are below the guidelines listed below, damage that will reduce the serviceability of the building will not occur and if damage to the building does occur, it is assumed that the damage is related to other activities or sources. Furthermore, the DIN4150-3 guideline states the following regarding the limits presented in Table 1 of the standard:

"Exceeding the guideline values does not necessarily lead to damage. Should they be exceeded, however, further investigations may be necessary, such as determining and evaluating the stresses as detailed in 4.3 and 4.4."

Table 3 -(Table 1 – DIN 4150-3 (2016)) – Guideline Values for Vibration Velocity, $v_{i,max}$, for Evaluating the Effects of Short-Term Vibration on Structures

	TYPE OF STRUCTURE	Guideline values for $v_{i,max}$ in mm/s				
		Foundation, all directions, $i = x, y, z$, at a frequency of			Topmost floor, horizontal direction, $i = x, y$	Floor slabs, vertical direction, $i = z$
		1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz ^(a)	All Frequencies	All Frequencies
L/C	1	2	3	4	5	6
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings) buildings that are under a preservation order)	3	3 to 8	8 to 10	8	20 ^(b)

NOTE Even if guideline values as in line 1, columns 2 to 5, are complied with, minor damage cannot be excluded.

a At frequencies above 100 Hz, the guideline values for 100 Hz can be applied as minimum values.

b It may be necessary to lower the guideline value markedly to prevent minor damage

5 MEASUREMENT RESULTS

5.1 NOISE MONITORING RESULTS

The following tables present a summary of daily measured noise levels across a 15-minute period. Refer to appendices for detailed noise monitoring results.

Standard construction hours are as follows:

- Monday to Friday between 7am and 6pm
- Saturday between 8am and 1pm

Note: all presented noise levels are measured at the monitoring location. Noise levels at surrounding receivers are likely to be lower given they are located further away.

NML = Noise Management Level

HNAML = Highly Noise Affected Management Level

A discussion will be provided where exceedances of the highly affected noise management level occur.

5.1.1 East Boundary Facing Shoalhaven Street (Monitor HEX-000171)

Table 4 – Monitored Noise Levels – East Boundary(HEX-000171)

Date	Noise Management Trigger Level dB(A) $L_{eq,15-min}$	NML Exceedance Range ($L_{Aeq, 15-min}$ dB(A)) – Standard Operating Hours				
		<NML	0-5 above NML	5-10 above NML	10-15 Above NML	75dB(A) Exceeded
1/02/2025	45 (external)	15%	85%	0%	0%	0%
2/02/2025		Sunday – No Works				
3/02/2025		0%	5%	27%	43%	0%
4/02/2025		0%	11%	20%	55%	0%
5/02/2025		0%	9%	16%	56%	0%
6/02/2025		0%	7%	18%	43%	0%
7/02/2025		0%	16%	16%	23%	0%
8/02/2025		0%	100%	0%	0%	0%
9/02/2025		Sunday – No Works				
10/02/2025		0%	9%	18%	34%	0%
11/02/2025		0%	2%	20%	30%	0%
12/02/2025		0%	2%	20%	34%	0%
13/02/2025		0%	9%	57%	20%	0%
14/02/2025		16%	34%	34%	5%	0%
15/02/2025		75%	20%	5%	0%	0%
16/02/2025		Sunday – No Works				
17/02/2025		0%	18%	36%	36%	0%
18/02/2025		0%	32%	39%	20%	0%
19/02/2025		0%	32%	55%	14%	0%
20/02/2025		5%	9%	53%	26%	0%
21/02/2025		0%	36%	16%	30%	0%
22/02/2025		95%	5%	0%	0%	0%
23/02/2025		Sunday – No Works				
24/02/2025		2%	48%	36%	7%	0%
25/02/2025		0%	30%	61%	9%	0%
26/02/2025		9%	30%	45%	16%	0%
27/02/2025		0%	48%	30%	18%	0%
28/02/2025		34%	39%	23%	5%	0%

5.1.2 North Boundary Near Block A and B (Monitor HEX-000130)

Table 5 – Monitored Noise Levels – North Boundary(HEX-000130)

Date	Noise Management Trigger Level dB(A) $L_{eq,15-min}$	NML Exceedance Range ($L_{Aeq, 15-min}$ dB(A)) – Standard Operating Hours				
		<NML	0-5 above NML	5-10 above NML	10-15 Above NML	75dB(A) Exceeded
1/02/2025	65 (external)	100%	0%	0%	0%	0%
2/02/2025		Sunday – No Works				
3/02/2025		23%	66%	11%	0%	0%
4/02/2025		27%	55%	14%	5%	5%
5/02/2025		12%	71%	18%	0%	0%
6/02/2025		100%	0%	0%	0%	0%
7/02/2025		100%	0%	0%	0%	0%
8/02/2025		Sunday – No Works				
9/02/2025		39%	55%	7%	0%	0%
10/02/2025		36%	59%	5%	0%	0%
11/02/2025		27%	55%	18%	0%	0%
12/02/2025		36%	50%	7%	7%	7%
13/02/2025		36%	64%	0%	0%	0%
14/02/2025		100%	0%	0%	0%	0%
15/02/2025		Sunday – No Works				
16/02/2025		16%	55%	25%	2%	5%
17/02/2025		14%	41%	43%	2%	2%
18/02/2025		20%	68%	11%	0%	0%
19/02/2025		16%	43%	39%	2%	2%
20/02/2025		32%	66%	2%	0%	0%
21/02/2025		100%	0%	0%	0%	0%
22/02/2025		Sunday – No Works				
23/02/2025		32%	43%	14%	11%	11%
24/02/2025		14%	59%	27%	0%	0%
25/02/2025		28%	58%	9%	5%	5%
26/02/2025		23%	65%	12%	0%	0%
27/02/2025		44%	37%	14%	5%	5%
28/02/2025		100%	0%	0%	0%	0%

Table 6 – Monitored Noise Levels – Near ICU and Loading Dock (HEX-000733)

Date	Noise Management Trigger Level dB(A) $L_{eq,15-min}$	NML Exceedance Range ($L_{Aeq, 15-min}$ dB(A)) – Standard Operating Hours				
		<NML	0-5 above NML	5-10 above NML	10-15 Above NML	75dB(A) Exceeded
1/02/2025	65 (external)	100%	0%	0%	0%	0%
2/02/2025		Sunday – No Works				
3/02/2025		52%	20%	11%	11%	16%
4/02/2025		30%	23%	39%	7%	9%
5/02/2025		36%	5%	32%	23%	27%
6/02/2025		34%	14%	27%	25%	25%
7/02/2025		59%	23%	16%	2%	2%
8/02/2025		100%	0%	0%	0%	0%
9/02/2025		Sunday – No Works				
10/02/2025		91%	9%	0%	0%	0%
11/02/2025		34%	18%	16%	27%	32%
12/02/2025		25%	7%	30%	30%	39%
13/02/2025		20%	27%	39%	14%	14%
14/02/2025		45%	16%	27%	7%	11%
15/02/2025		100%	0%	0%	0%	0%
16/02/2025		Sunday – No Works				
17/02/2025		28%	16%	26%	16%	30%
18/02/2025		14%	5%	5%	45%	77%
19/02/2025		20%	23%	36%	20%	20%
20/02/2025		23%	49%	19%	7%	9%
21/02/2025		34%	48%	16%	2%	2%
22/02/2025		100%	0%	0%	0%	0%
23/02/2025		Sunday – No Works				
24/02/2025		43%	32%	16%	9%	9%
25/02/2025		18%	25%	55%	2%	2%
26/02/2025		30%	21%	28%	5%	21%
27/02/2025		24%	17%	14%	33%	45%
28/02/2025		45%	23%	16%	7%	16%

5.2 VIBRATION MONITORING RESULTS

5.2.1 East Boundary Opposite Shoalhaven Street (Monitor ETM7326)

Table 7 – Monitored Vibration Levels – East Boundary (ETM7326)

Date	Measured PPV Daily Maximum (mm/s)	Vibration Monitoring Criteria	Compliance
1/02/2025	0.2	DIN4150 Type 2 (Refer Table 3): 5 mm/s (<10 Hz) 10 to 15 mm/s (10- 50Hz) 15 to 20 mm/s (50 - 100 Hz)	Yes
2/02/2025	0.1		Yes
3/02/2025	0.3		Yes
4/02/2025	1.2		Yes
5/02/2025	0.5		Yes
6/02/2025	0.5		Yes
7/02/2025	1.0		Yes
8/02/2025	0.2		Yes
9/02/2025	0.1		Yes
10/02/2025	0.6		Yes
11/02/2025	5.1*		Yes
12/02/2025	6.9*		Yes
13/02/2025	7.2*		Yes
14/02/2025	1.1		Yes
15/02/2025	0.1		Yes
16/02/2025	0.2		Yes
17/02/2025	0.6		Yes
18/02/2025	0.3		Yes
19/02/2025	0.2		Yes
20/02/2025	0.6		Yes
21/02/2025	0.2		Yes
22/02/2025	0.1		Yes
23/02/2025	0.2		Yes
24/02/2025	0.2		Yes
25/02/2025	0.2		Yes
26/02/2025	0.4		Yes
27/02/2025	1.7		Yes
28/02/2025	0.6		Yes

*Measured levels were below the DIN4150 frequency based criteria curve and are compliant.

5.2.2 North Boundary Near Block A and B (Monitor ETM7687)

Table 8 – Monitored Vibration Levels – North Boundary (ETM7687)

Date	Measured PPV Daily Maximum (mm/s)	Vibration Monitoring Criteria	Compliance
1/02/2025	1.0	DIN4150 Type 2 (Refer Table 3): 5 mm/s (<10 Hz) 10 to 15 mm/s (10- 50Hz) 15 to 20 mm/s (50 - 100 Hz)	Yes
2/02/2025	2.2		Yes
3/02/2025	2.5		Yes
4/02/2025	7.2*		Yes
5/02/2025	1.8		Yes
6/02/2025	0.9		Yes
7/02/2025	3.2		Yes
8/02/2025	1.0		Yes
9/02/2025	0.6		Yes
10/02/2025	1.5		Yes
11/02/2025	1.2		Yes
12/02/2025	3.8		Yes
13/02/2025	7.0*		Yes
14/02/2025	8.9*		Yes
15/02/2025	1.4		Yes
16/02/2025	0.6		Yes
17/02/2025	6.7*		Yes
18/02/2025	1.9		Yes
19/02/2025	2.9		Yes
20/02/2025	8.6*		Yes
21/02/2025	5.3*		Yes
22/02/2025	2.0		Yes
23/02/2025	0.5		Yes
24/02/2025	15.3*		Yes
25/02/2025	7.8*		Yes
26/02/2025	6.7*		Yes
27/02/2025	2.0		Yes
28/02/2025	32.0		Yes – See Discussion

*Measured levels were below the DIN4150 frequency based criteria curve and are compliant.

Table 9 – Monitored Vibration Levels – Near ICU and Loading Dock (ETM7393)

Date	Measured PPV Daily Maximum (mm/s)	Vibration Monitoring Criteria	Compliance
1/02/2025	0.1	DIN4150 Type 2 (Refer Table 3): 5 mm/s (<10 Hz) 10 to 15 mm/s (10- 50Hz) 15 to 20 mm/s (50 - 100 Hz)	Yes
2/02/2025	0.1		Yes
3/02/2025	1.2		Yes
4/02/2025	1.3		Yes
5/02/2025	1.5		Yes
6/02/2025	2.8		Yes
7/02/2025	0.7		Yes
8/02/2025	0.1		Yes
9/02/2025	0.1		Yes
10/02/2025	0.1		Yes
11/02/2025	1.9		Yes
12/02/2025	1.7		Yes
13/02/2025	2.5		Yes
14/02/2025	4.9		Yes
15/02/2025	0.1		Yes
16/02/2025	0.1		Yes
17/02/2025	1.9		Yes
18/02/2025	4.6		Yes
19/02/2025	2.9		Yes
20/02/2025	2.2		Yes
21/02/2025	3.1		Yes
22/02/2025	0.1		Yes
23/02/2025	0.1		Yes
24/02/2025	0.7		Yes
25/02/2025	2.3		Yes
26/02/2025	7.5*		Yes
27/02/2025	1.6		Yes
28/02/2025	6.1		Yes

*Measured levels were below the DIN4150 frequency based criteria curve and are compliant.

5.3 DISCUSSION

5.3.1 Noise

East Boundary Opposite Shoalhaven Street (HEX-000171)

Works were typically above the Noise Management Level and were generally below the Highly Noise Affected Management Level over the monitoring period.

North Boundary Near Block A and B (HEX-000130)

Works were generally below the Noise Management Level over the monitoring period and were generally below the Highly Noise Affected Management Level over the monitoring period.

Where measured exceedances above the 'highly-noise affected' management level have occurred at this location throughout the monitoring period, periods where the HNAML was exceeded were generally short (15-30 minutes) and were preceded and followed by periods of quieter noise levels.

Near ICU and Loading Dock (HEX-000733)

Works were typically below the Noise Management Level and were generally below the Highly Noise Affected Management Level over the monitoring period.

Where measured exceedances above the 'highly-noise affected' management level have occurred at this location throughout the monitoring period, these are detailed below:

- 3rd February -- maximum noise level of 86 dB(A) $L_{eq(15min)}$
 - The exceedance periods were recorded between 11am and 11:30am, and 2pm and 3pm
- 5th February -- maximum noise level of 84 dB(A) $L_{eq(15min)}$
 - The exceedance periods were recorded between 8am and 9am, and 1pm and 4pm
- 6th February -- maximum noise level of 79 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 1 hour periods separated by 30min-1hr long respite
- 11th February -- maximum noise level of 80 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 1 hour periods separated by 30min-1hr long respite
- 12th February -- maximum noise level of 80 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 1 hour periods separated by 30min-1hr long respite
- 17th February -- maximum noise level of 92 dB(A) $L_{eq(15min)}$
 - The largest exceedance periods were recorded between 1:30pm and 4:30pm
- 18th February -- maximum noise level of 88 dB(A) $L_{eq(15min)}$
 - The exceedance periods were recorded between 8am-11am and 12pm-4:30pm
- 19th February -- maximum noise level of 79 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 30 minute periods separated by 30min-1hr long respite
- 26th February -- maximum noise level of 94 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 1 hour periods separated by 30min-1hr long respite
- 27th February -- maximum noise level of 83 dB(A) $L_{eq(15min)}$
 - The exceedance periods were recorded between 8am-11am and 12pm-2pm
- 28th February -- maximum noise level of 86 dB(A) $L_{eq(15min)}$
 - The exceedance periods were generally 1 hour periods separated by 30min-1hr long respite

On days where the highly affected noise management level is expected to be exceeded as a result of construction activities, the following guidance is provided by the Construction Noise and Vibration Guideline (Roads):

Respite offers should be considered where there are high-noise and vibration-generating activities near receivers. As a guide, work should be carried out in continuous blocks that do not exceed three hours each with a minimum respite period of one hour between each block.

Note that the guideline also states that the measure is evaluated on a project-by-project basis and may not be applicable to all projects. Should John Holland undertake similar works as carried out on dates detailed above, it is recommended that a discussion with the hospital to determine if internal receivers are being heavily impacts and if so, introduce a respite period in between lengthy continuous works as per the guideline.

5.3.2 Vibration

North Boundary Near Block A and B (ETM7687)

- Across all works within this monitoring period, maximum vibration levels were generally within acceptable levels.
- Exceedances of the DIN 4150 criteria were observed on the following dates and detailed as follows:
 - 28/01/2025 – maximum recorded PPV of 32.0mm/s
 - On the dates above, a review of the waveforms indicates that the exceedances were generated by handling or disturbed by direct impact with the geophone, and not as a result of construction equipment which would typically generate sustained levels of vibration.
 - On this basis, it is expected that the exceedances would be localised immediately adjacent to the monitor, and not to surrounding sensitive structures.

East Boundary Opposite Shoalhaven Street (ETM7326)

- Across all works within this monitoring period, maximum vibration levels were all within acceptable levels.

Near ICU and Loading Dock (ETM7393)

- Across all works within this monitoring period, maximum vibration levels were all within acceptable levels.

5.3.3 General Notes:

- Regarding measured exceedances generally, we note that an exceedance of the noise management level is not necessarily prohibited, however is a trigger for providing mitigation measures for the control of noise from construction activities.
- It should be noted that the measured noise levels will also capture noise outside the project site, such as environmental / traffic noise. Noise from construction activity at nearby residential receivers are expected to be lower than measured values given:
 - Receivers are setback further from the project site
 - The hoarding located along the site boundary will provide at minimum a line-of-sight barrier effect to residents along Shoalhaven Street with approximately 5-10dB noise reduction from the measured levels.
- We note that given the monitors were installed at ground level within site boundaries, any measured vibration levels are likely to be elevated compared to vibration levels at the receiver locations as they are located further away from the vibration source(s).

6 CONCLUSION

Noise and Vibration monitoring has been conducted at various locations for the Shoalhaven Hospital Redevelopment between 1/2/2025 and 28/2/2025. For this monitoring period, we note the following:

Noise

- East Boundary Opposite Shoalhaven Street (HEX-000171) – measured noise levels generally exceeded the NML and were generally below the HNAML over this monitoring period.
- North Boundary Near Block A and B (HEX-000130) - noise levels were generally below the NML over this monitoring period and were generally below the HNAML over this monitoring period.
- Near ICU and Loading Dock (HEX-000733) - noise levels were typically above the NML over this monitoring period and were generally below the HNAML over this monitoring period.

Vibration

- East Boundary Opposite Shoalhaven Street (ETM7687), vibration levels were all within the nominated criteria during this monitoring period.
- North Boundary Near Block A and B (ETM7326), vibration levels were all within the nominated criteria during this monitoring period.
- Near ICU and Loading Dock (ETM7393), vibration levels were all within the nominated criteria during this monitoring period.

On dates where exceedances have occurred, these have been documented for further review and remedial action for JH review.

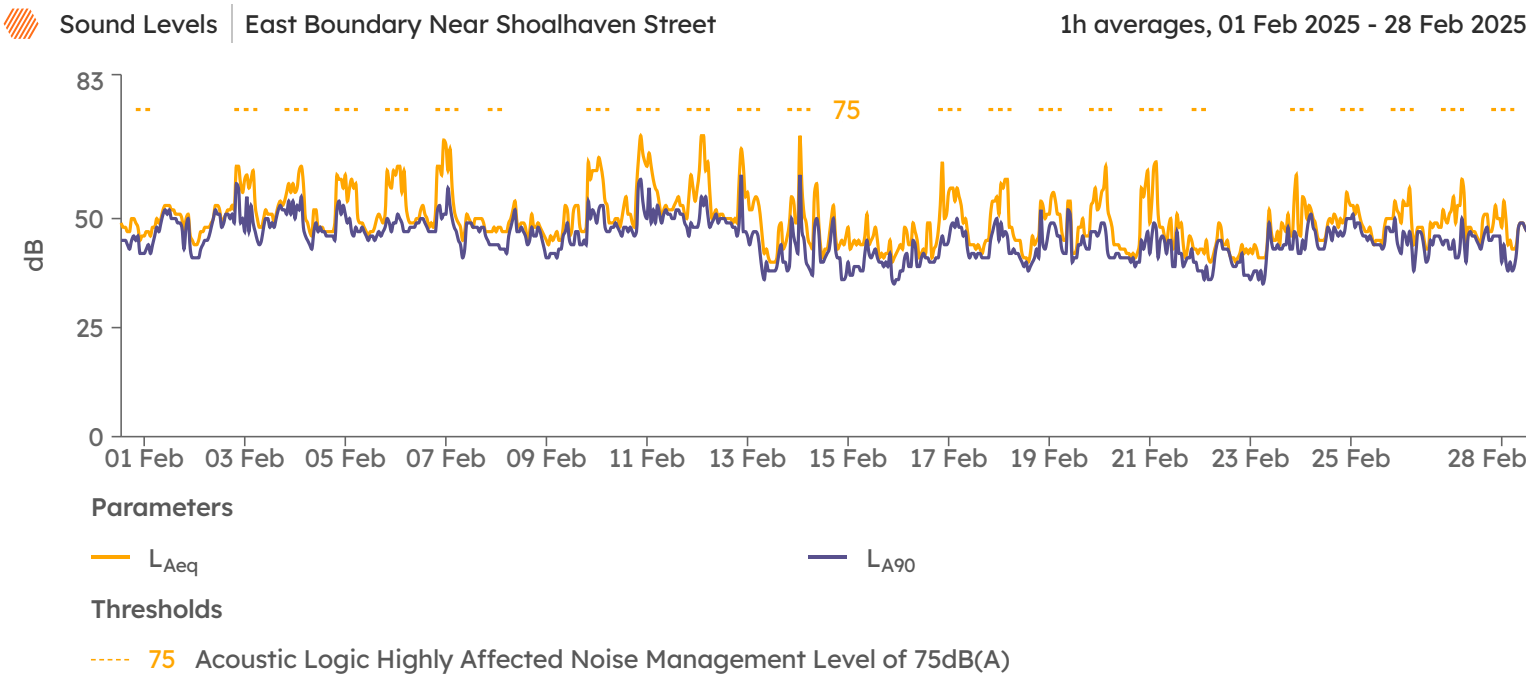
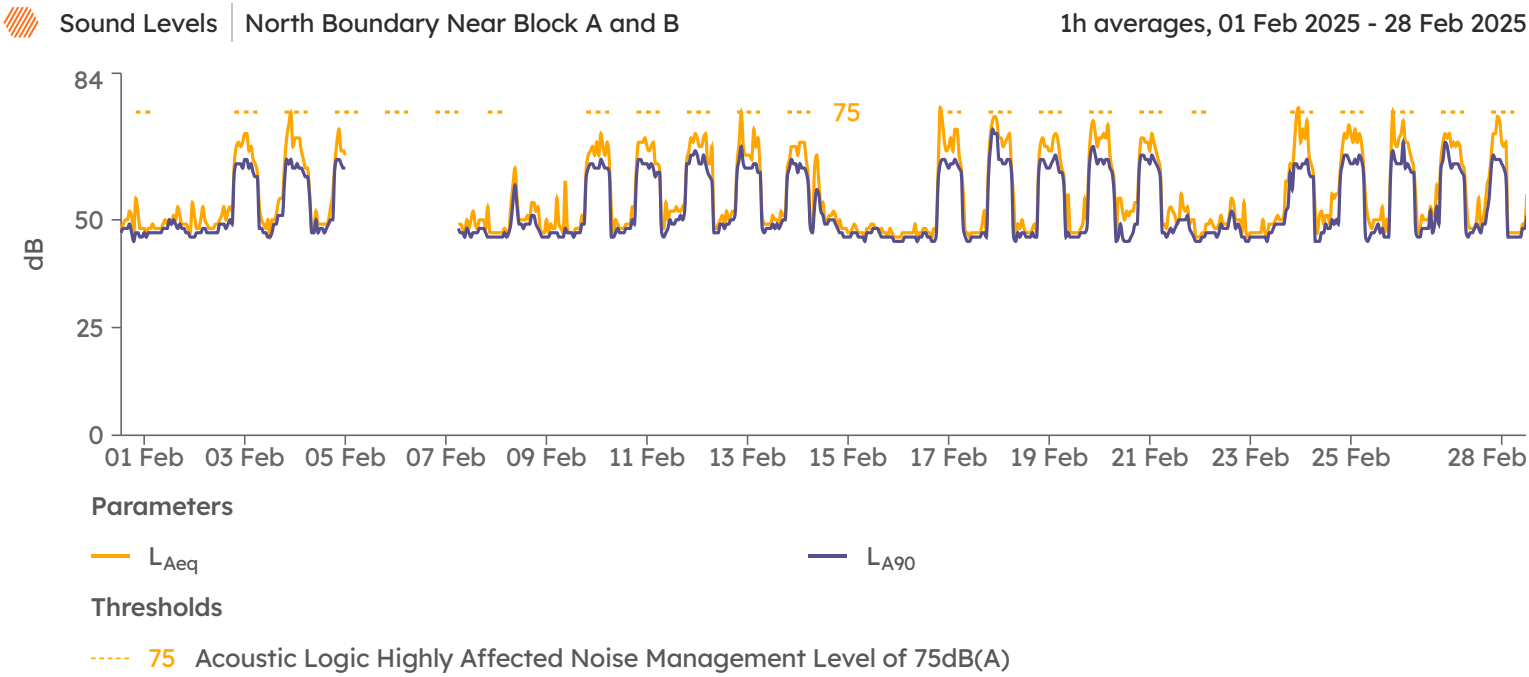
We trust this information is satisfactory. Please contact us should you have any further queries.

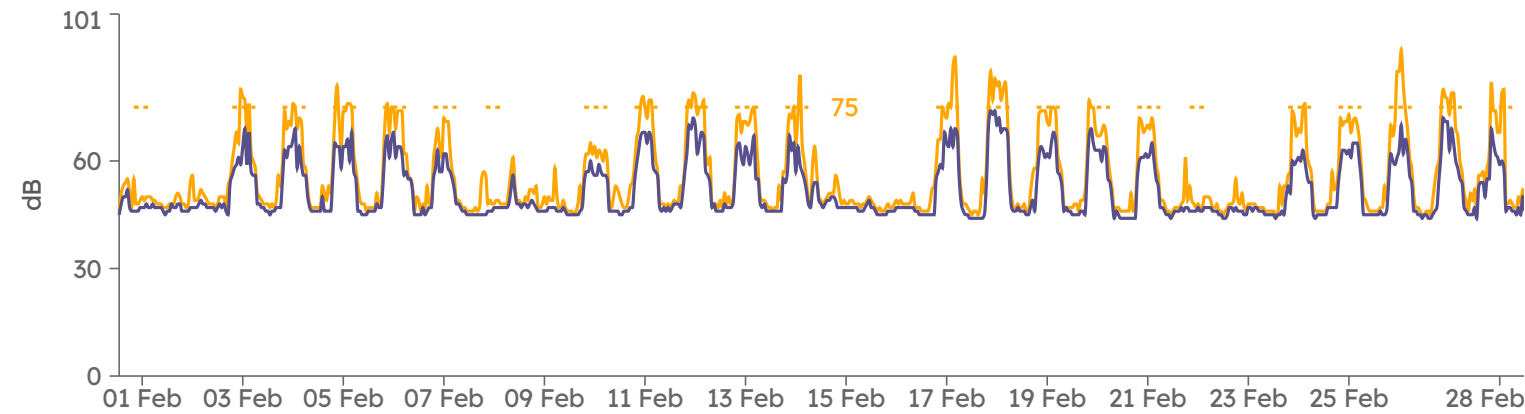
Yours faithfully,



Acoustic Logic Pty Ltd
Hyde Deng

APPENDIX A – NOISE MONITORING GRAPHS





Parameters

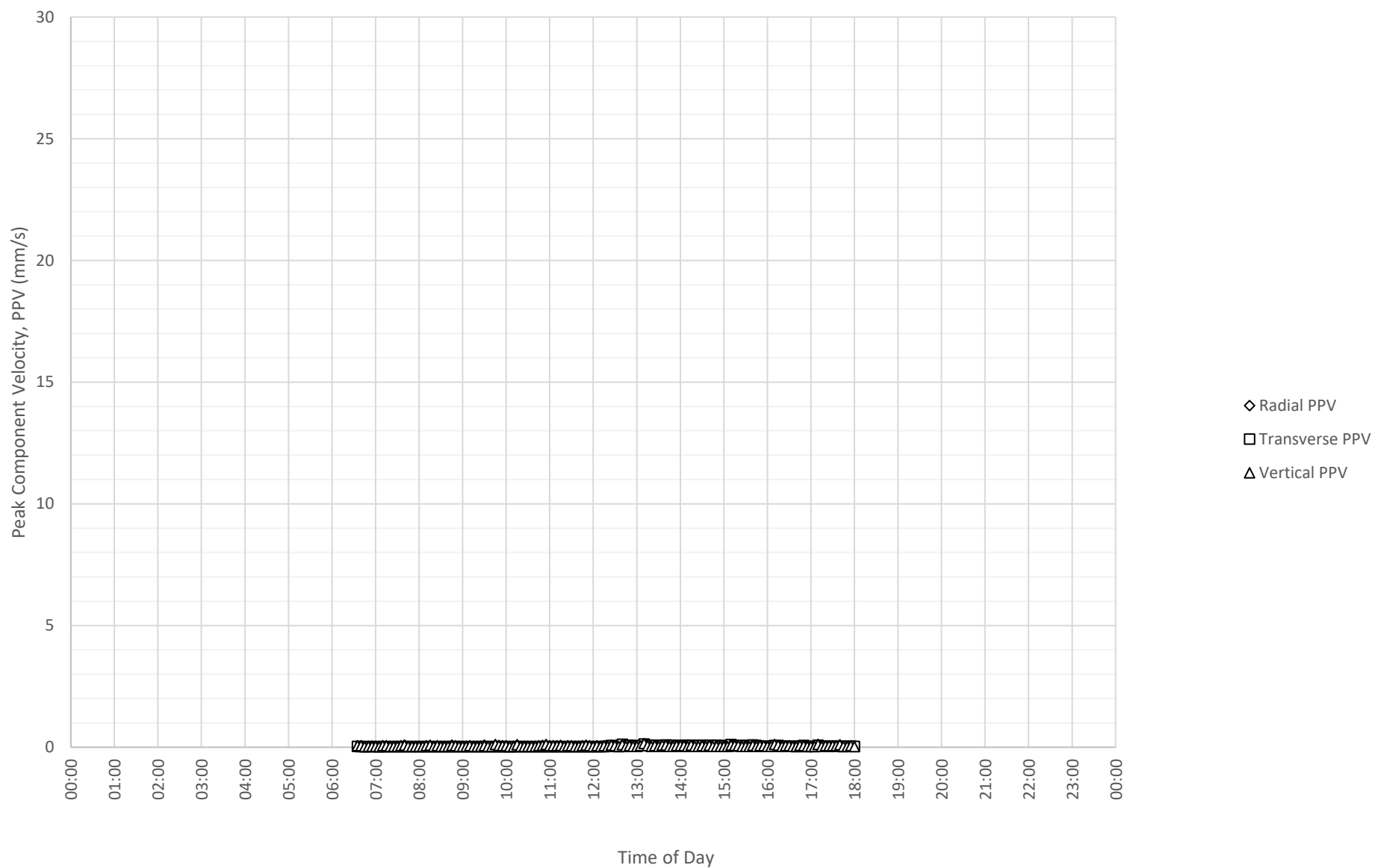
— L_{Aeq} — L_{A90}

Thresholds

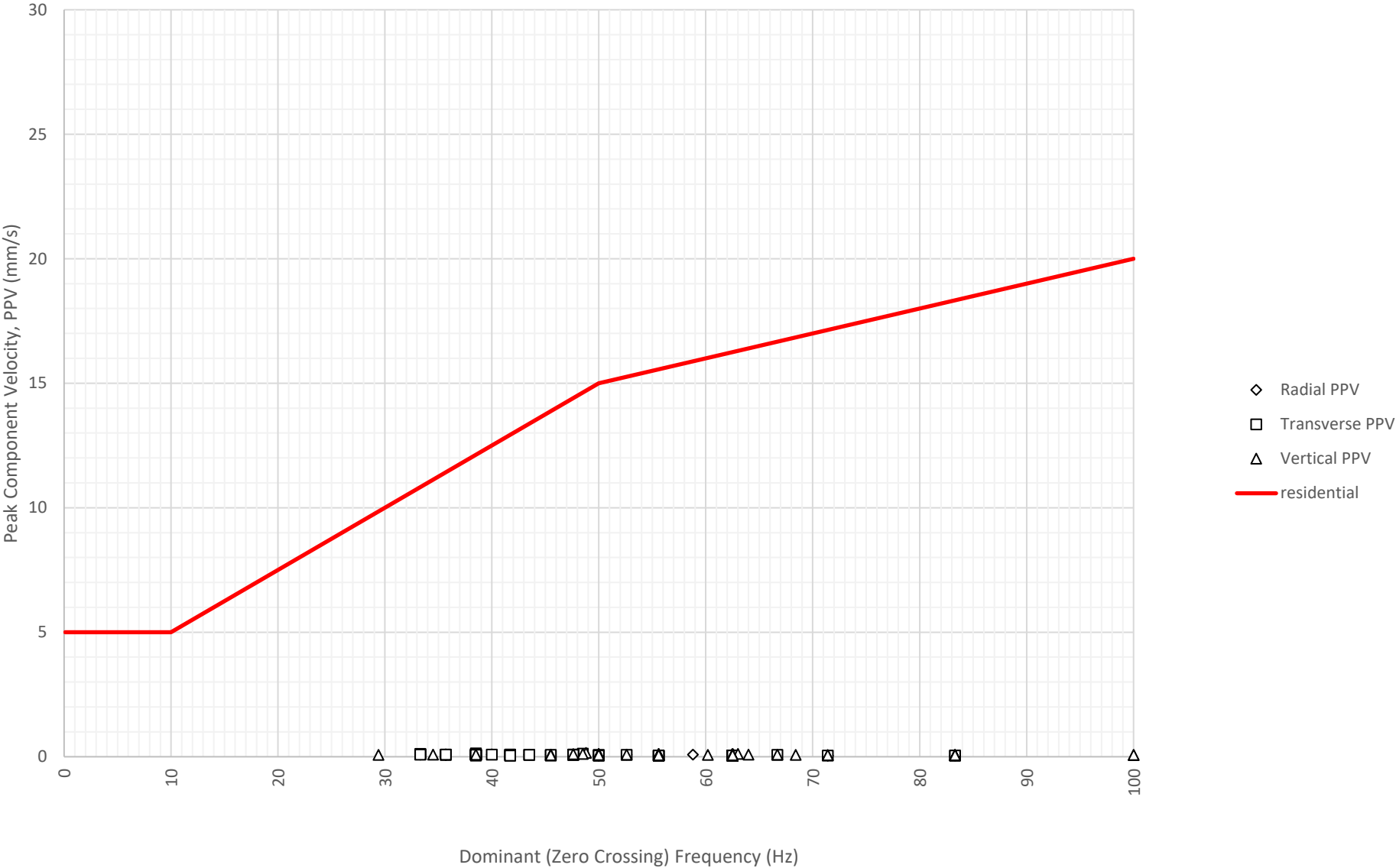
- - - - 75 Acoustic Logic Highly Affected Noise Management Level of 75dB(A)

APPENDIX B – VIBRATION MONITORING GRAPHS

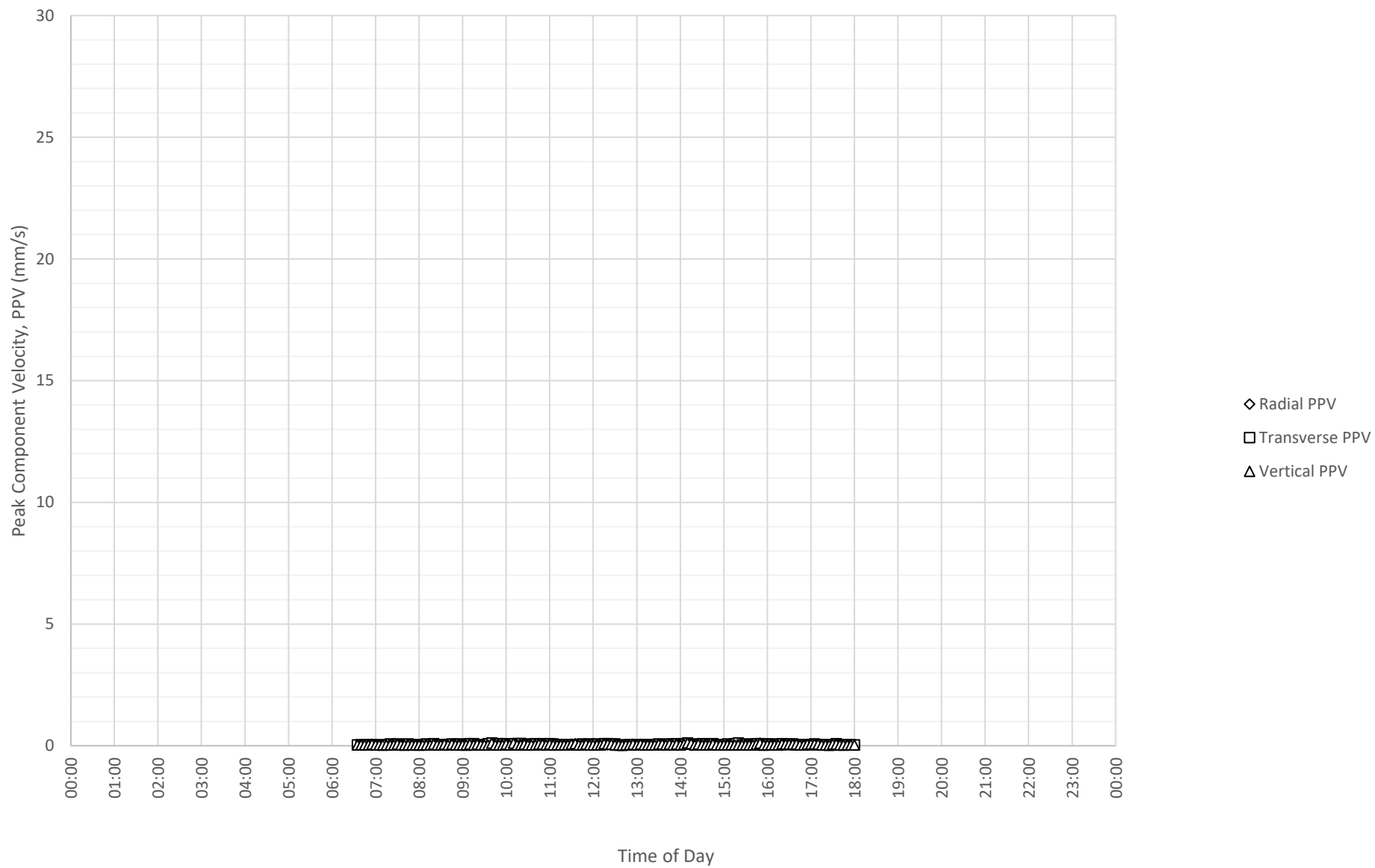
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 1-02-2025



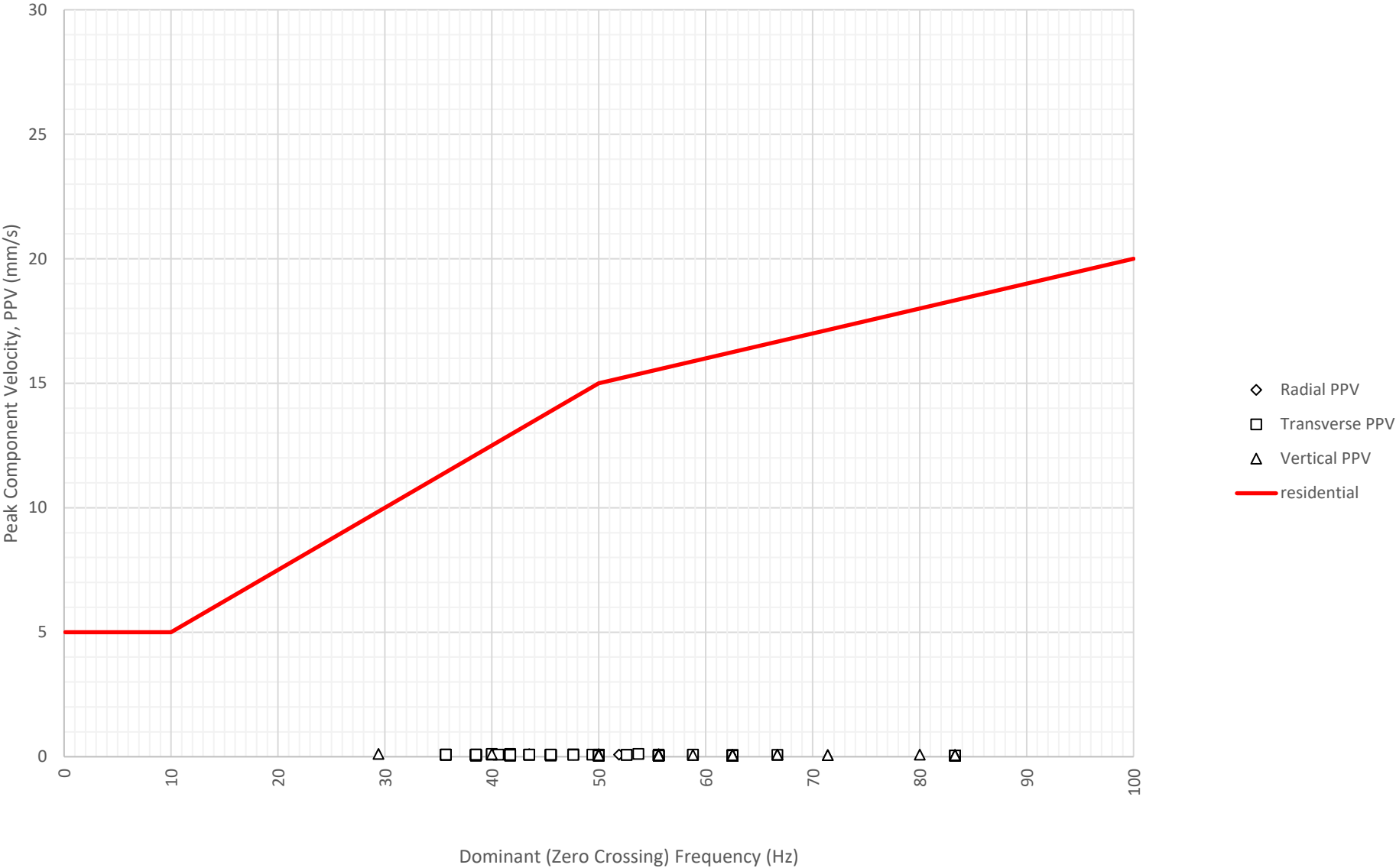
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 1-02-2025



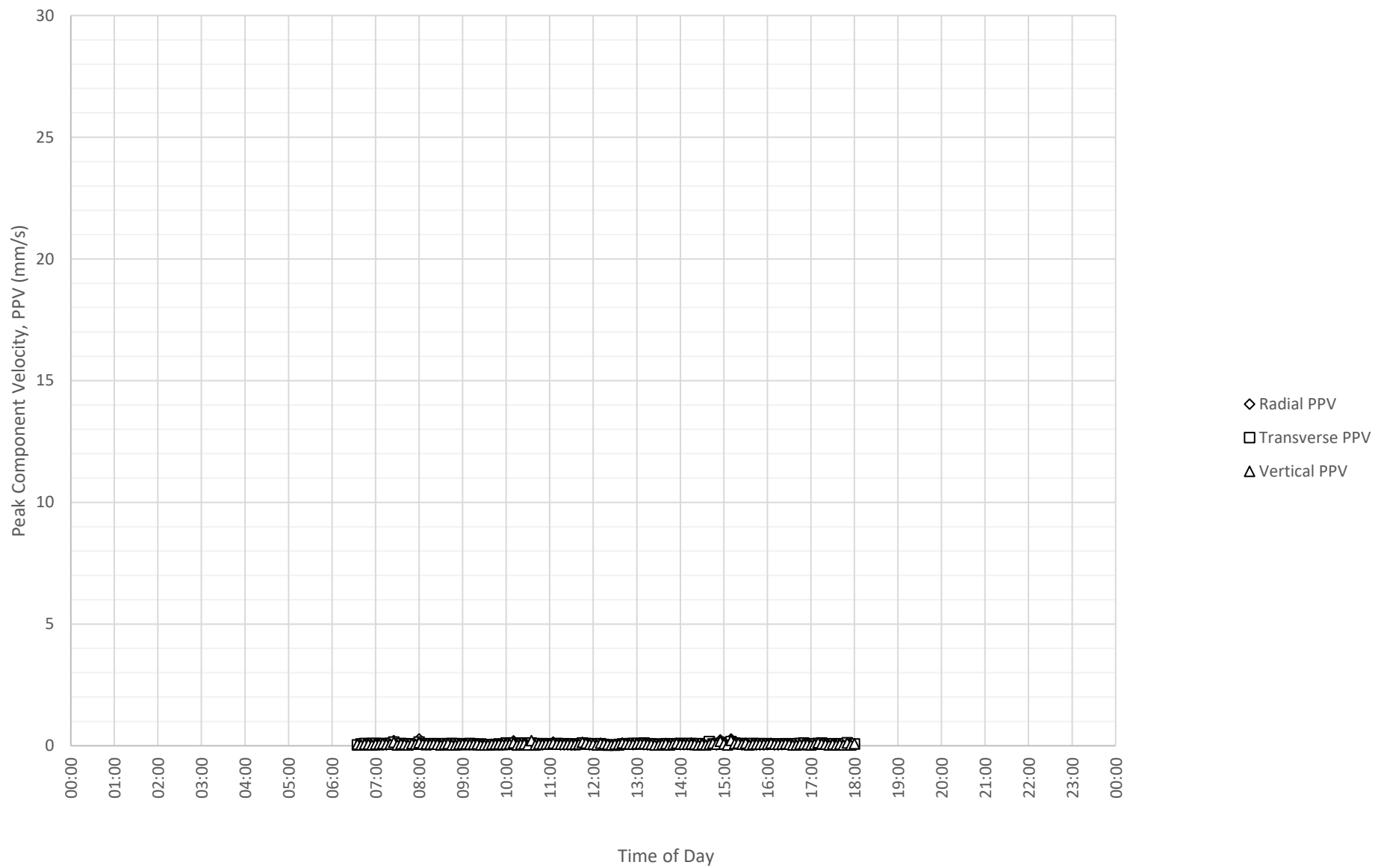
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 2-02-2025



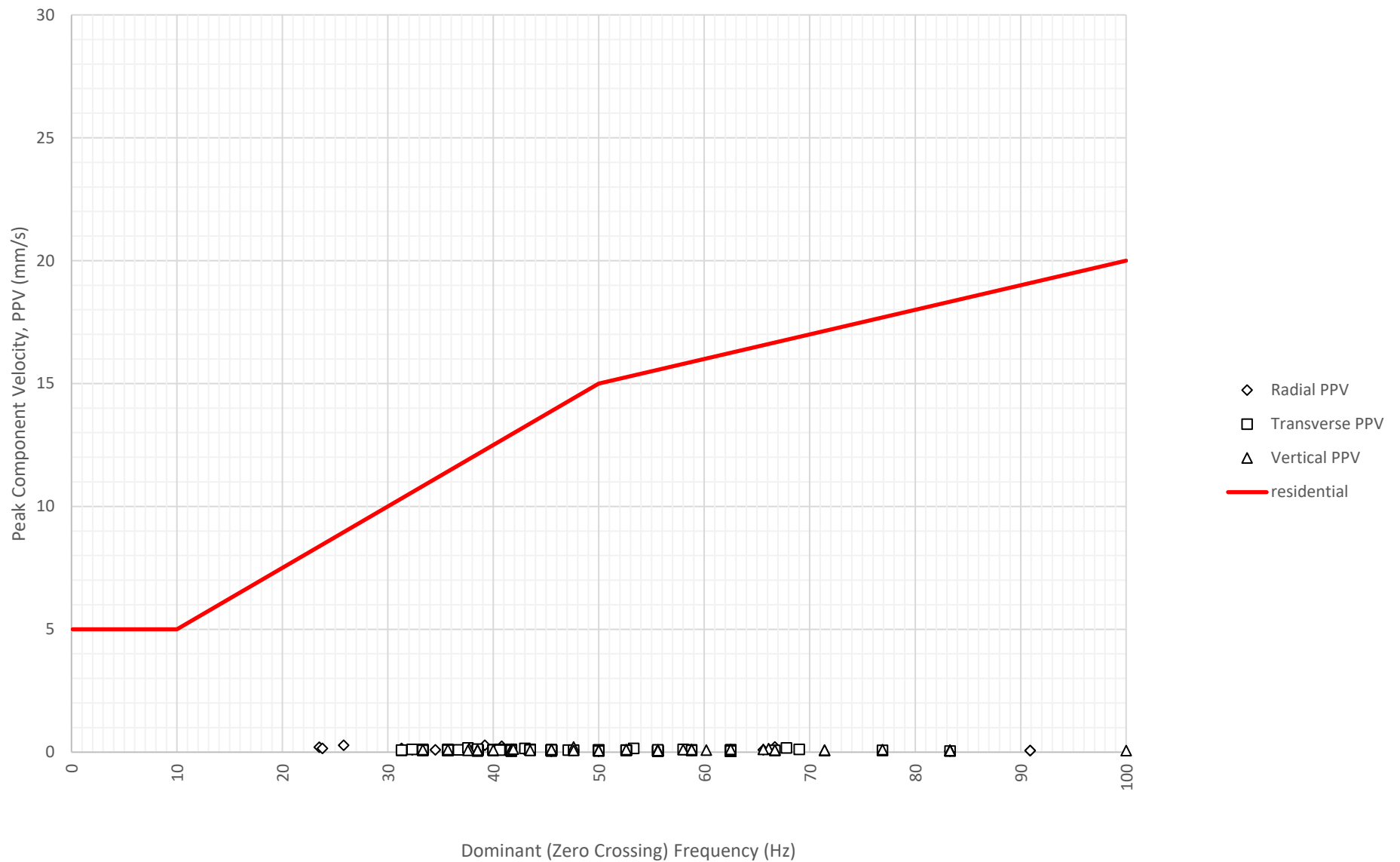
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 2-02-2025



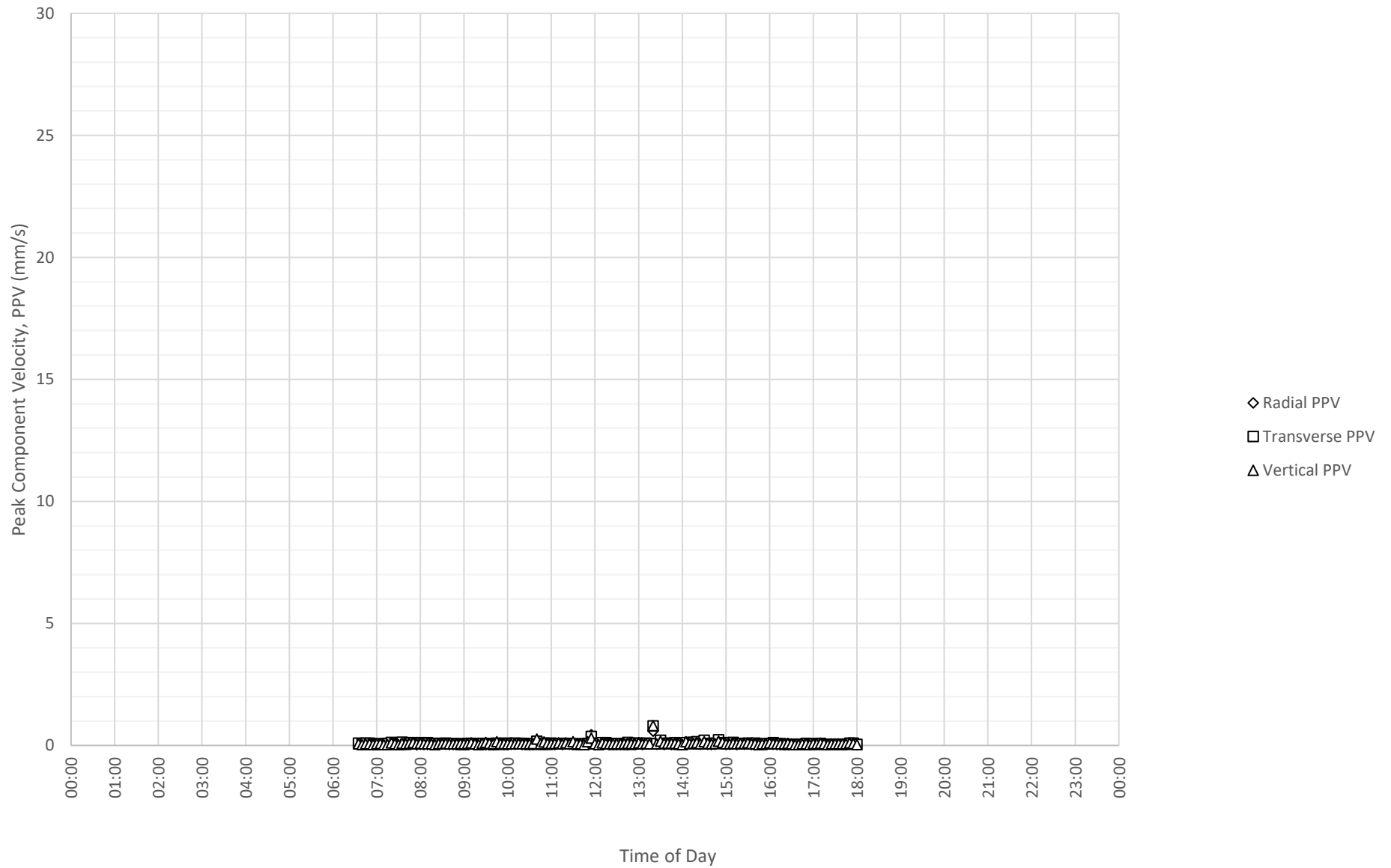
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 3-02-2025



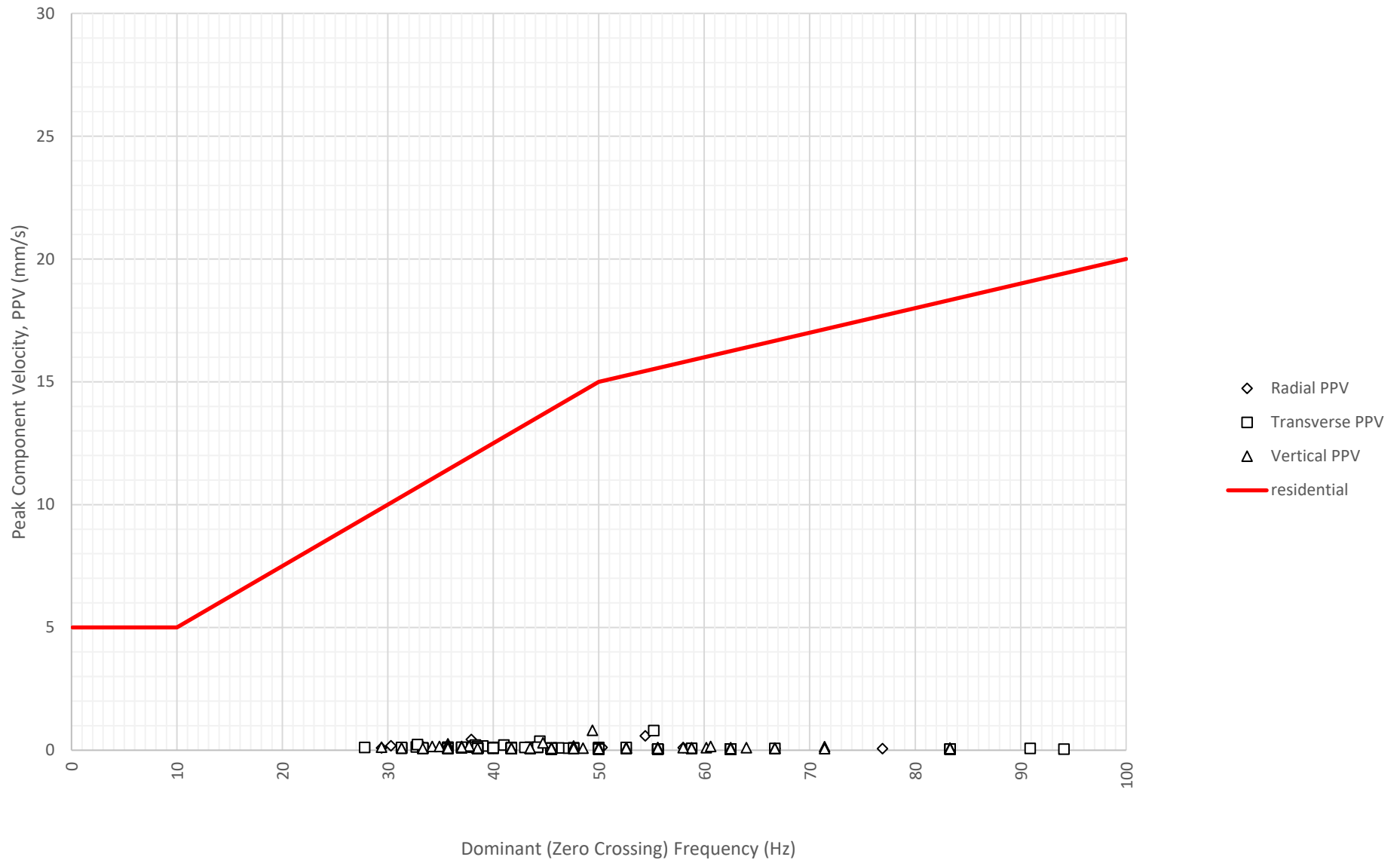
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 3-02-2025



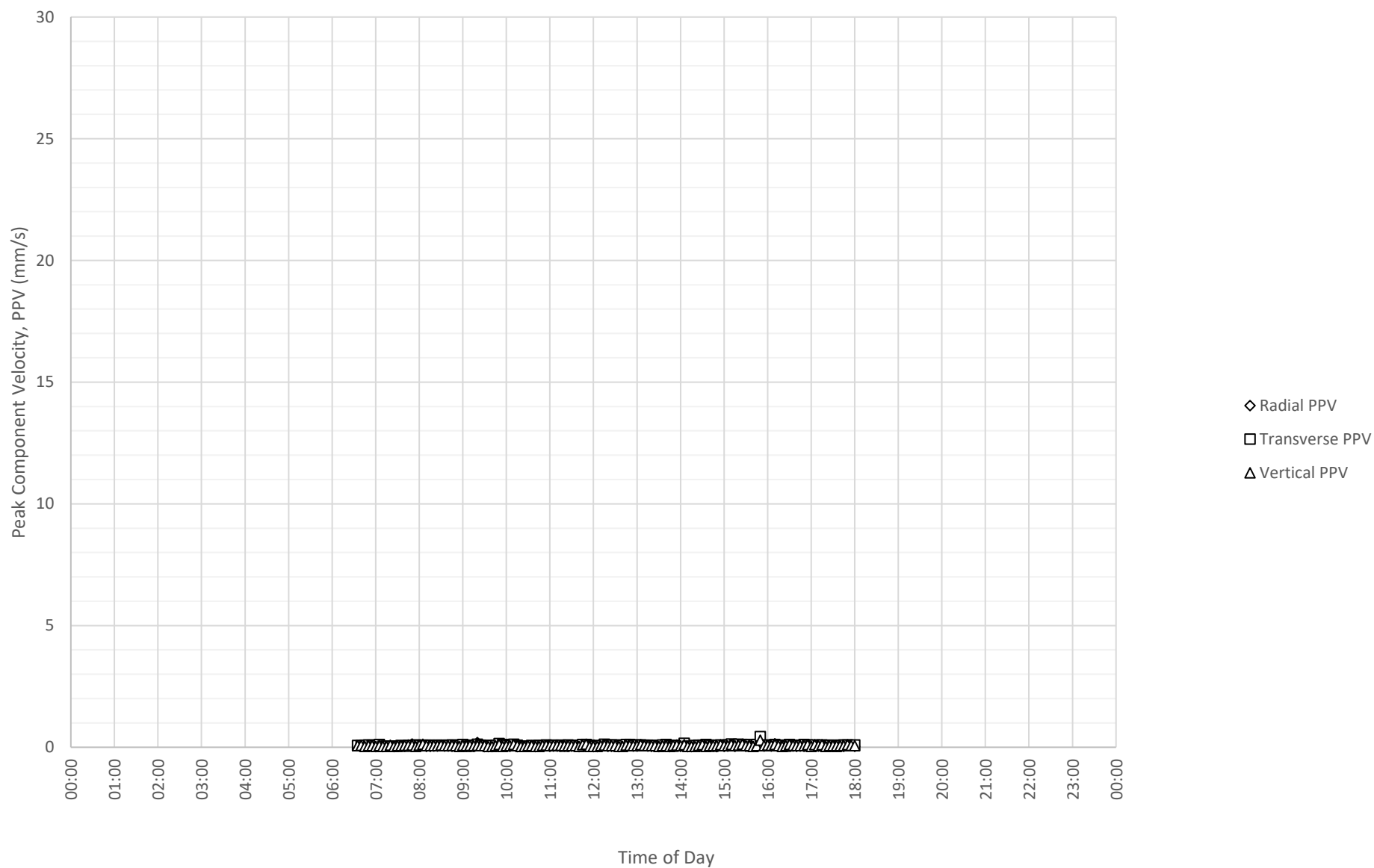
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 4-02-2025



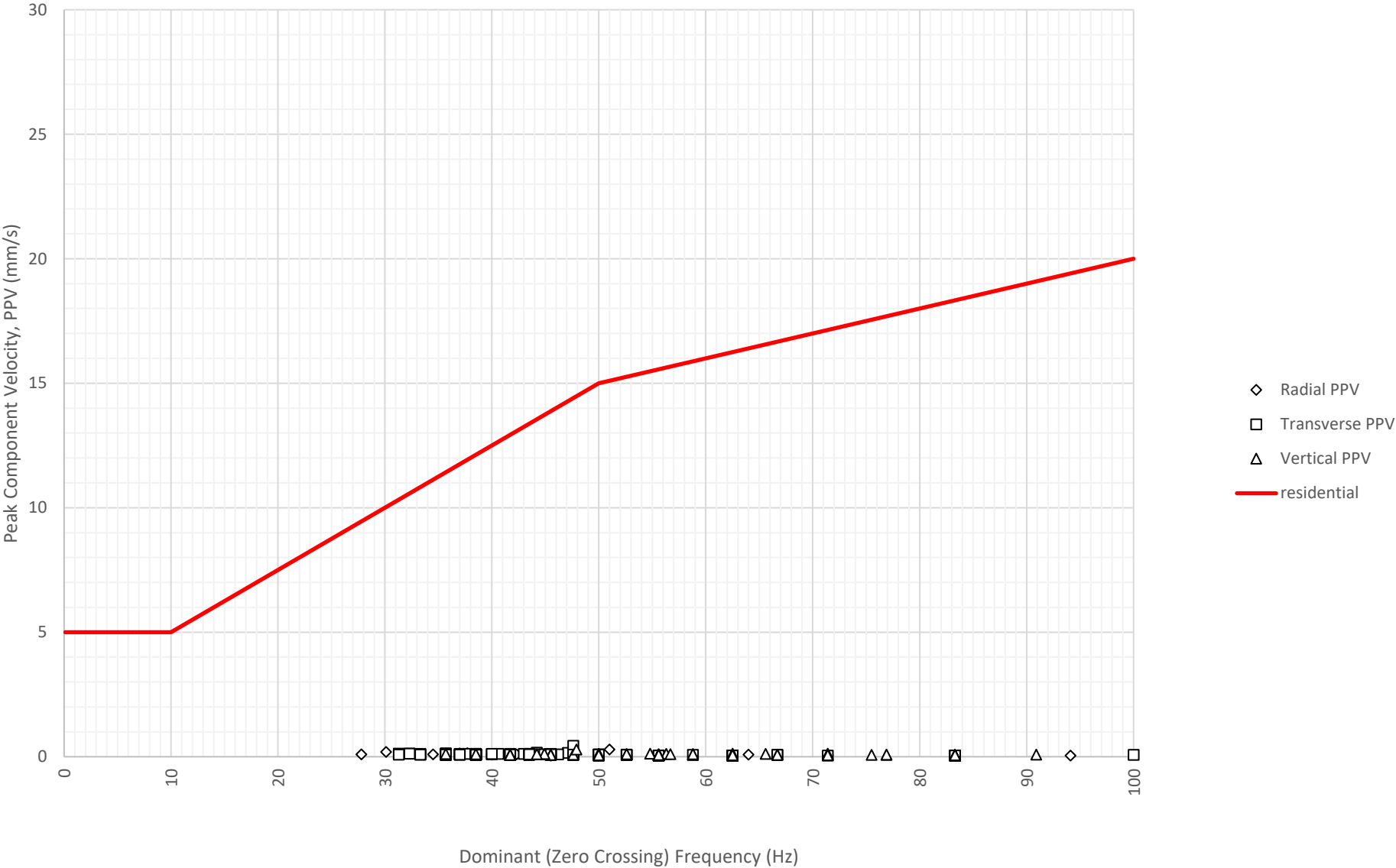
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 4-02-2025



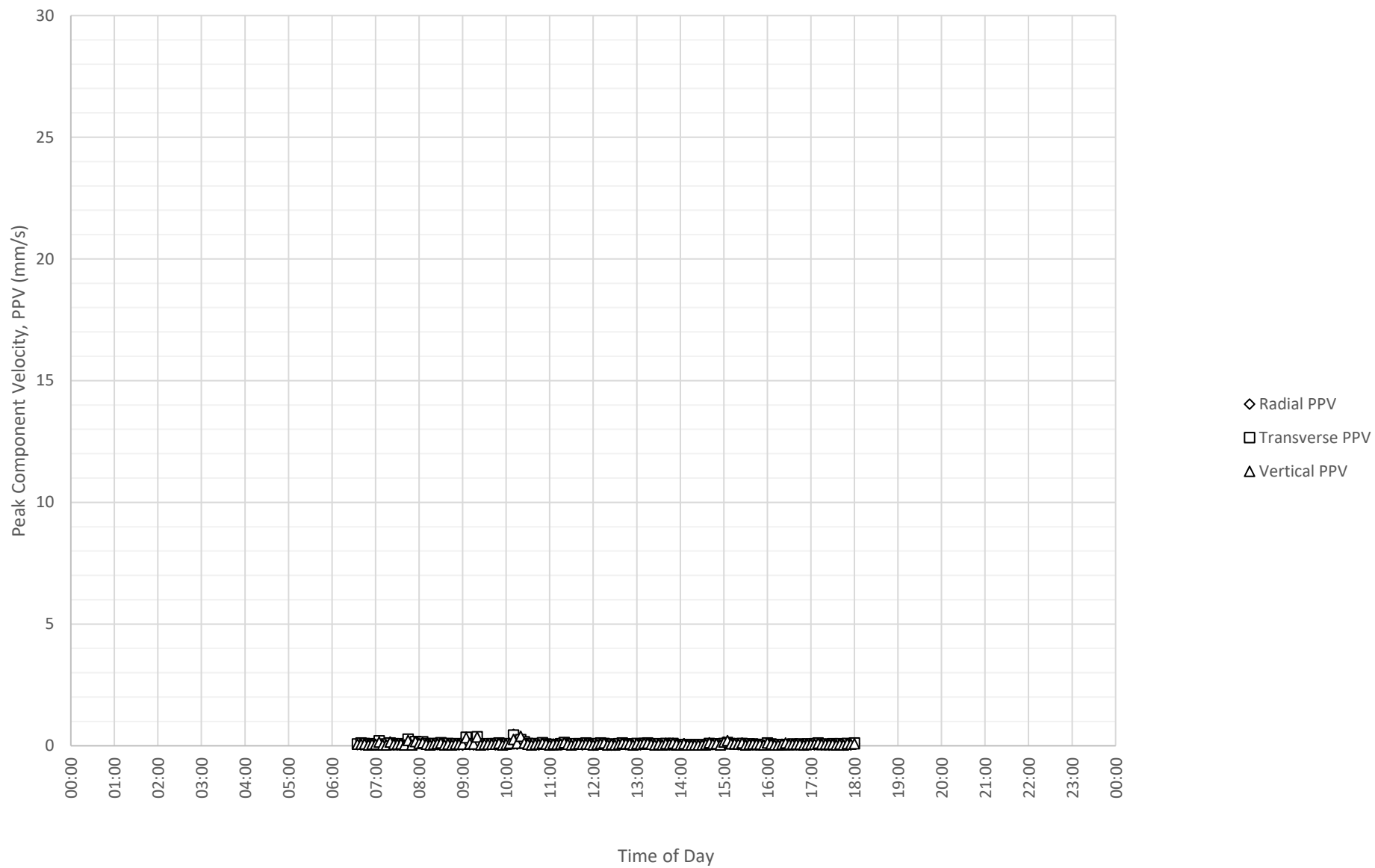
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 5-02-2025



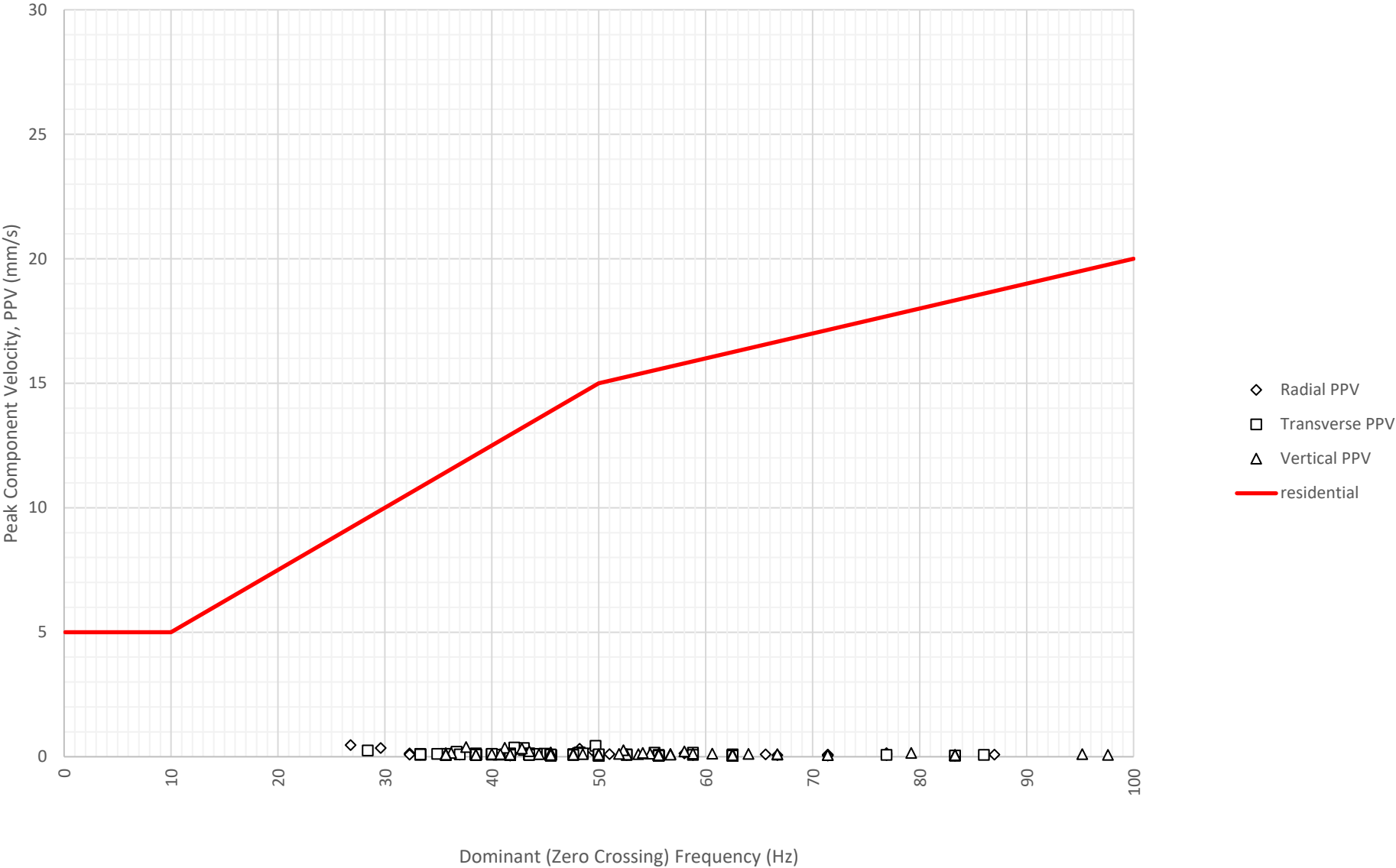
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 5-02-2025



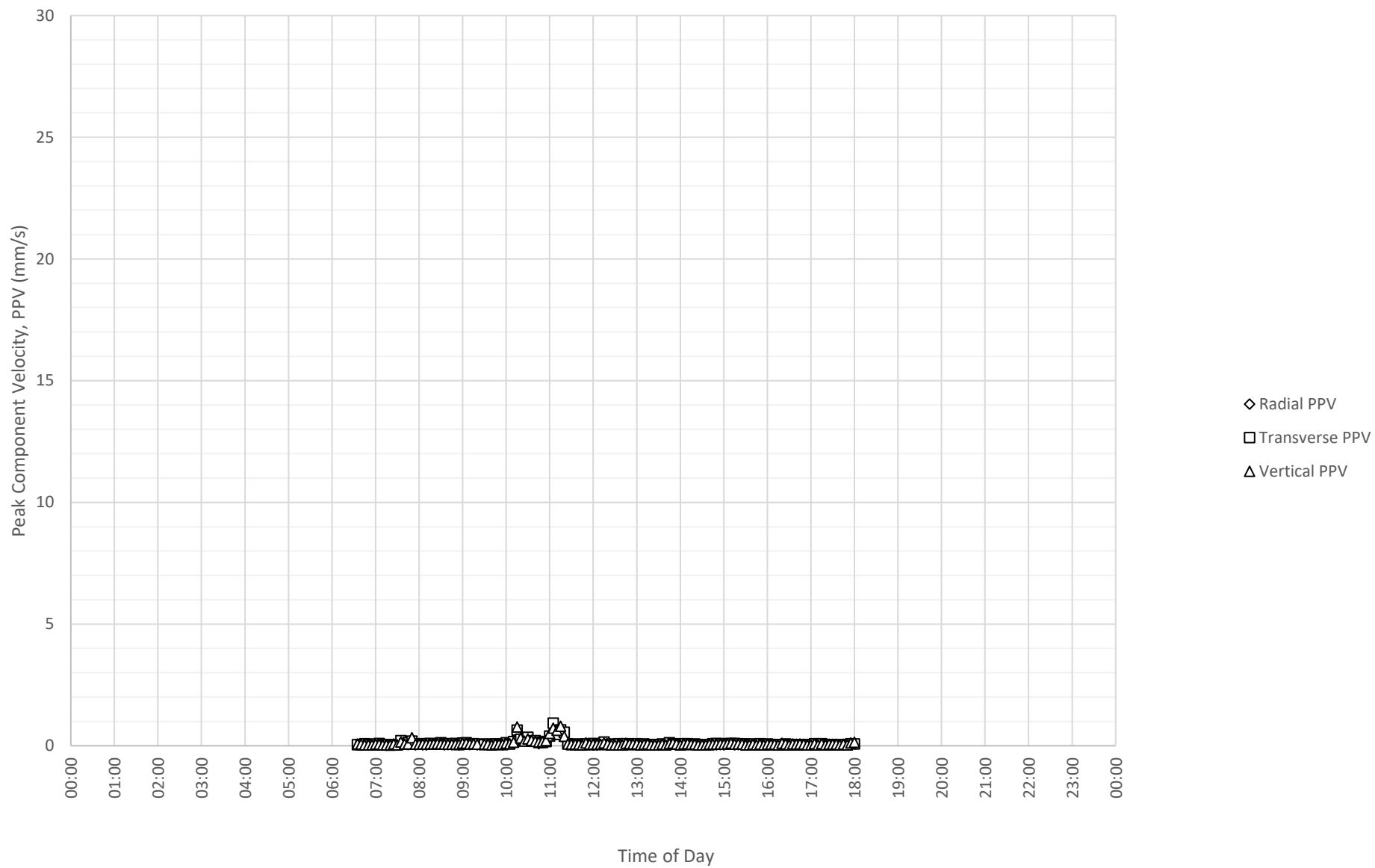
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 6-02-2025



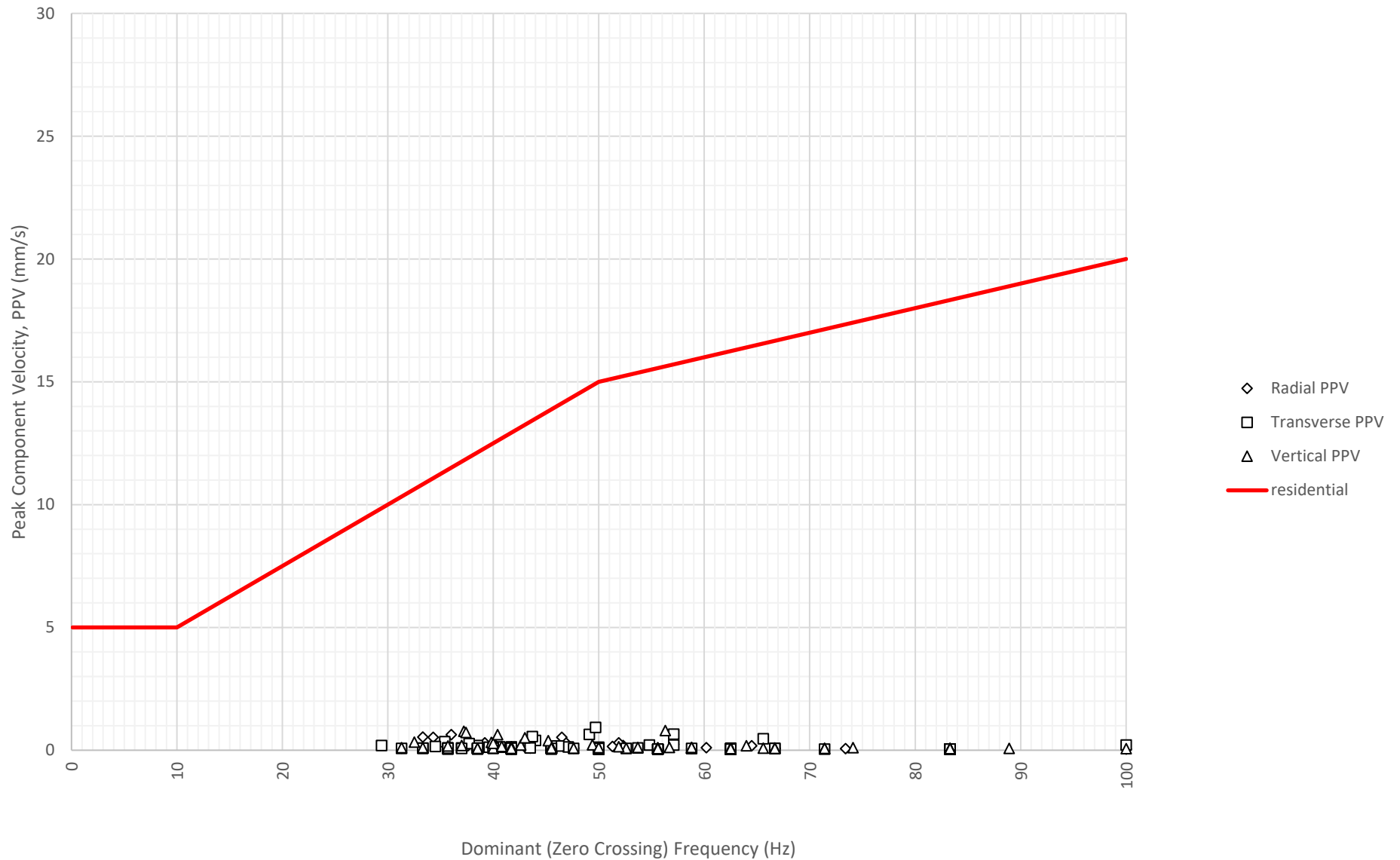
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 6-02-2025



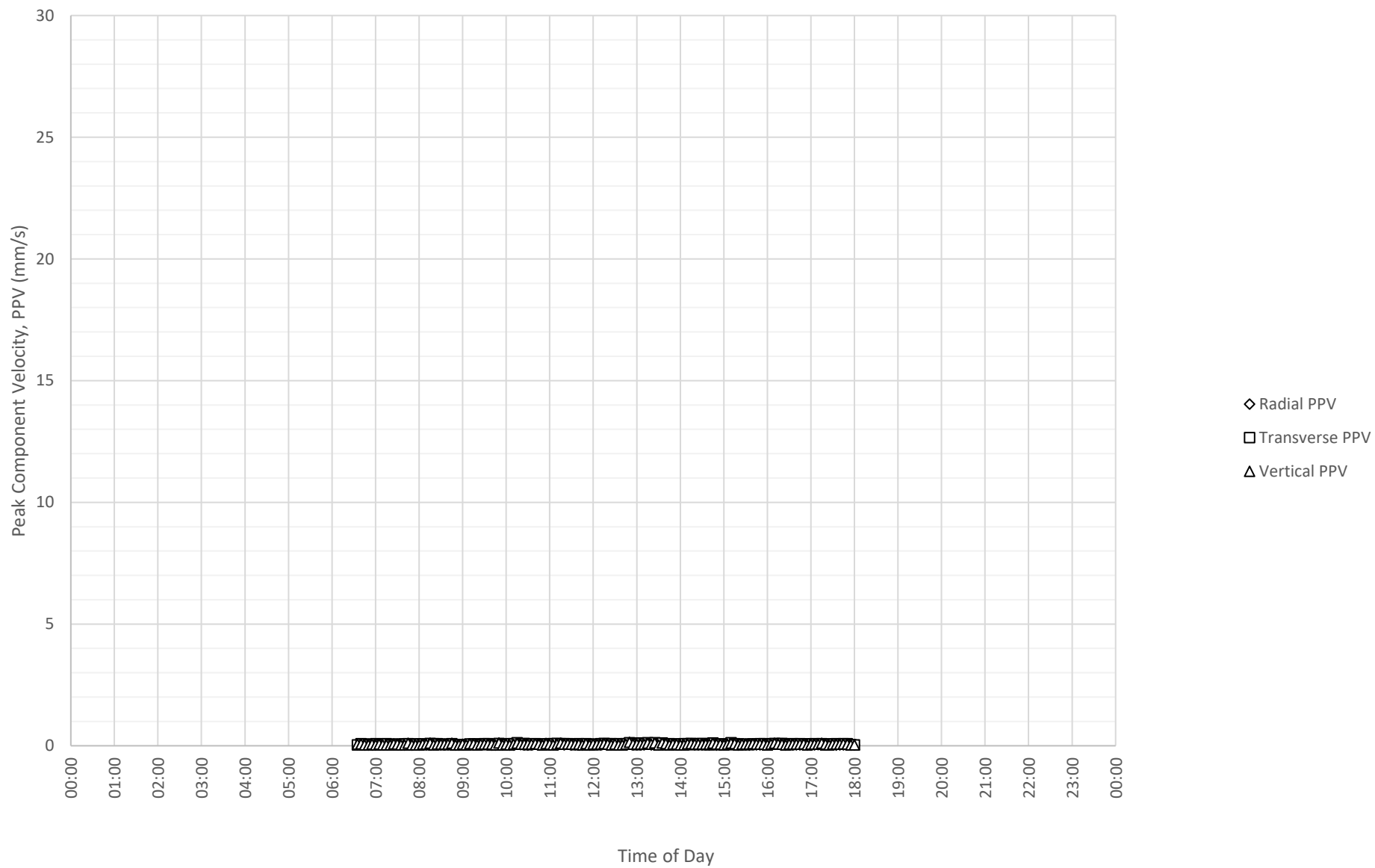
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 7-02-2025



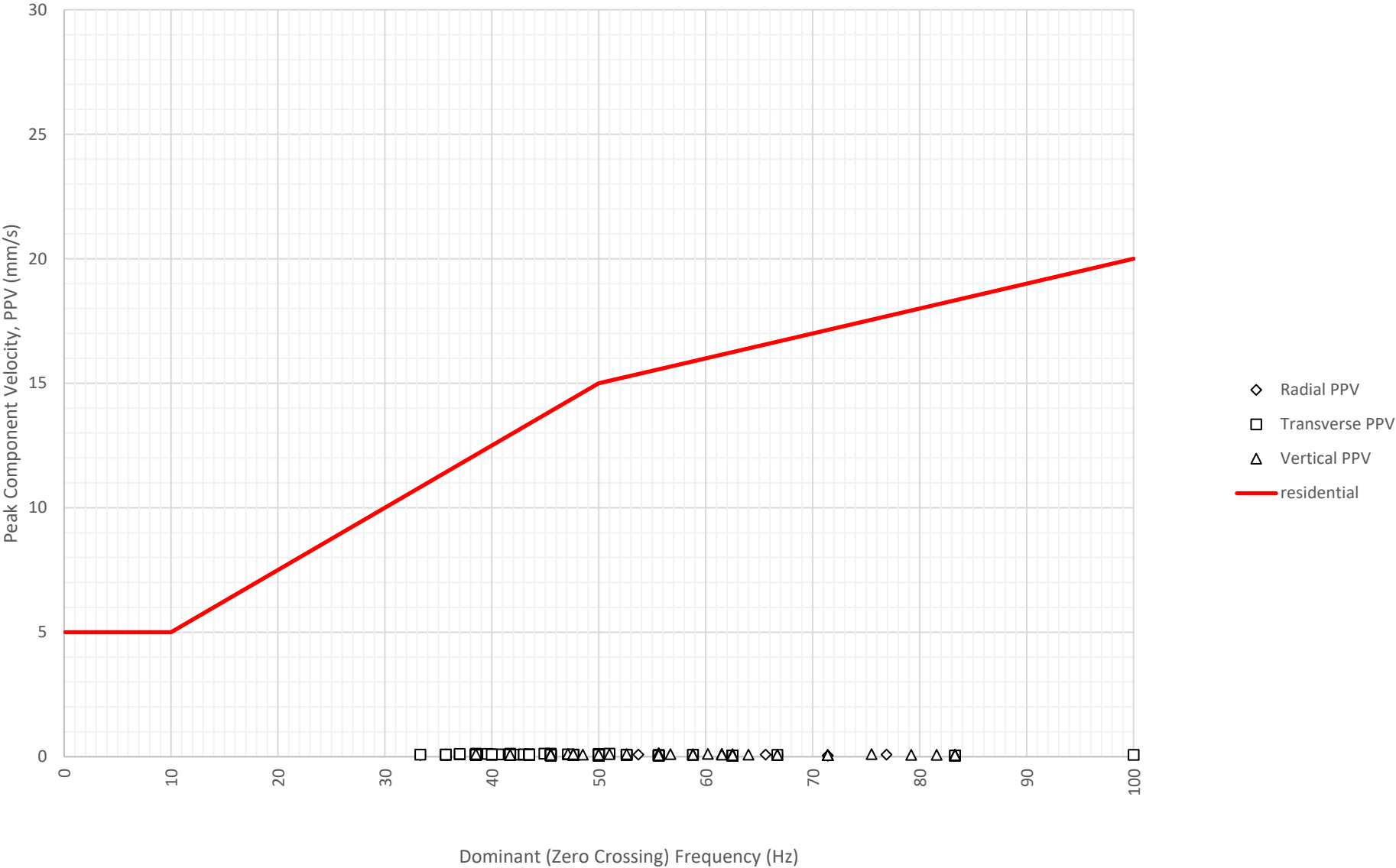
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 7-02-2025



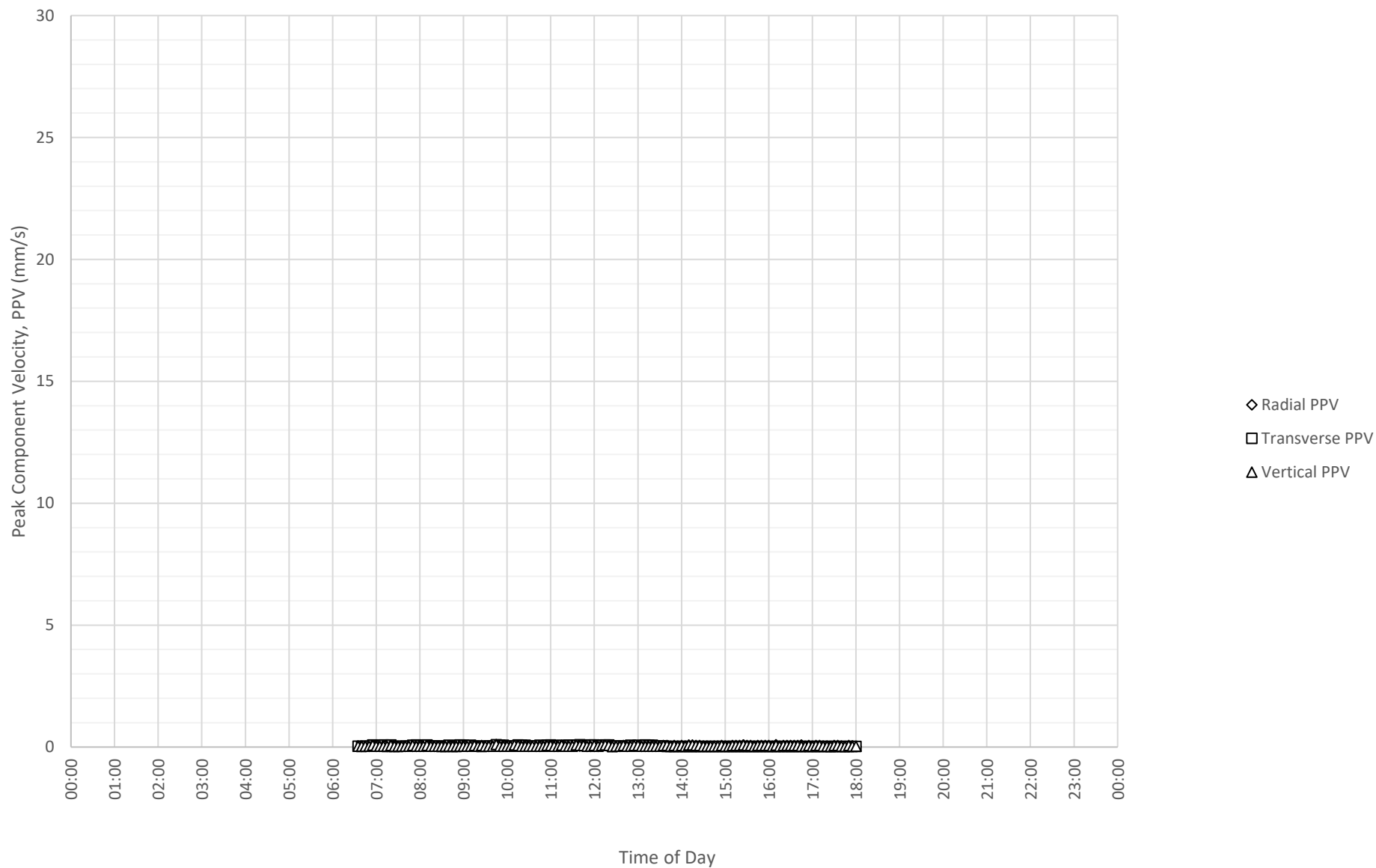
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 8-02-2025



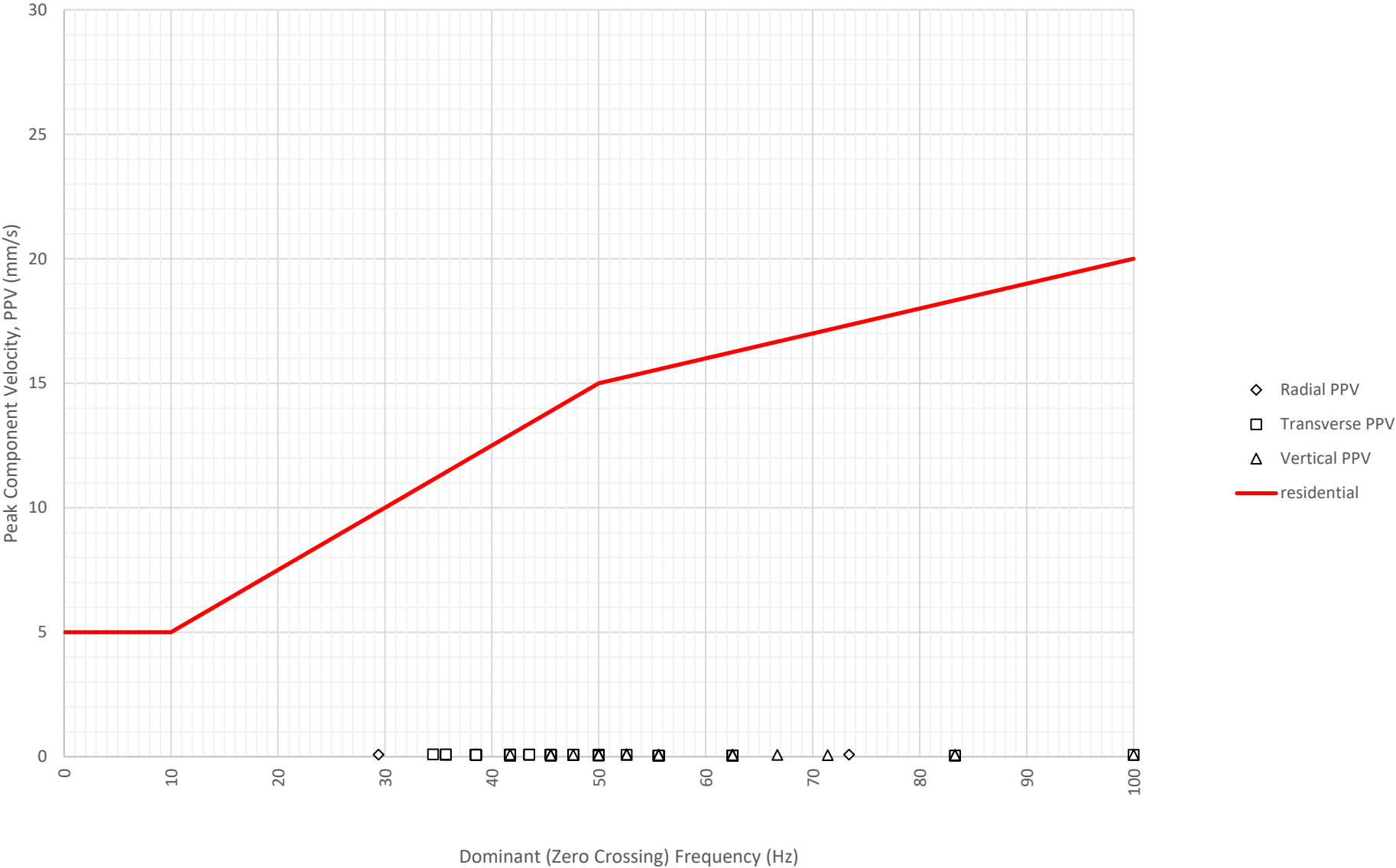
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 8-02-2025



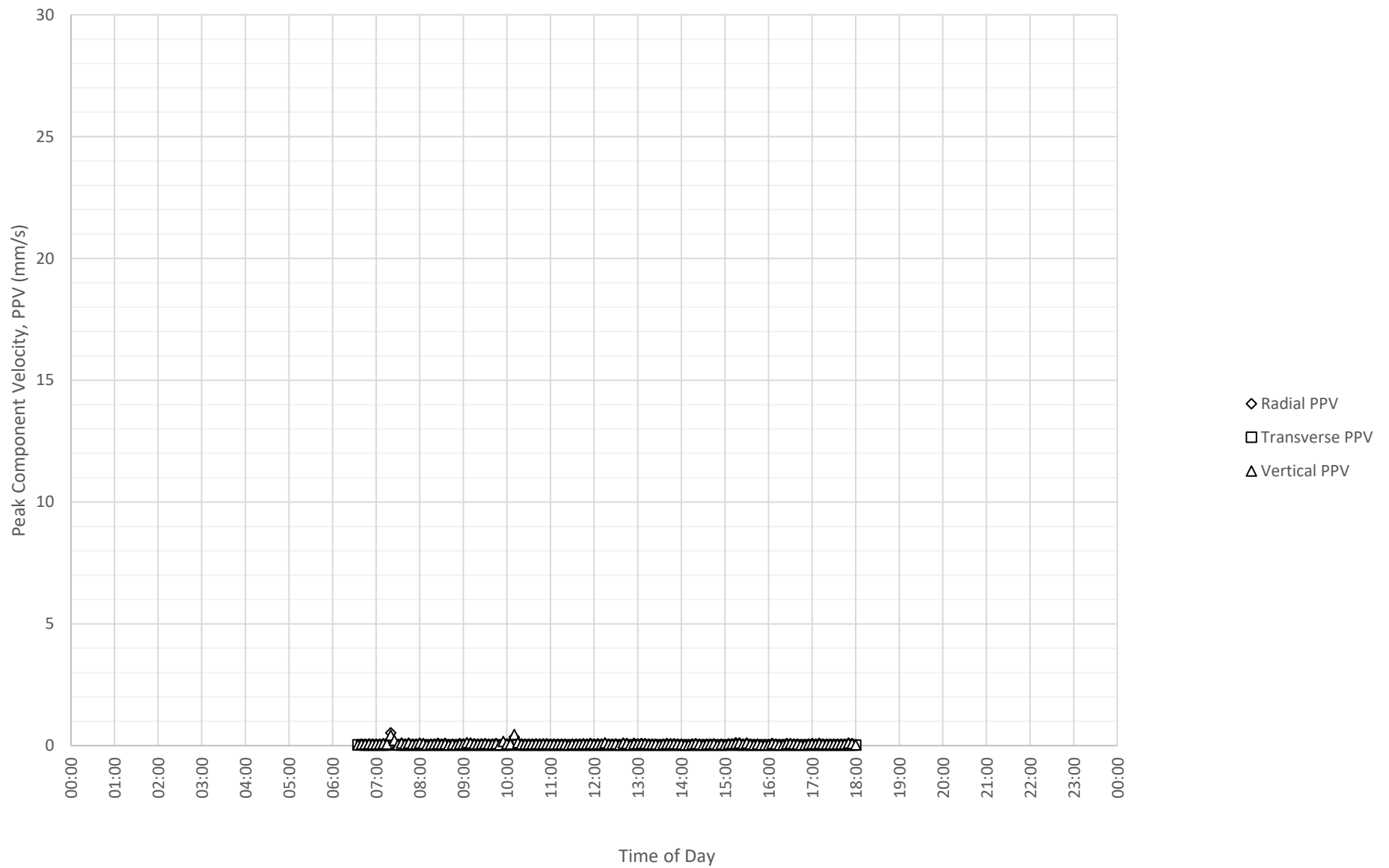
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 9-02-2025



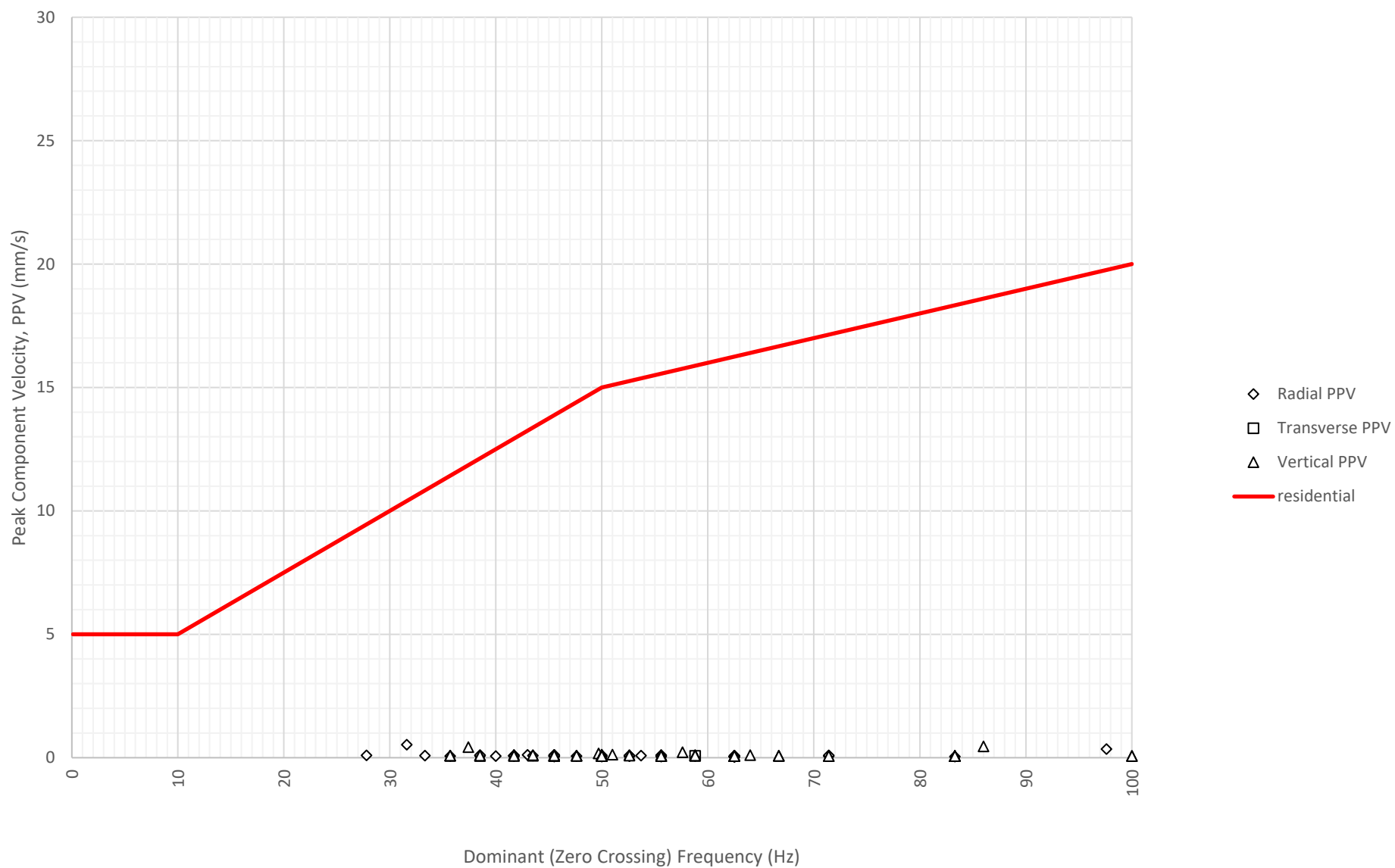
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 9-02-2025



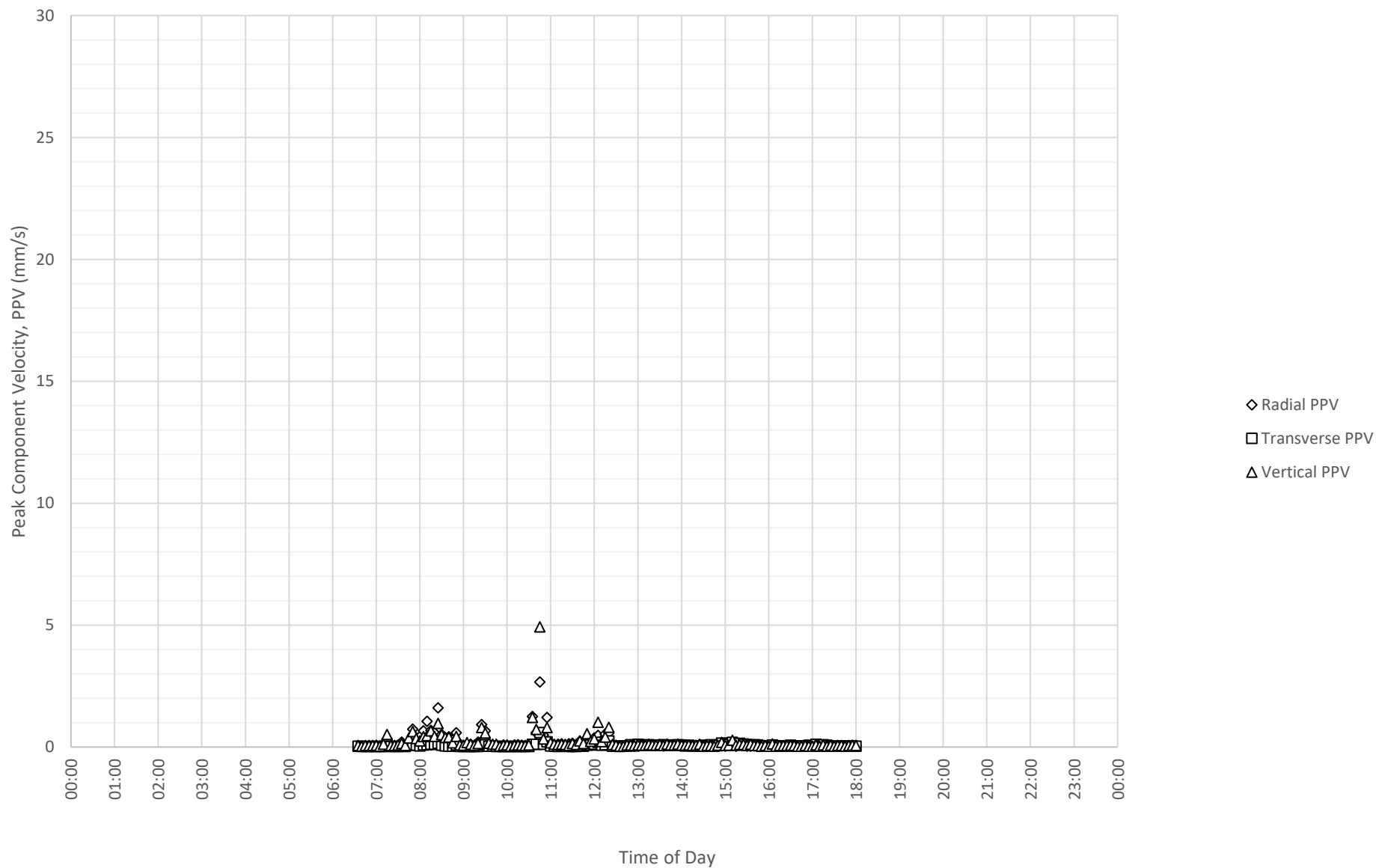
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 10-02-2025



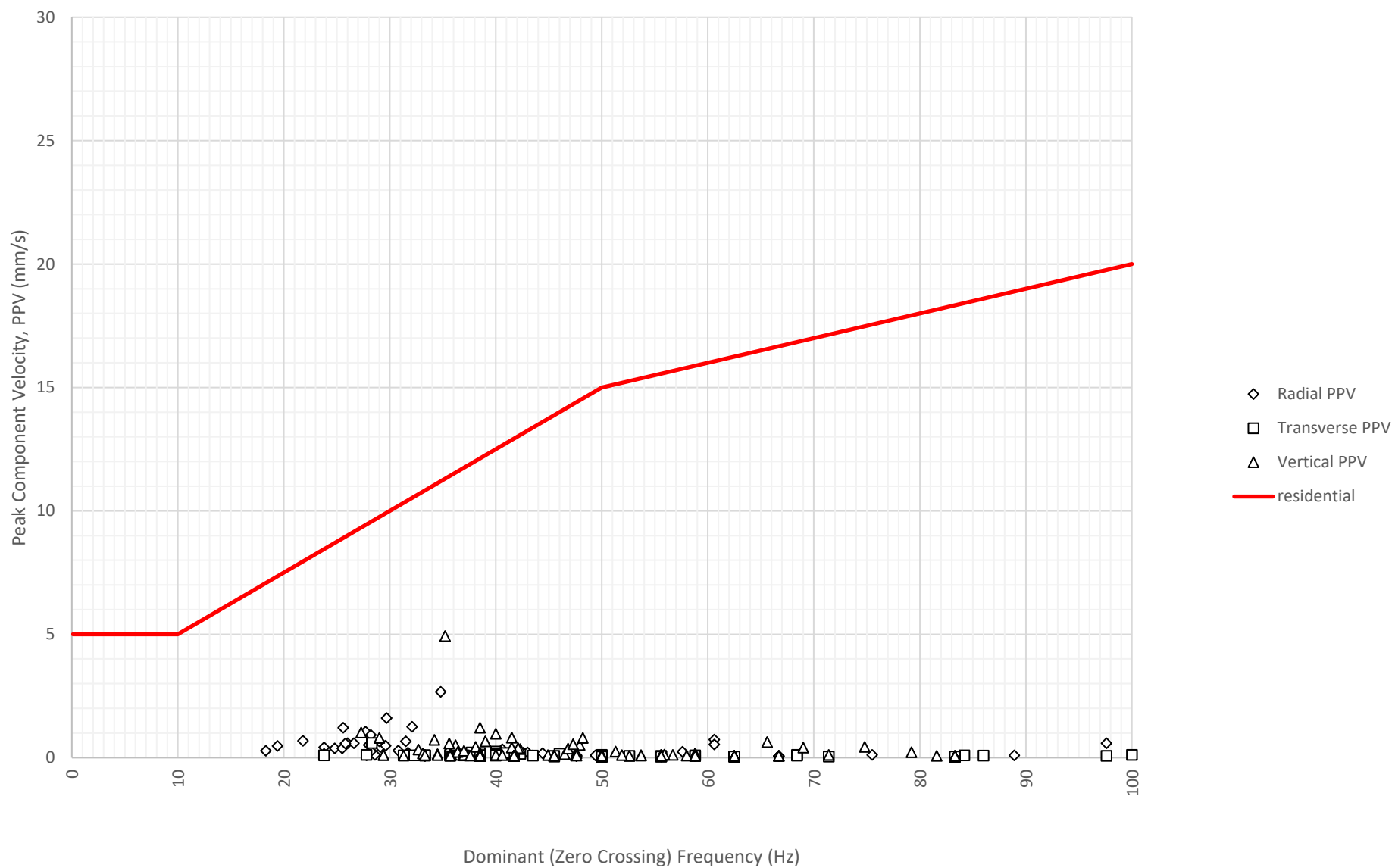
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
10-02-2025



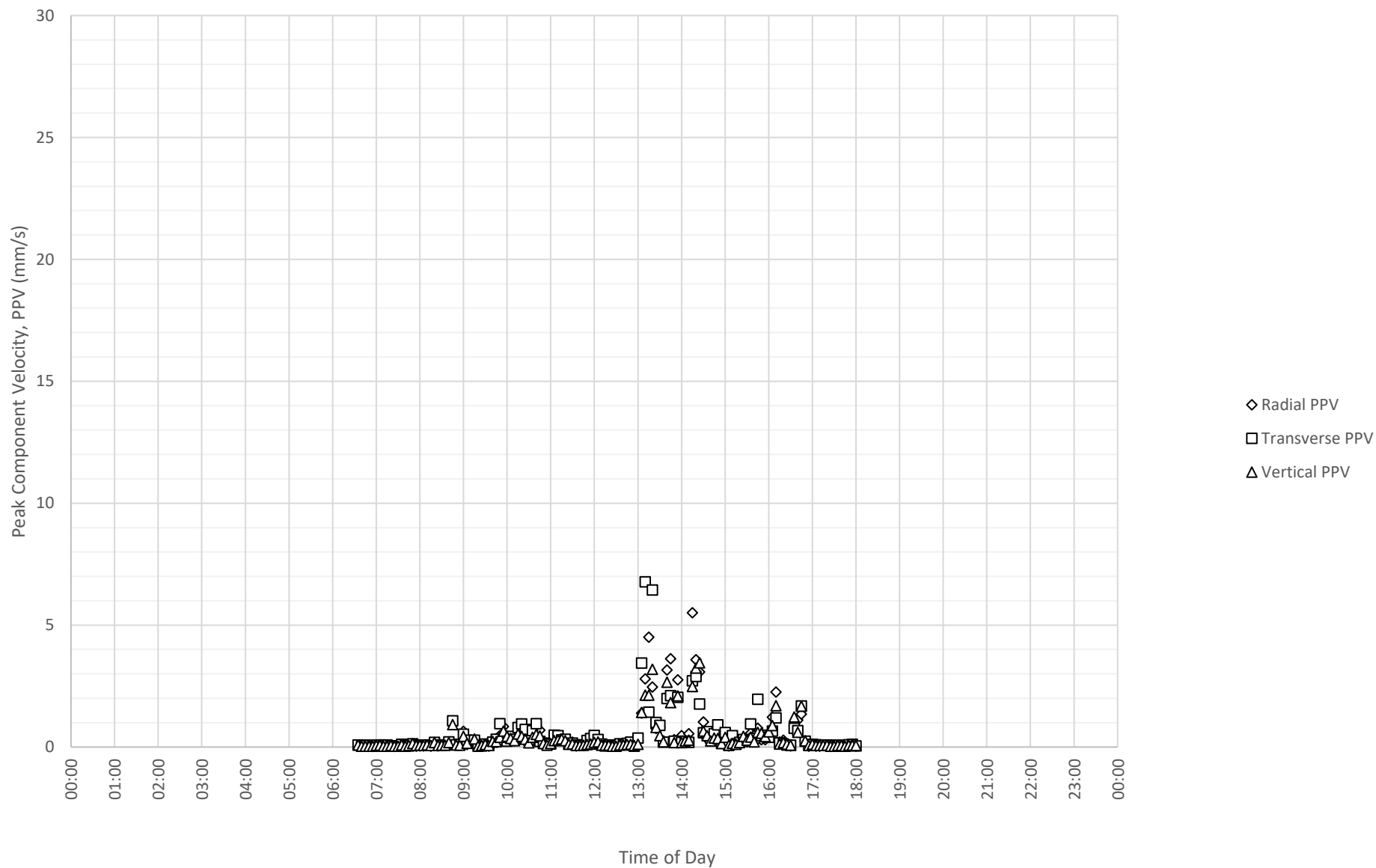
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 11-02-2025



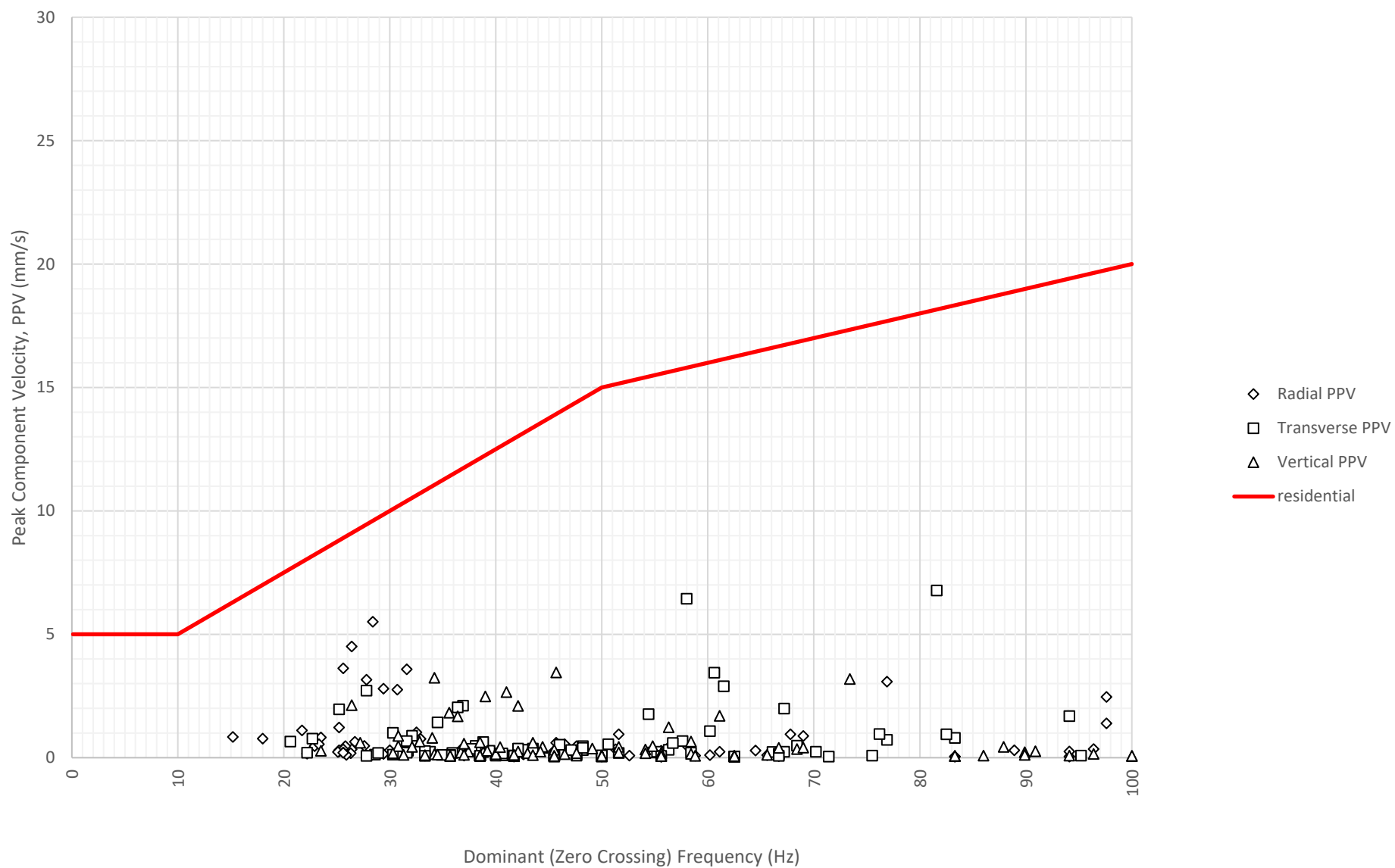
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
11-02-2025



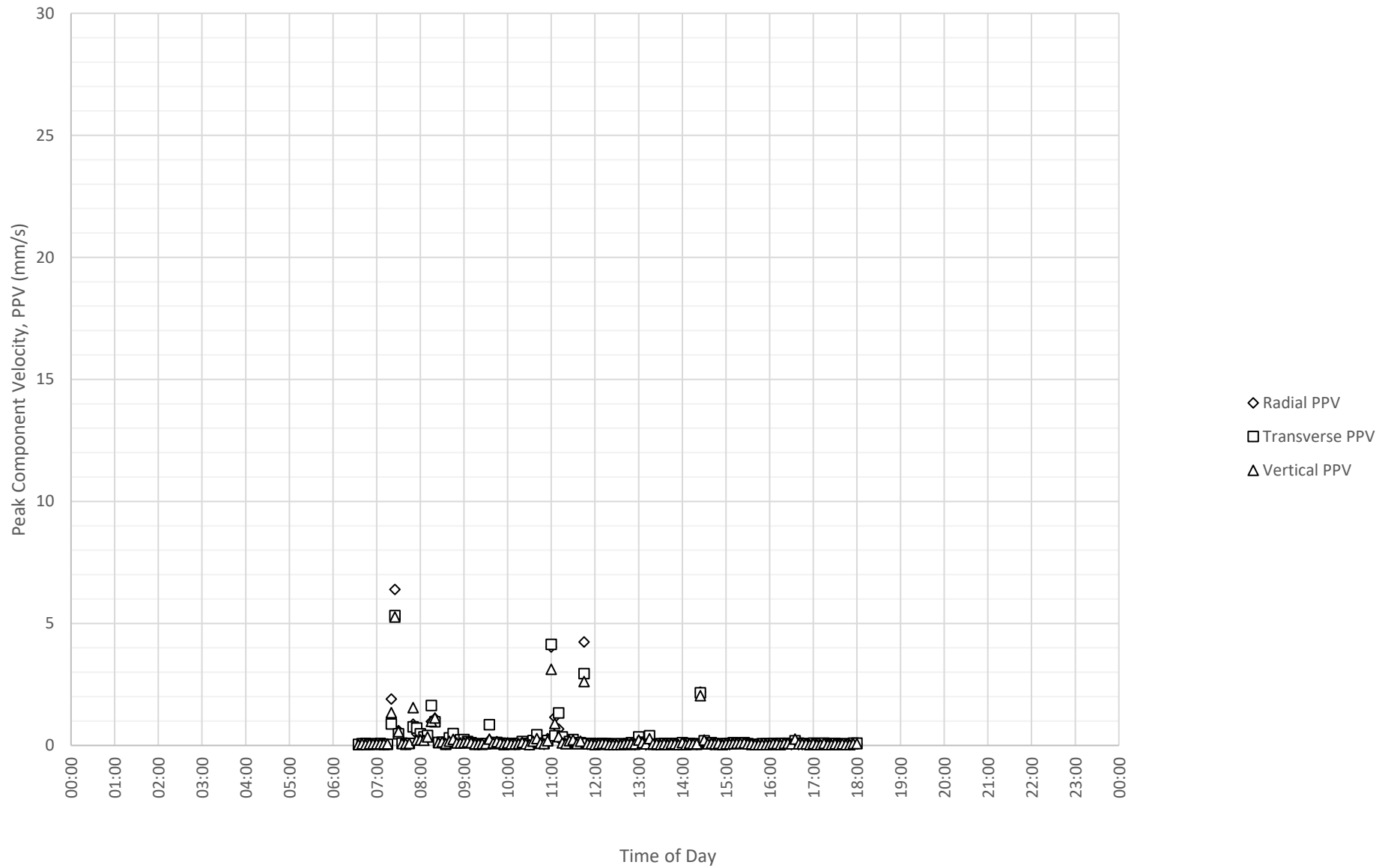
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 12-02-2025



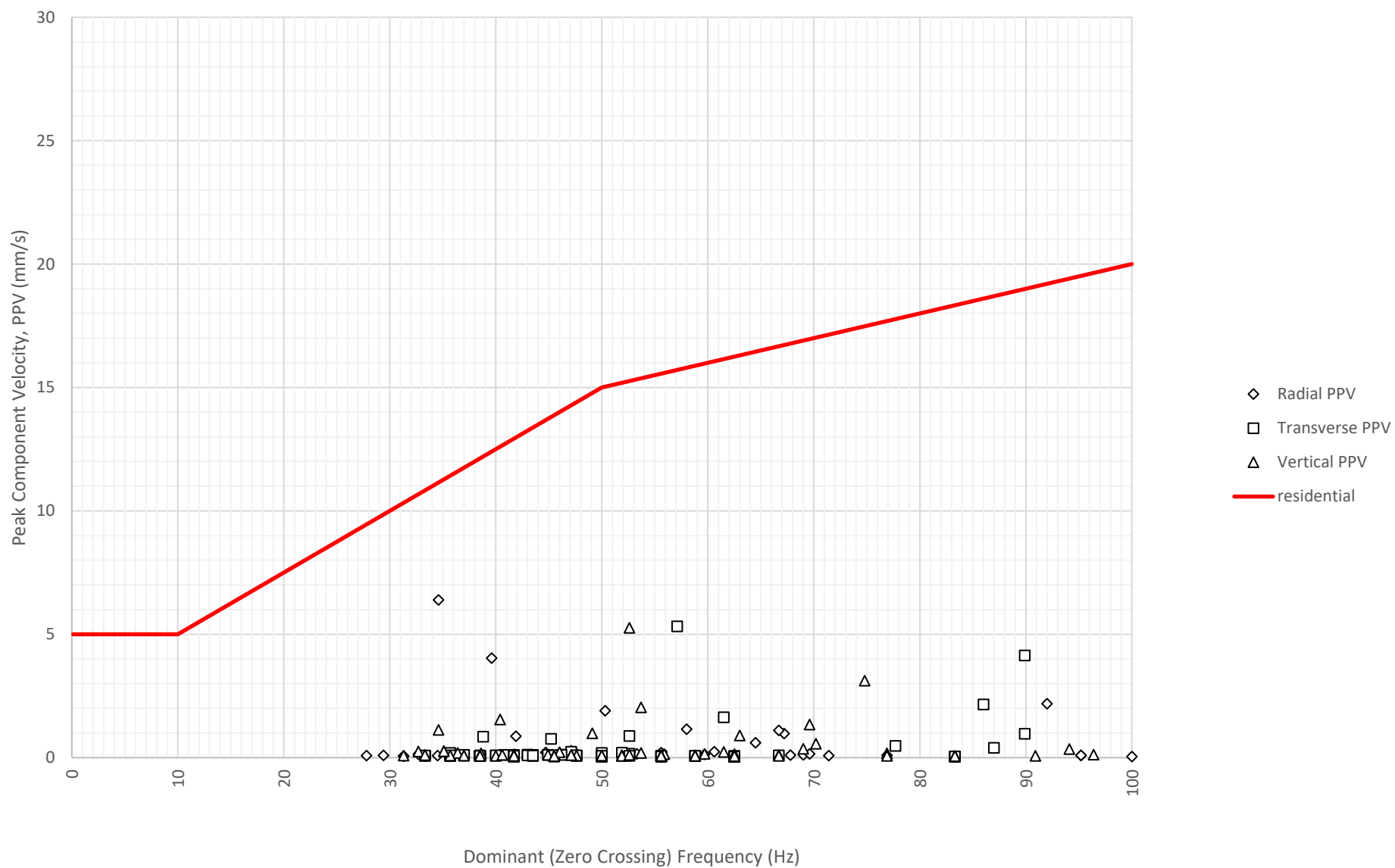
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
12-02-2025



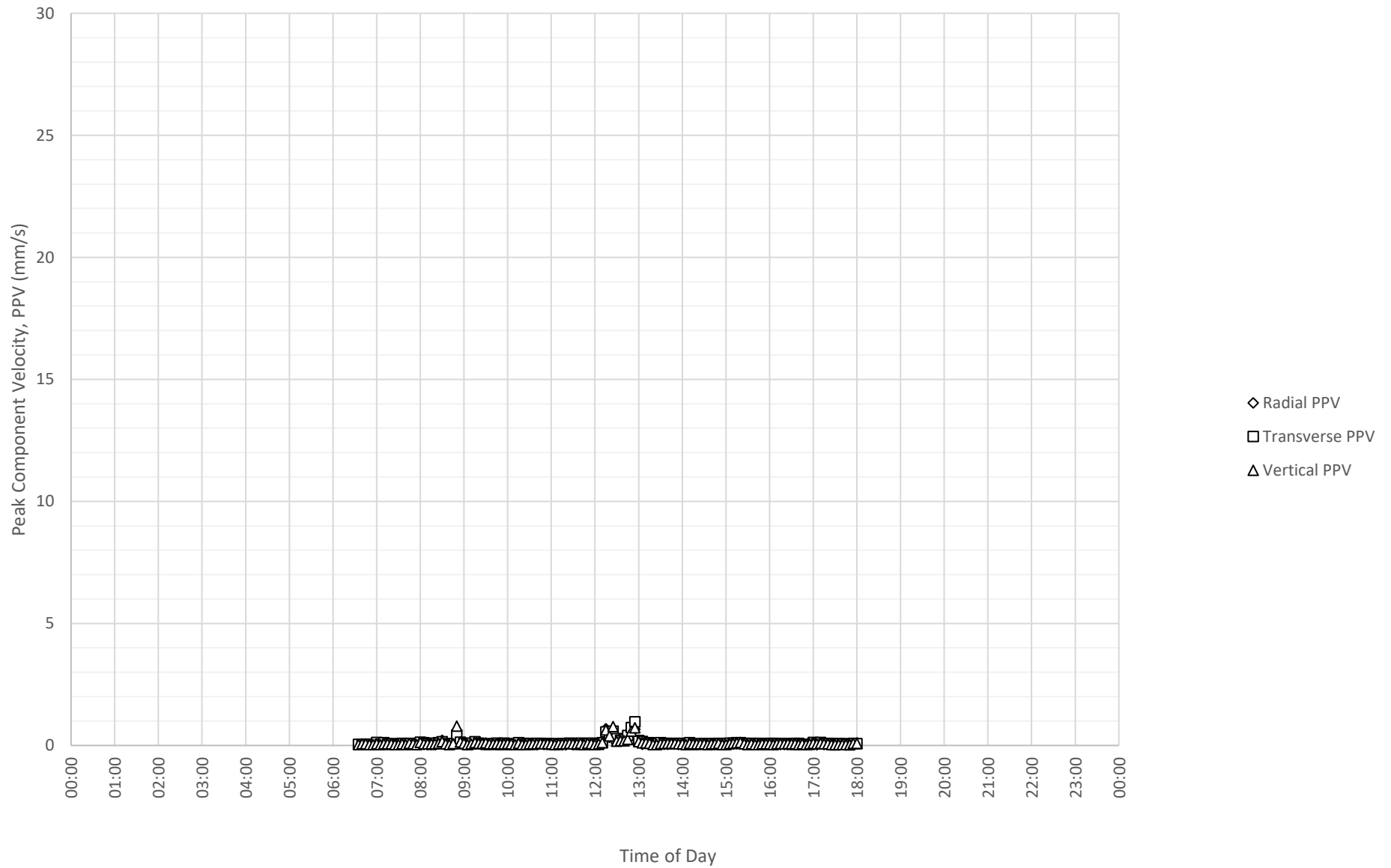
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 13-02-2025



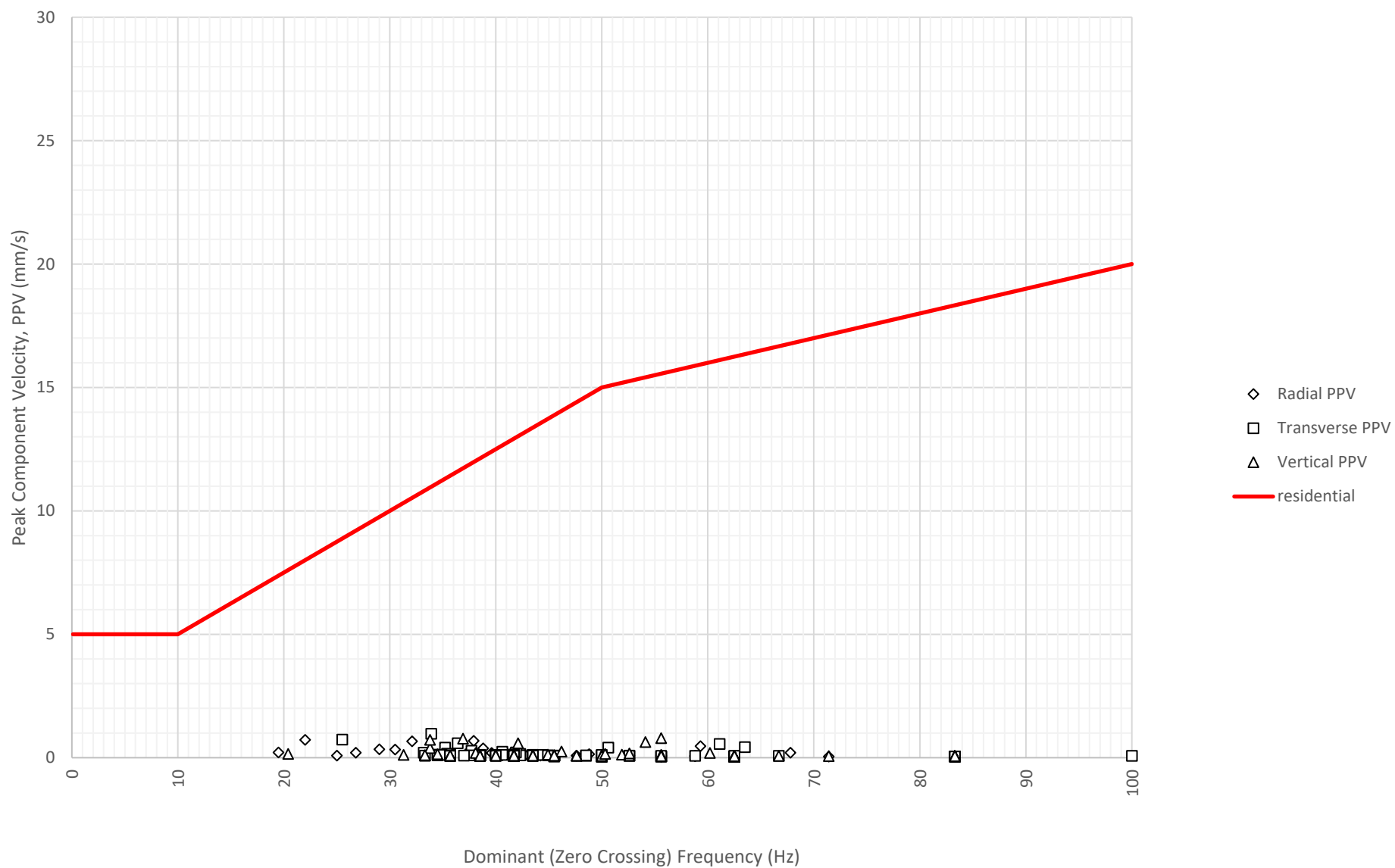
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
13-02-2025



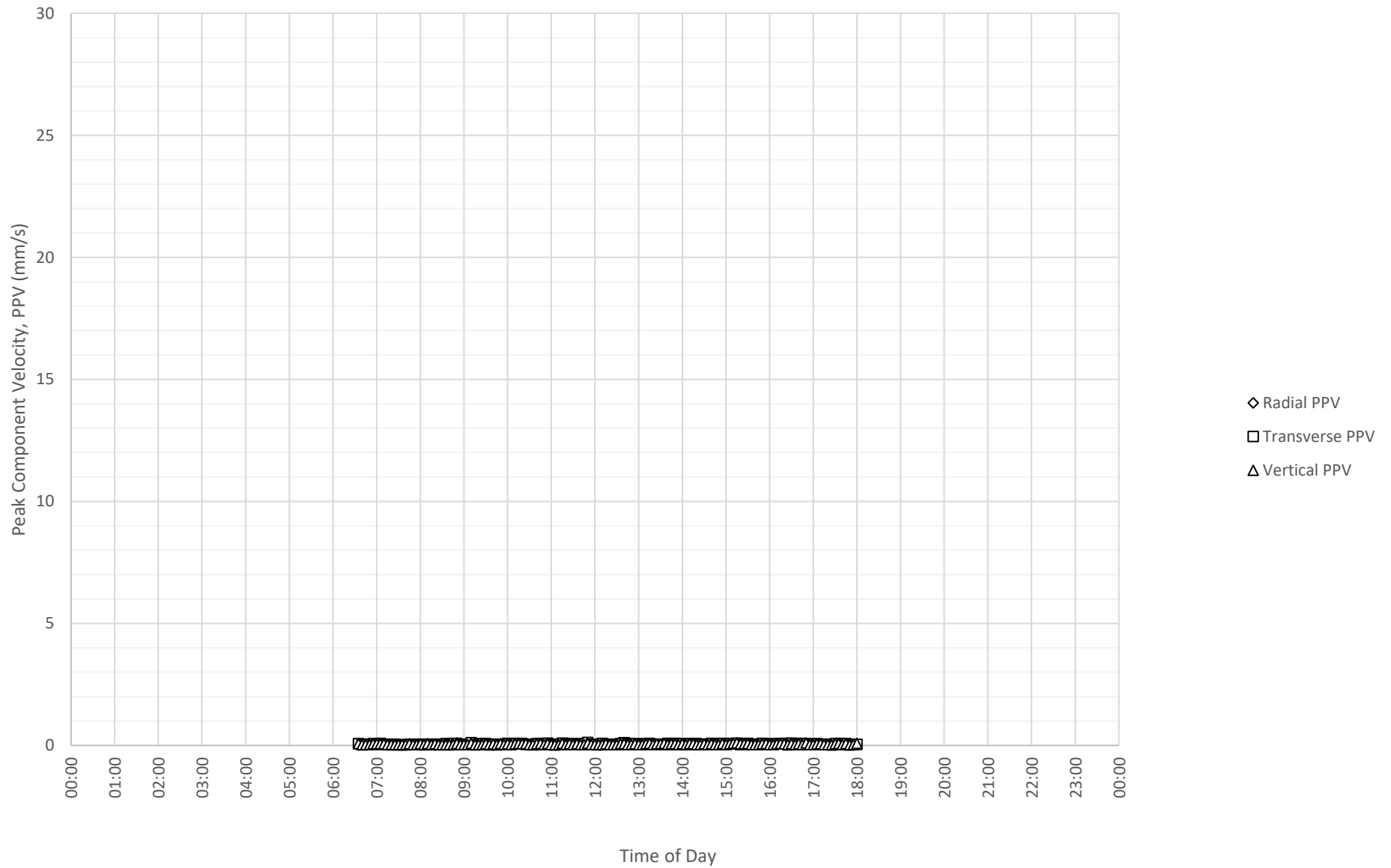
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 14-02-2025



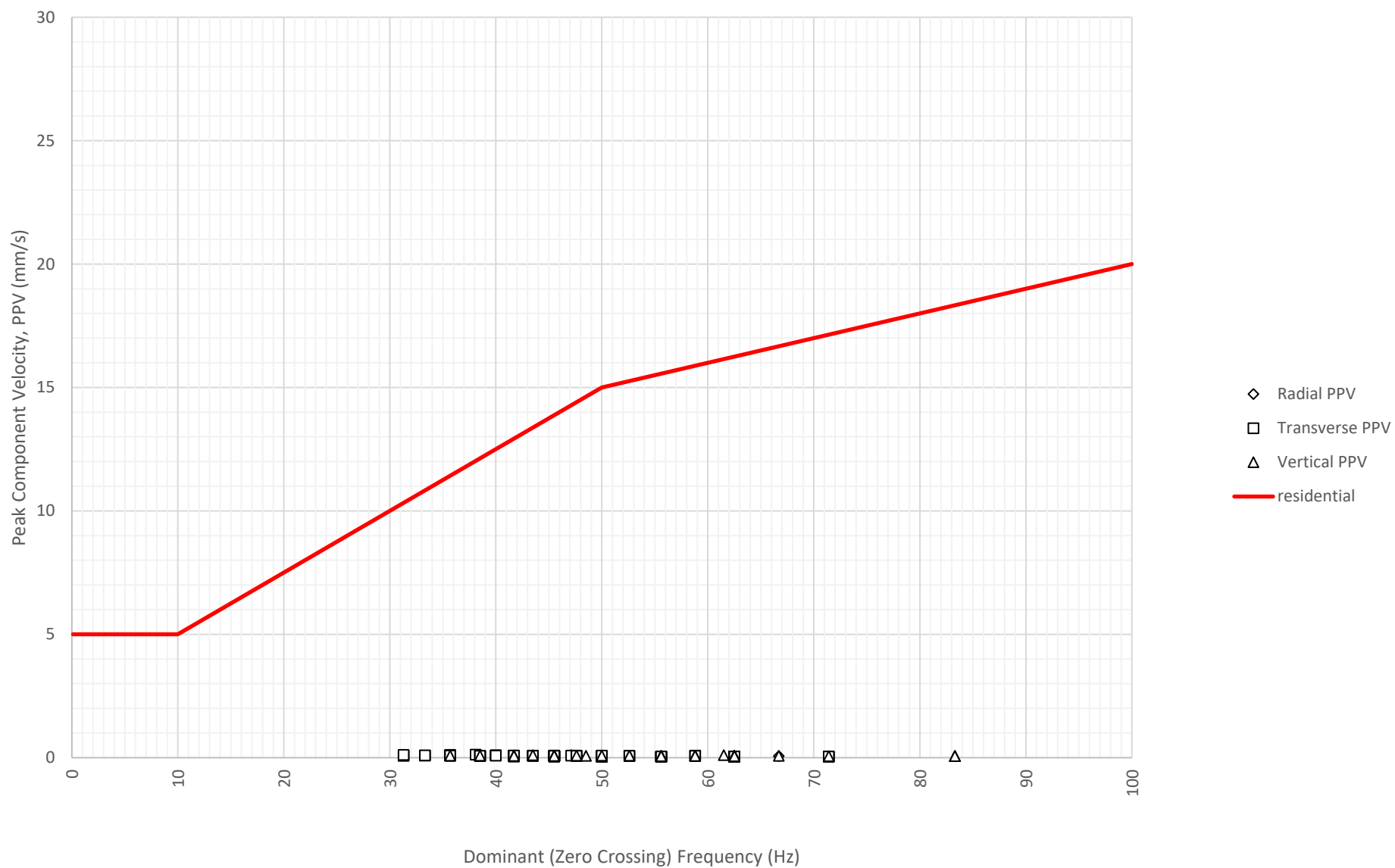
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
14-02-2025



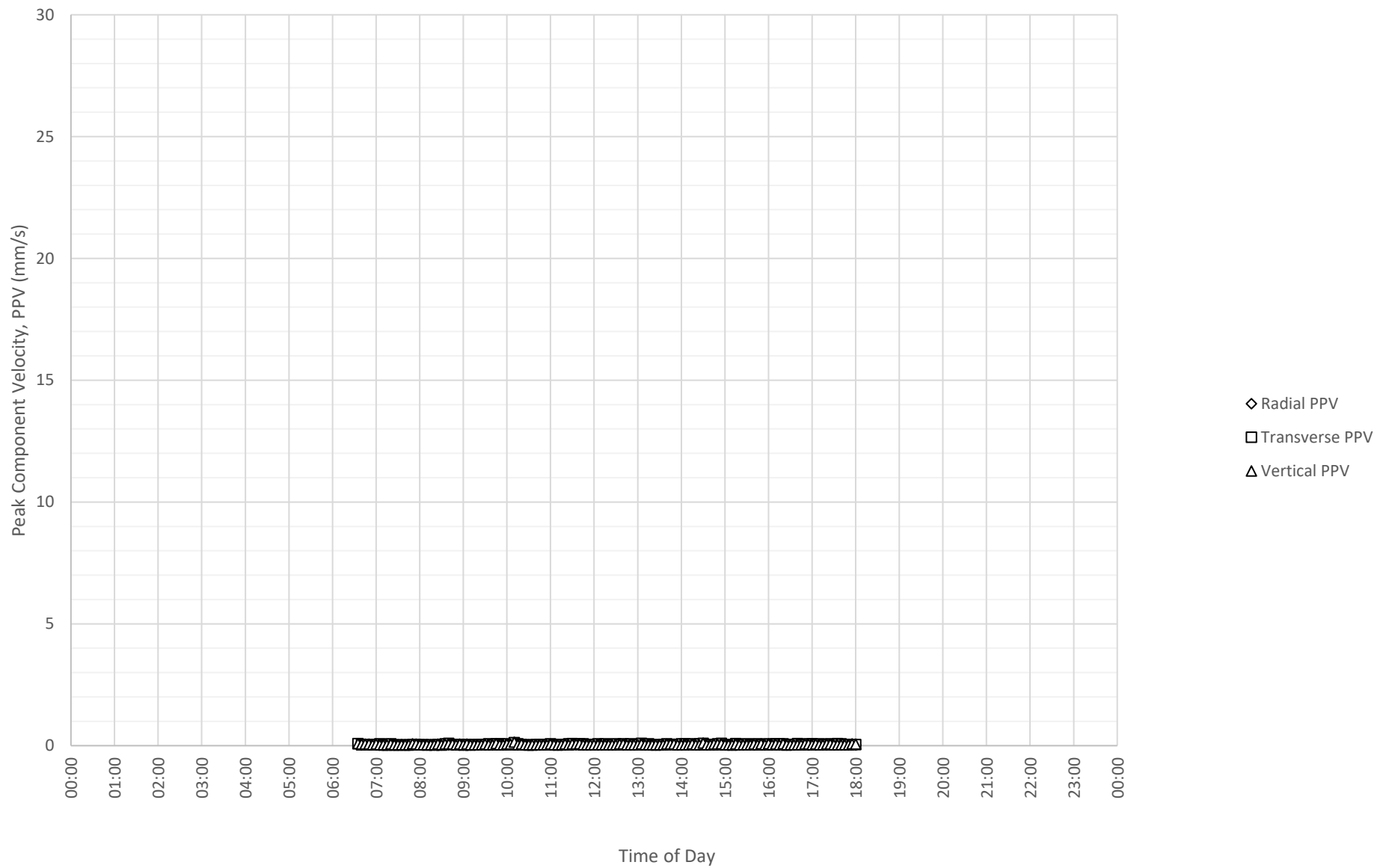
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 15-02-2025



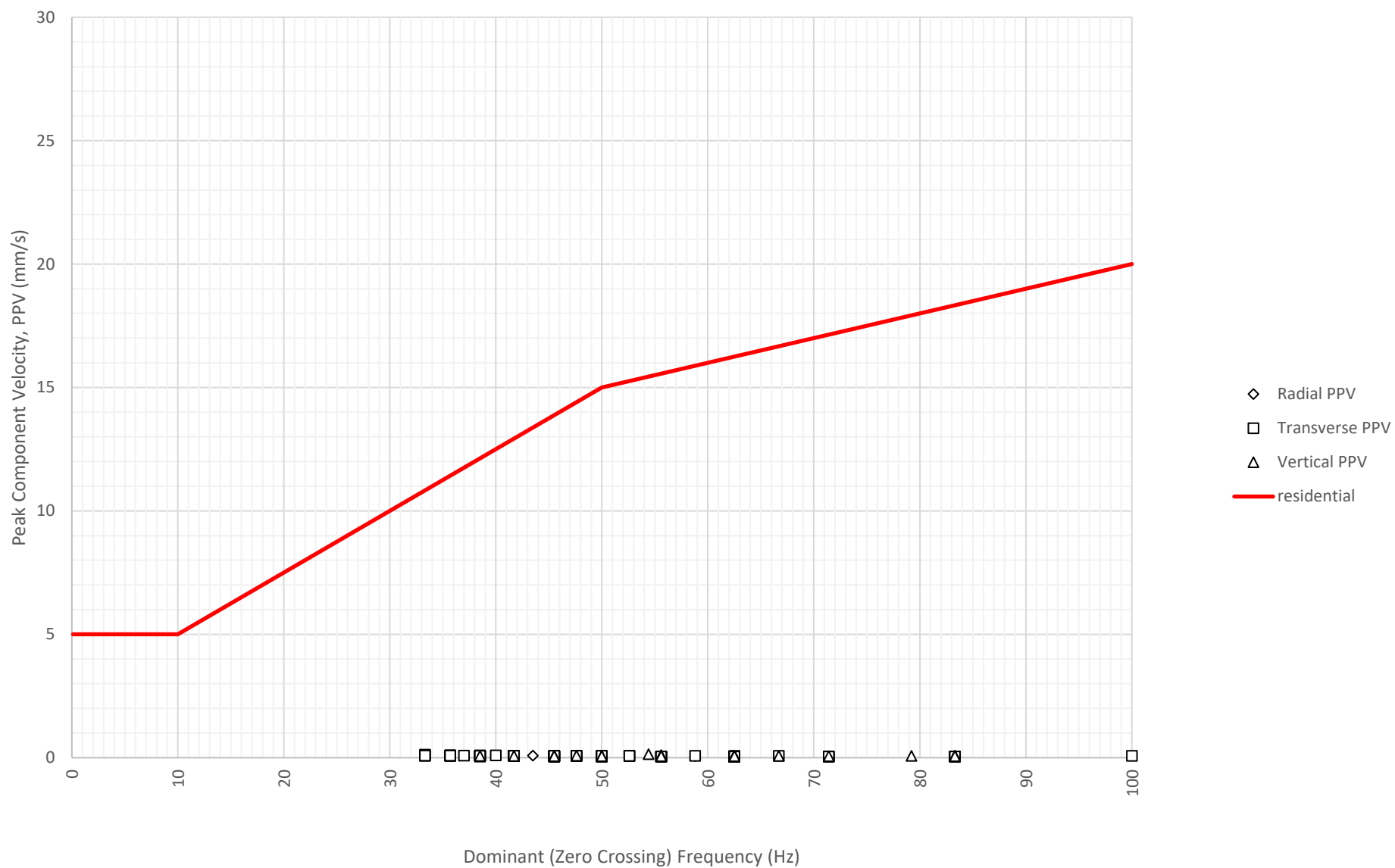
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
15-02-2025



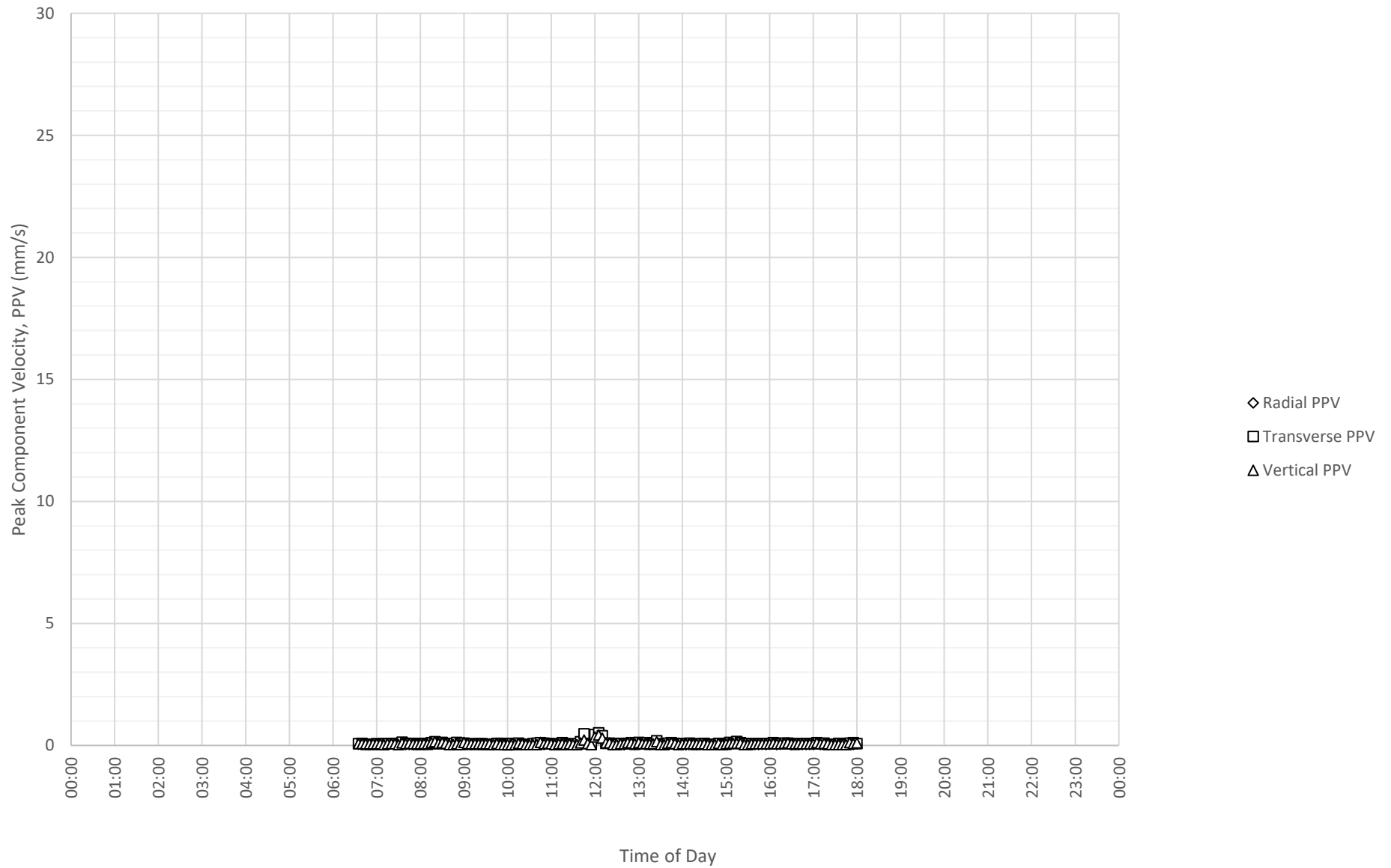
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 16-02-2025



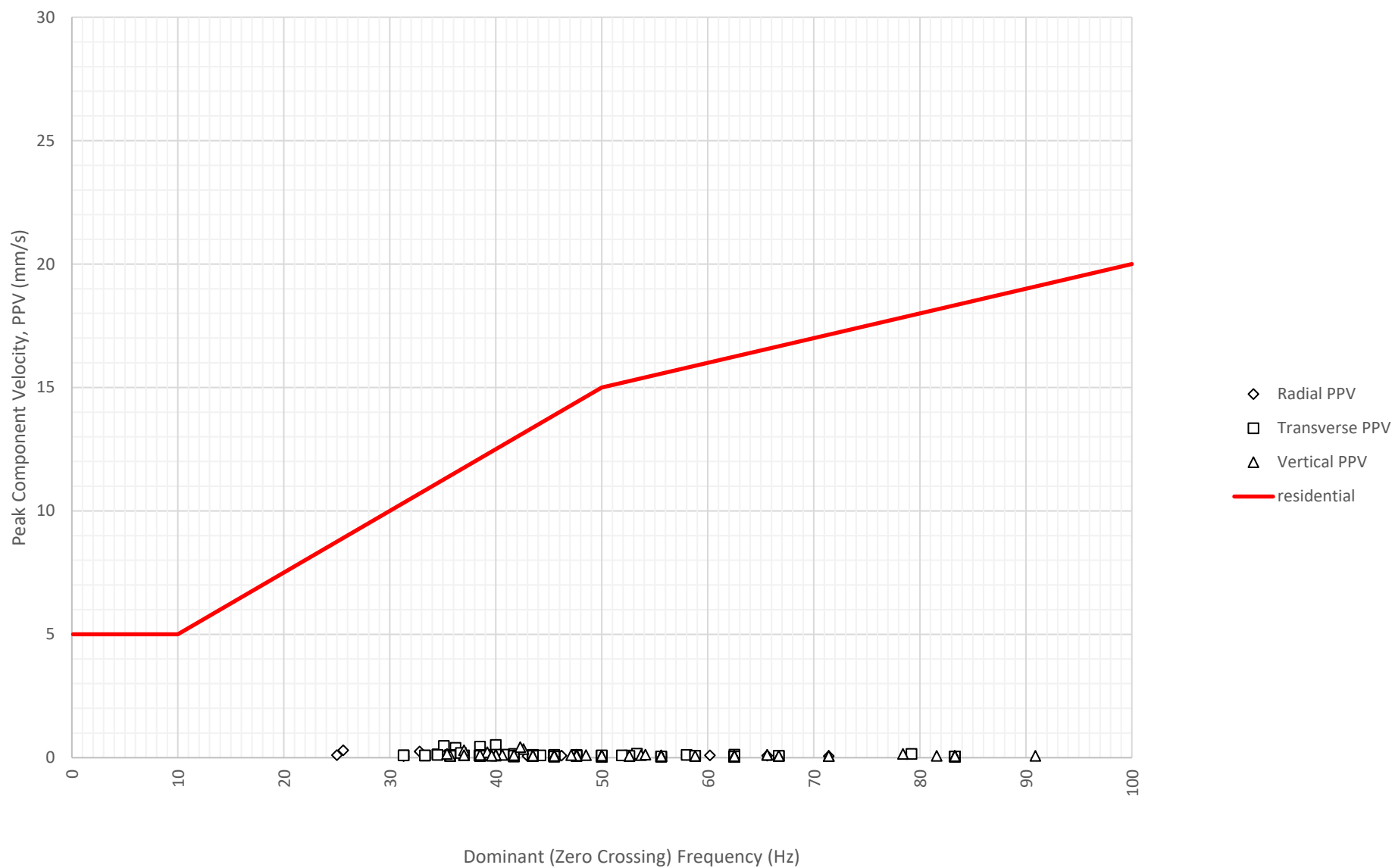
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
16-02-2025



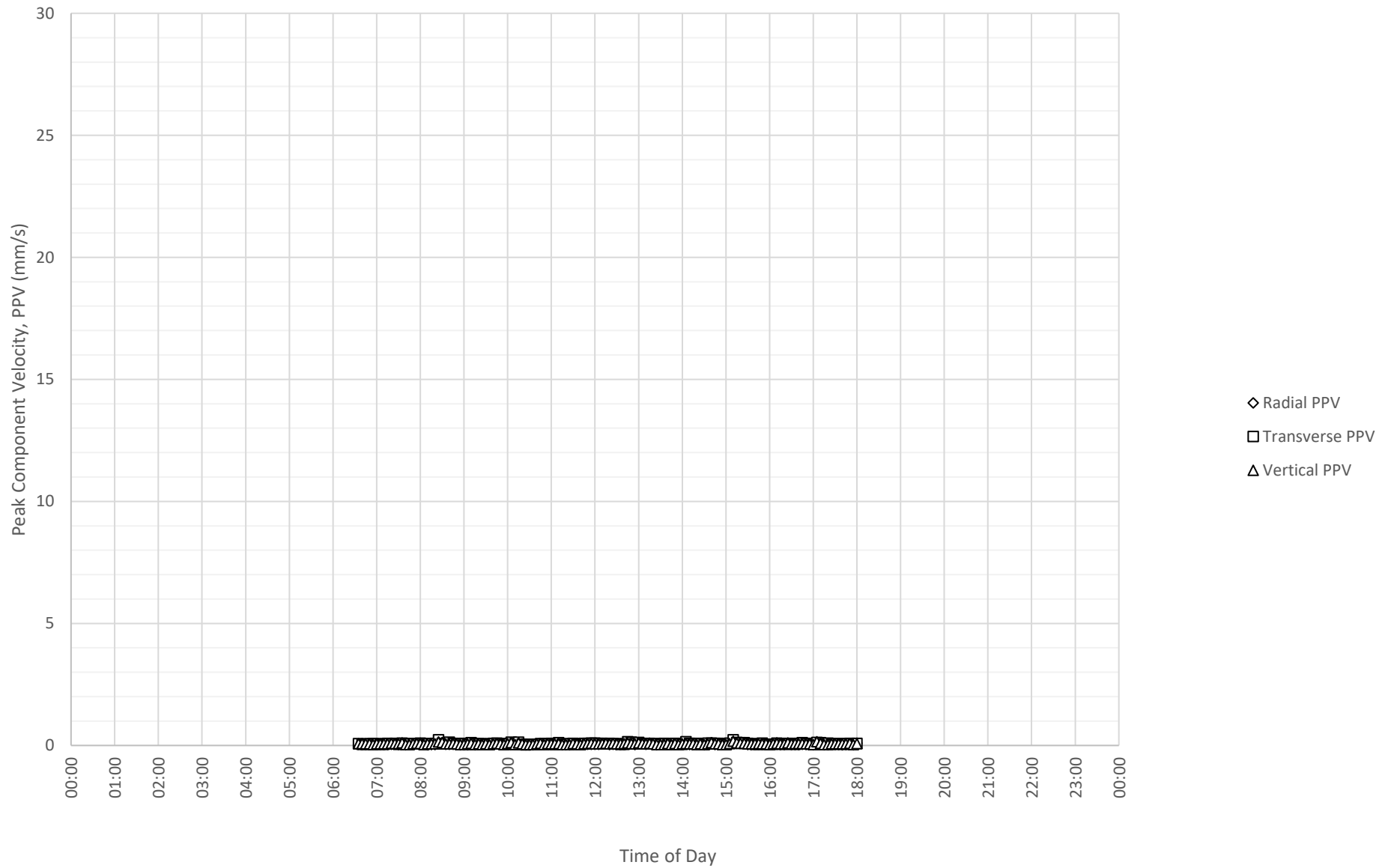
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 17-02-2025



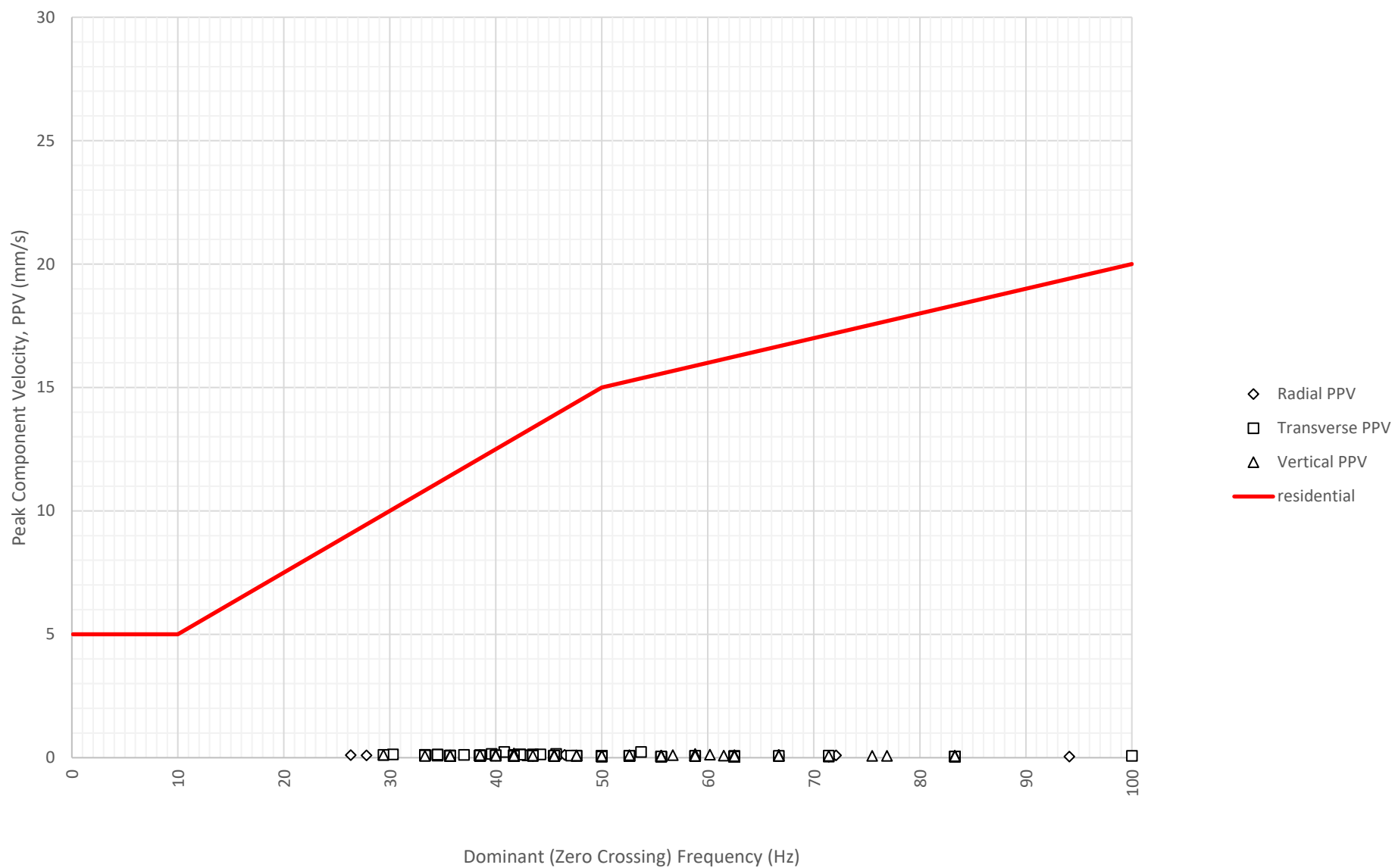
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
17-02-2025



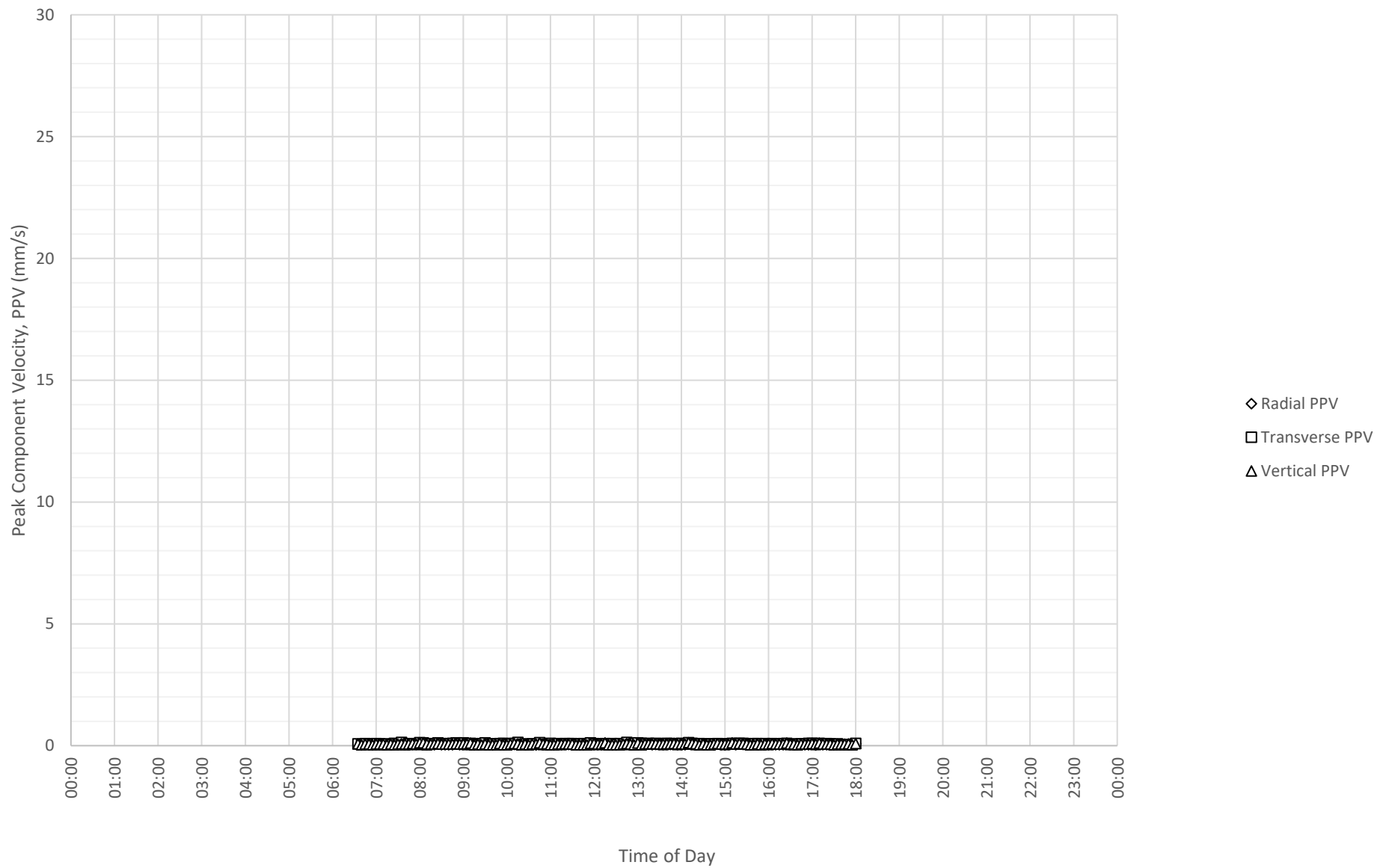
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 18-02-2025



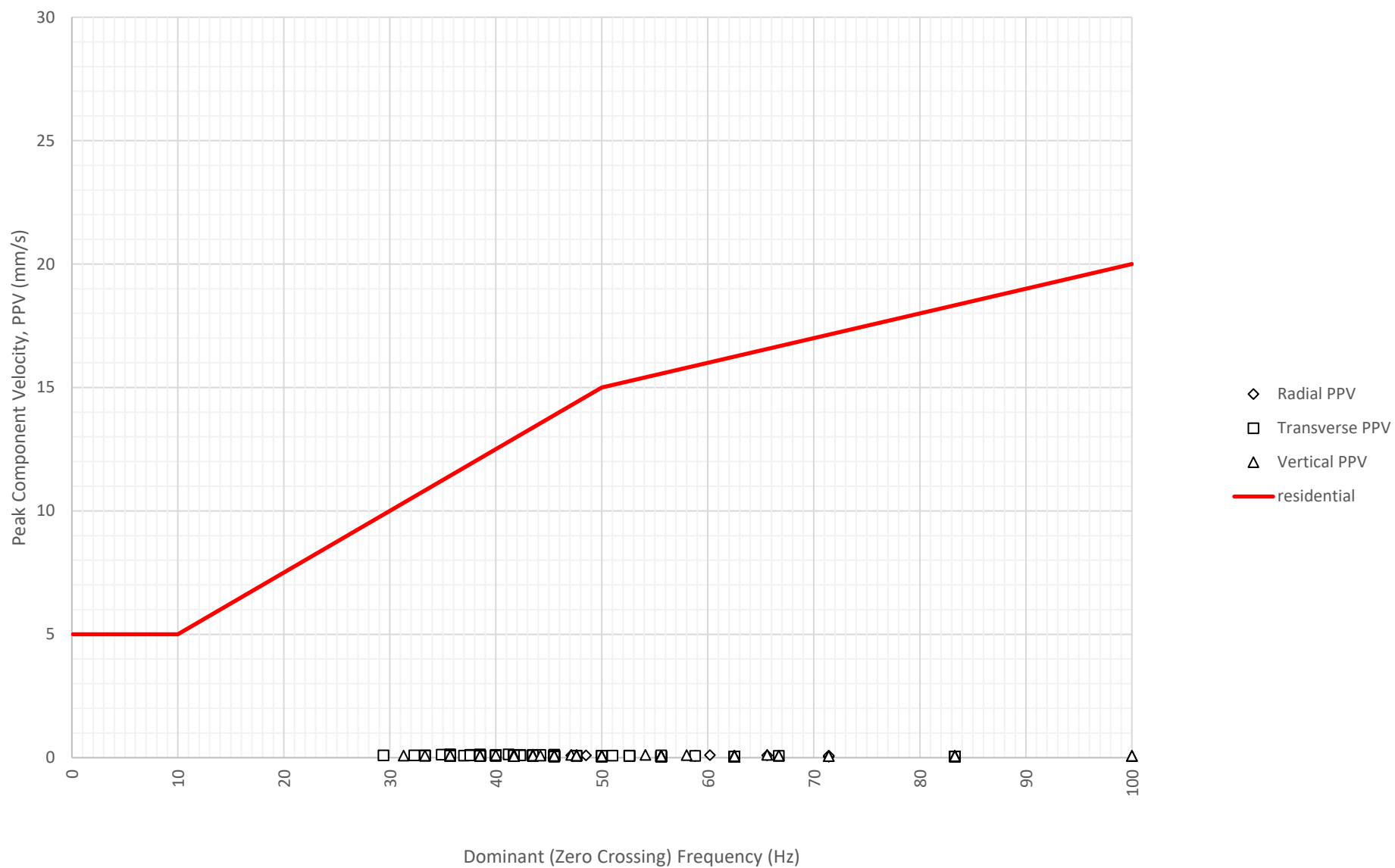
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
18-02-2025



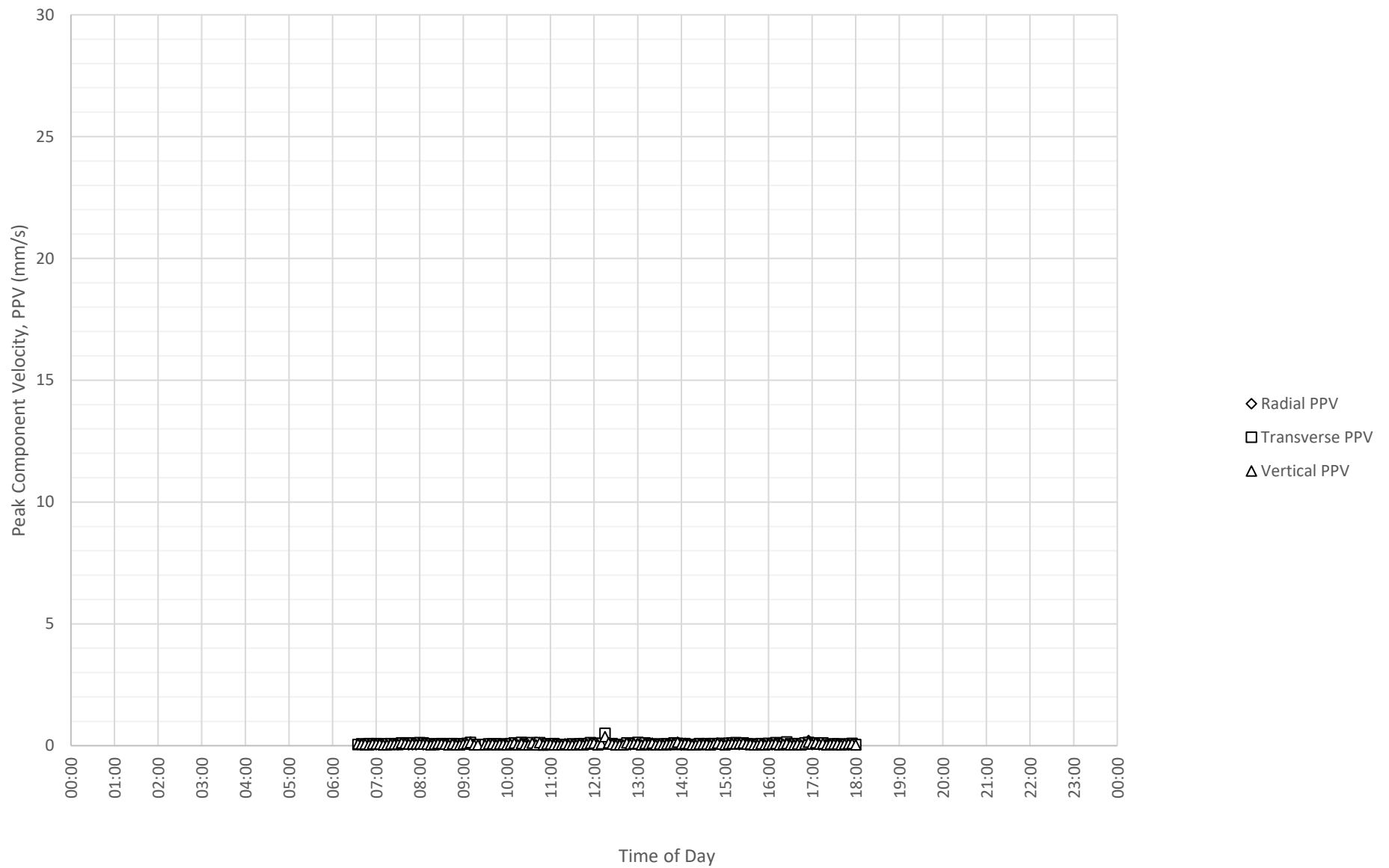
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 19-02-2025



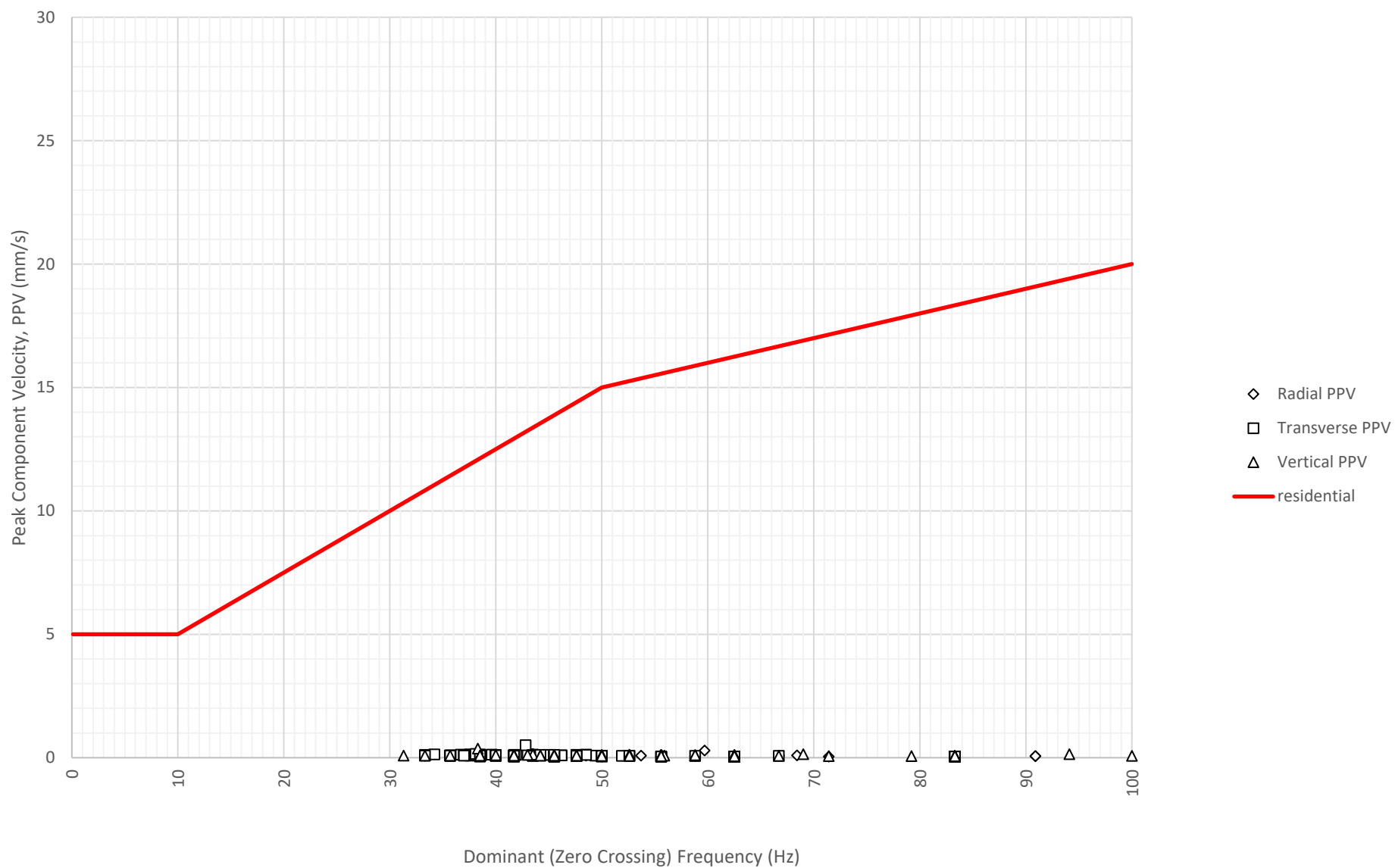
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
19-02-2025



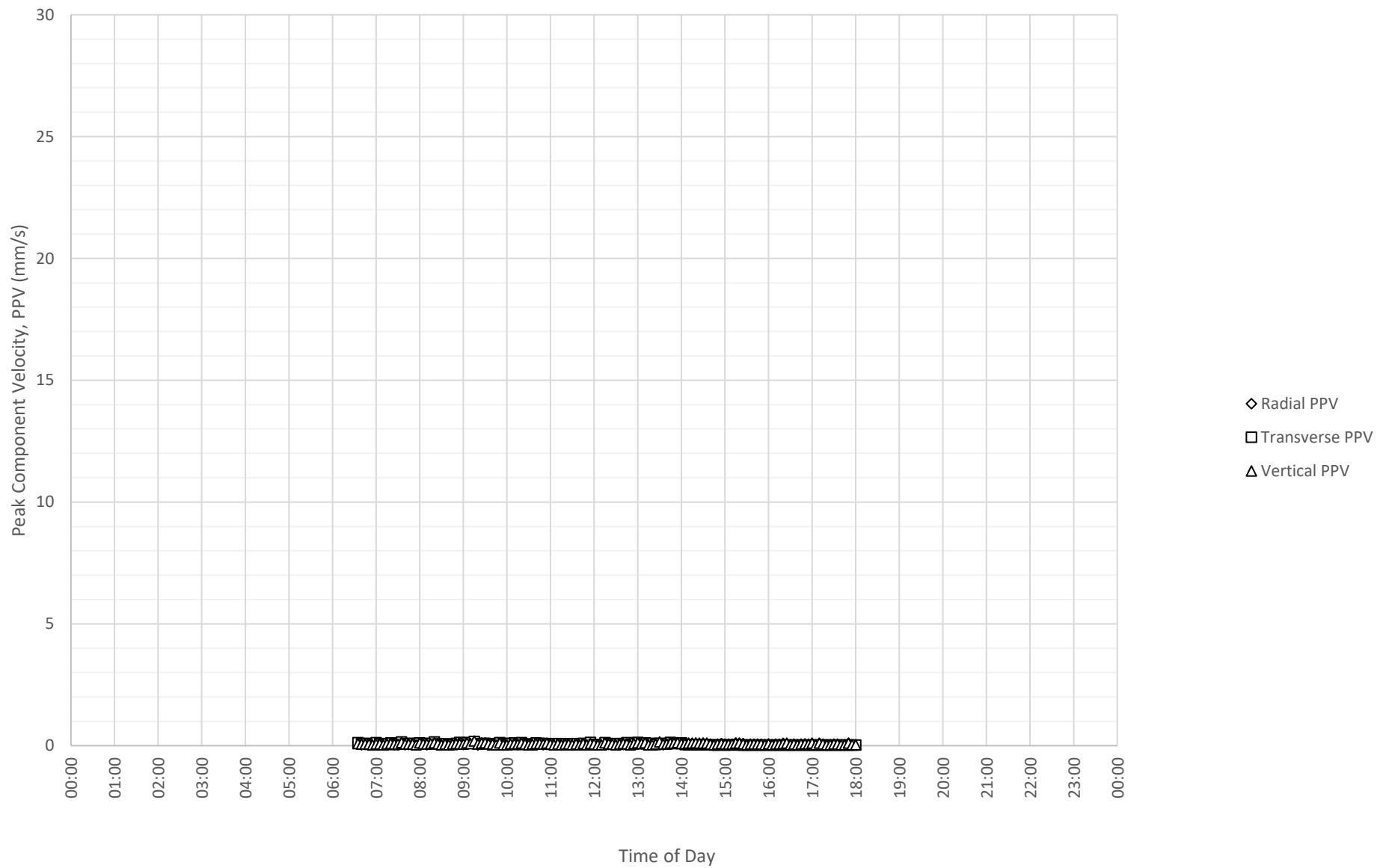
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 20-02-2025



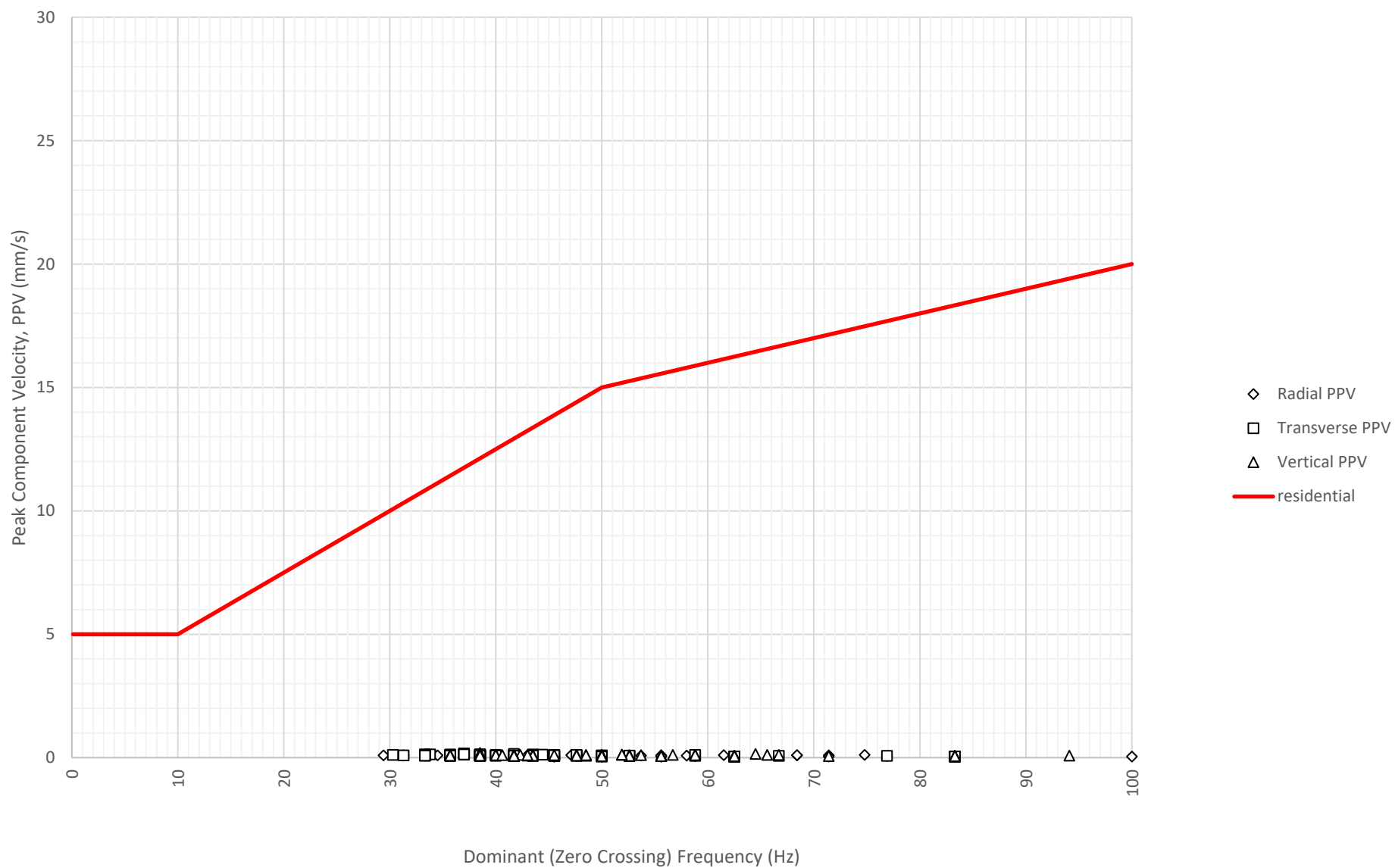
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
20-02-2025



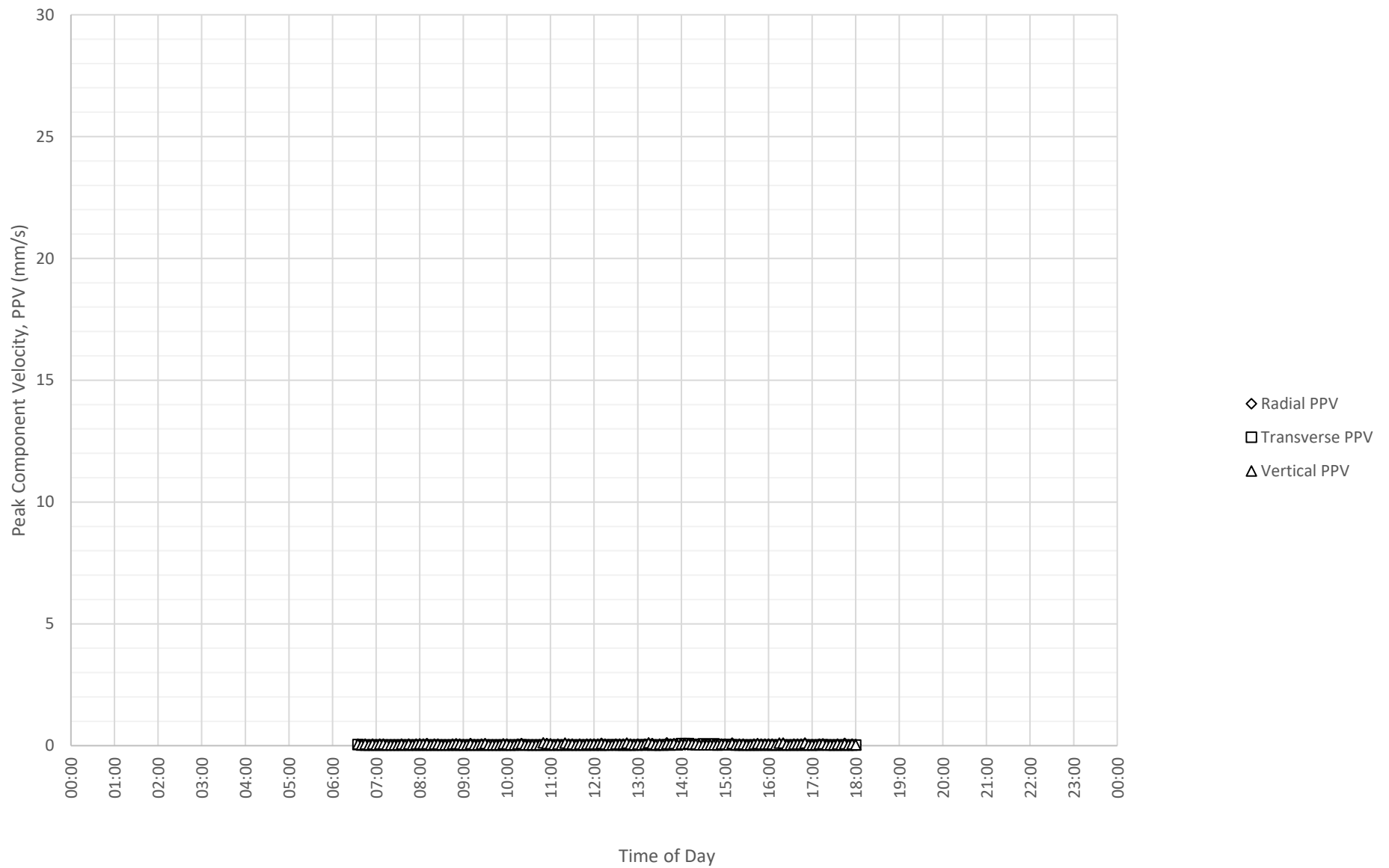
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 21-02-2025



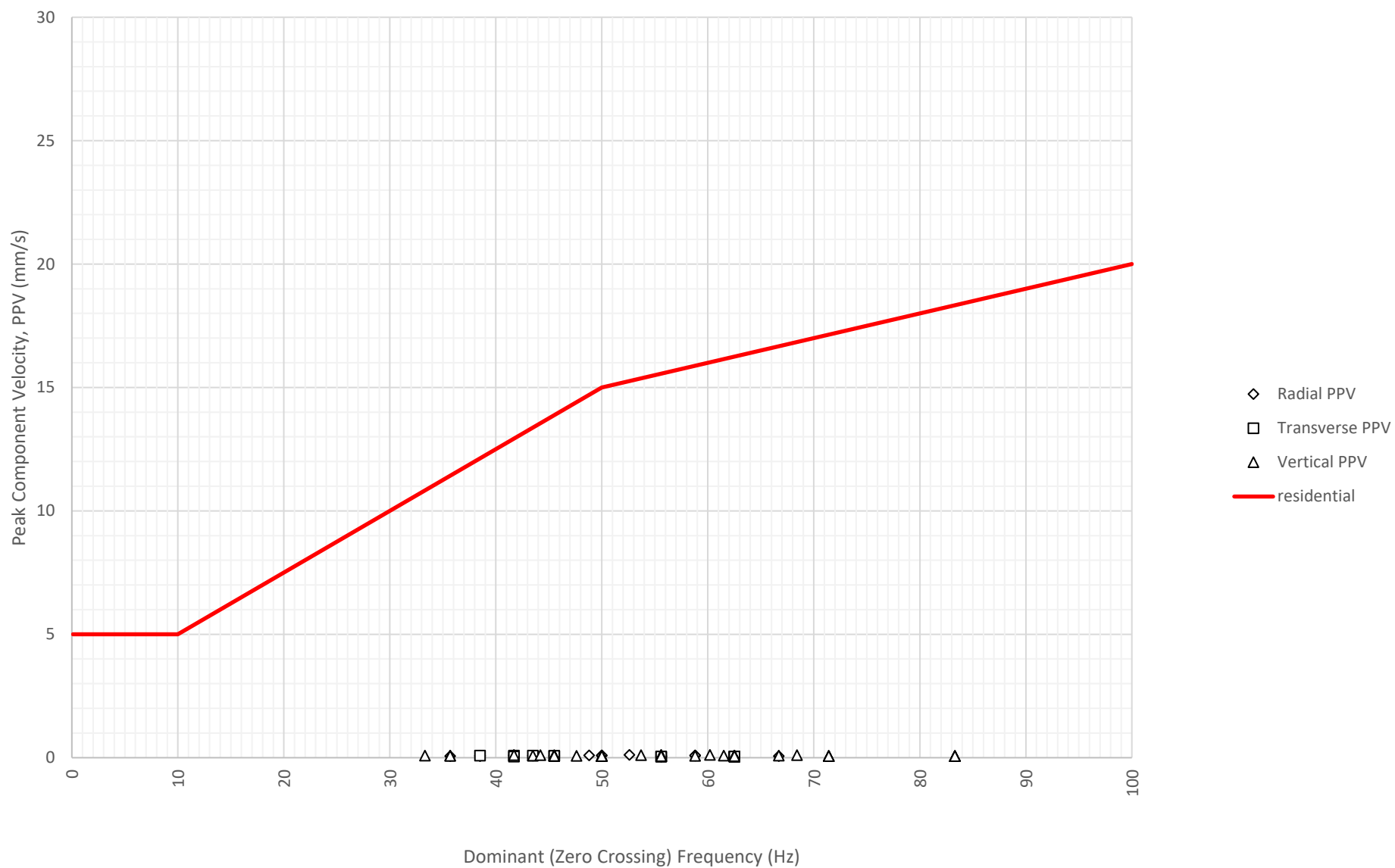
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
21-02-2025



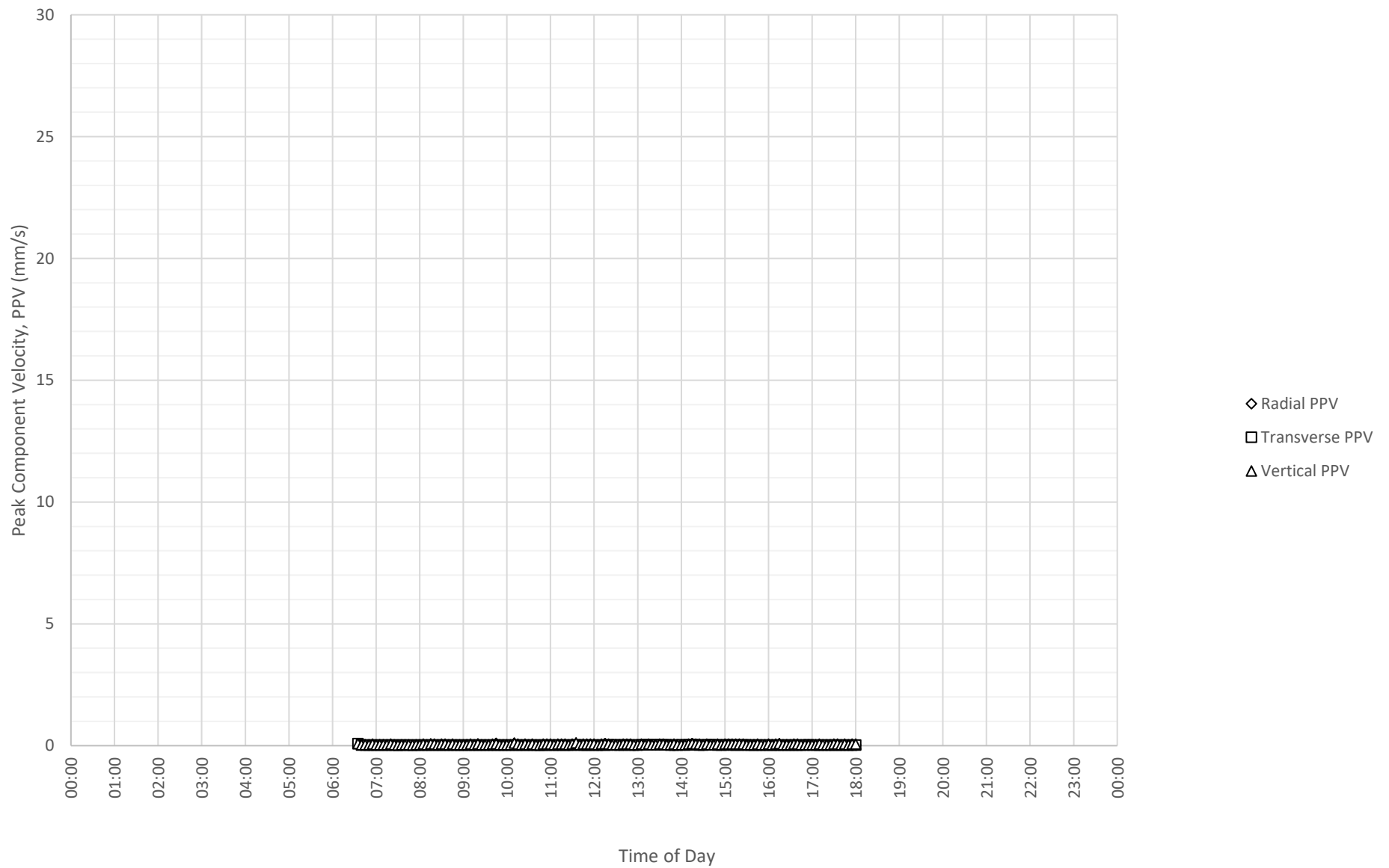
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 22-02-2025



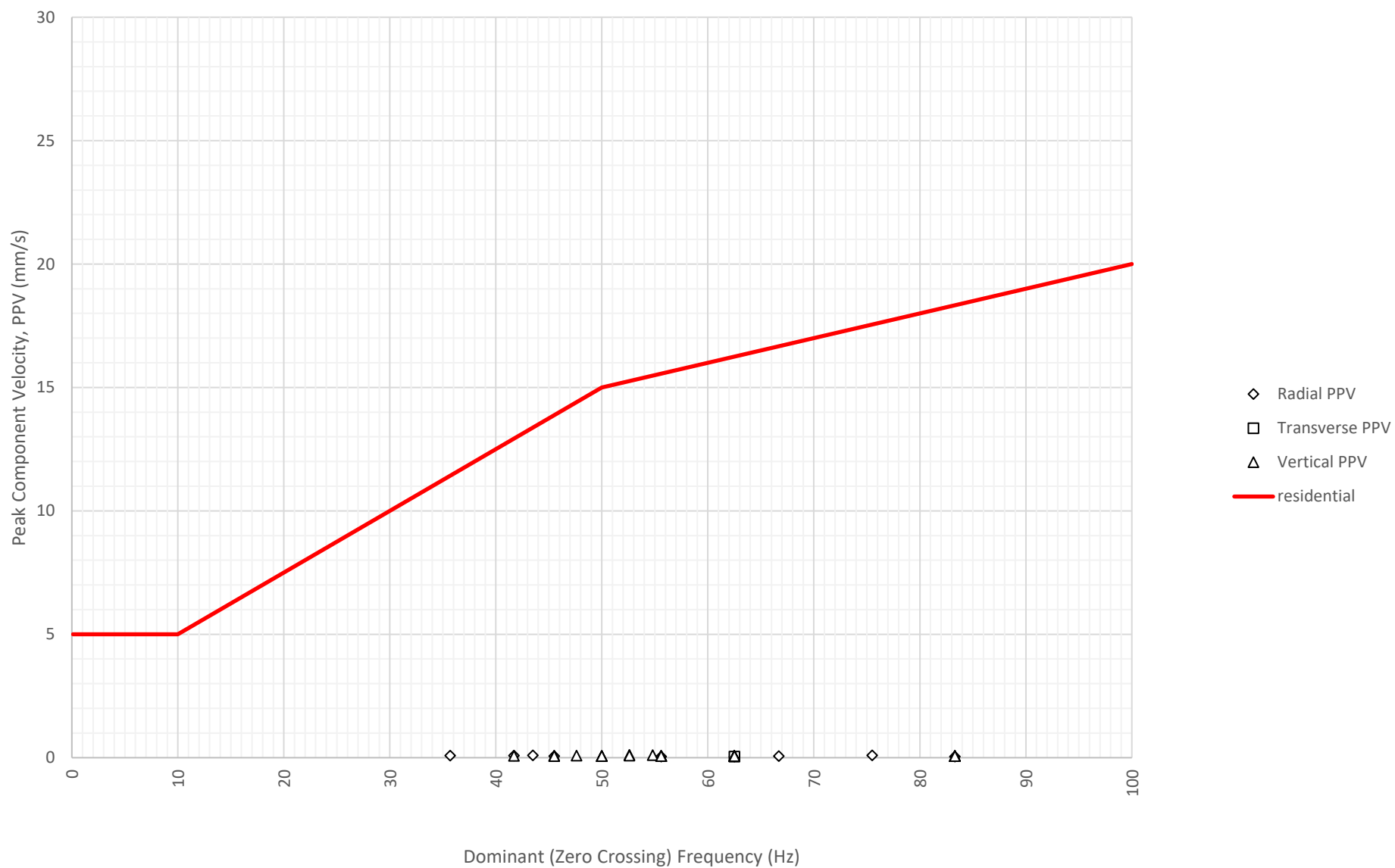
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
22-02-2025



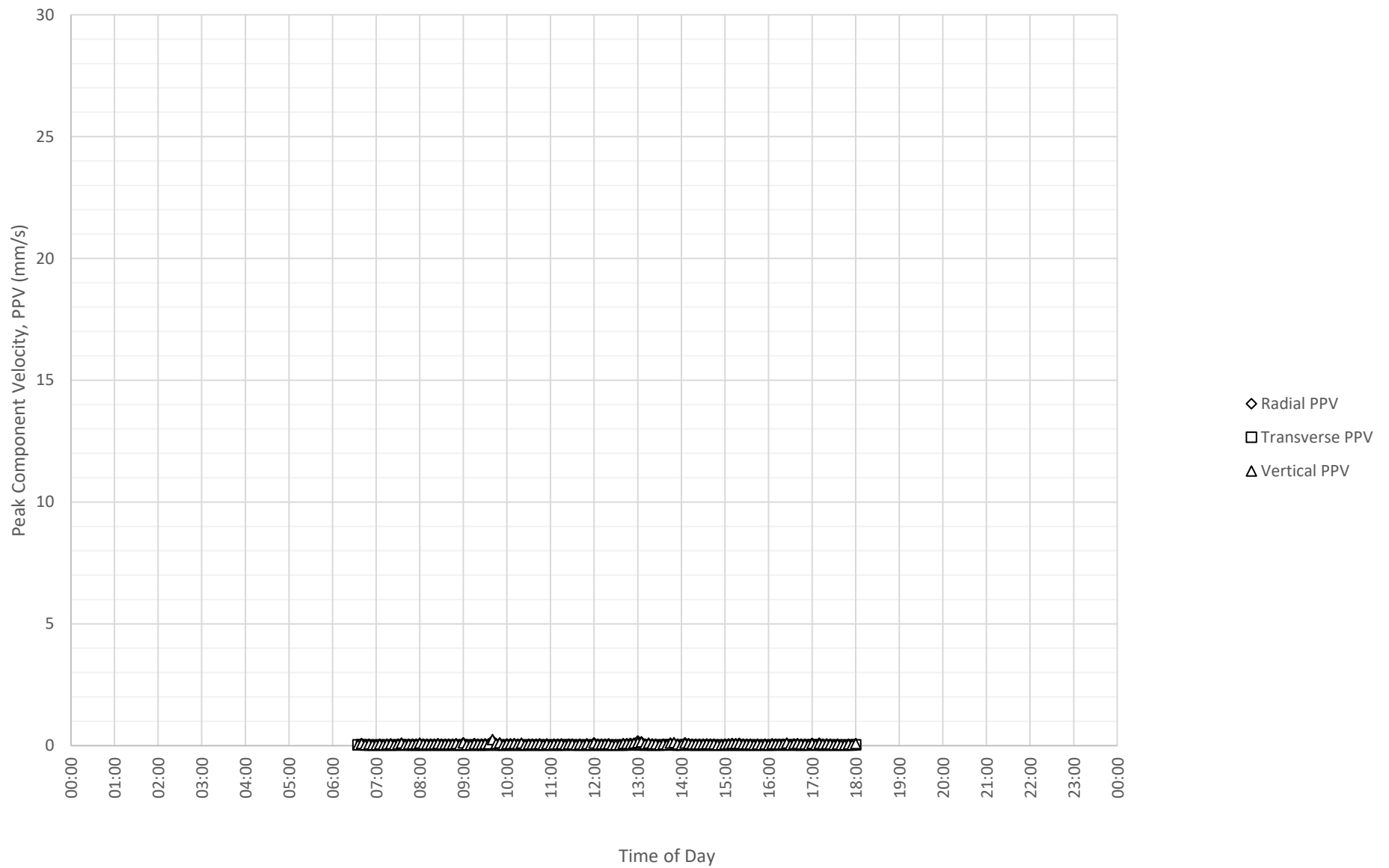
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 23-02-2025



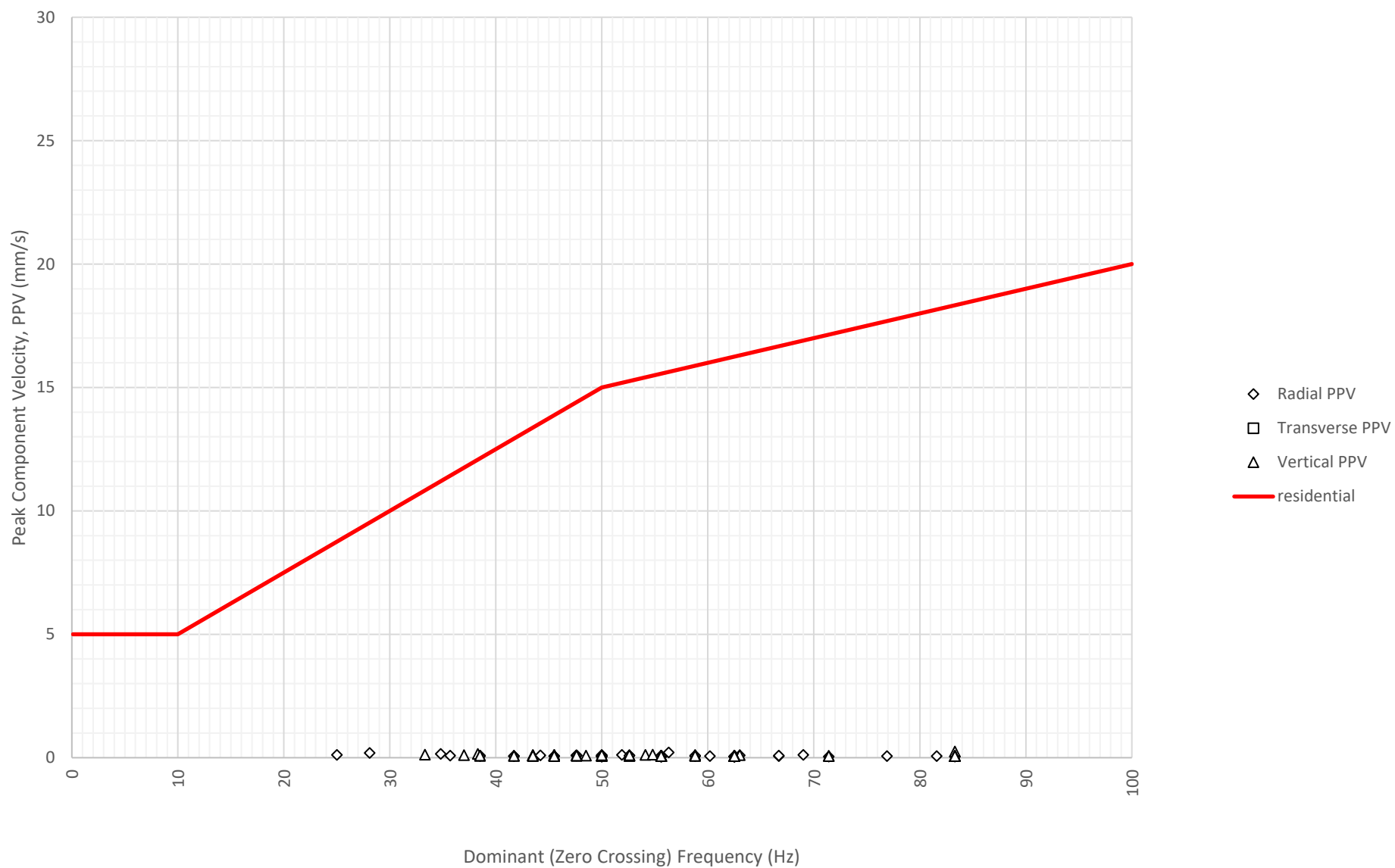
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
23-02-2025



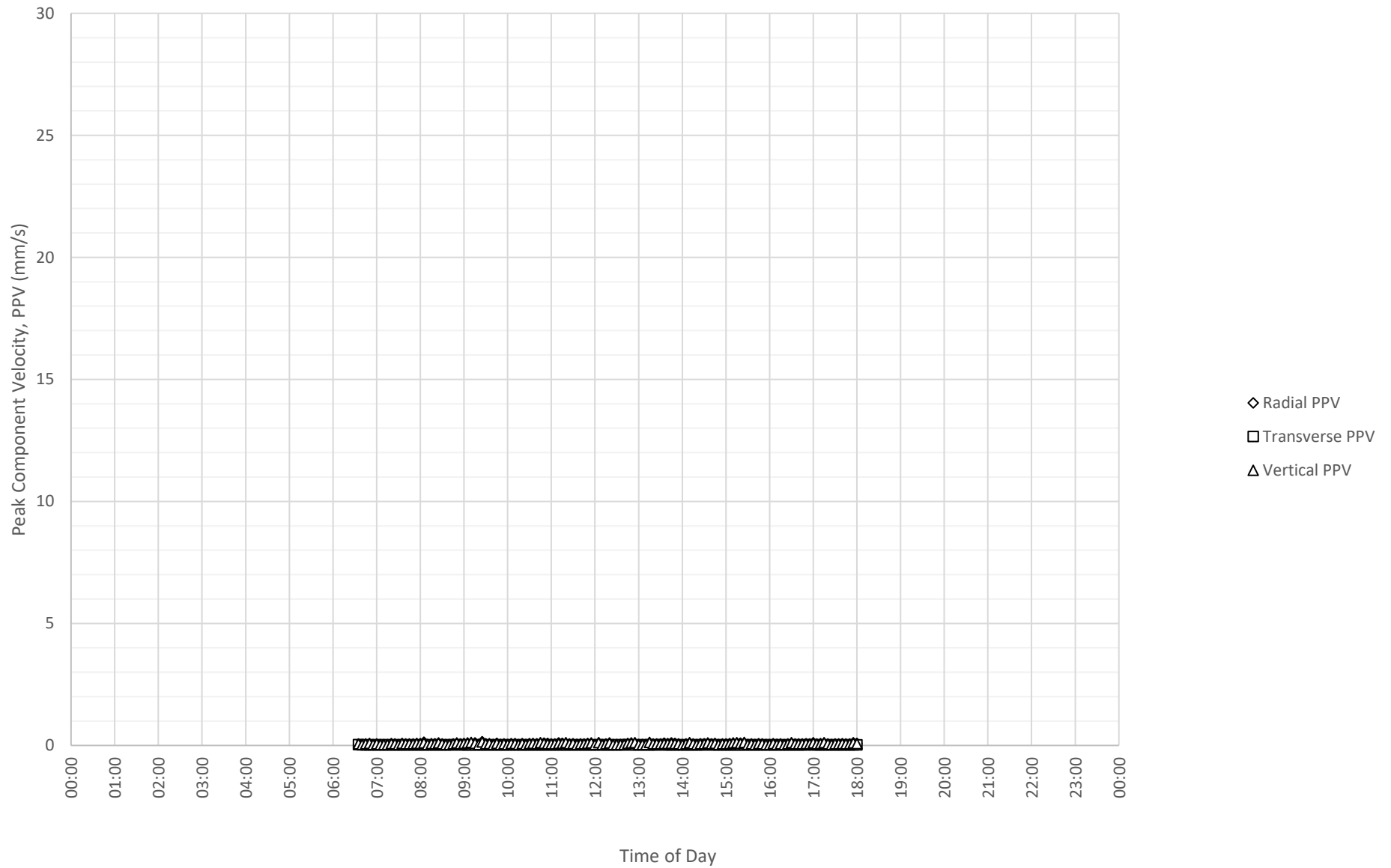
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 24-02-2025



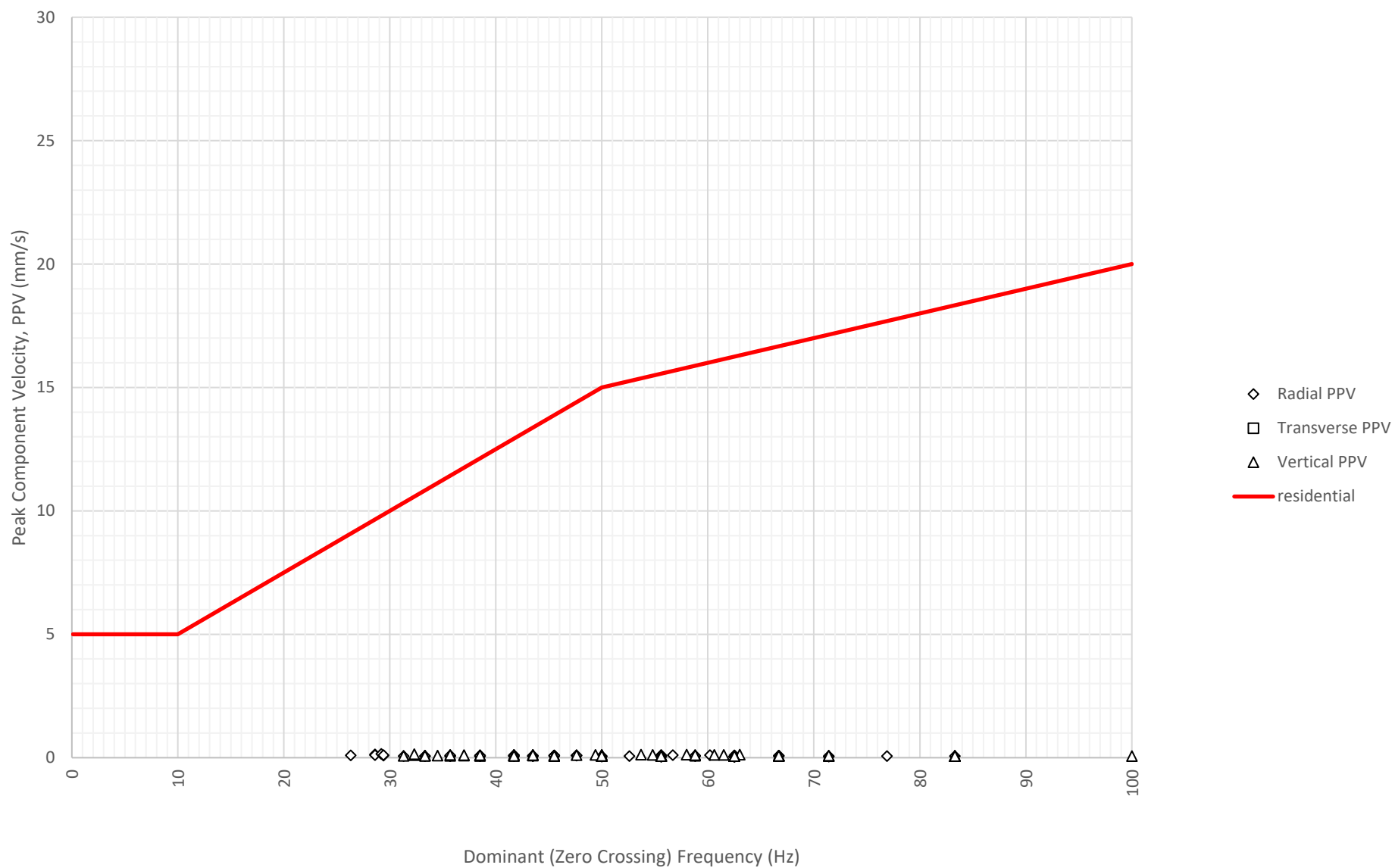
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
24-02-2025



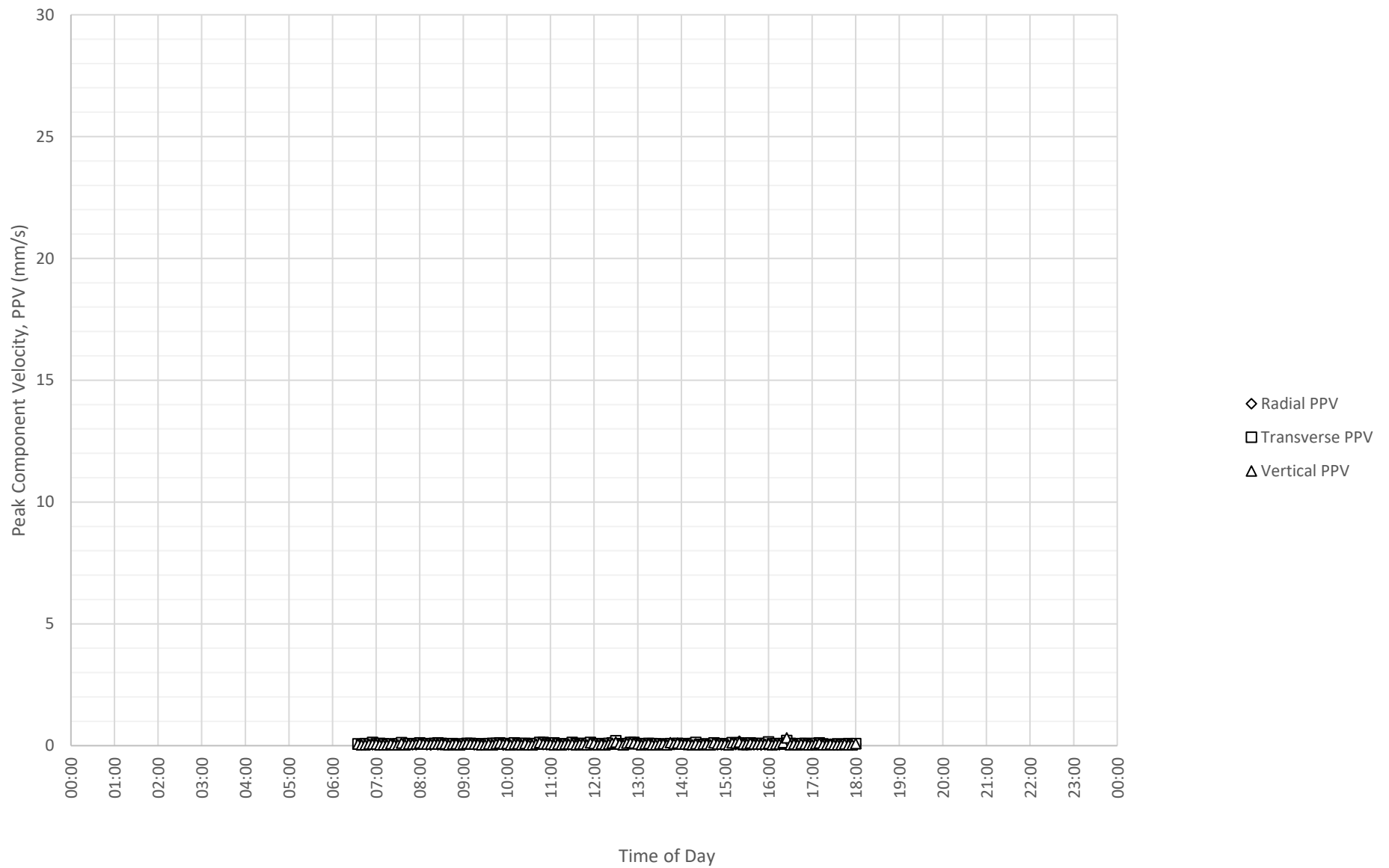
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 25-02-2025



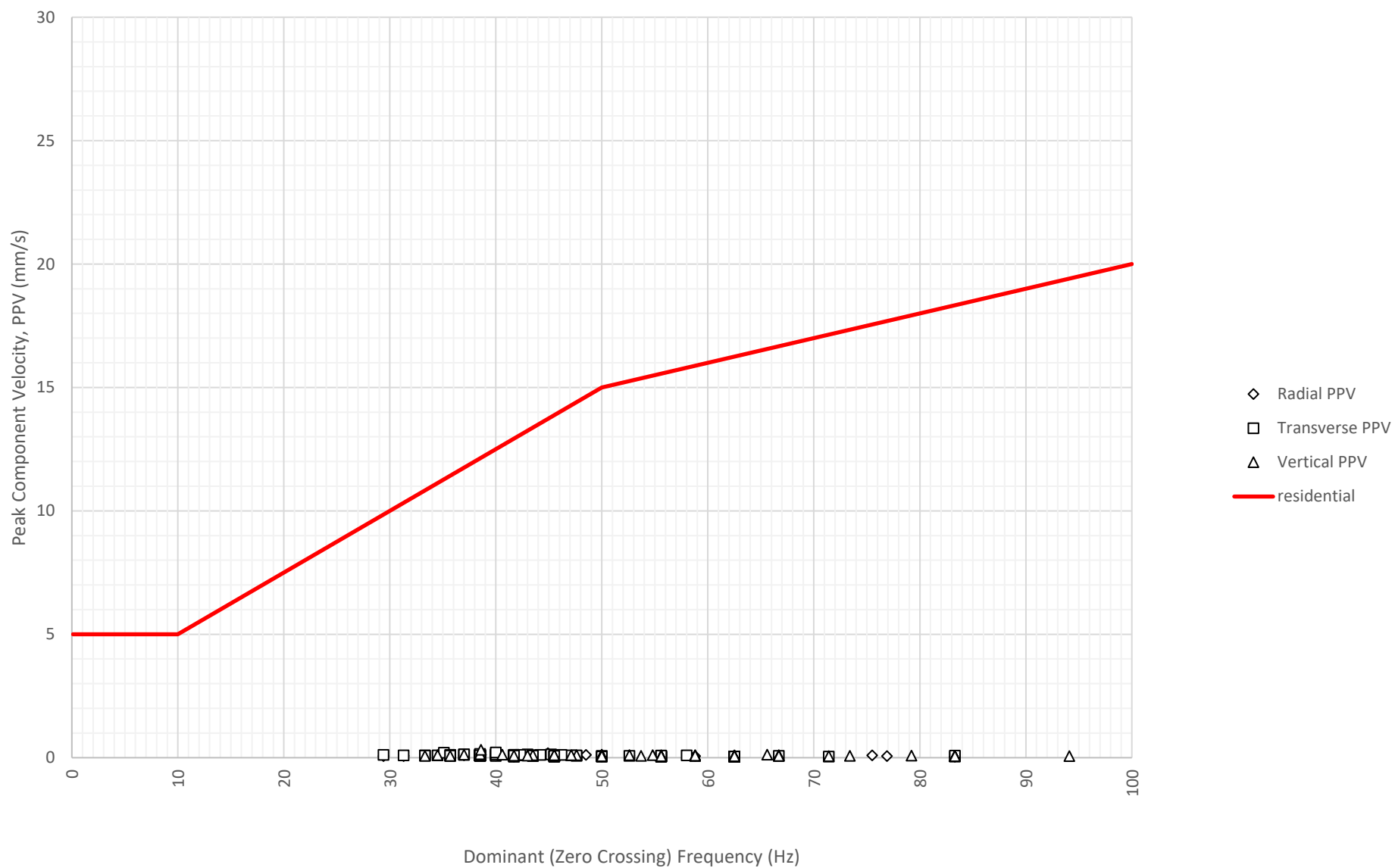
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
25-02-2025



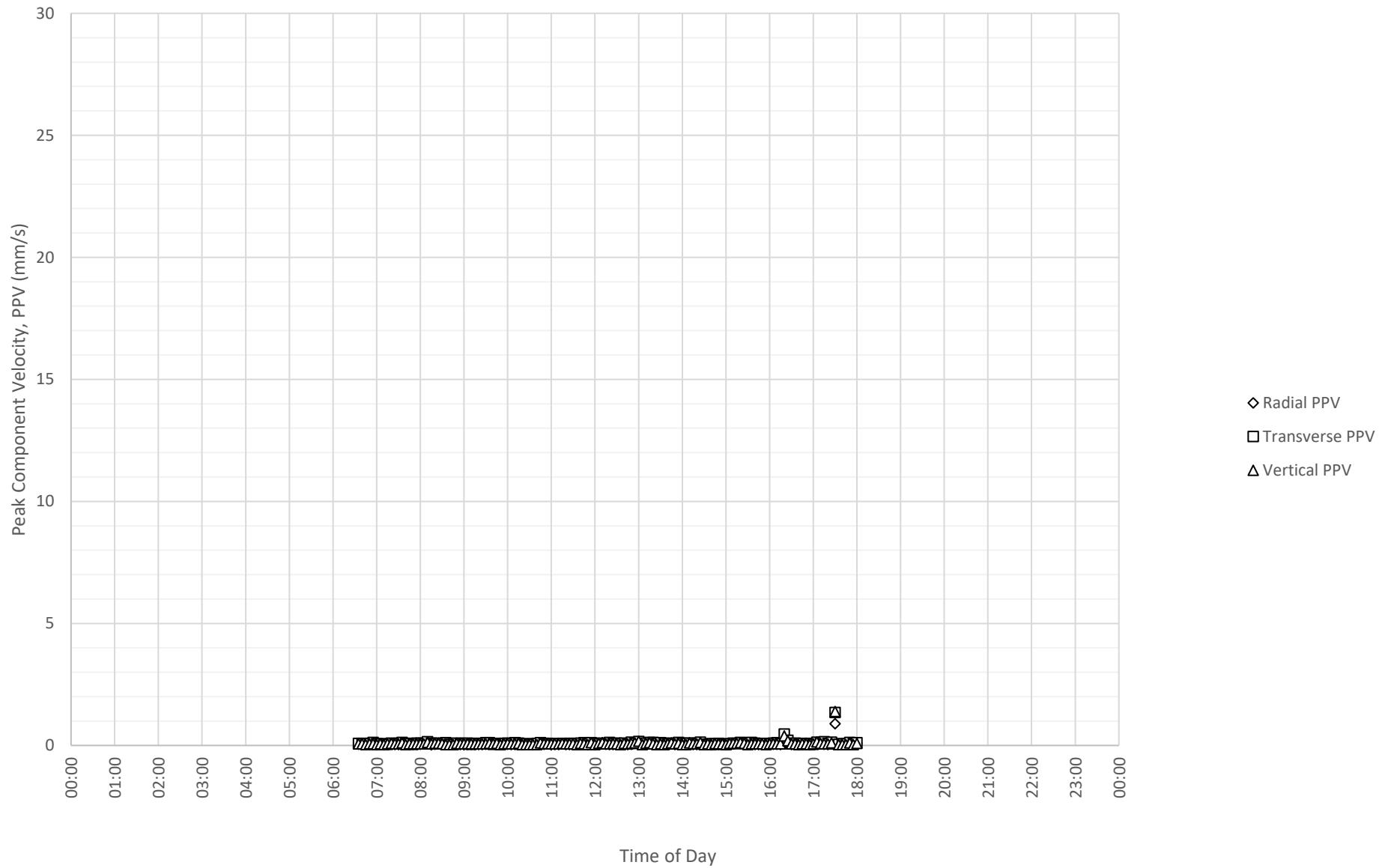
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 26-02-2025



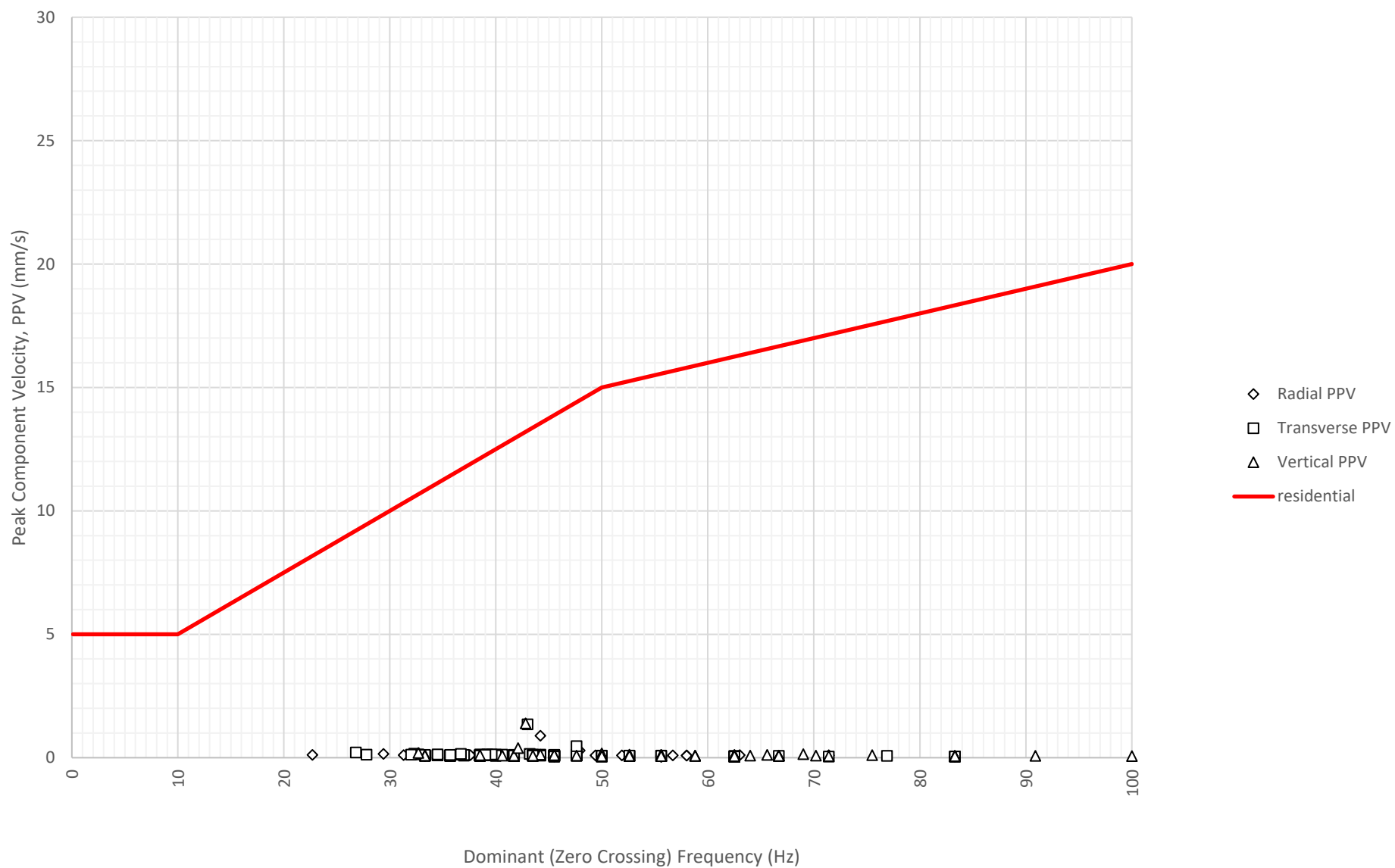
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
26-02-2025



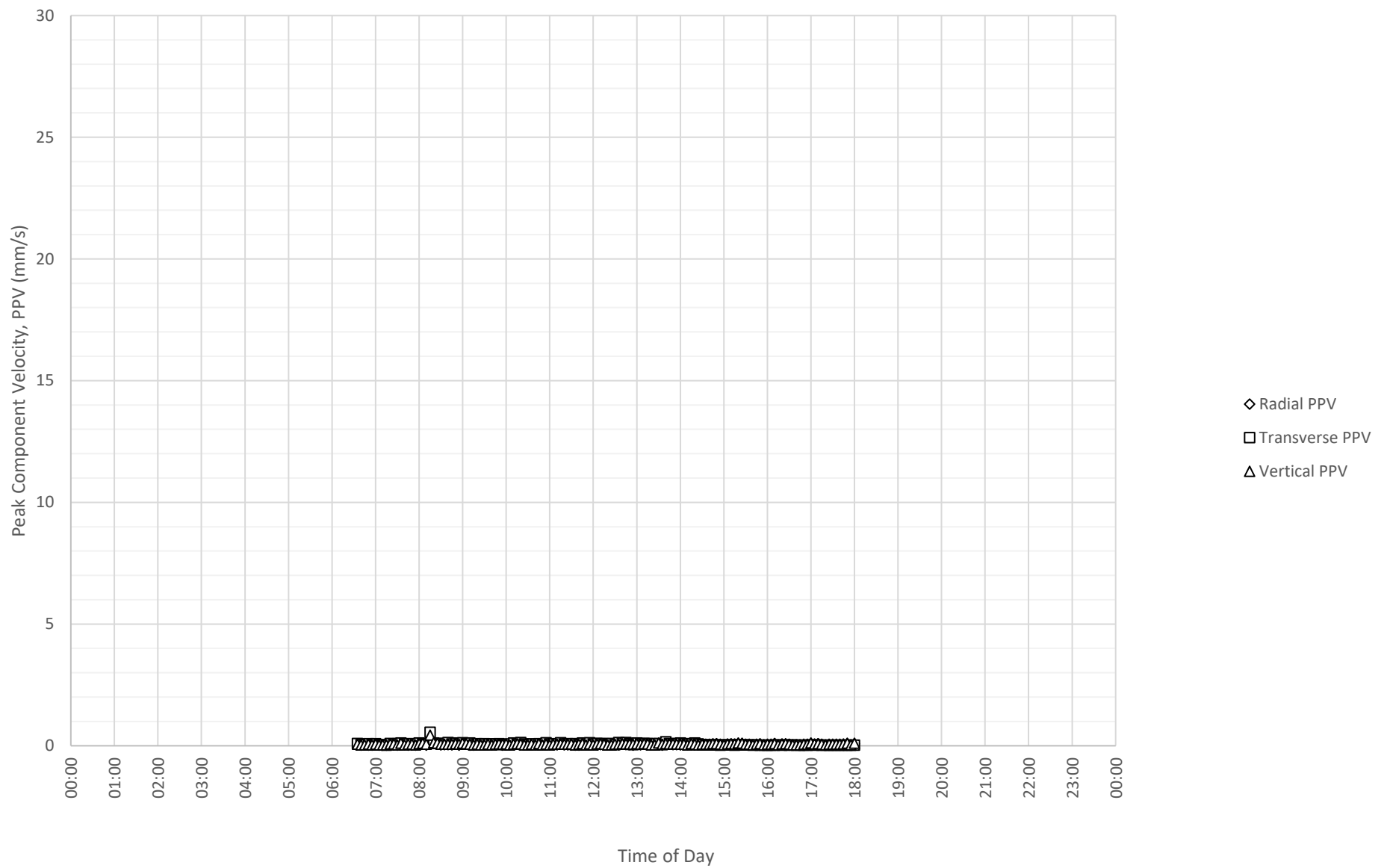
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 27-02-2025



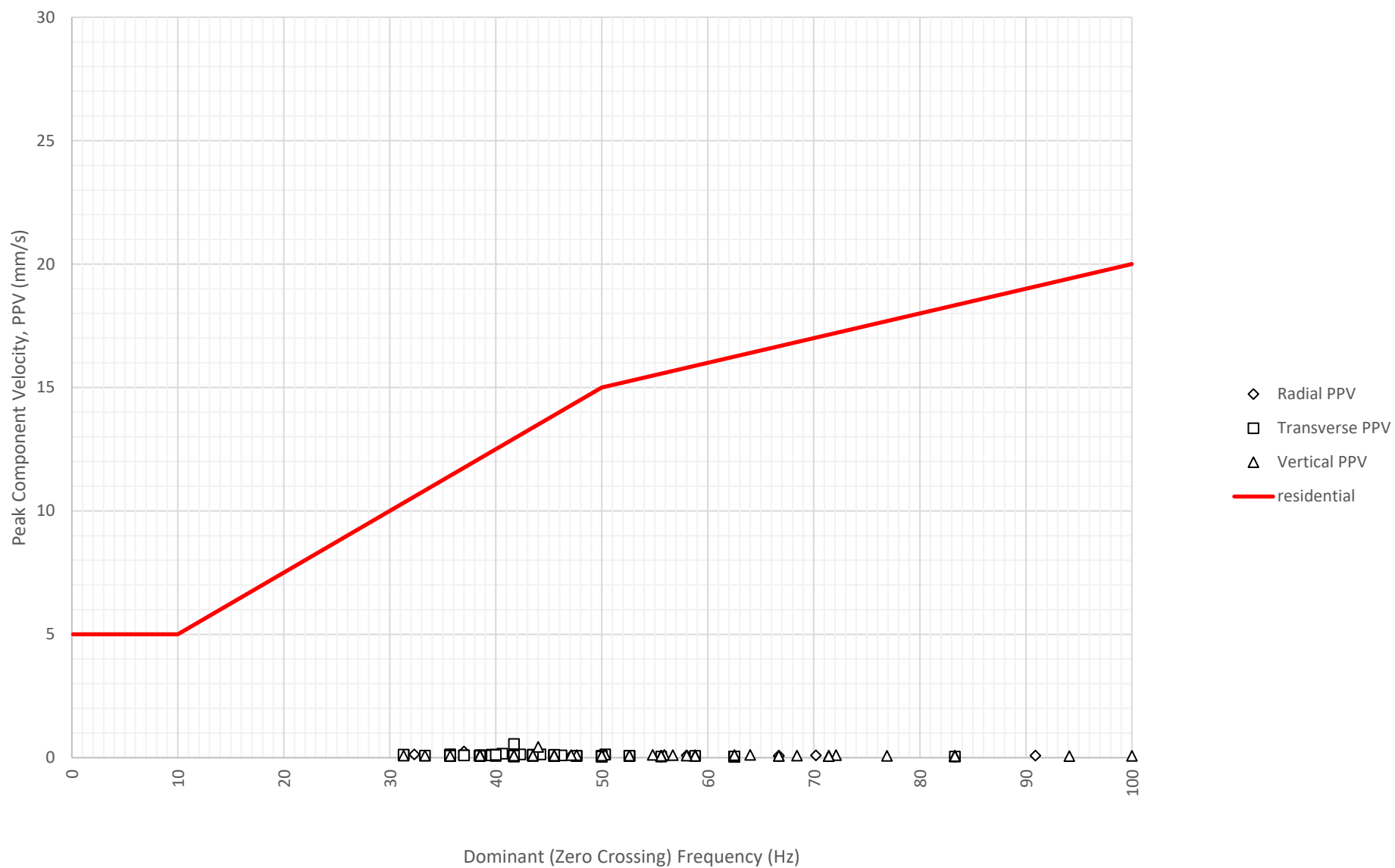
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
27-02-2025



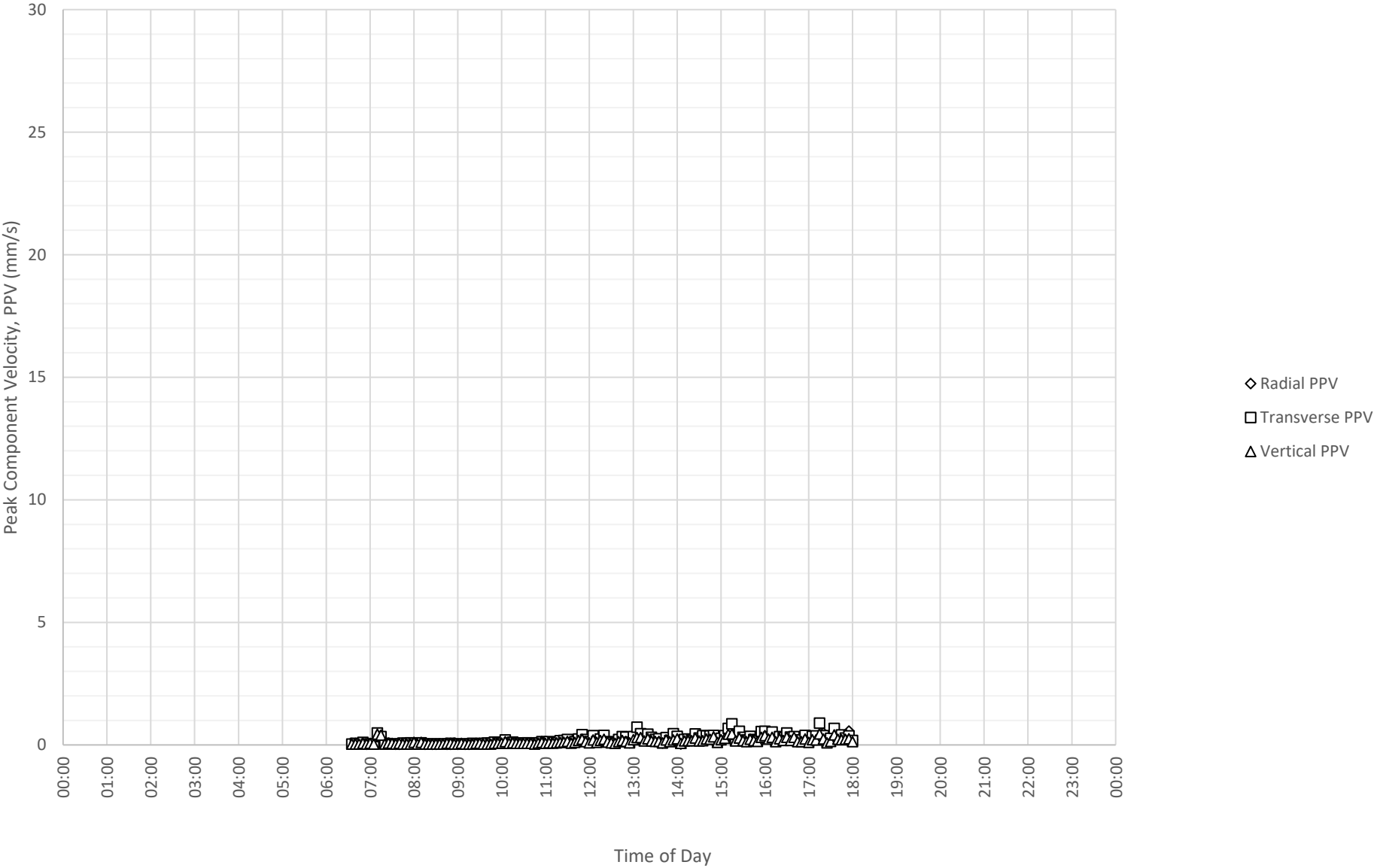
Daily Monitored Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on 28-02-2025



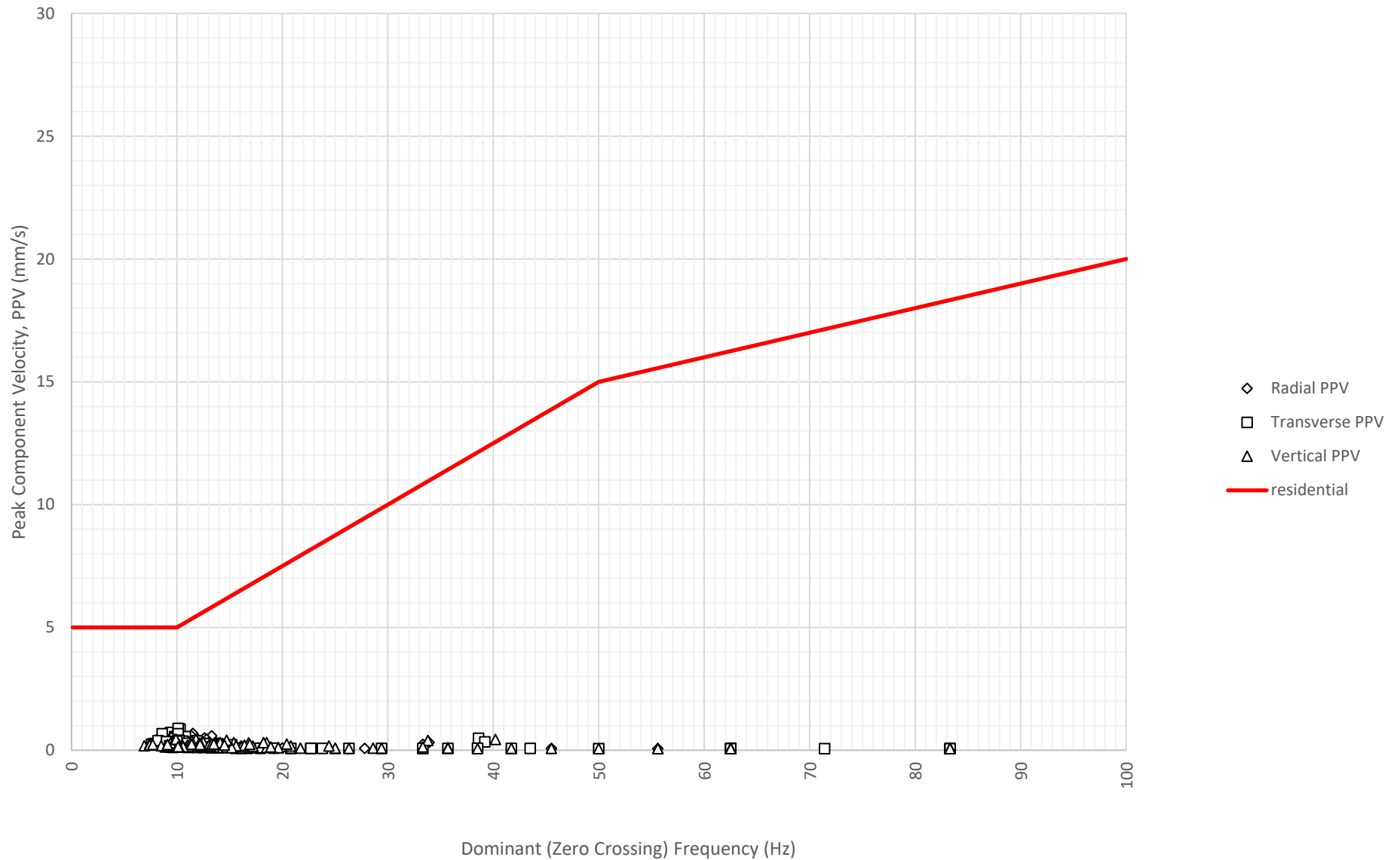
Frequency Content of Vibration Levels at East Boundary Opposite Shoalhaven Street (ETM7326) on
28-02-2025



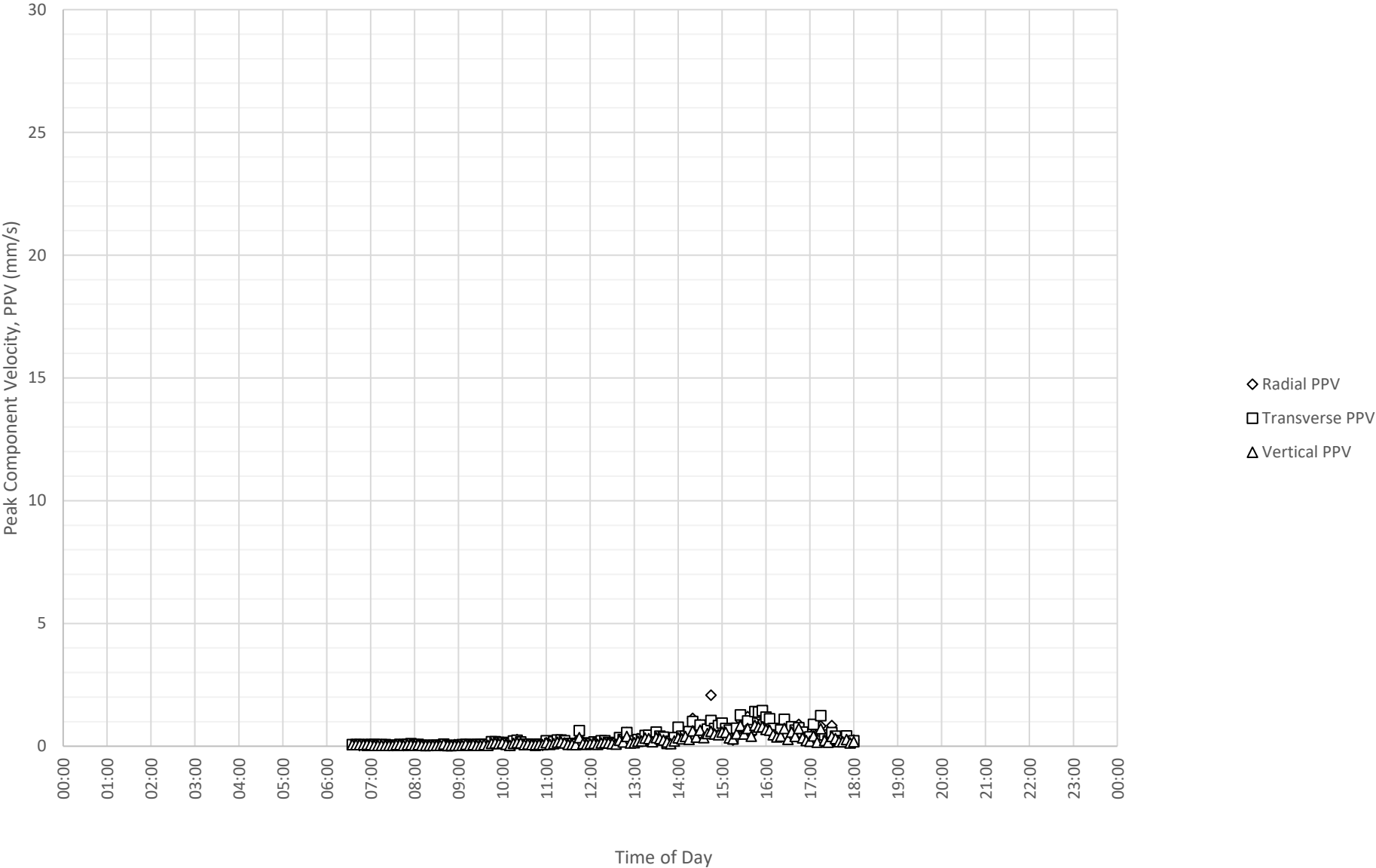
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 1-02-2025



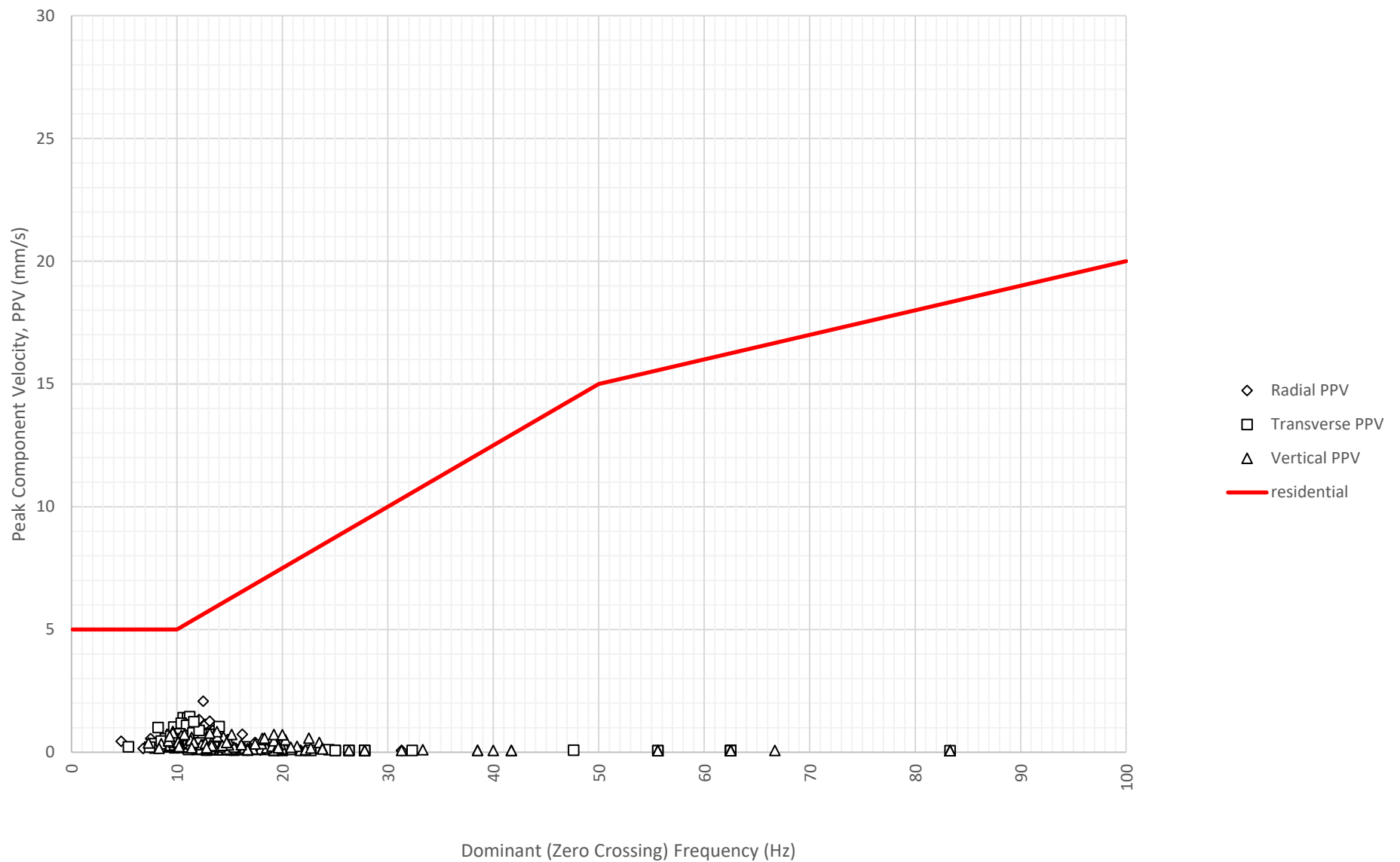
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 1-02-2025



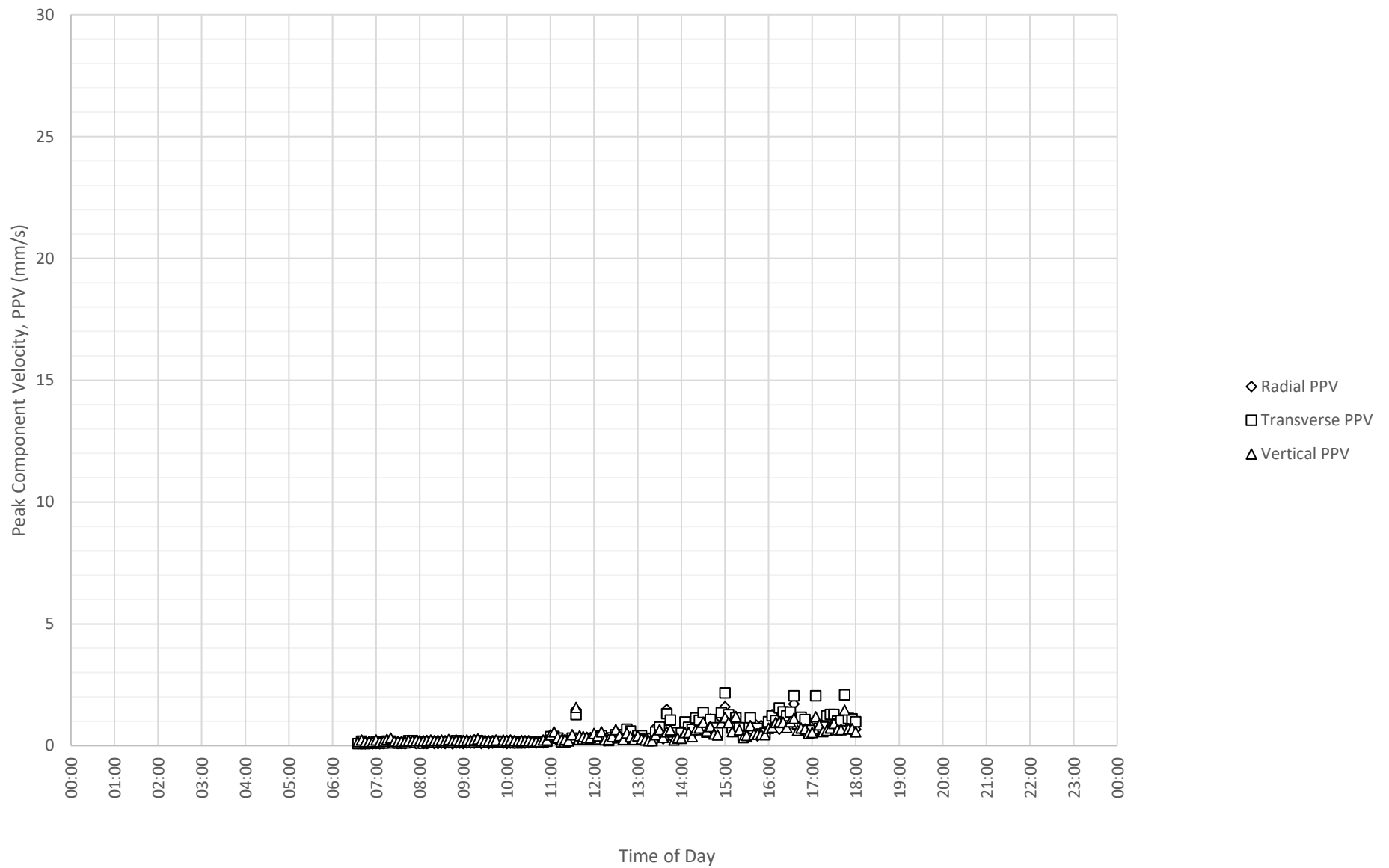
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 2-02-2025



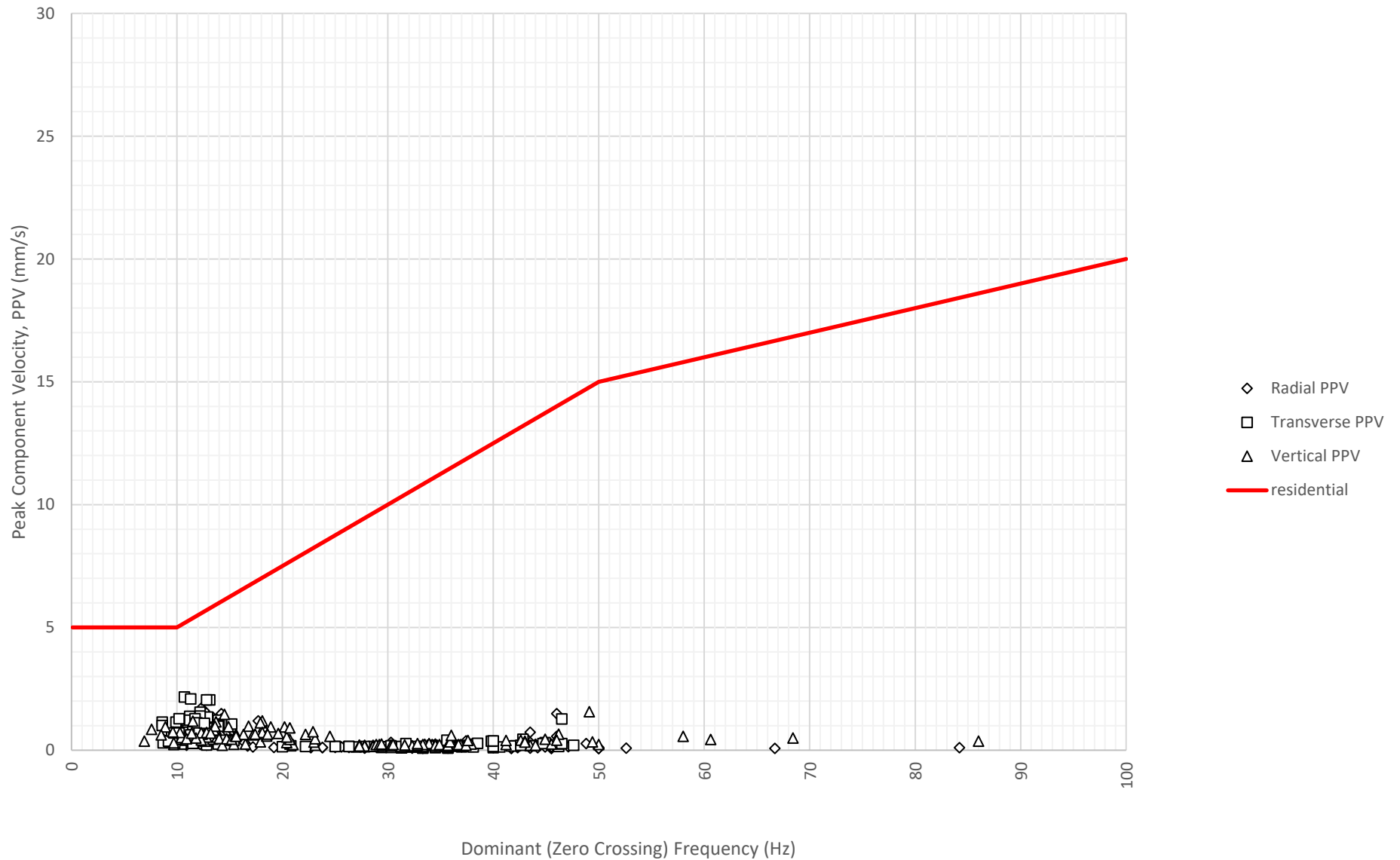
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 2-02-2025



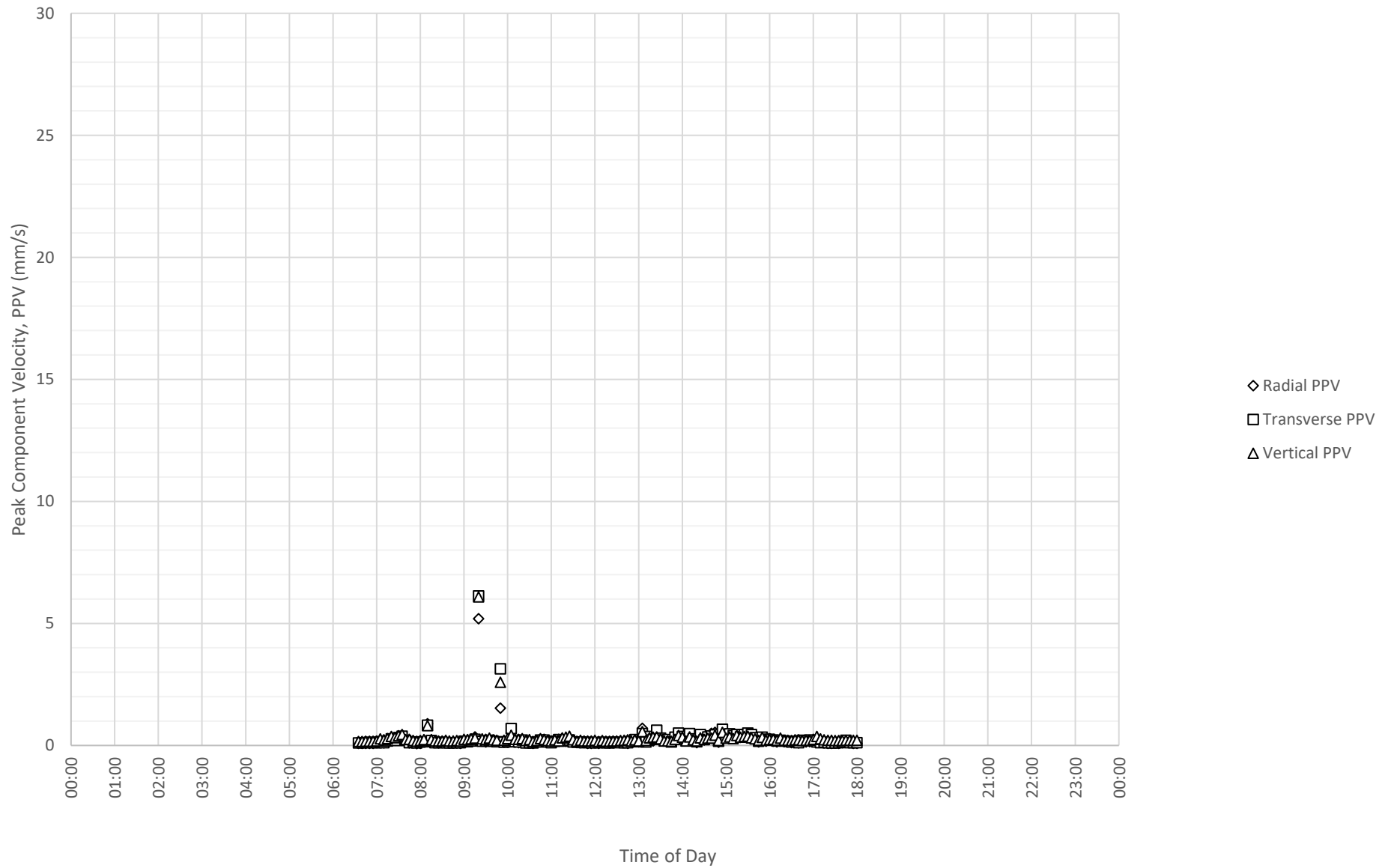
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 3-02-2025



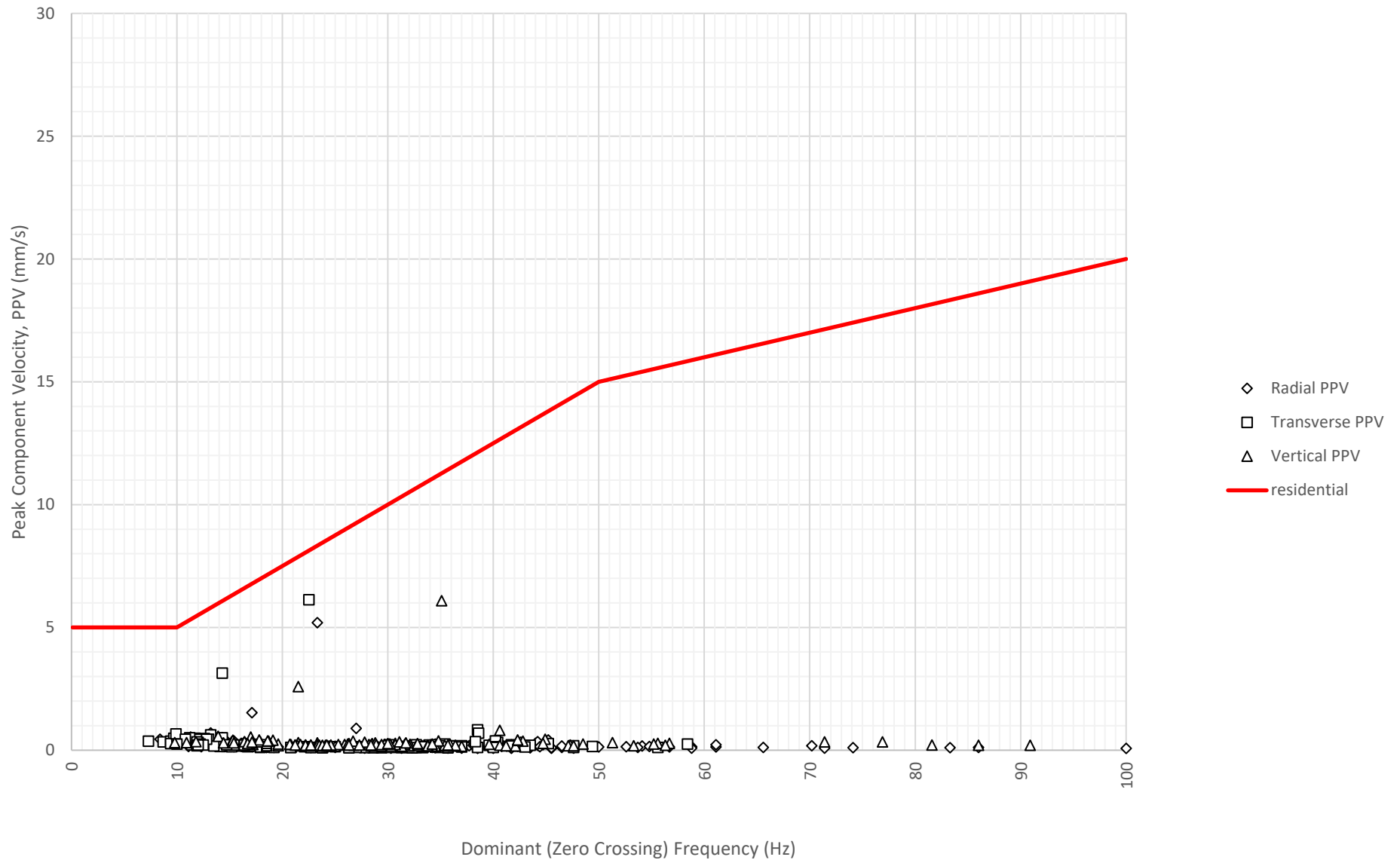
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 3-02-2025



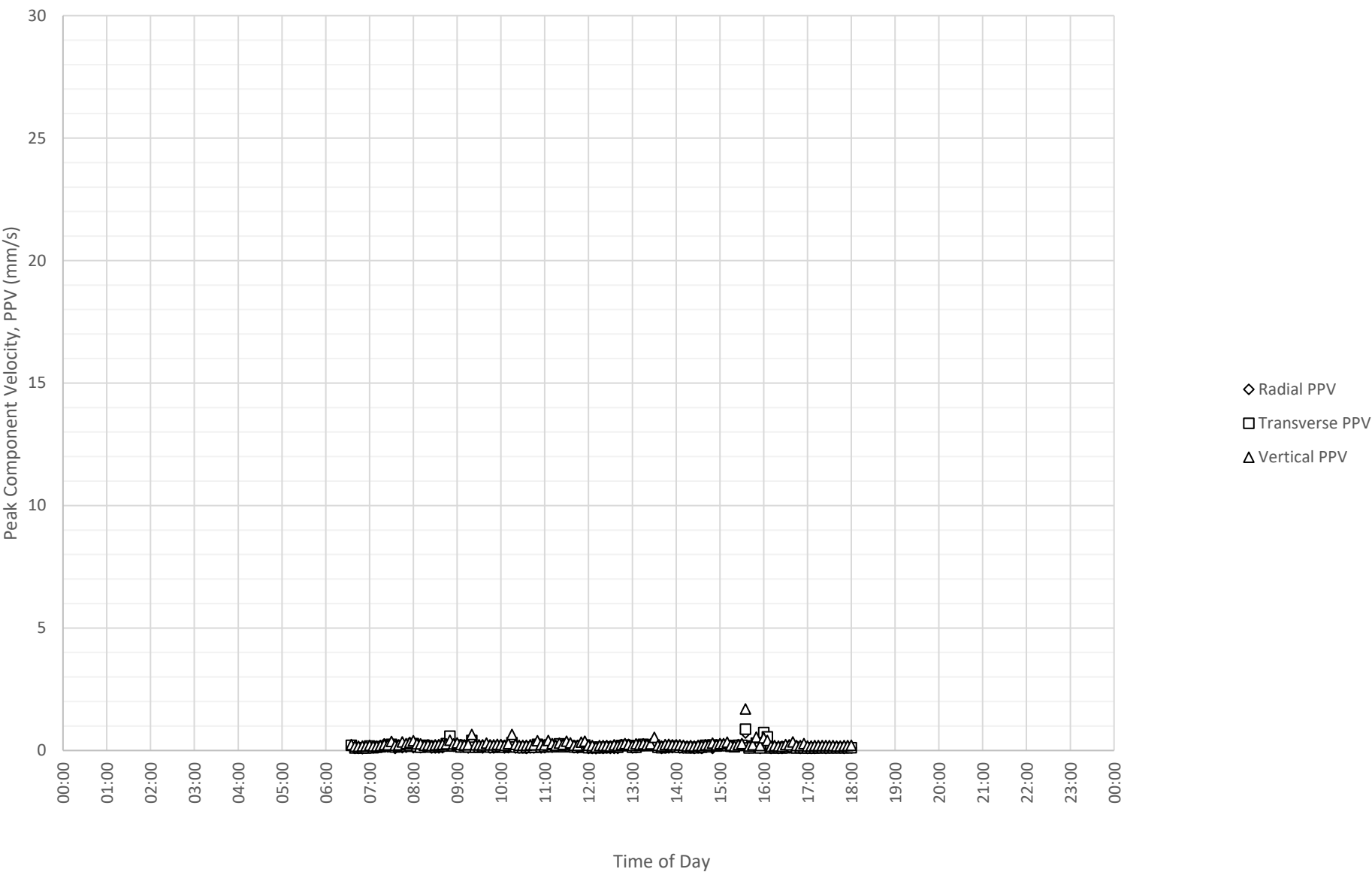
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 4-02-2025



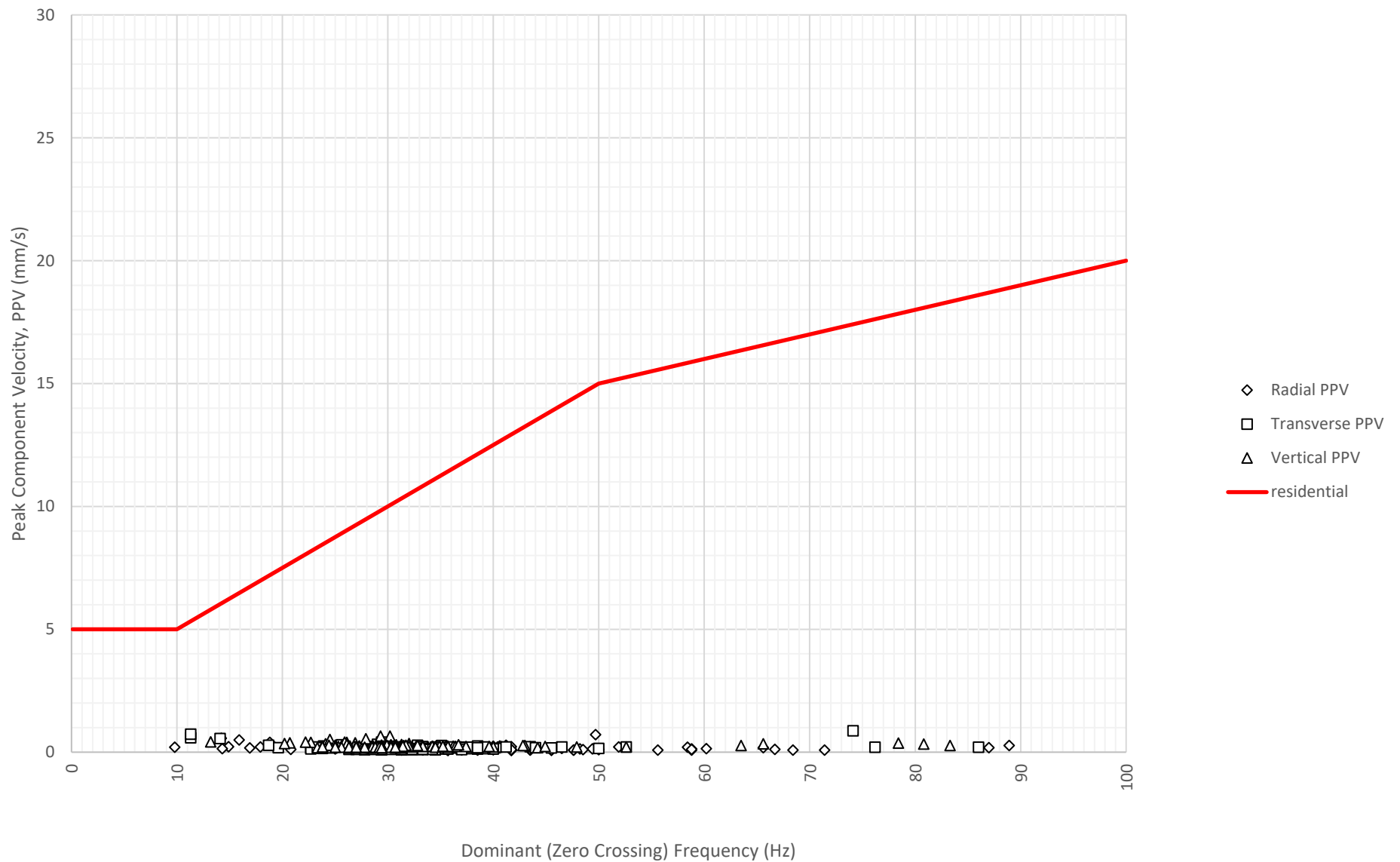
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 4-02-2025



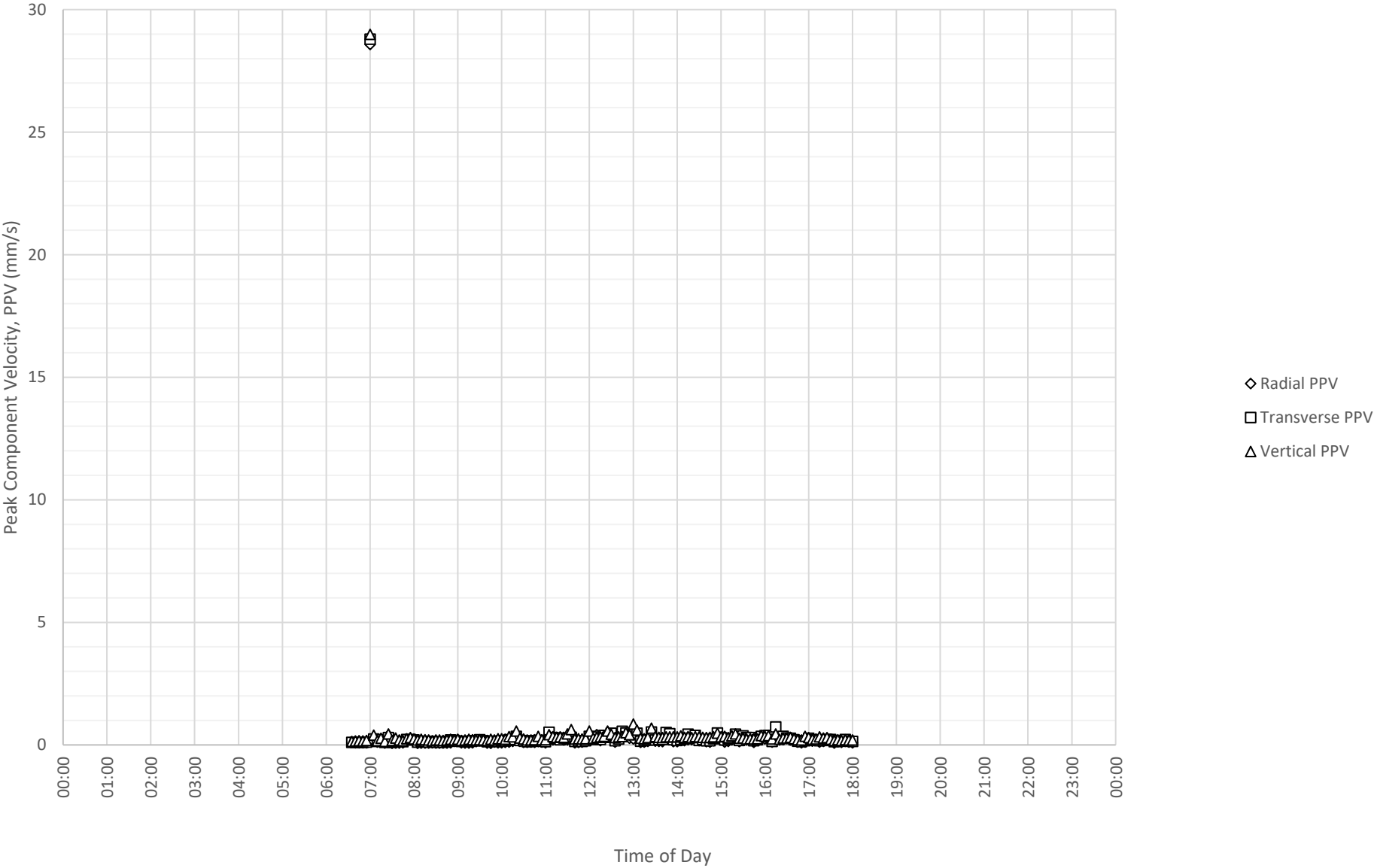
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 5-02-2025



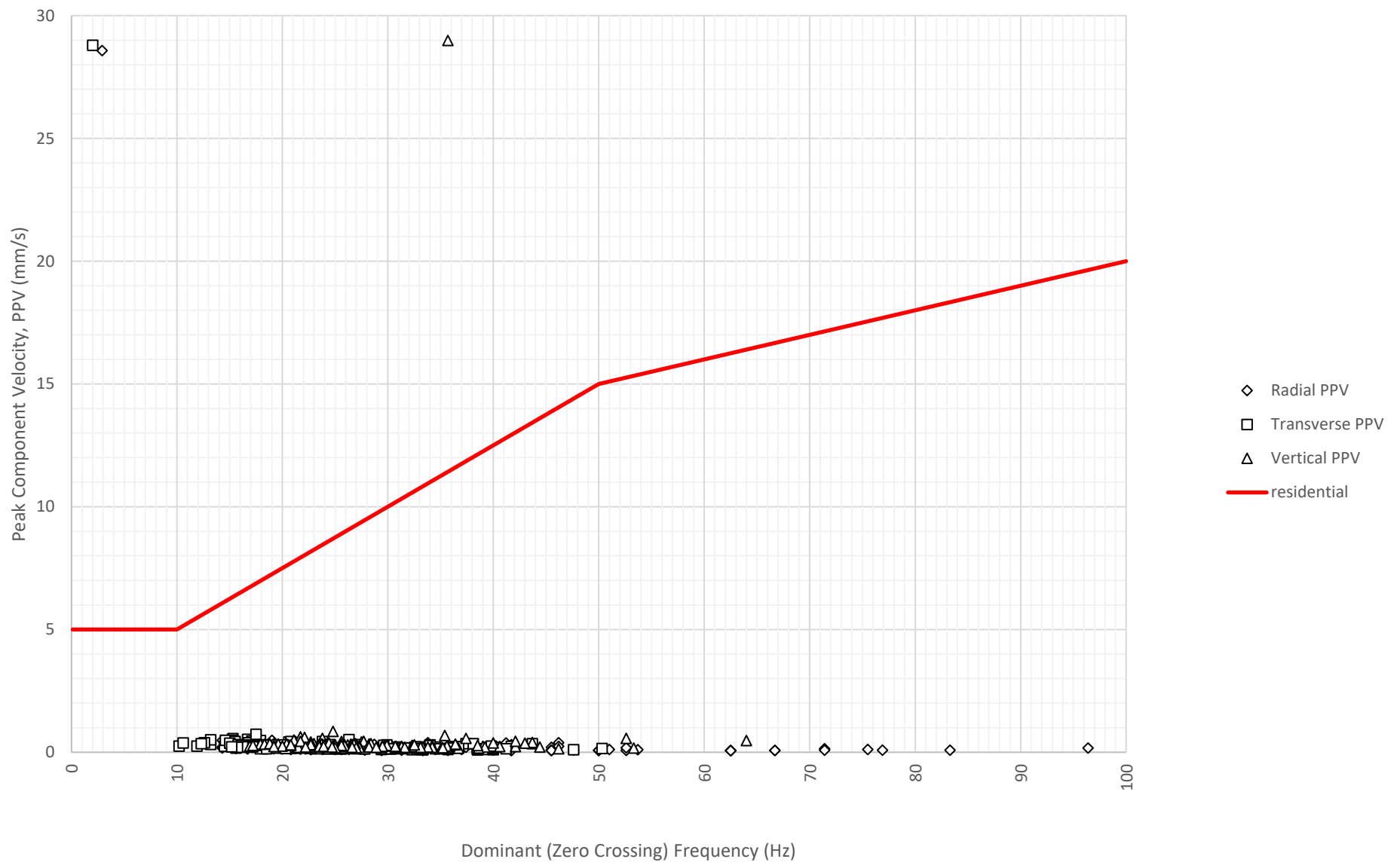
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 5-02-2025



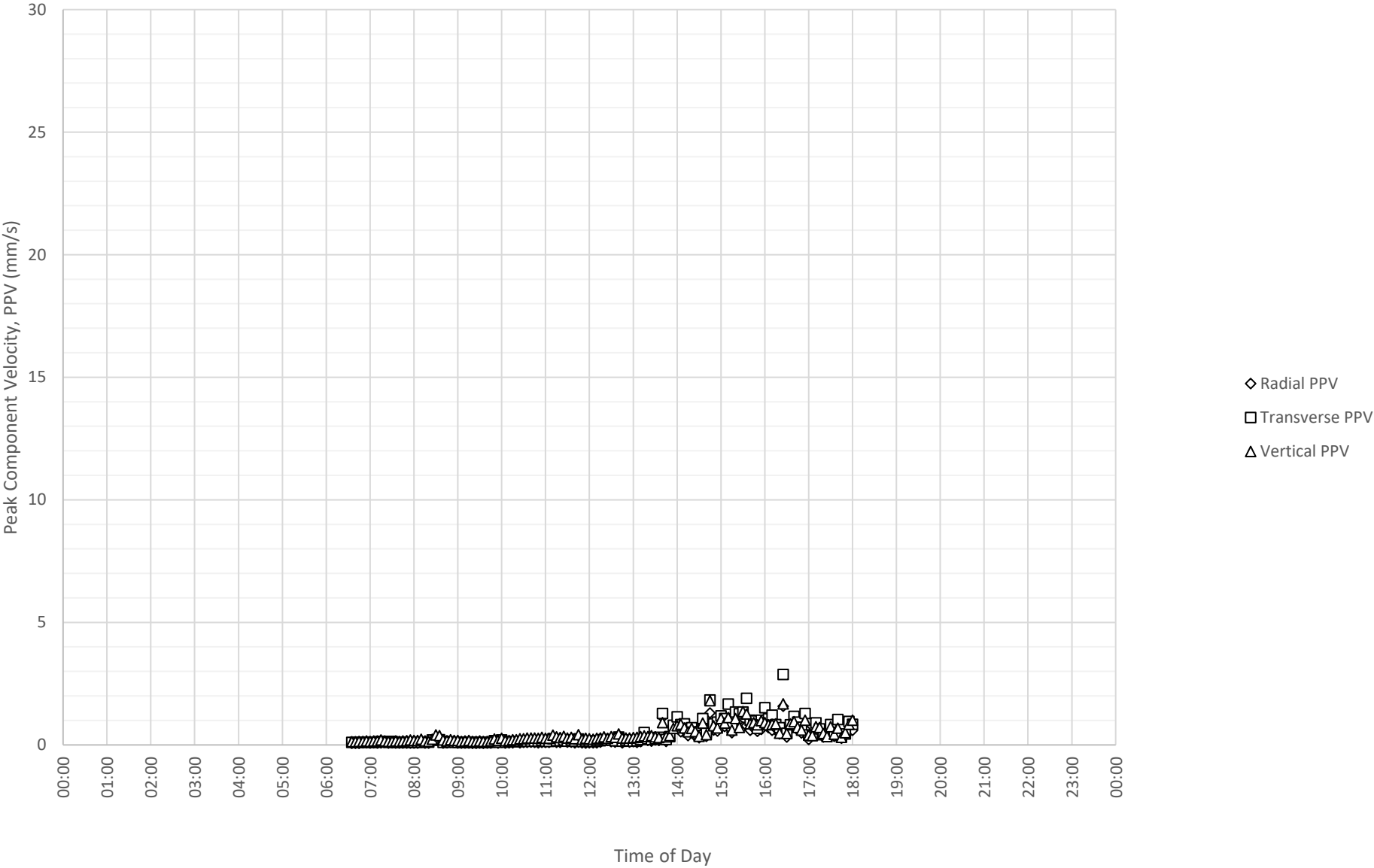
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 6-02-2025



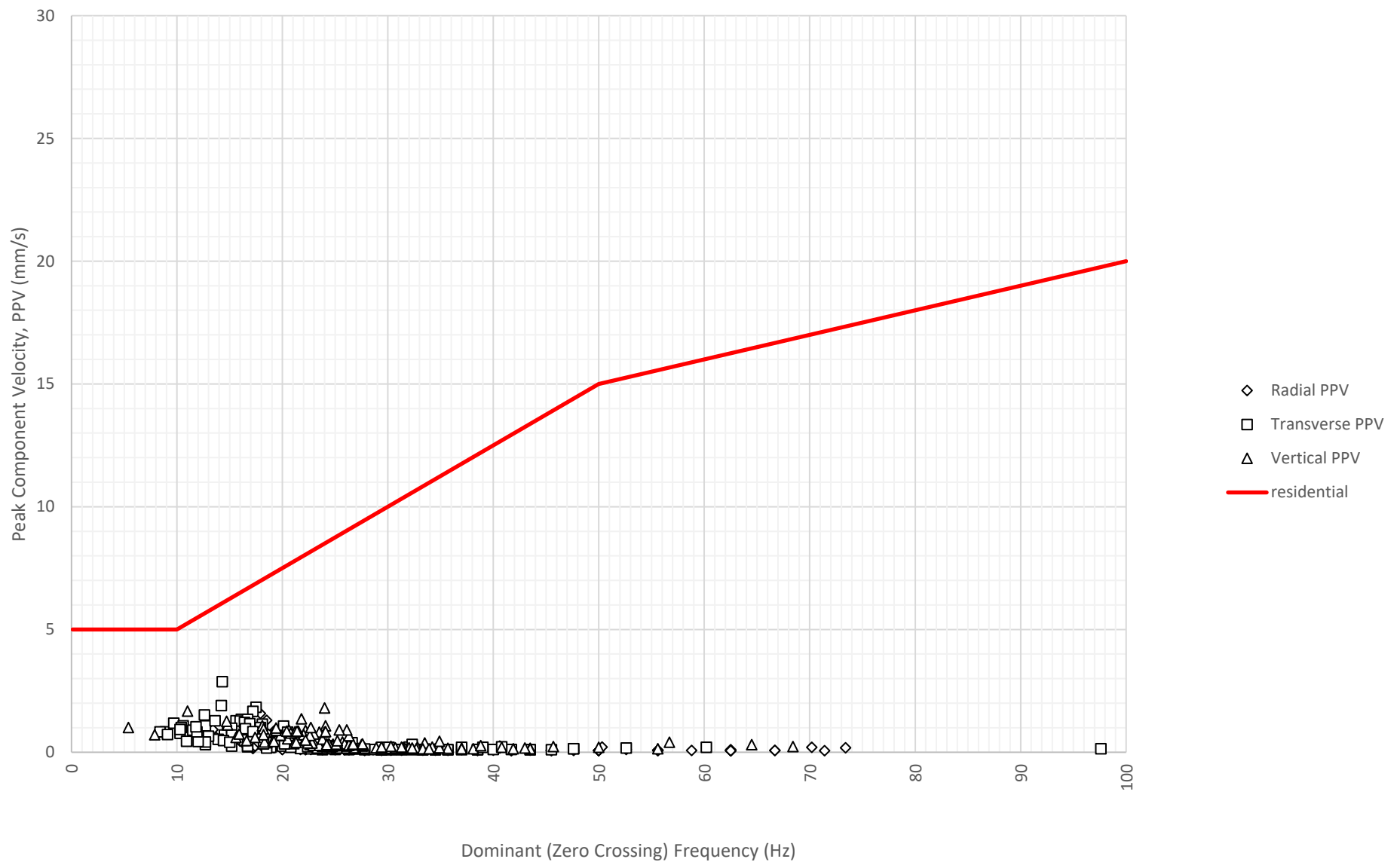
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 6-02-2025



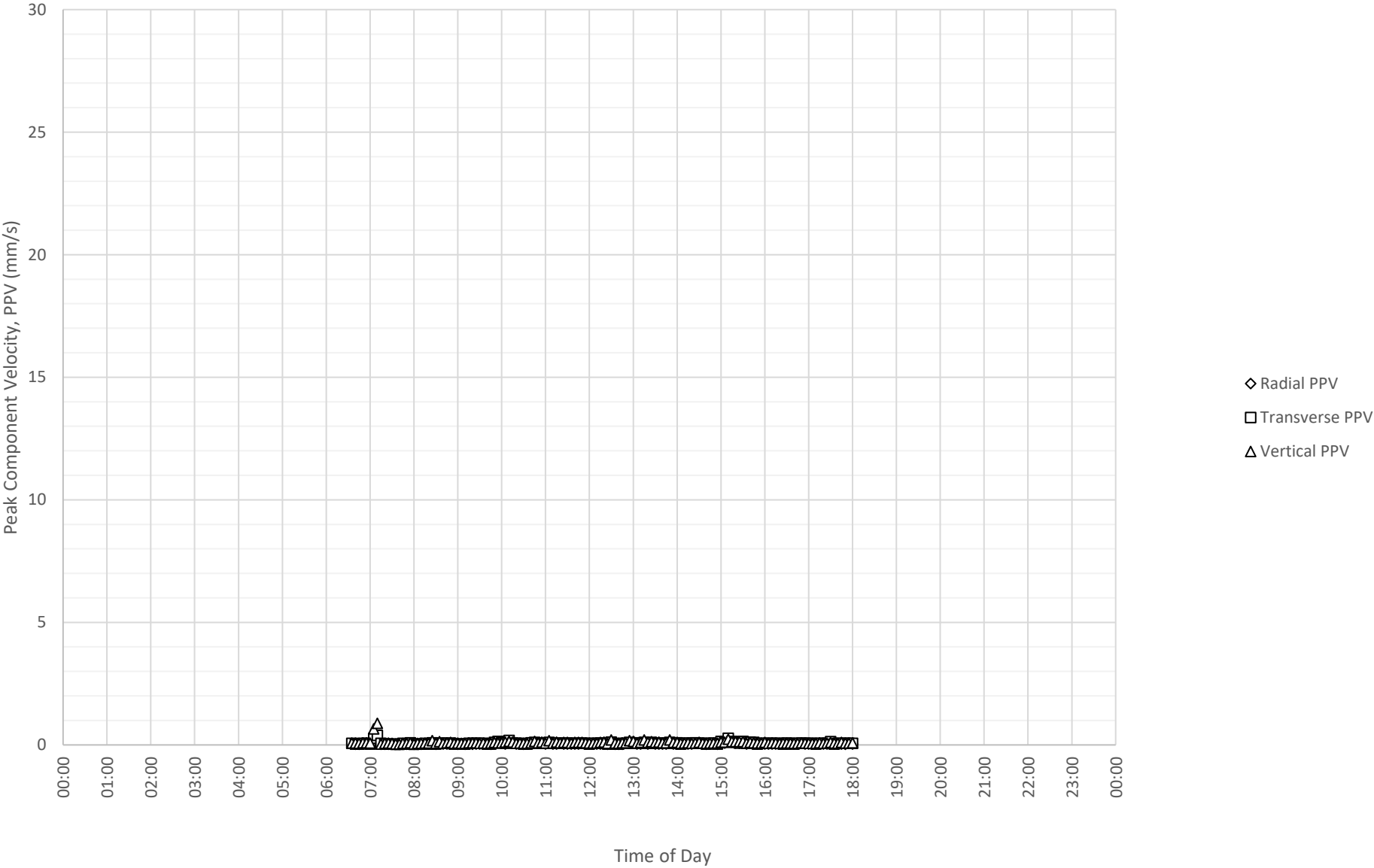
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 7-02-2025



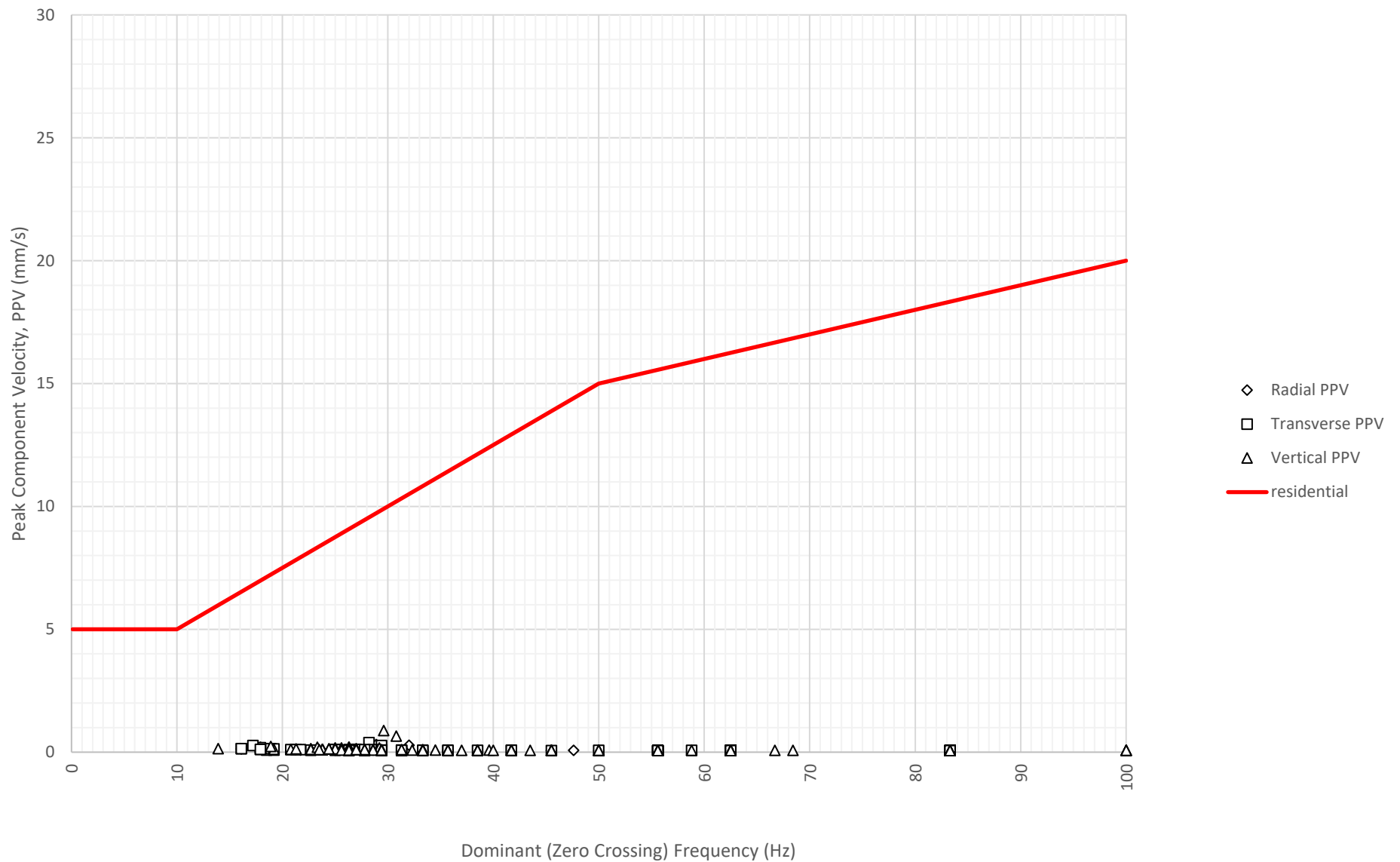
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 7-02-2025



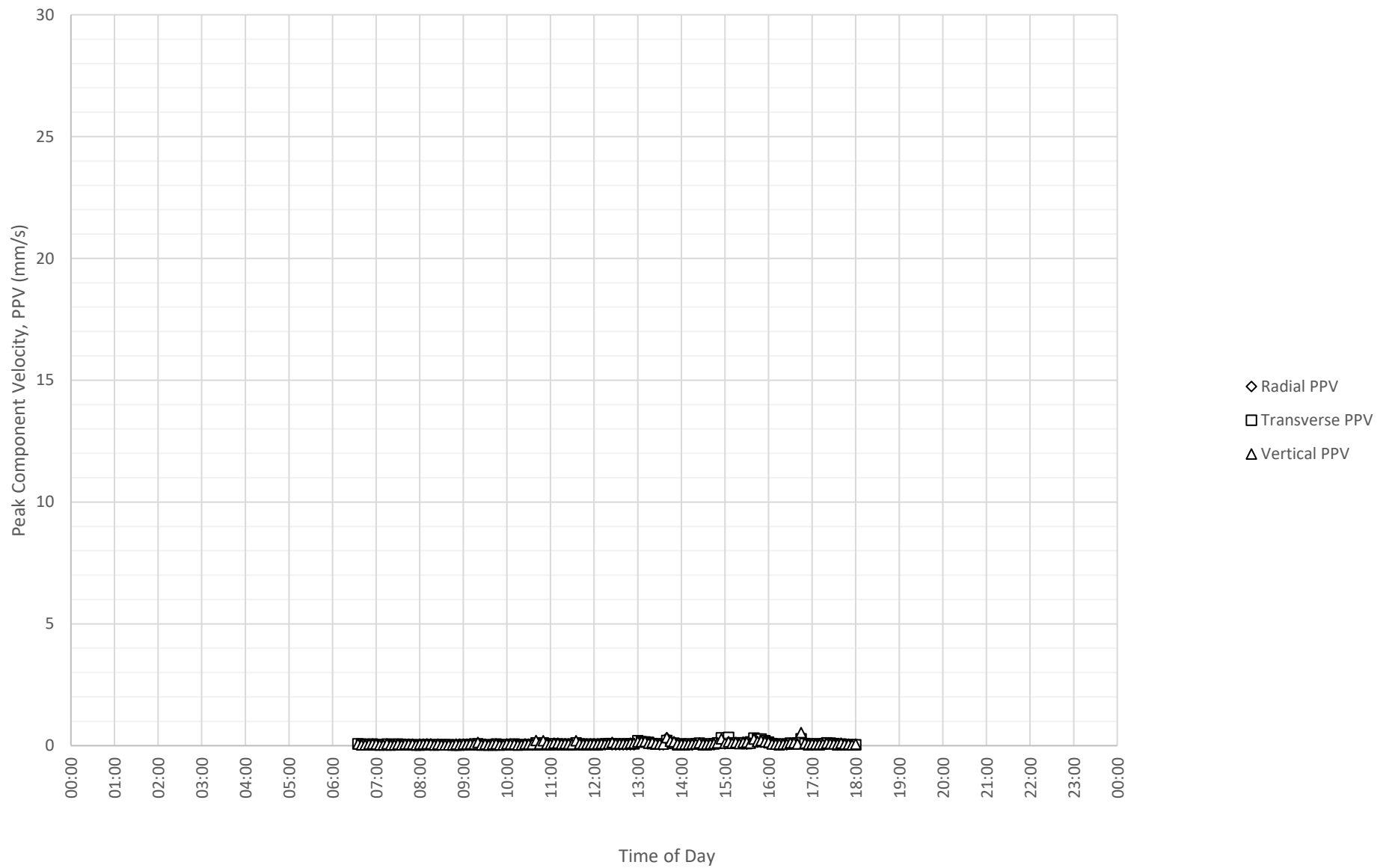
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 8-02-2025



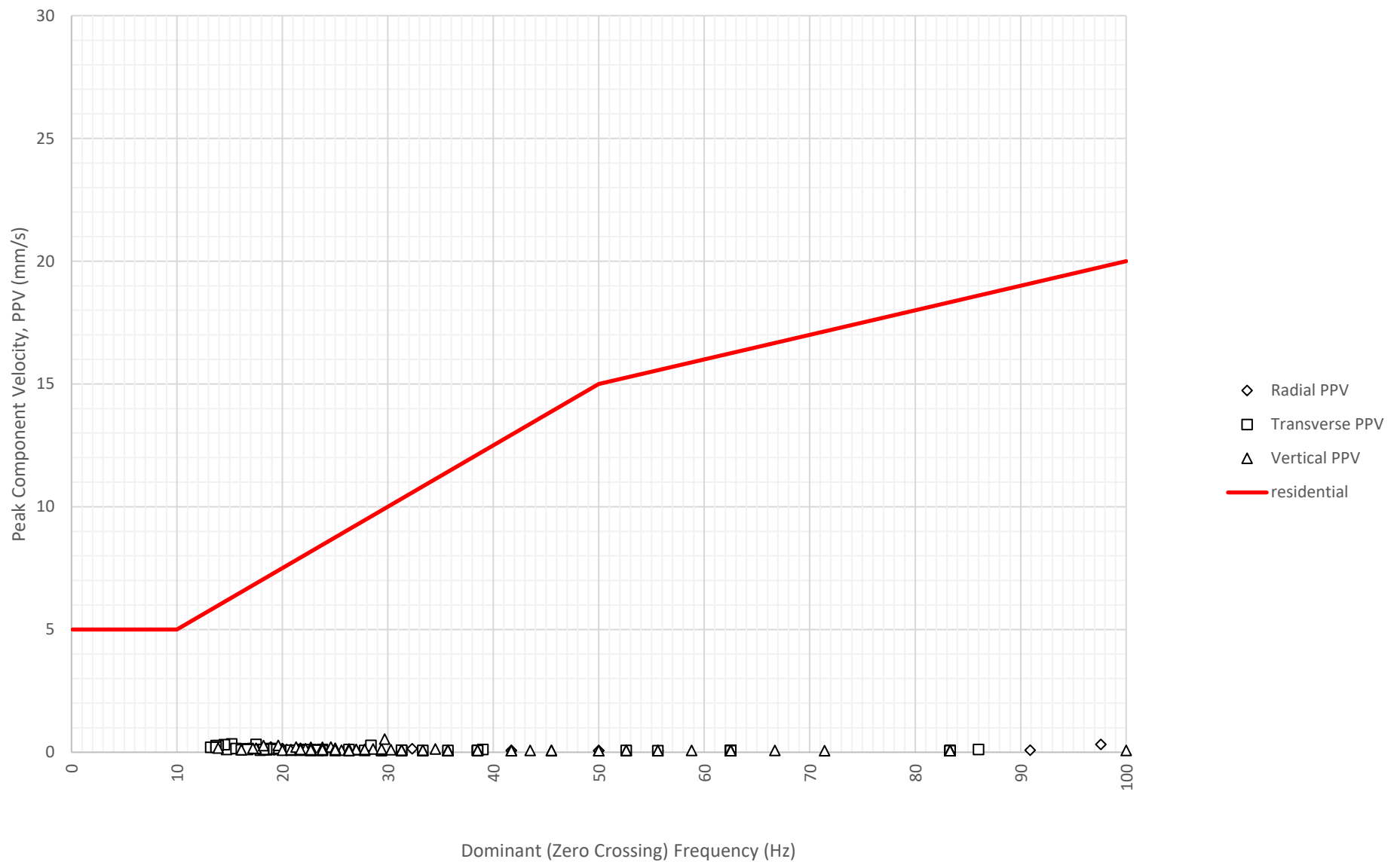
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 8-02-2025



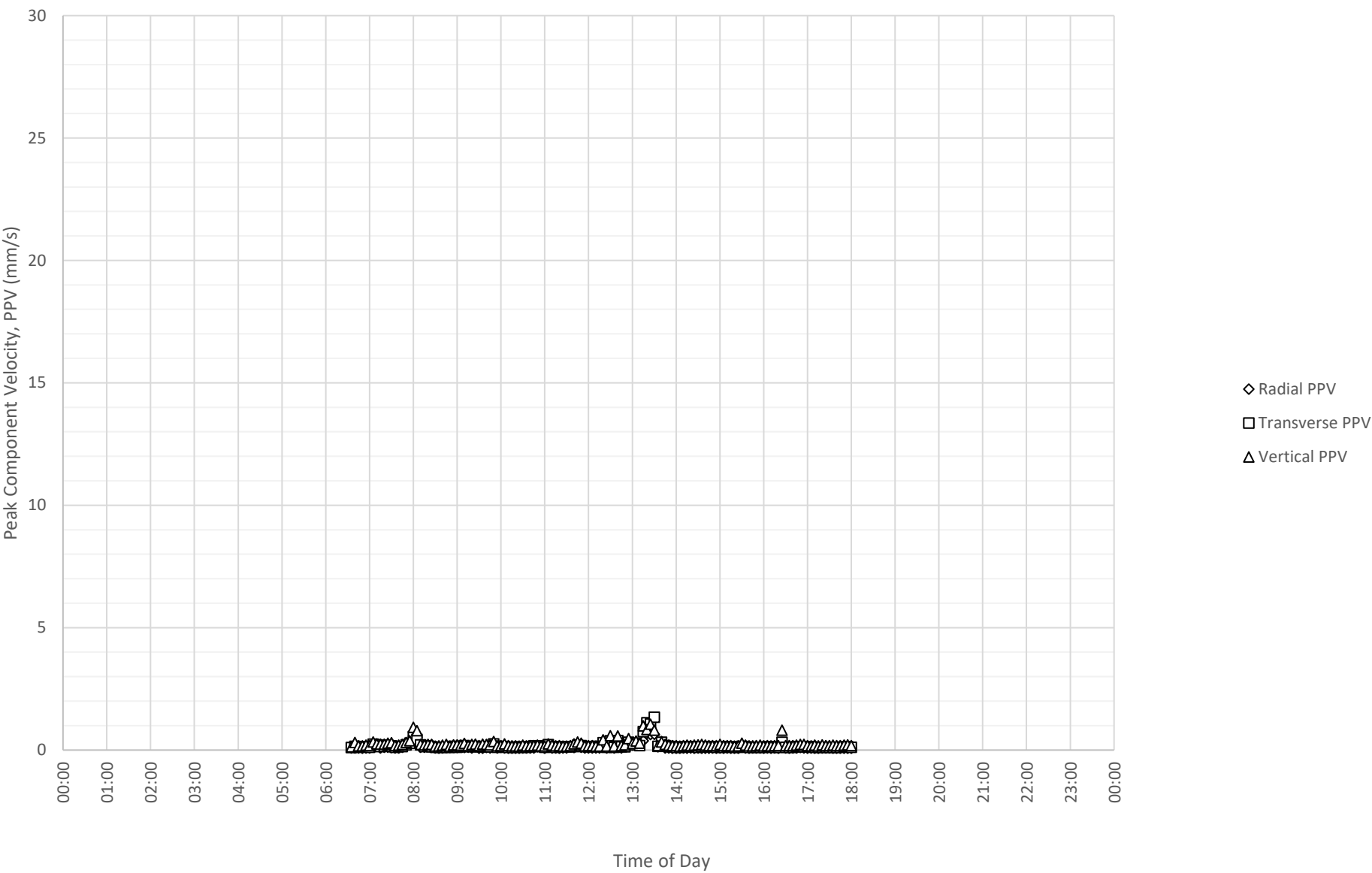
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 9-02-2025



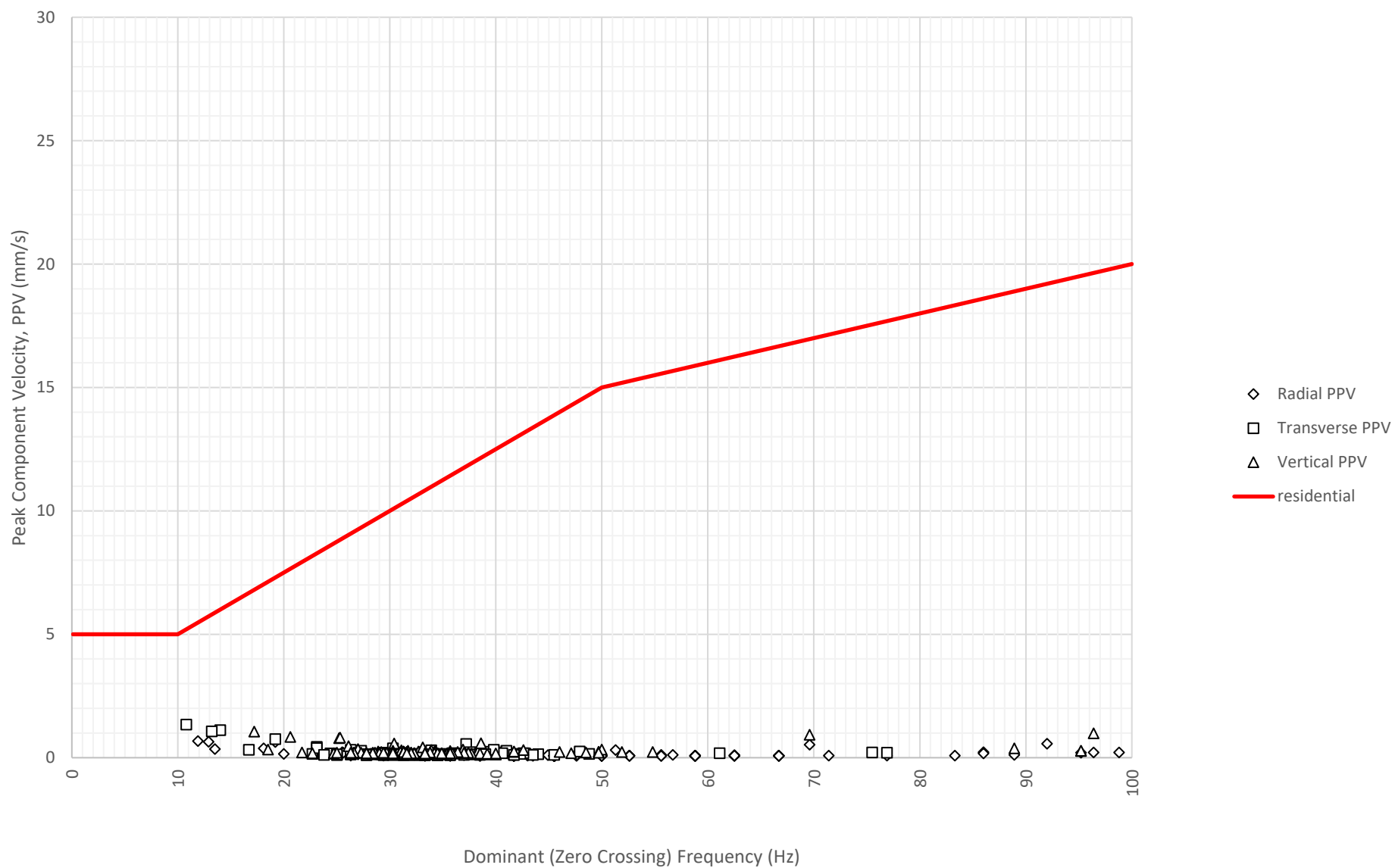
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 9-02-2025



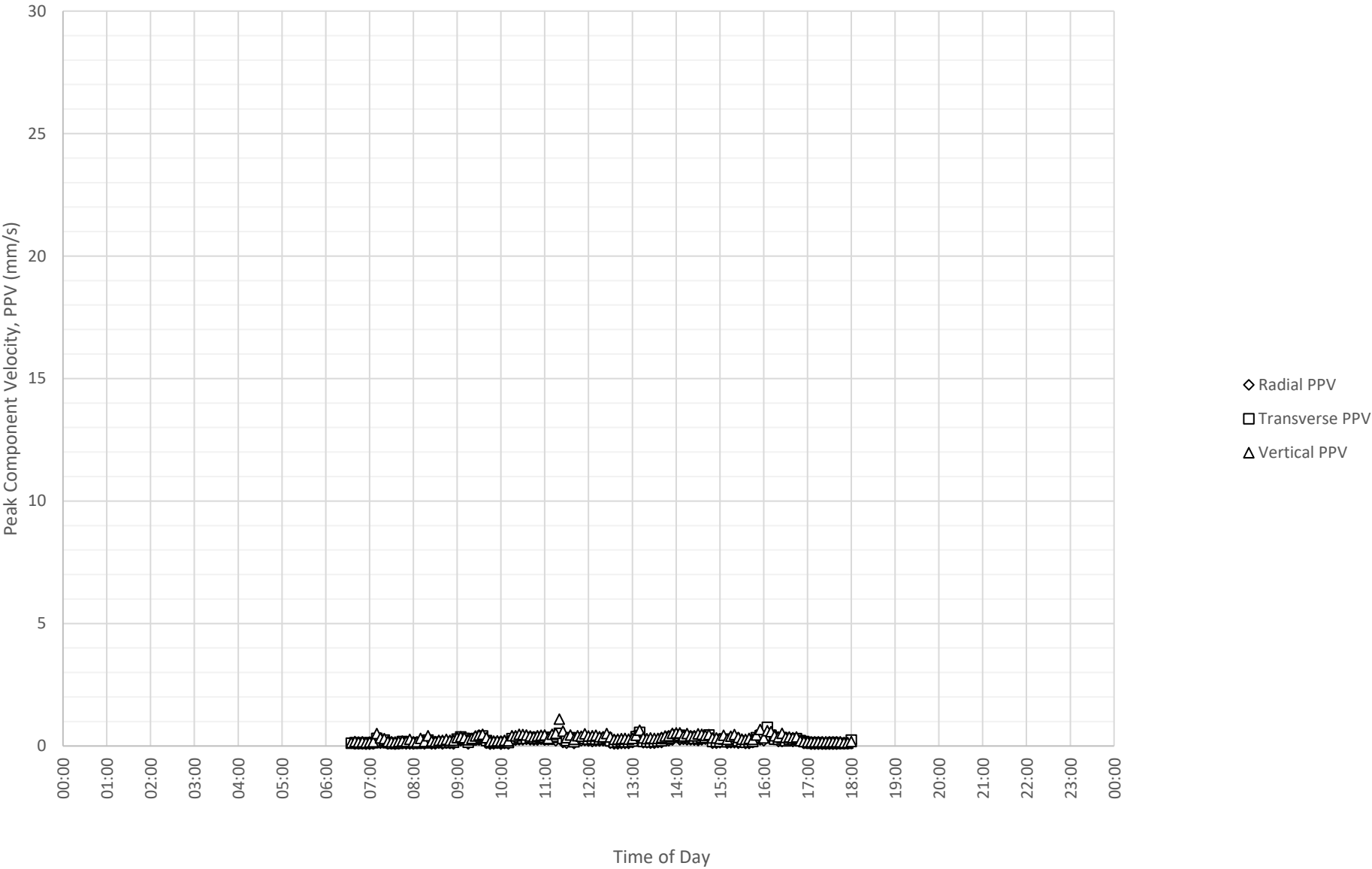
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 10-02-2025



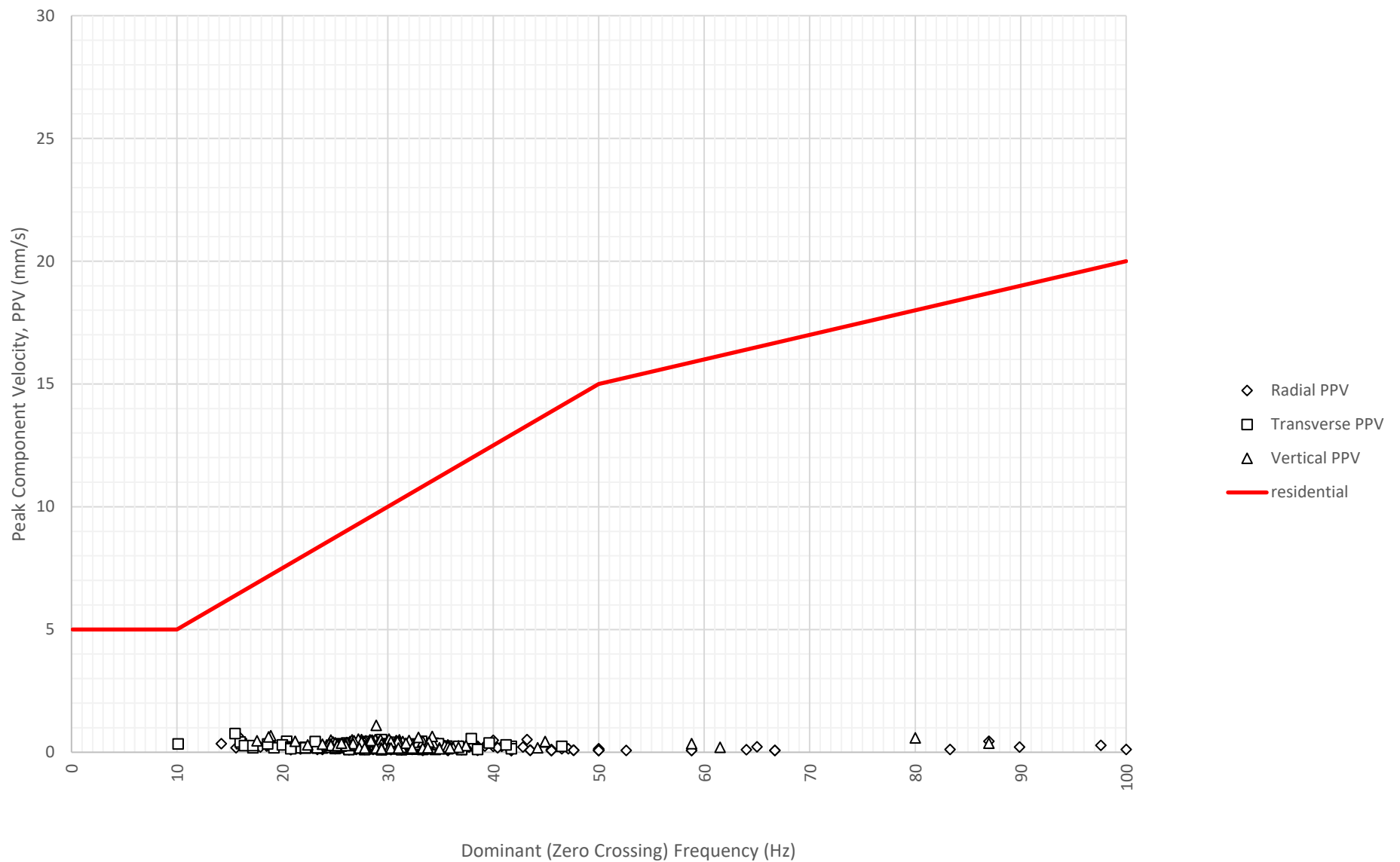
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 10-02-2025



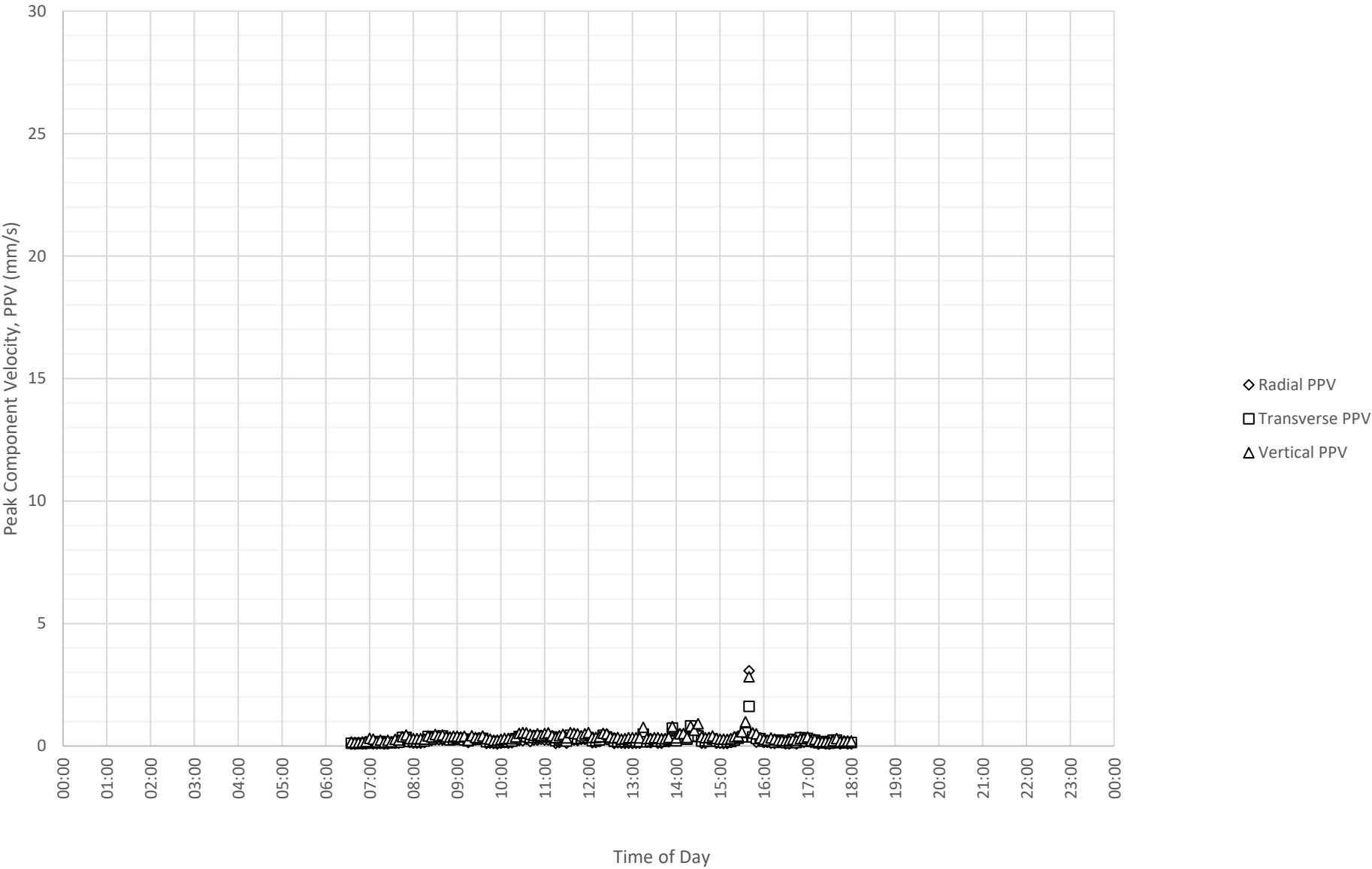
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 11-02-2025



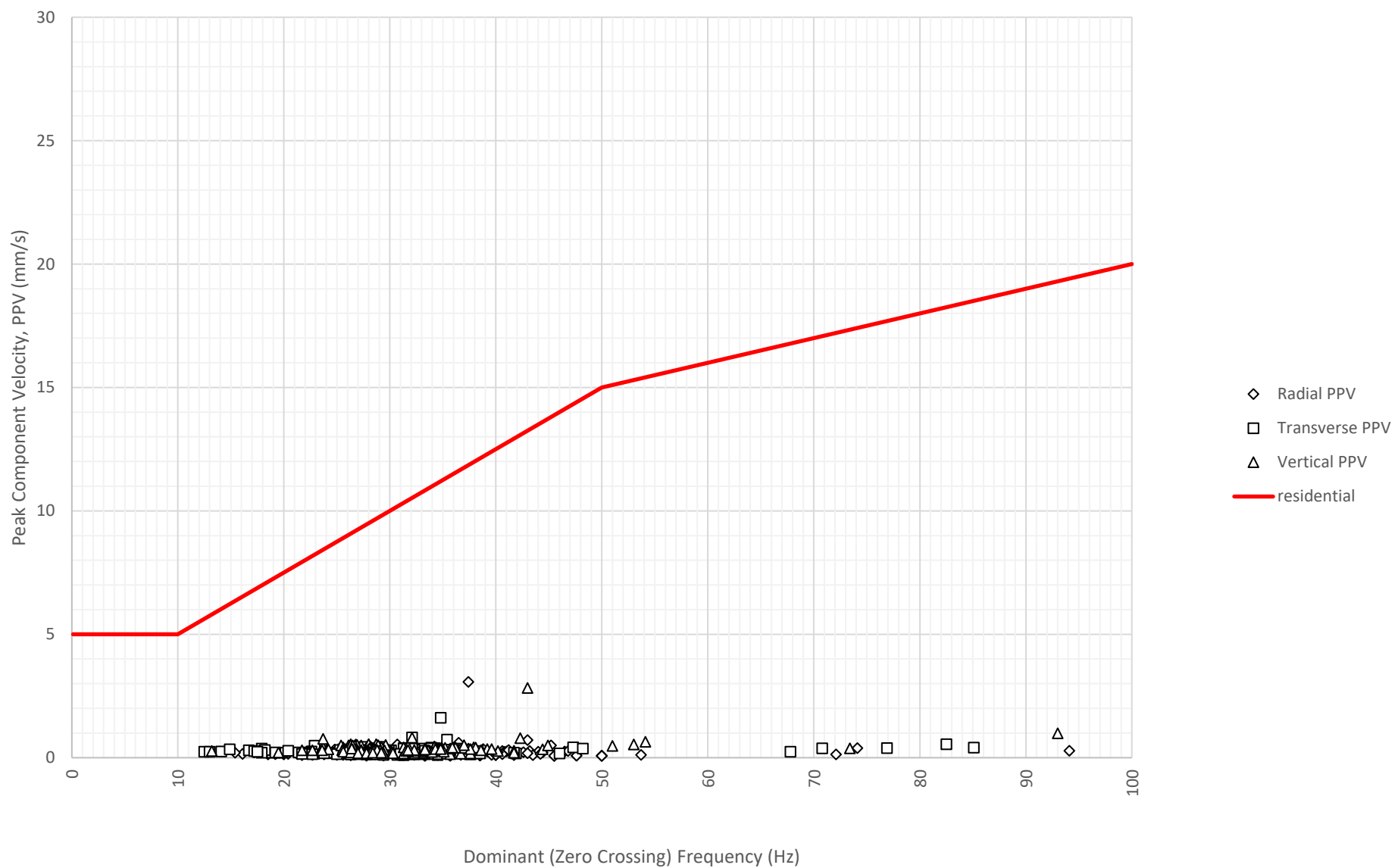
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 11-02-2025



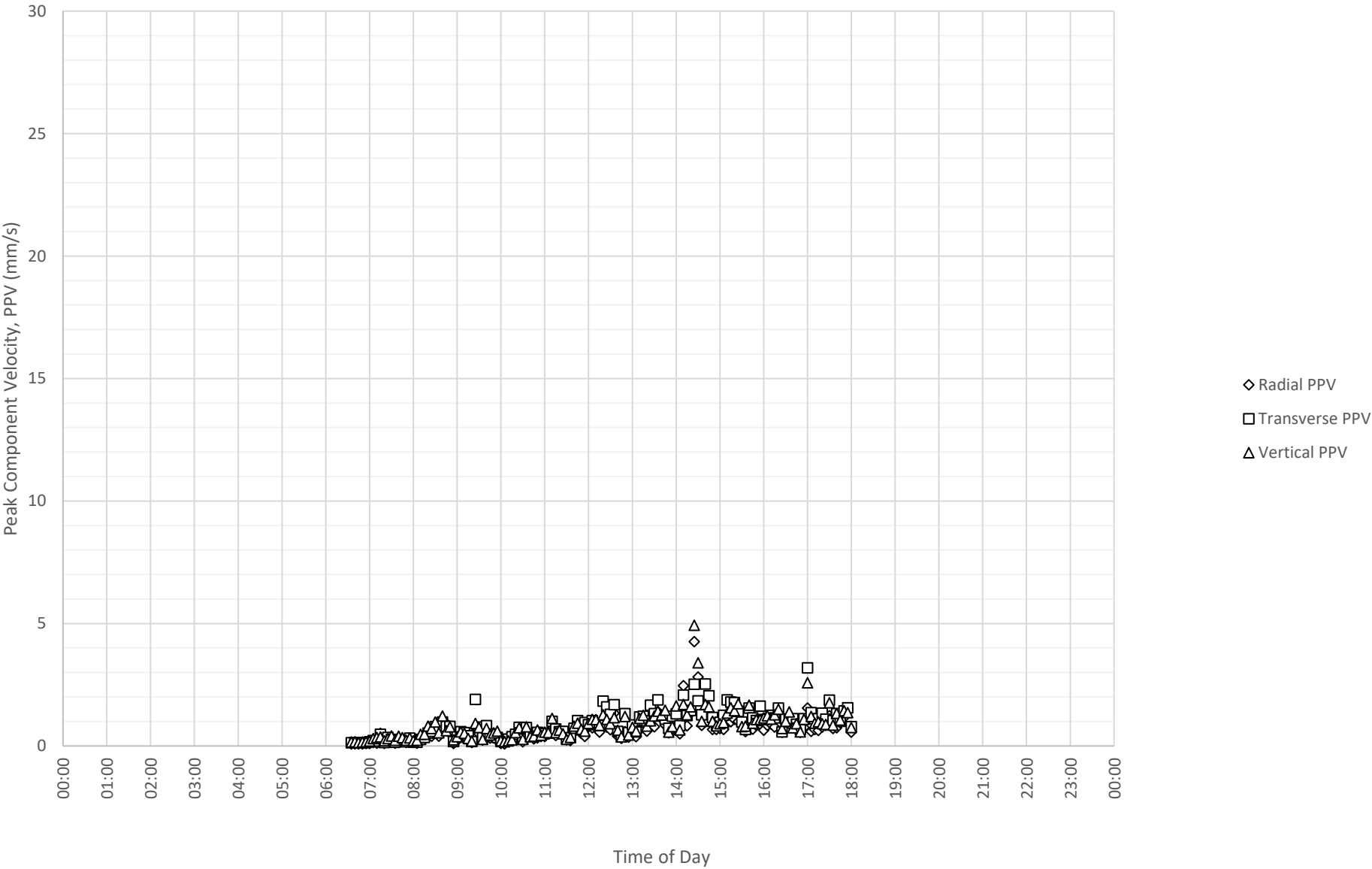
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 12-02-2025



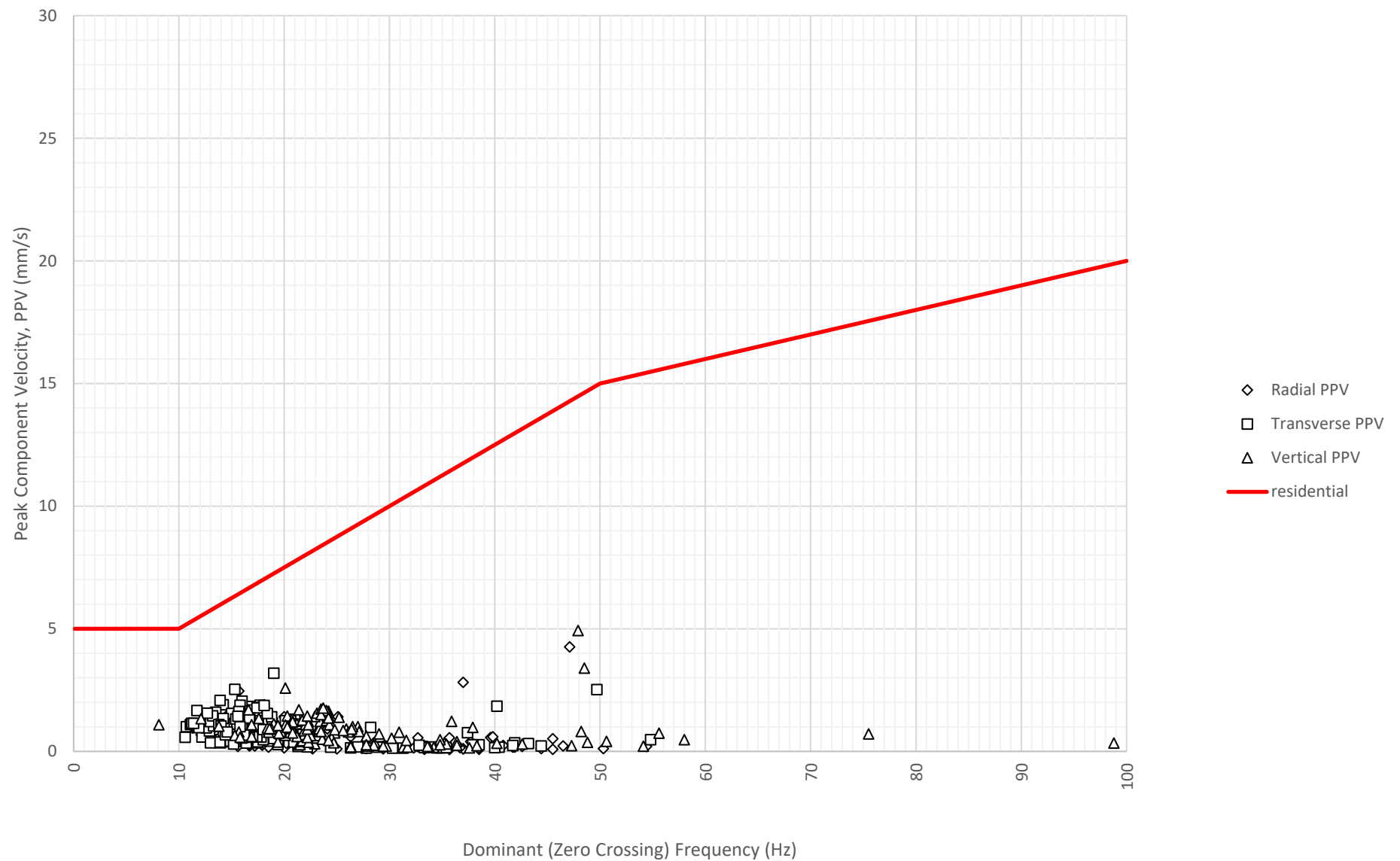
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 12-02-2025



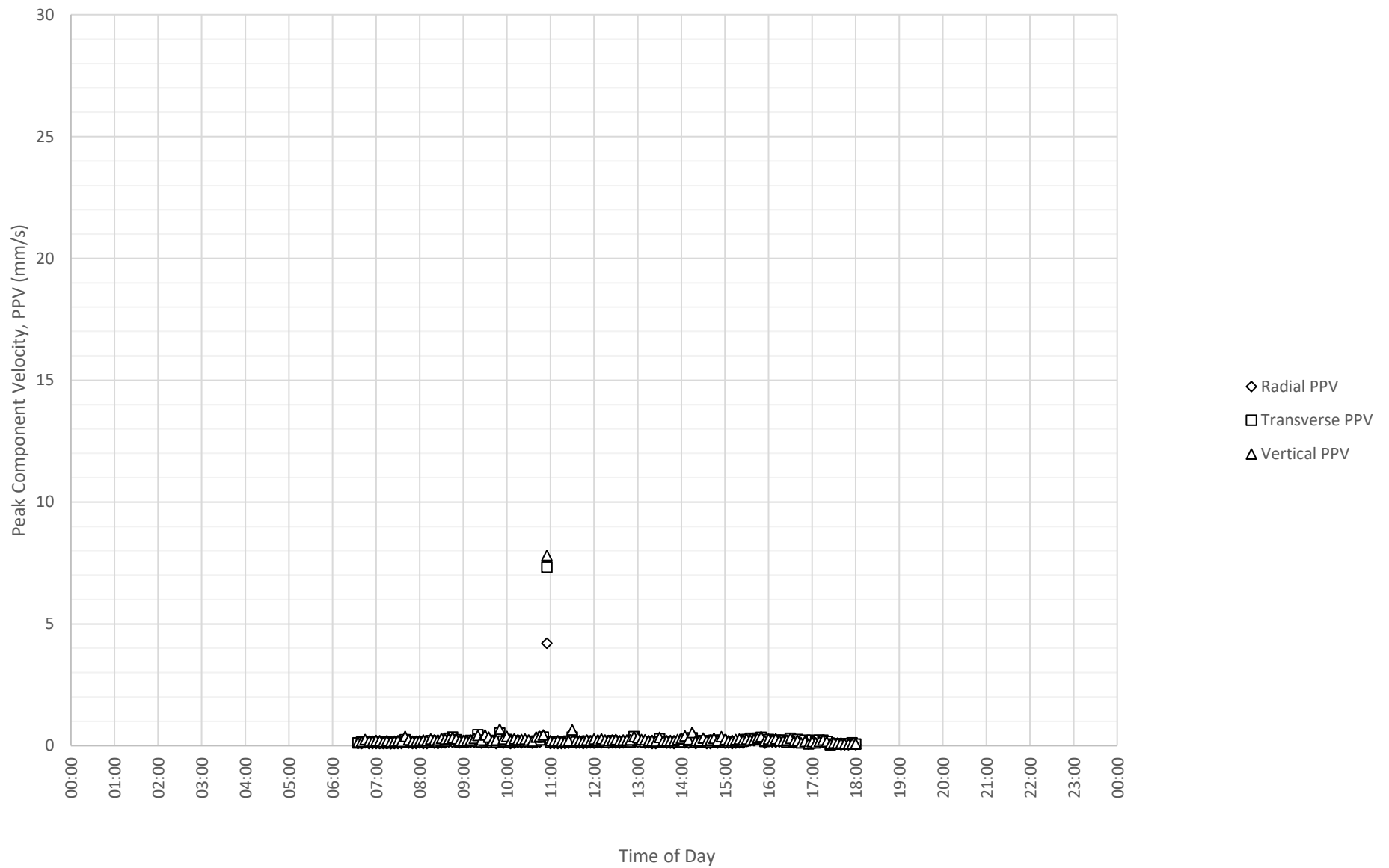
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 13-02-2025



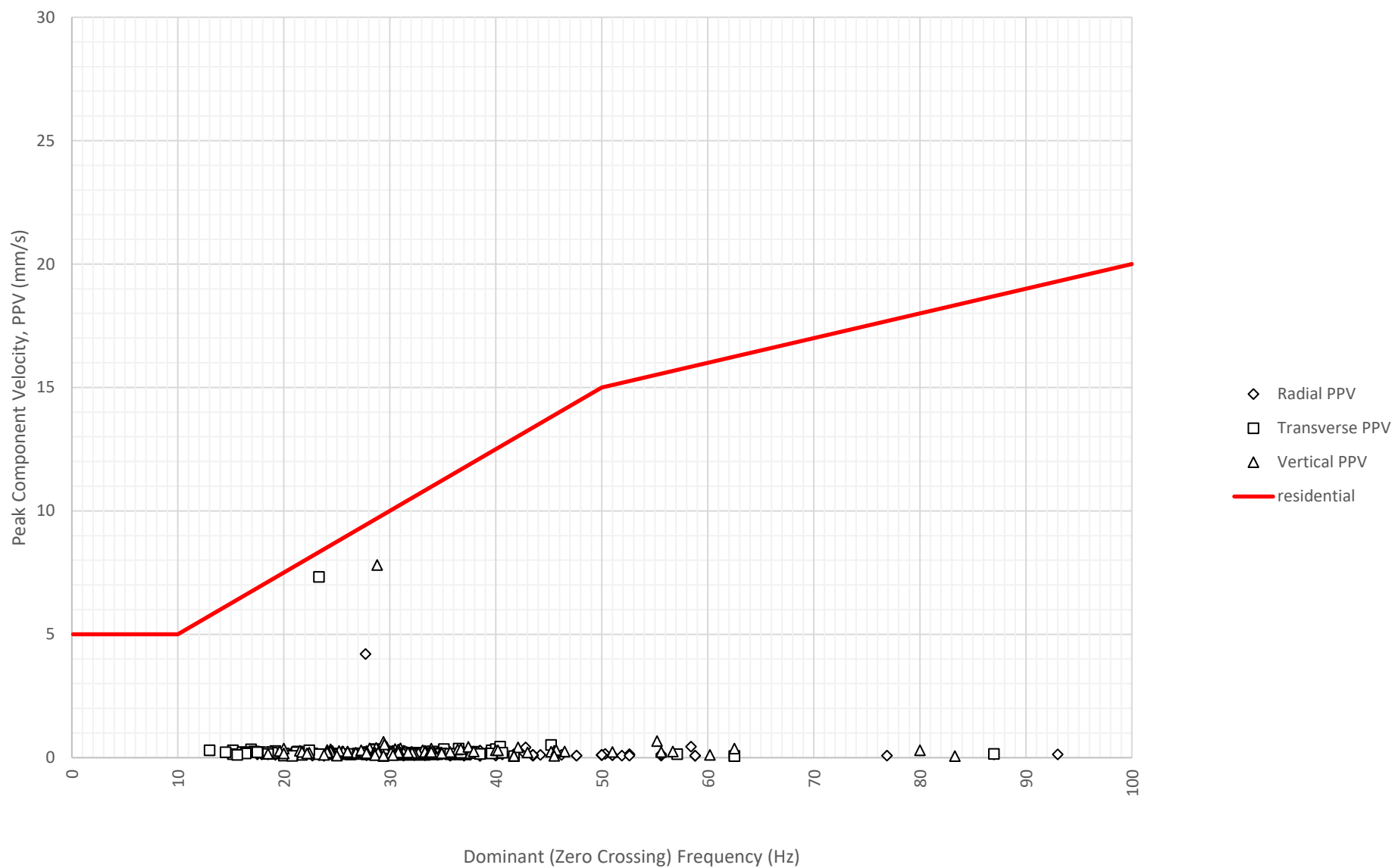
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 13-02-2025



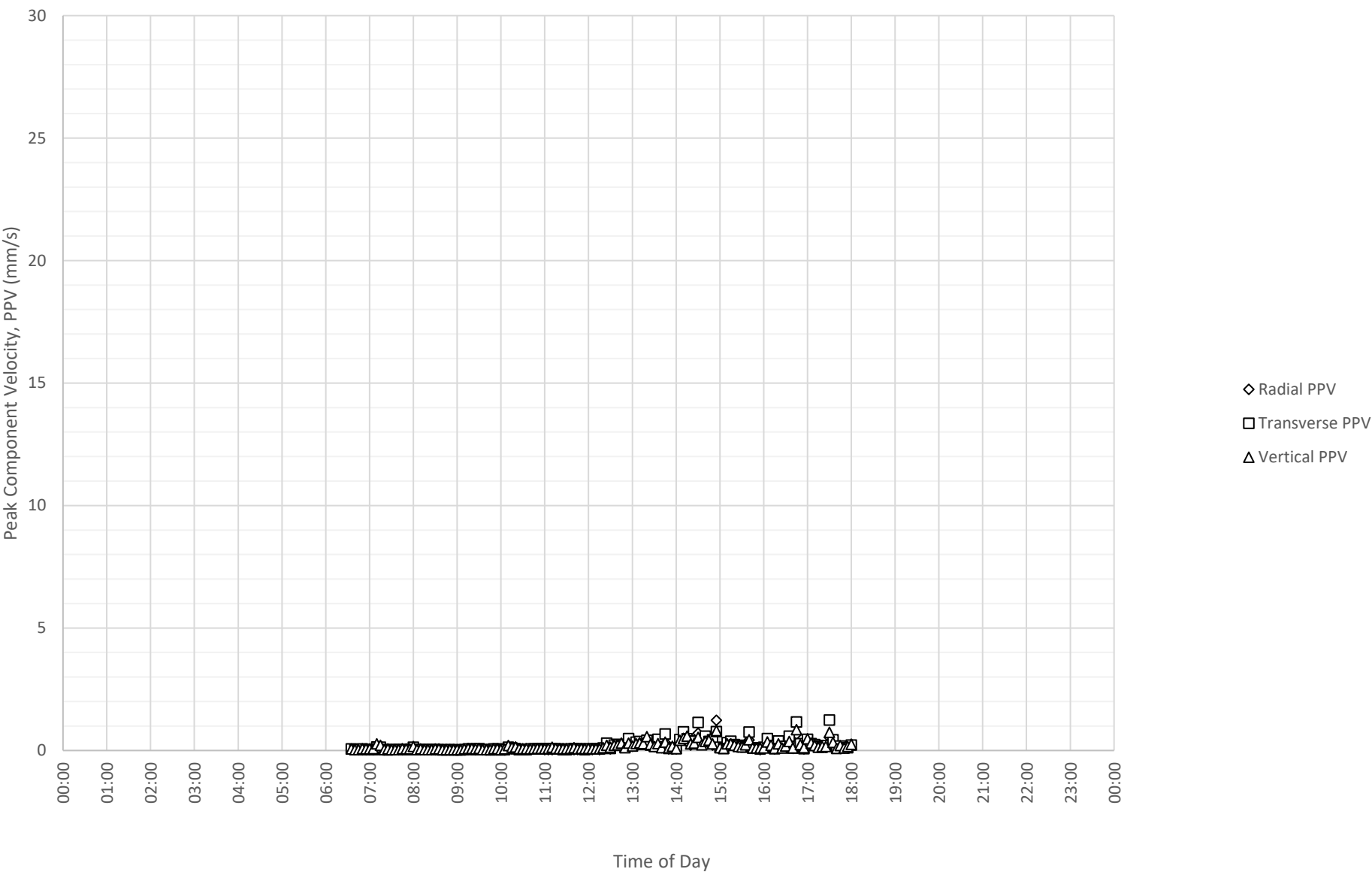
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 14-02-2025



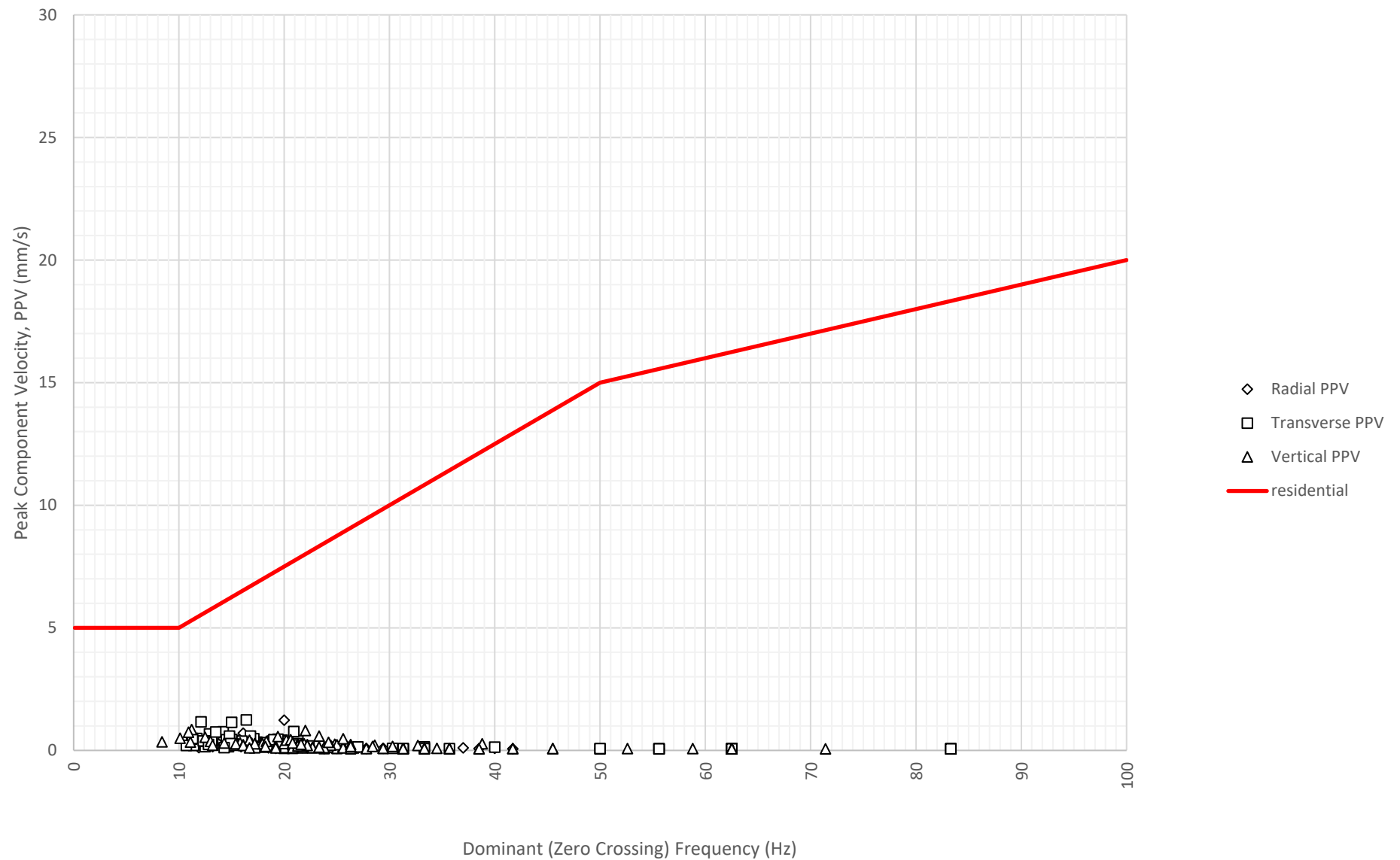
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 14-02-2025



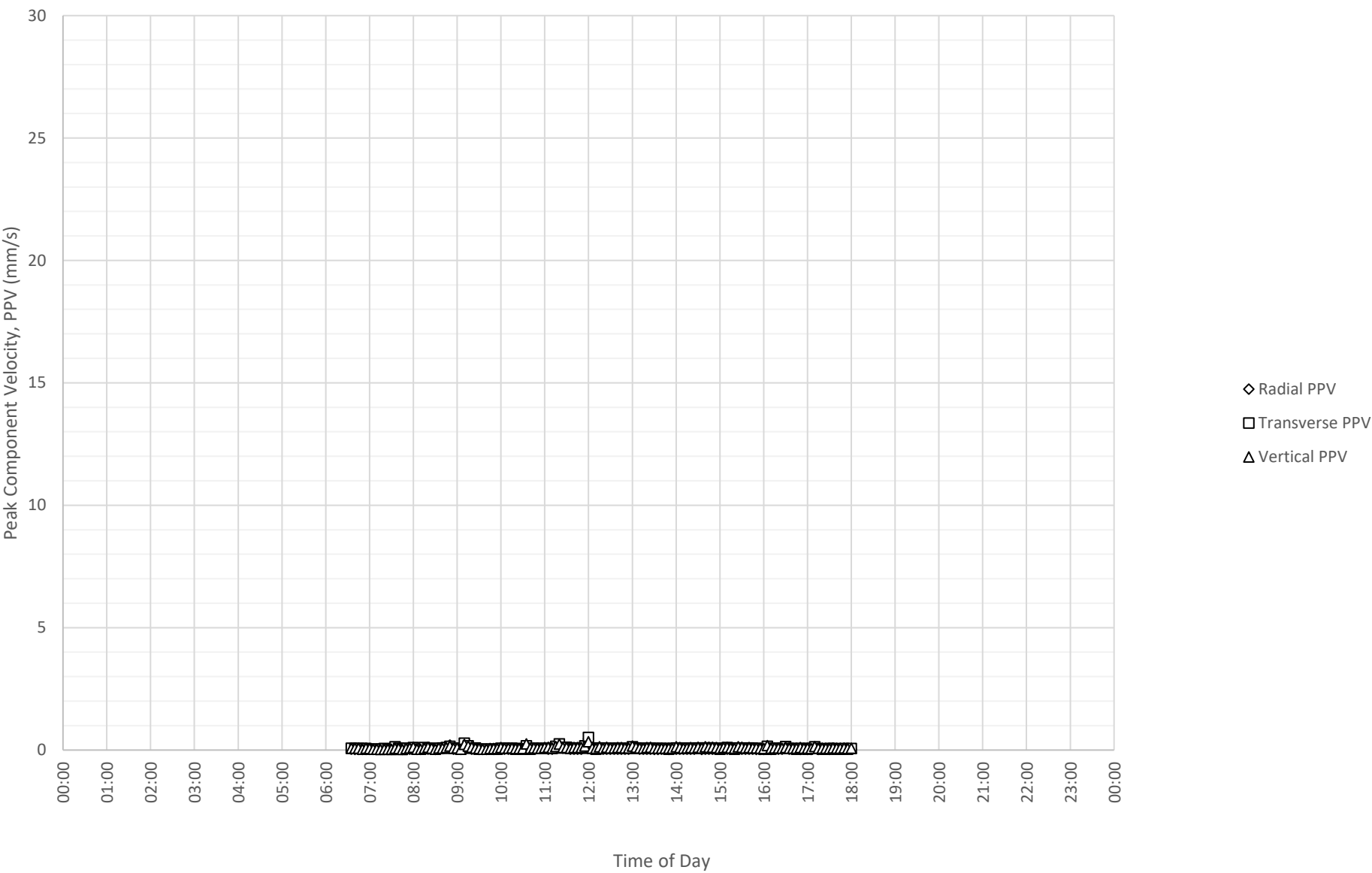
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 15-02-2025



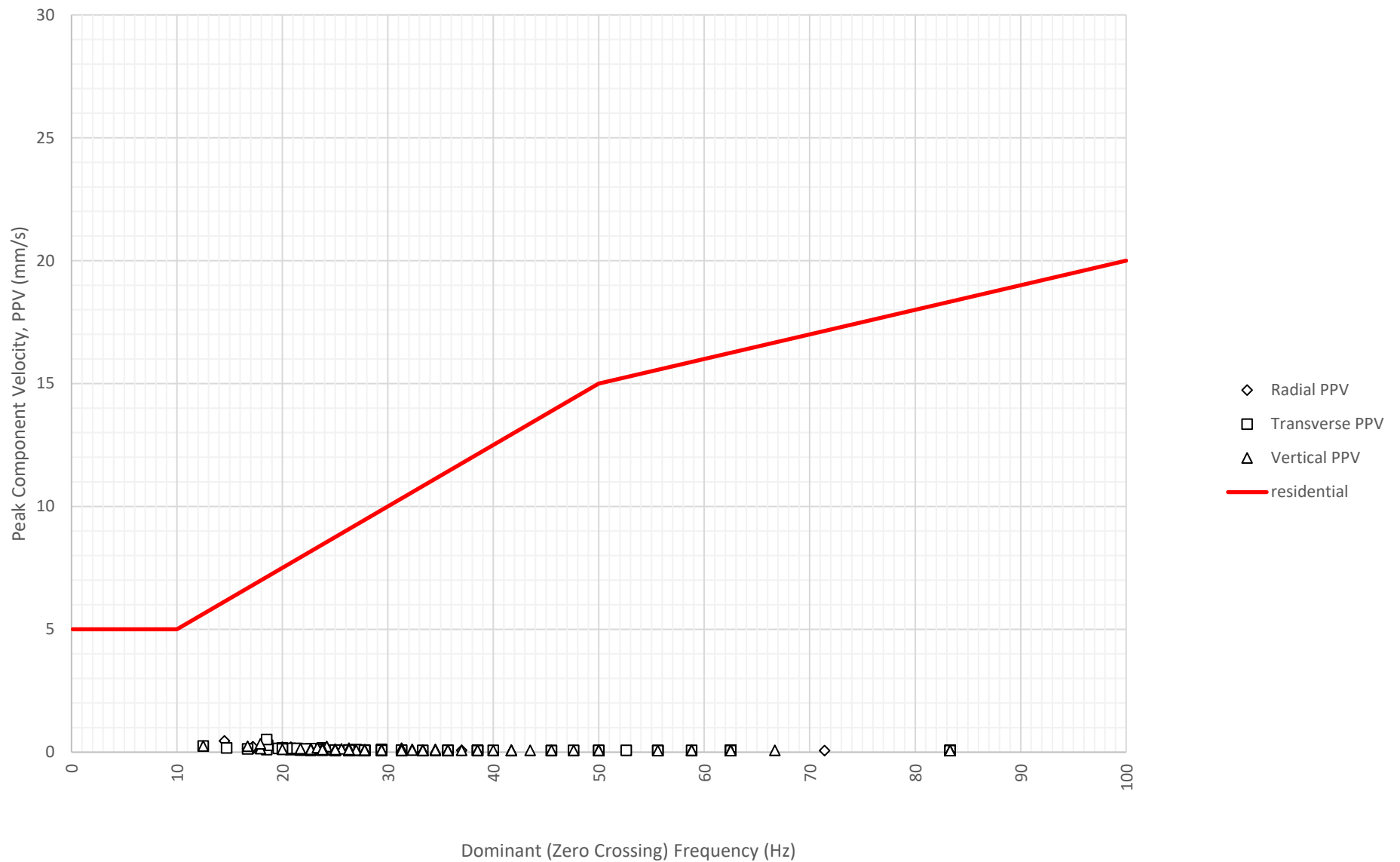
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 15-02-2025



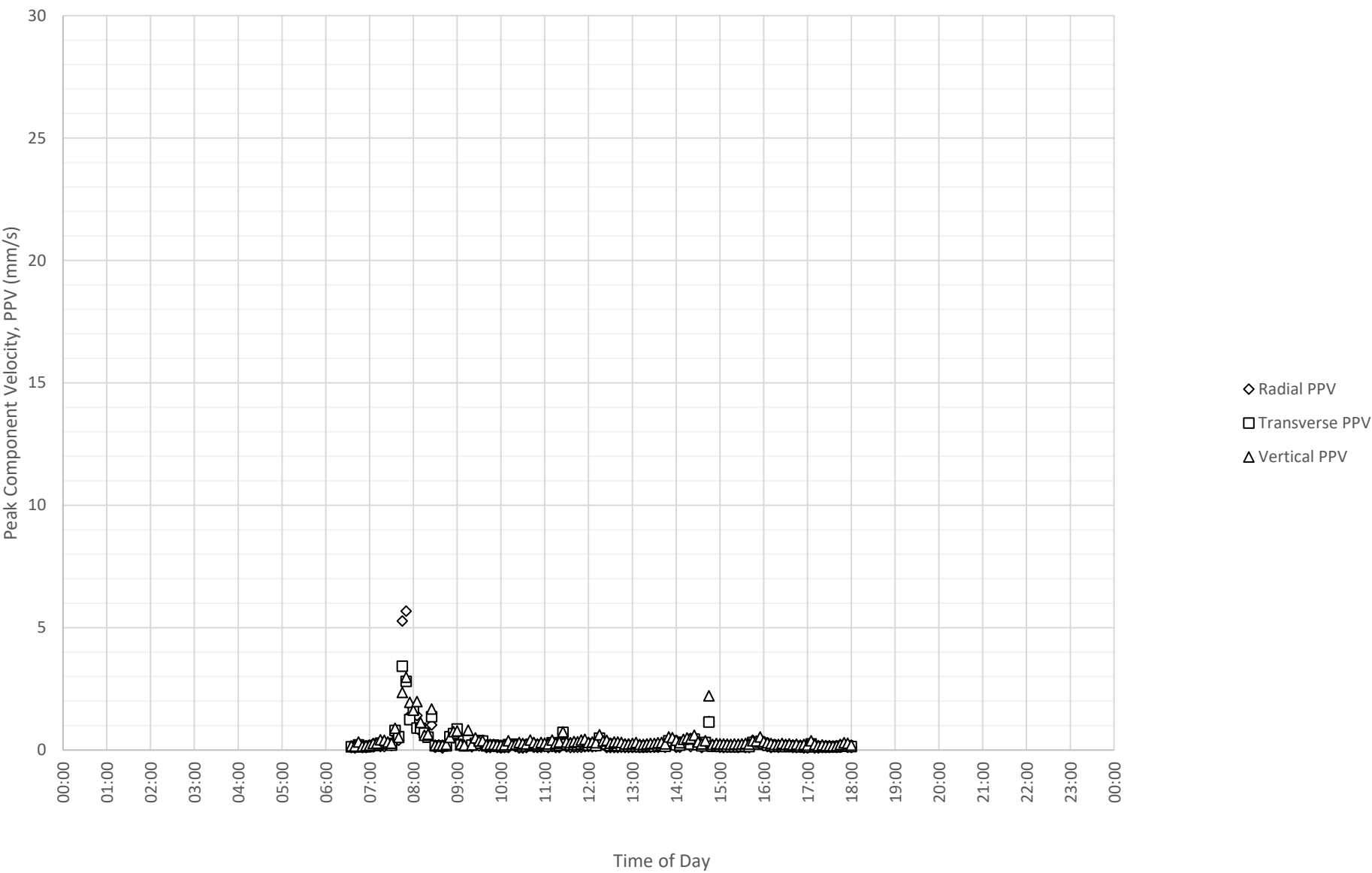
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 16-02-2025



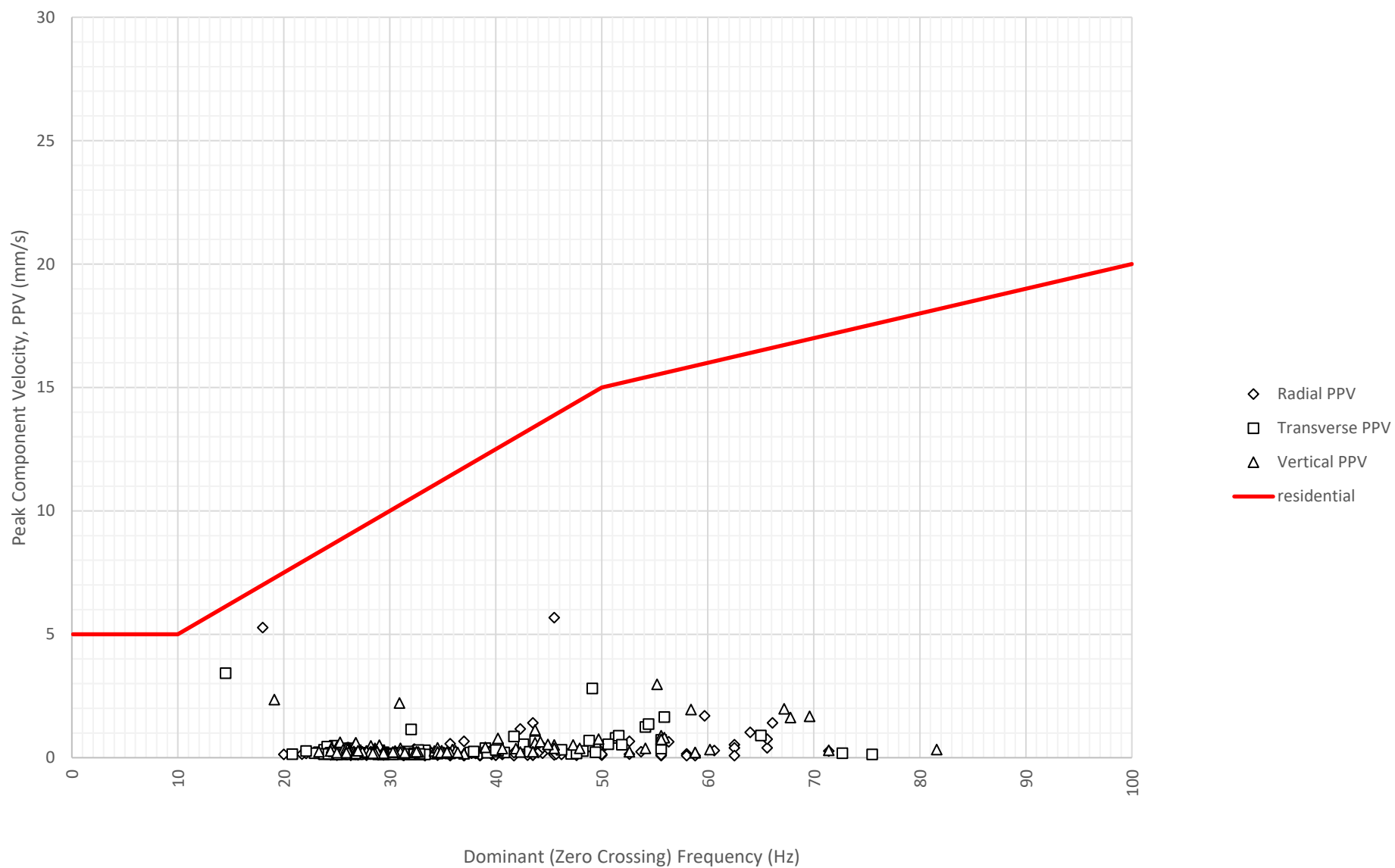
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 16-02-2025



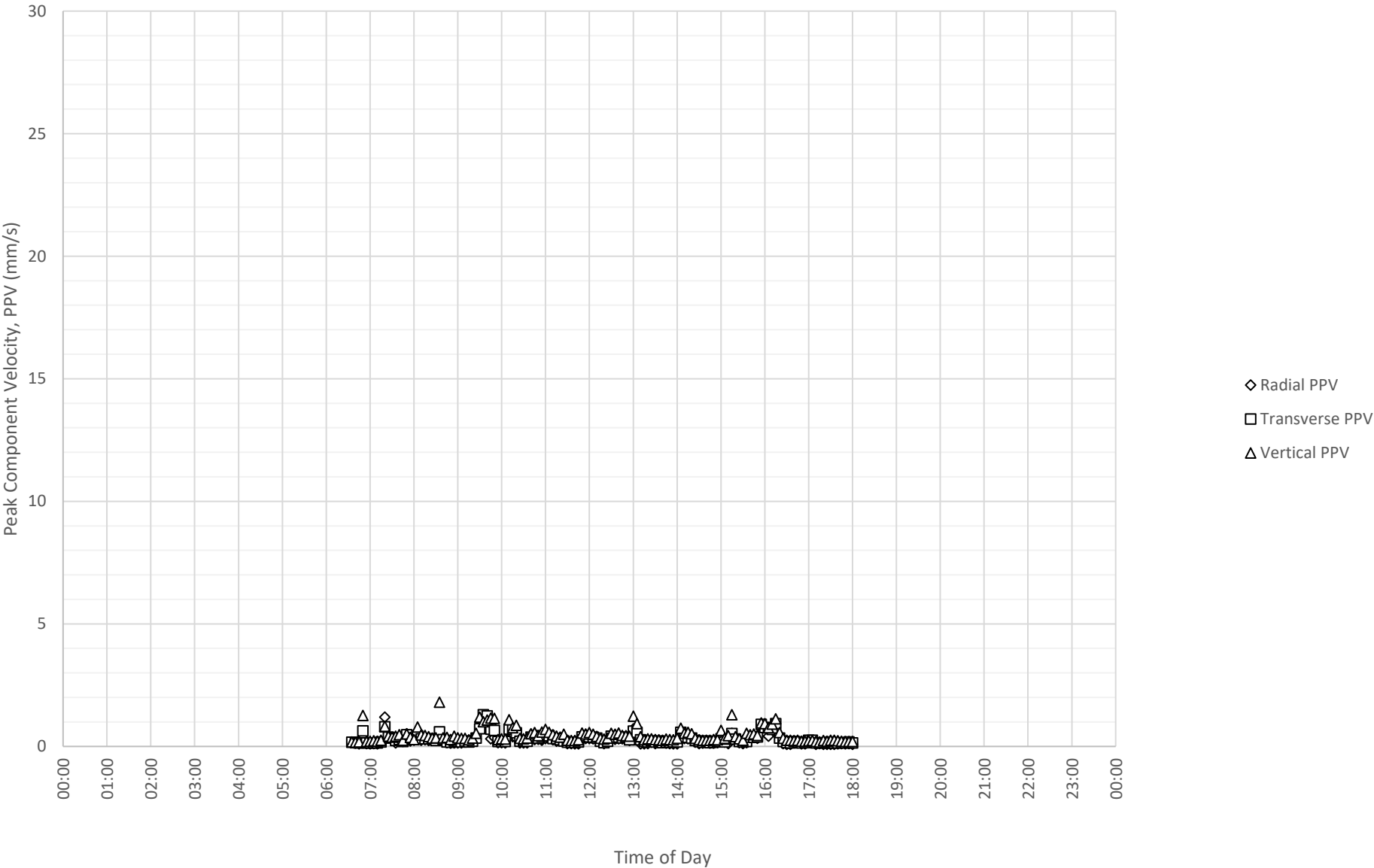
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 17-02-2025



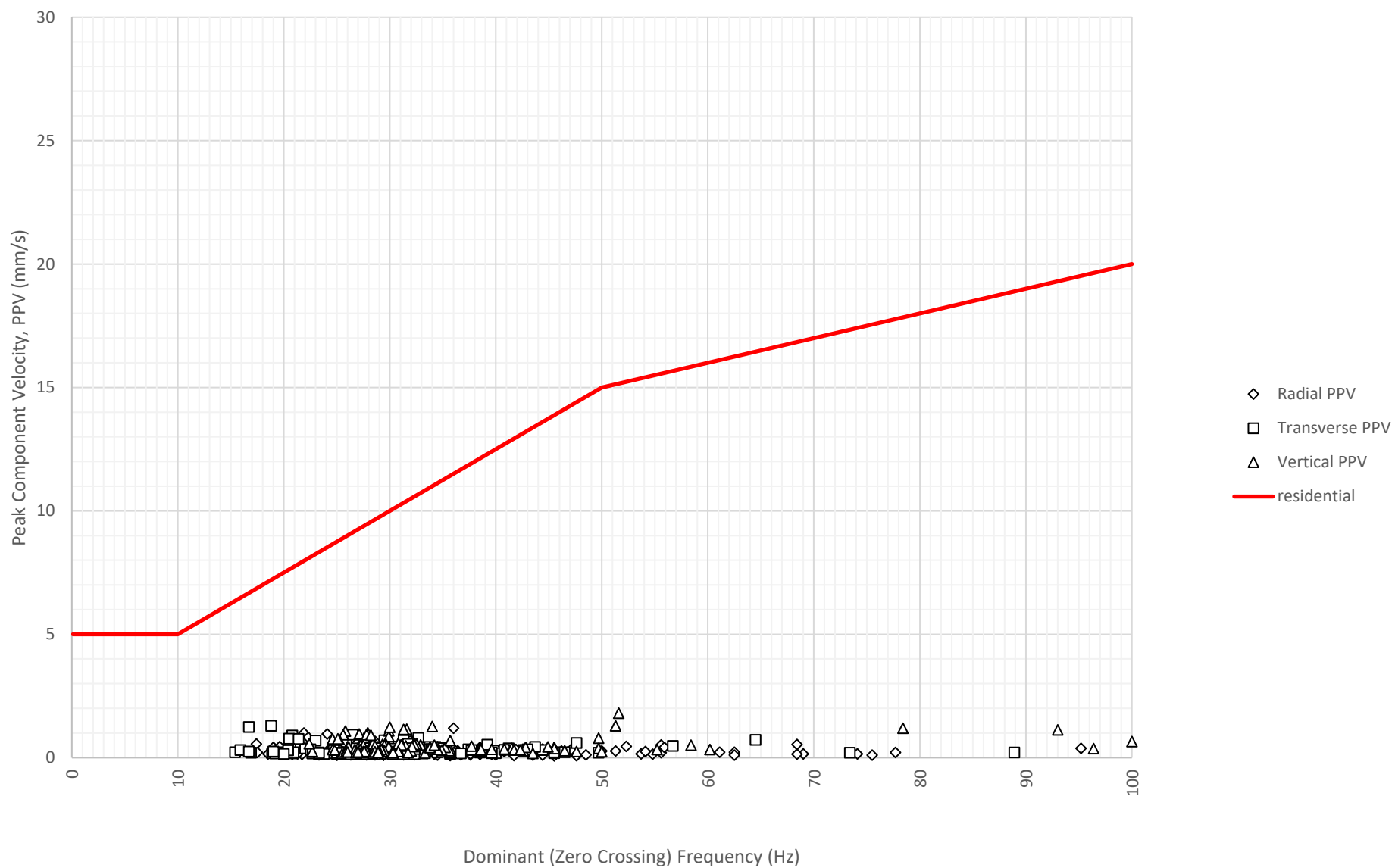
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 17-02-2025



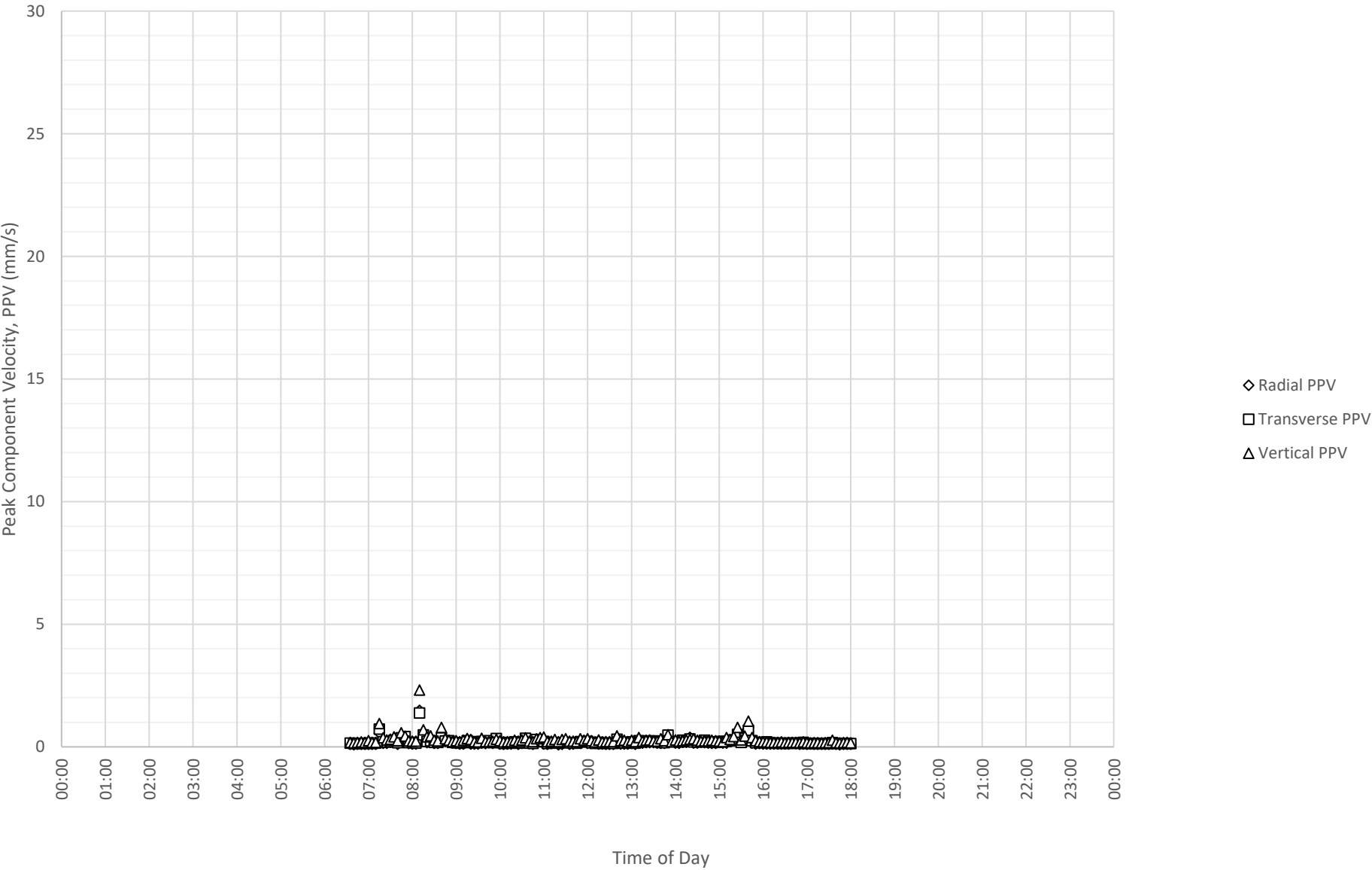
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 18-02-2025



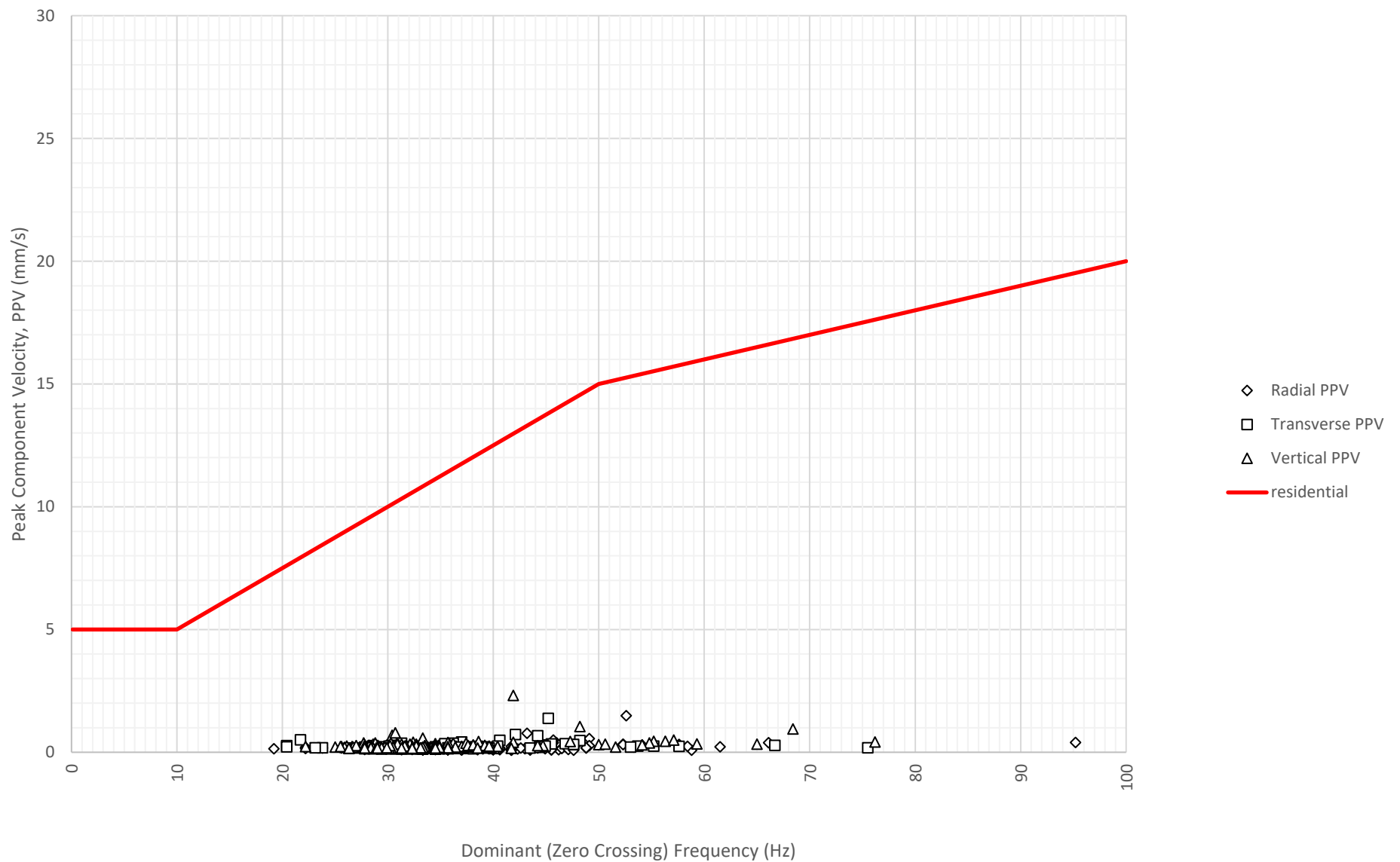
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 18-02-2025



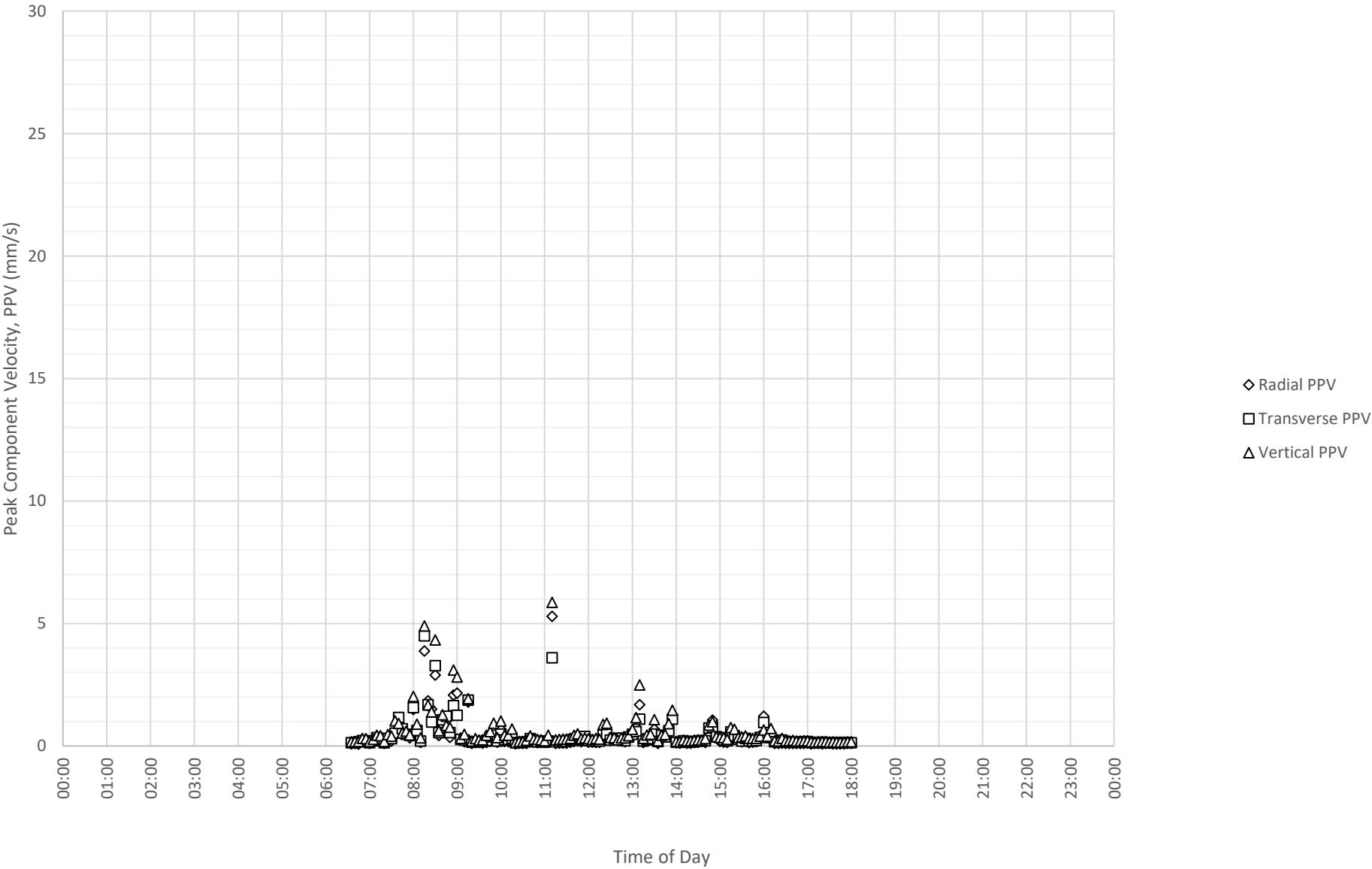
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 19-02-2025



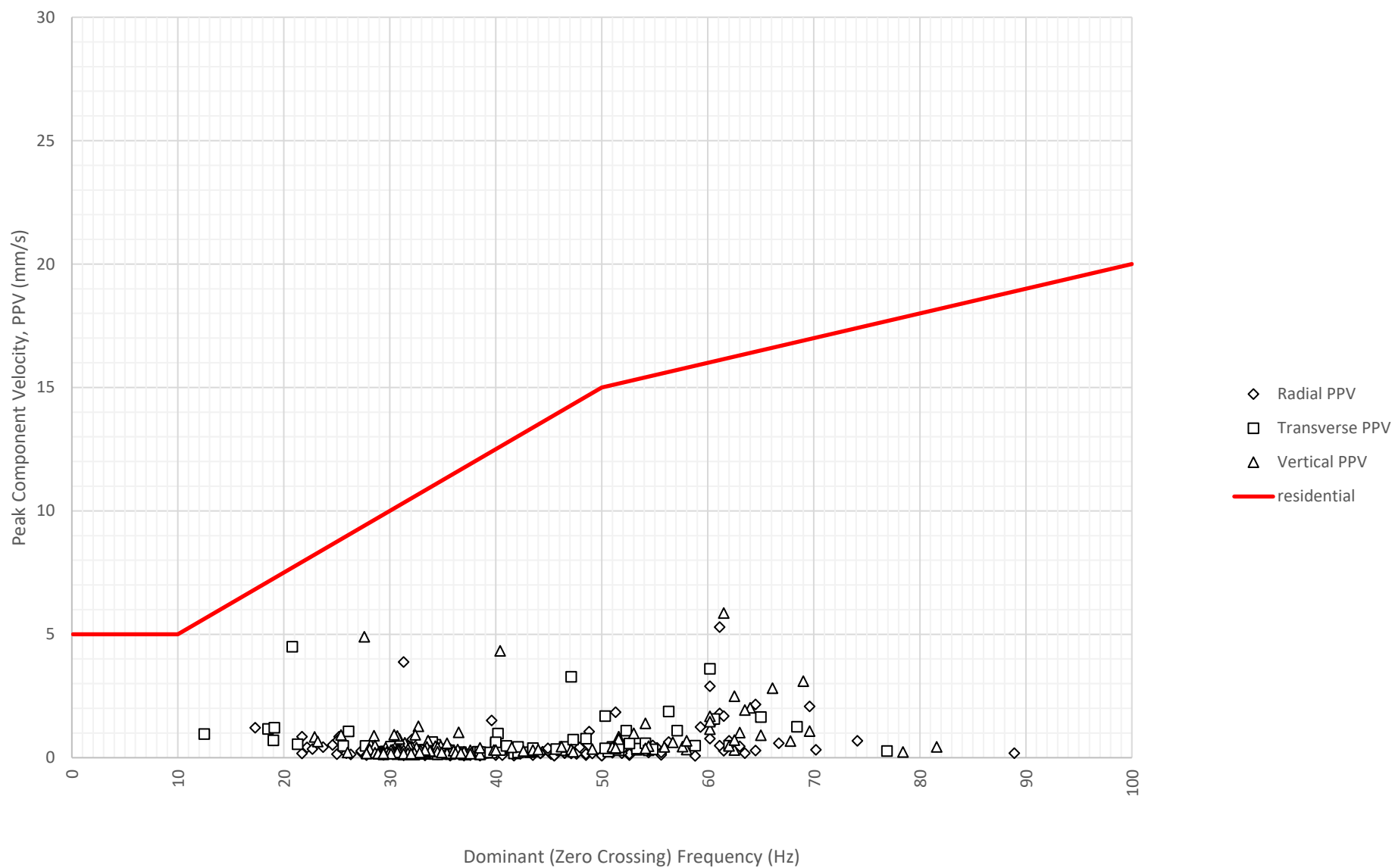
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 19-02-2025



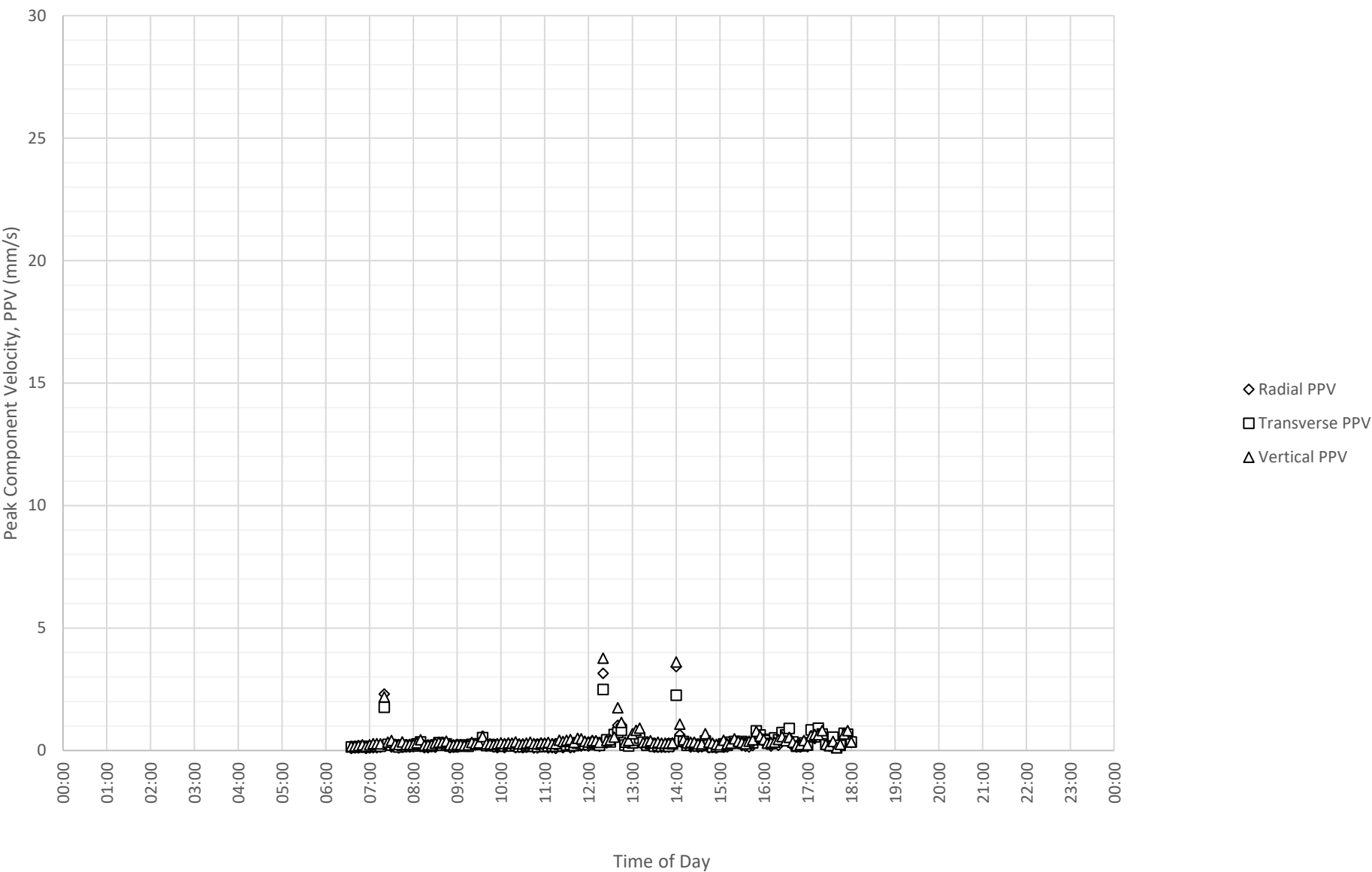
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 20-02-2025



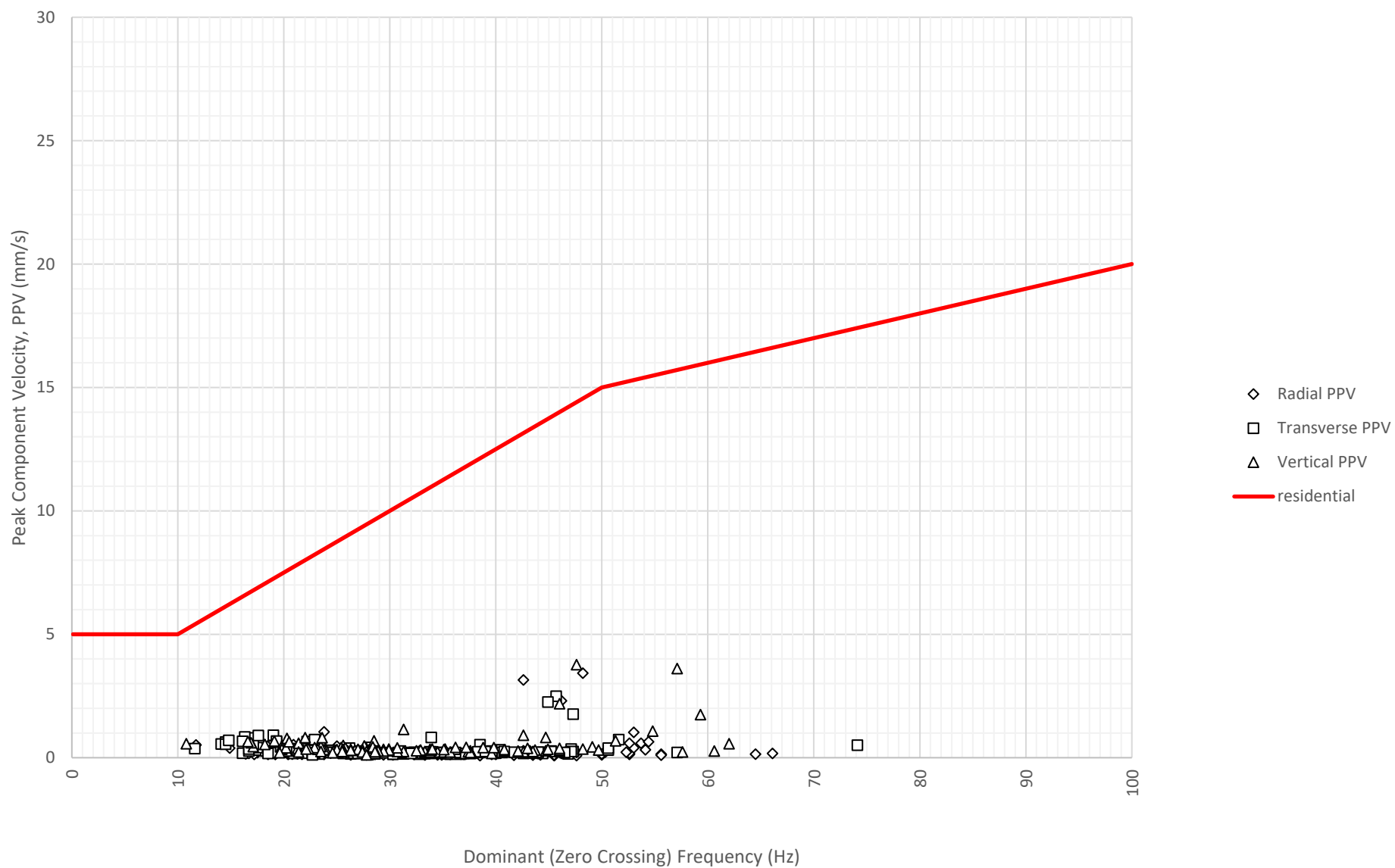
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 20-02-2025



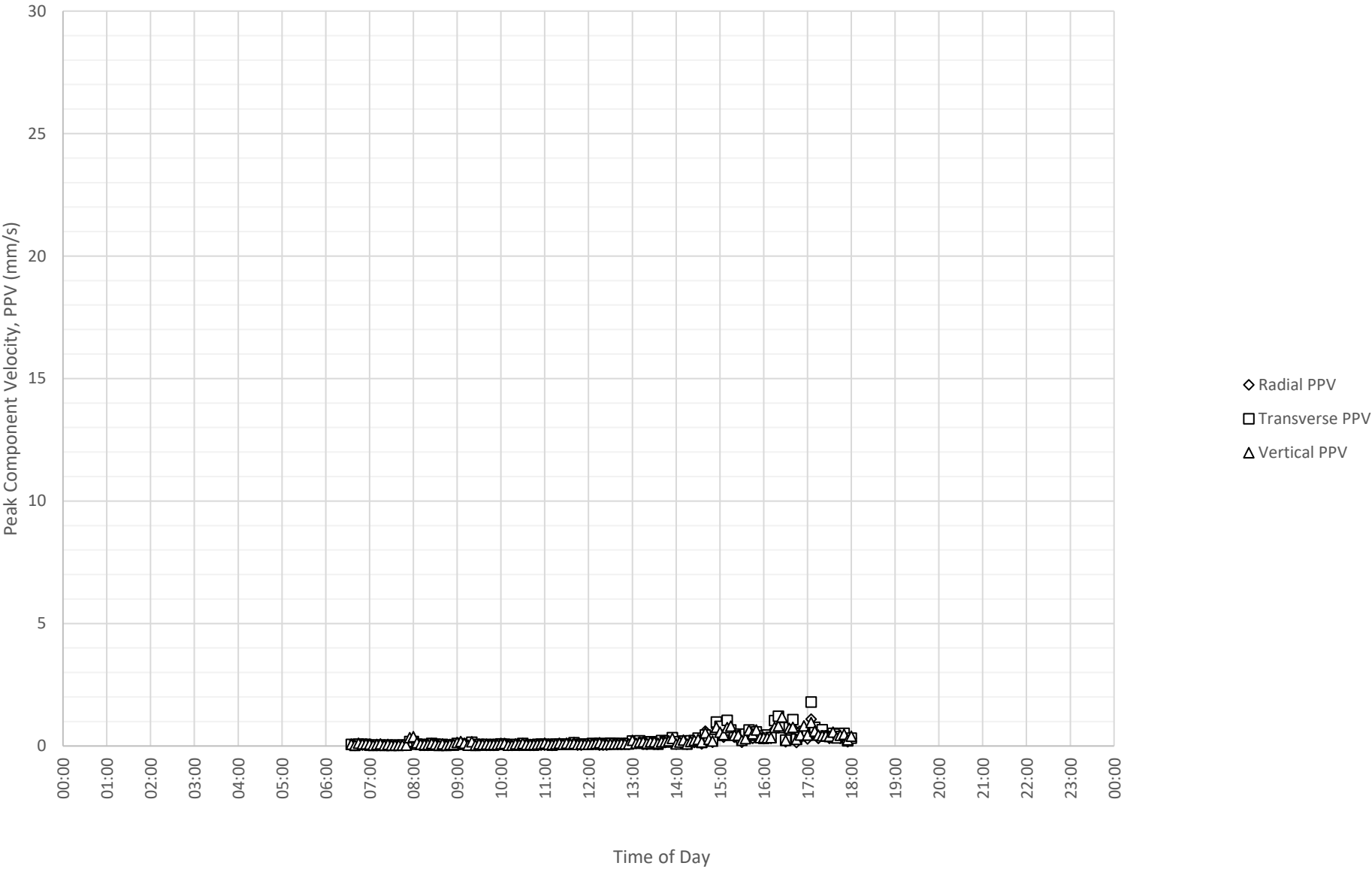
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 21-02-2025



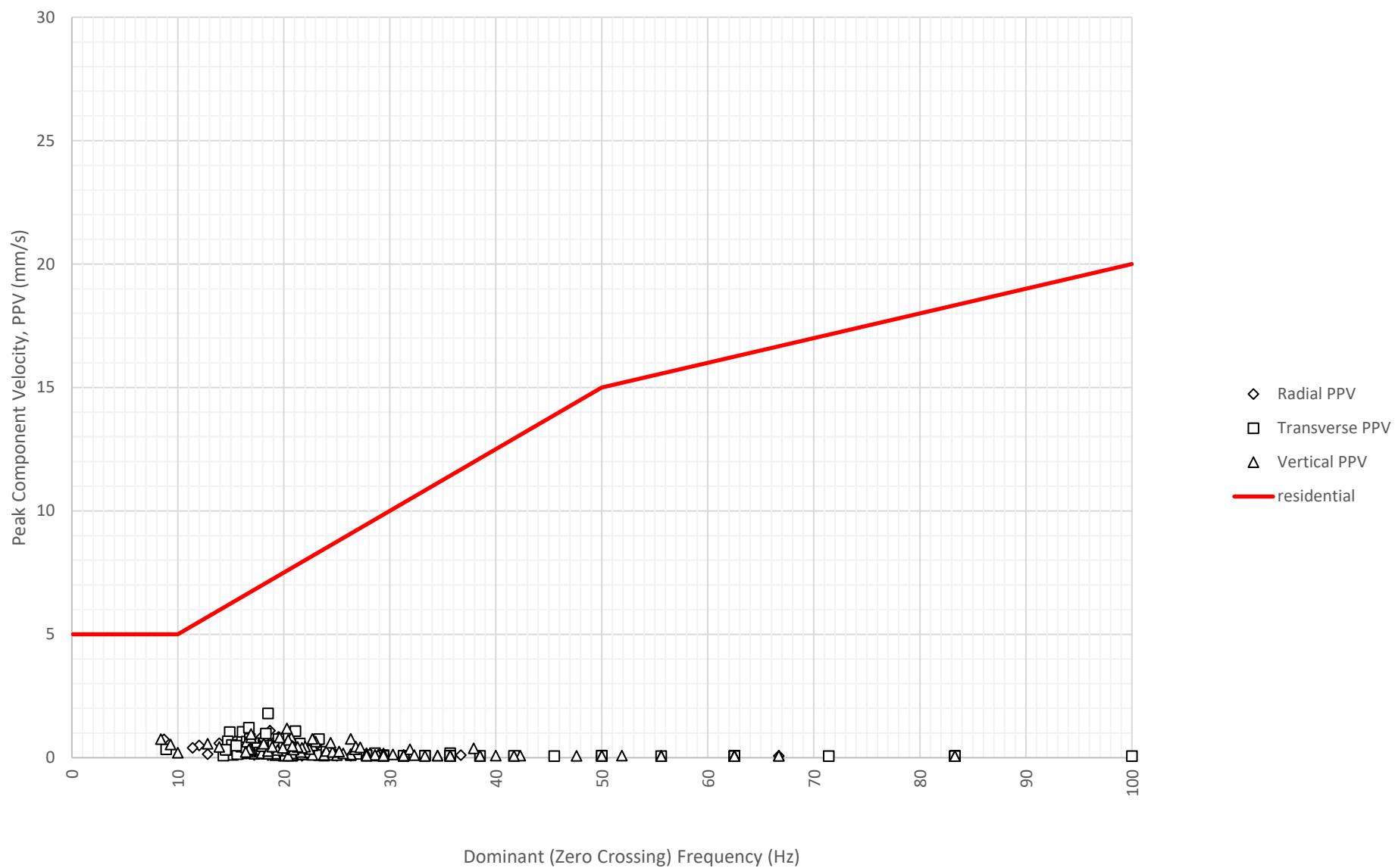
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 21-02-2025



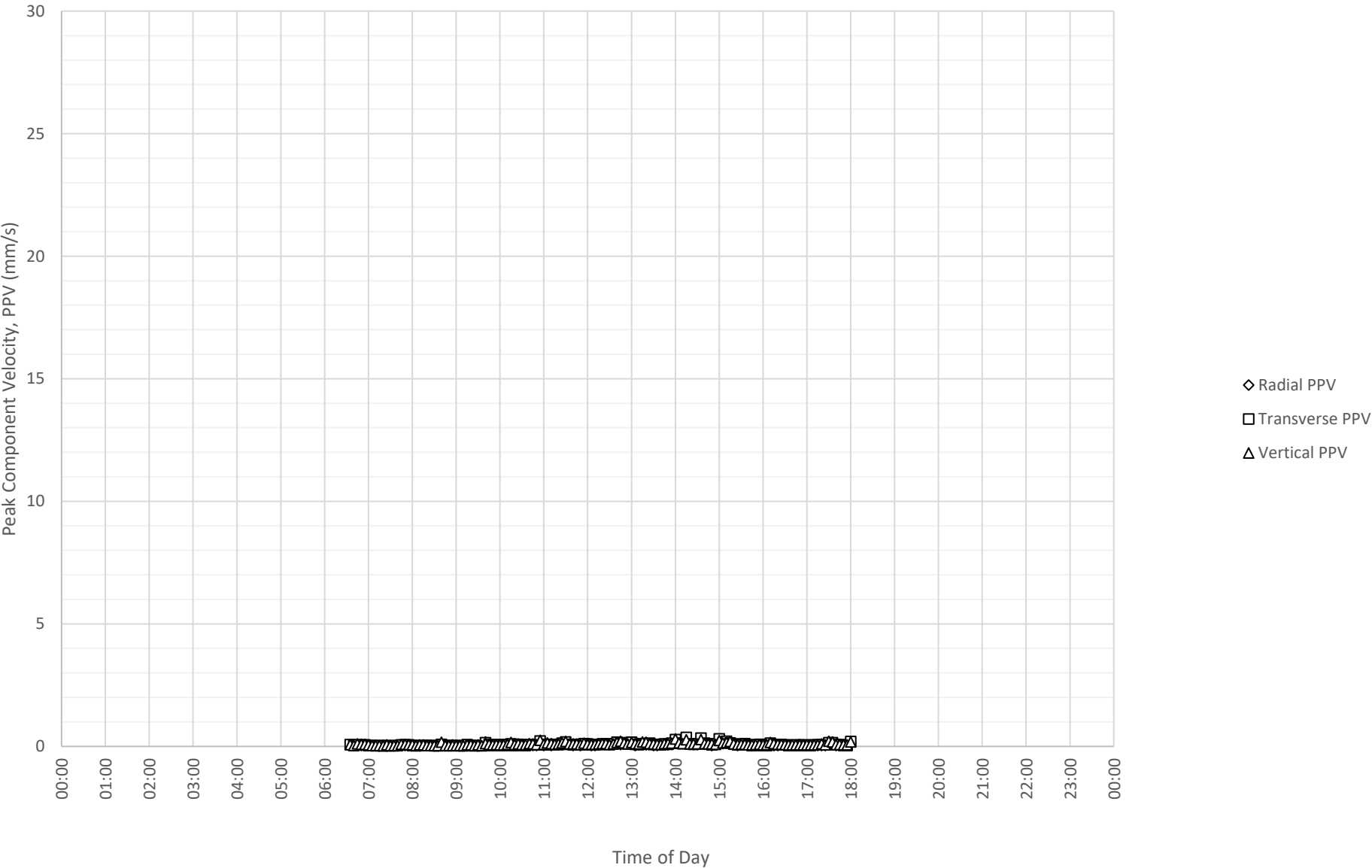
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 22-02-2025



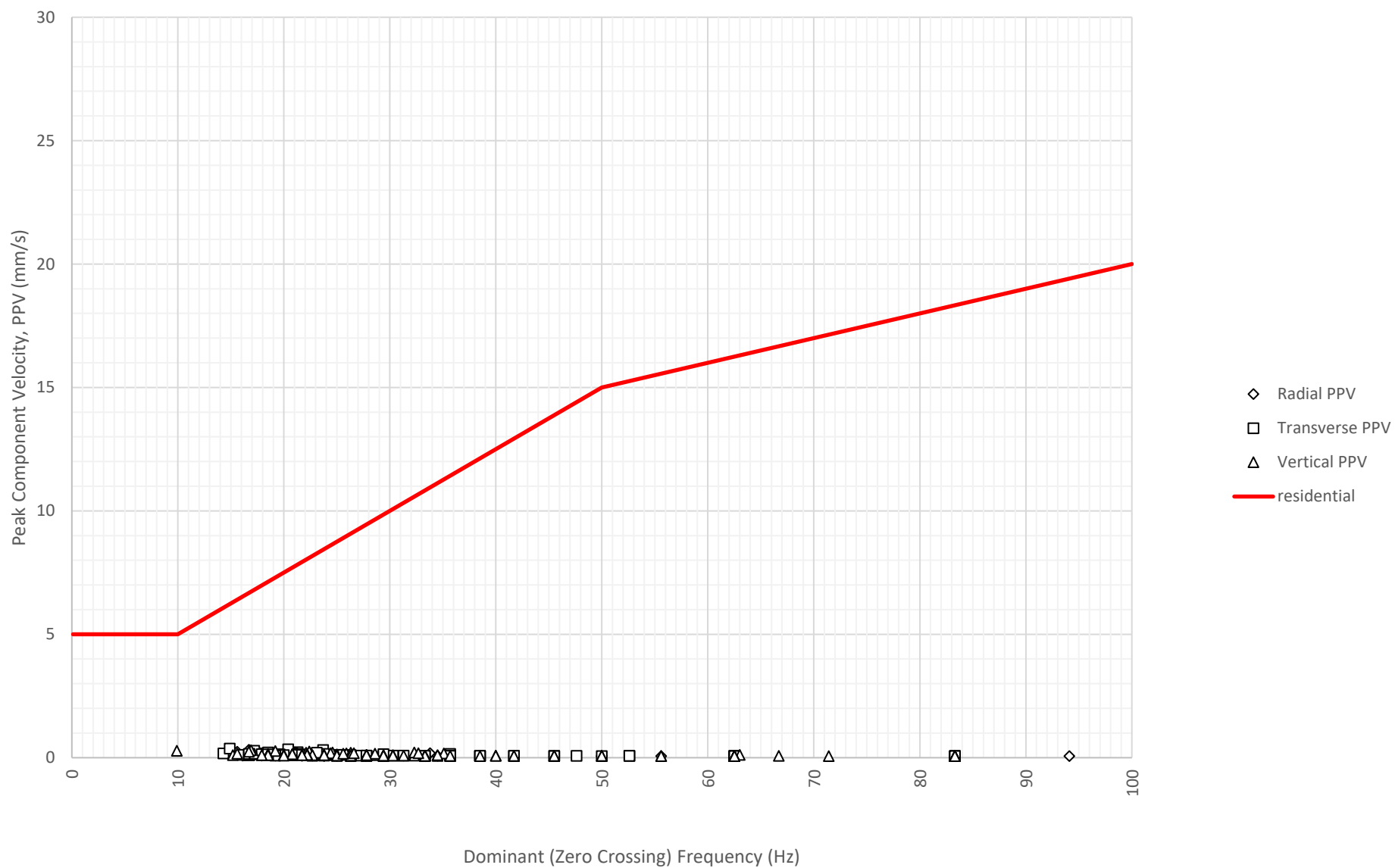
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 22-02-2025



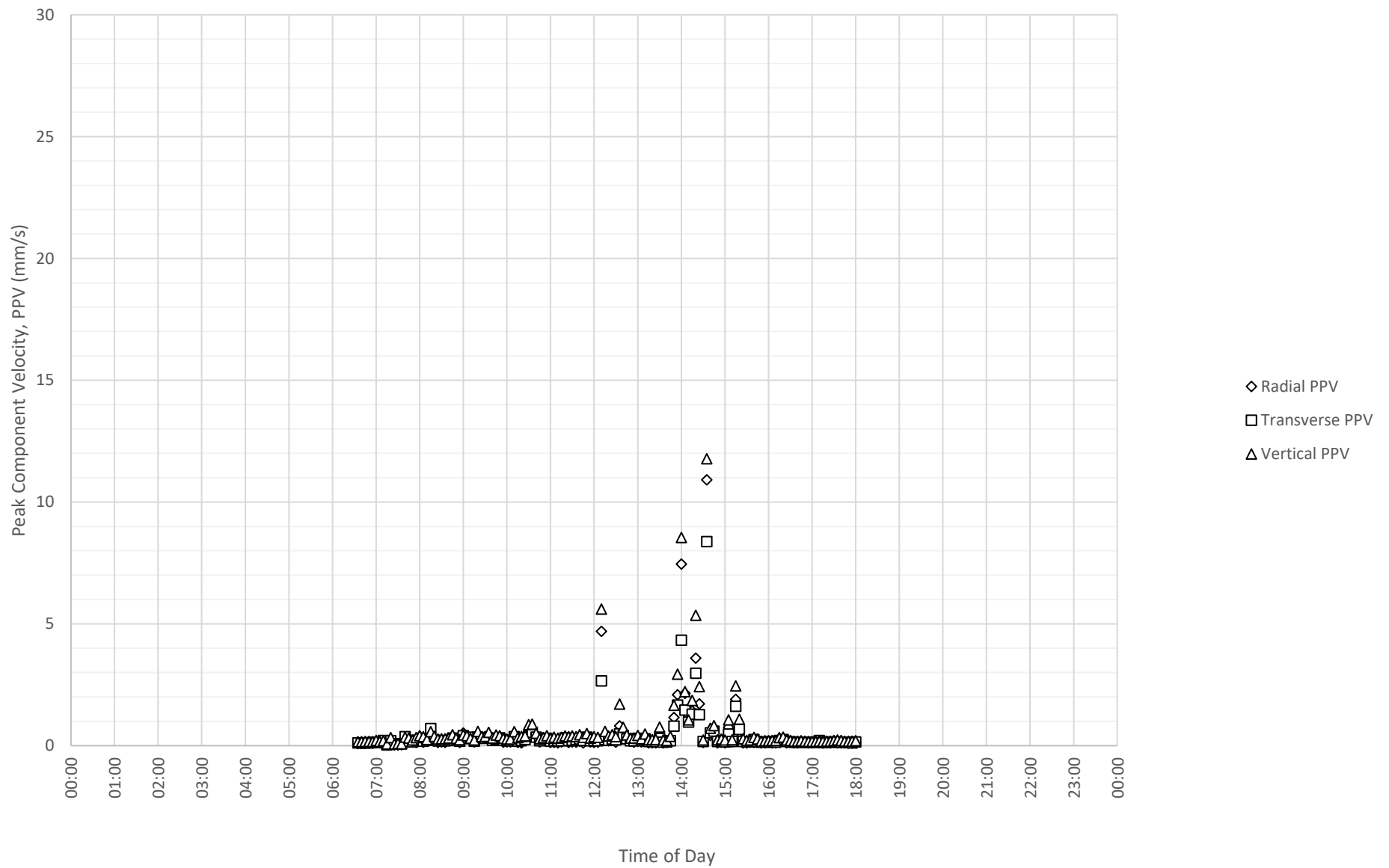
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 23-02-2025



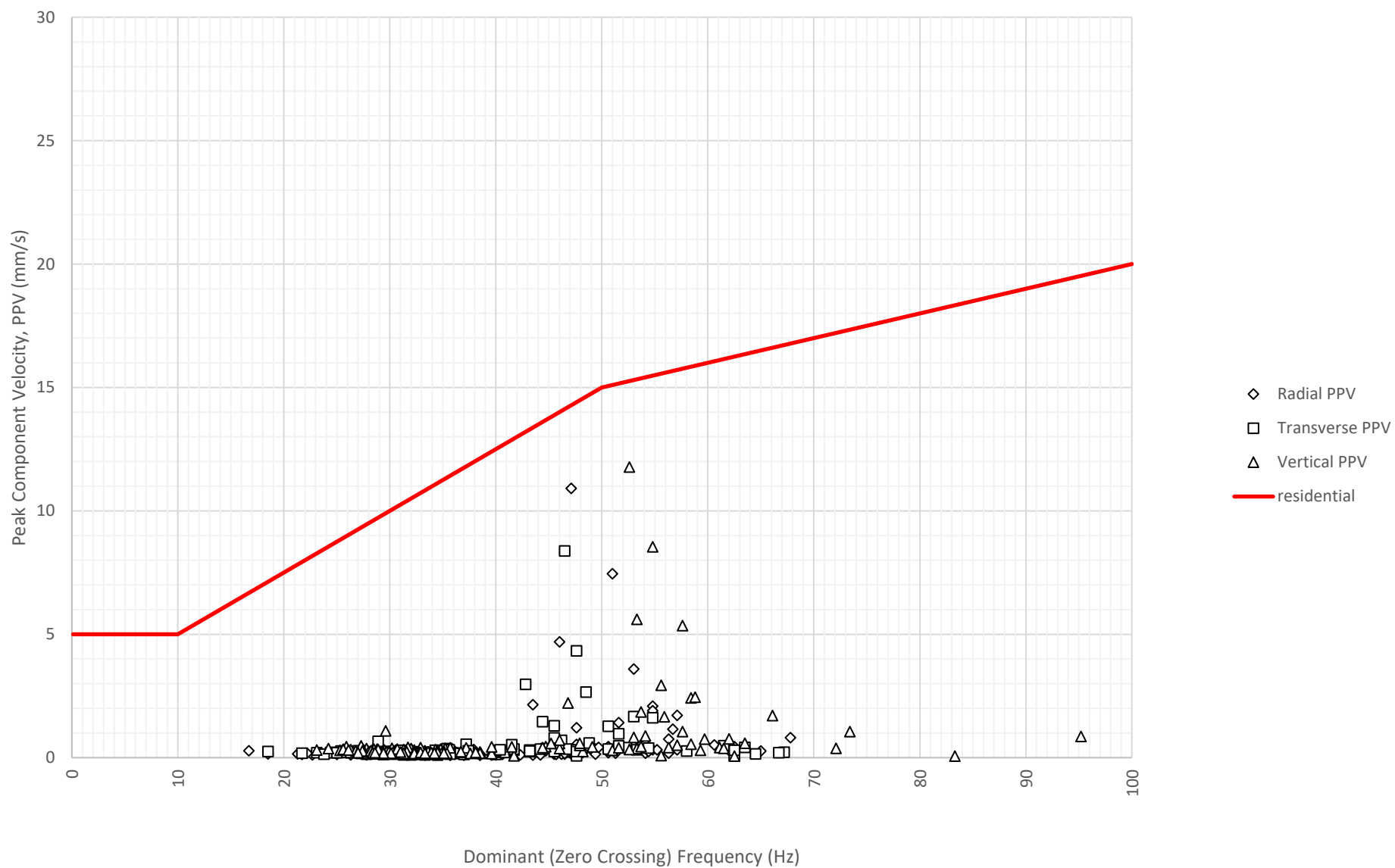
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 23-02-2025



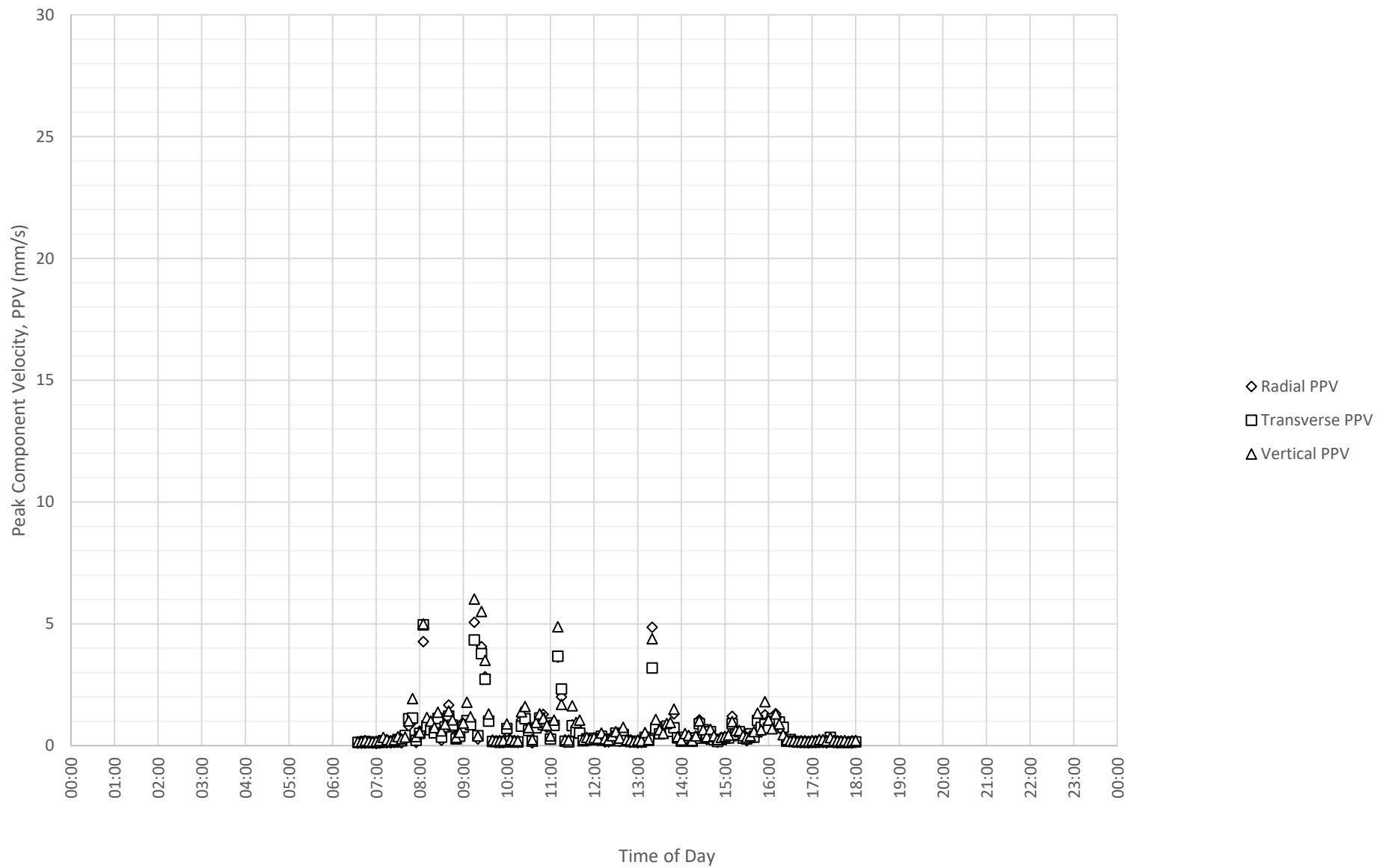
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 24-02-2025



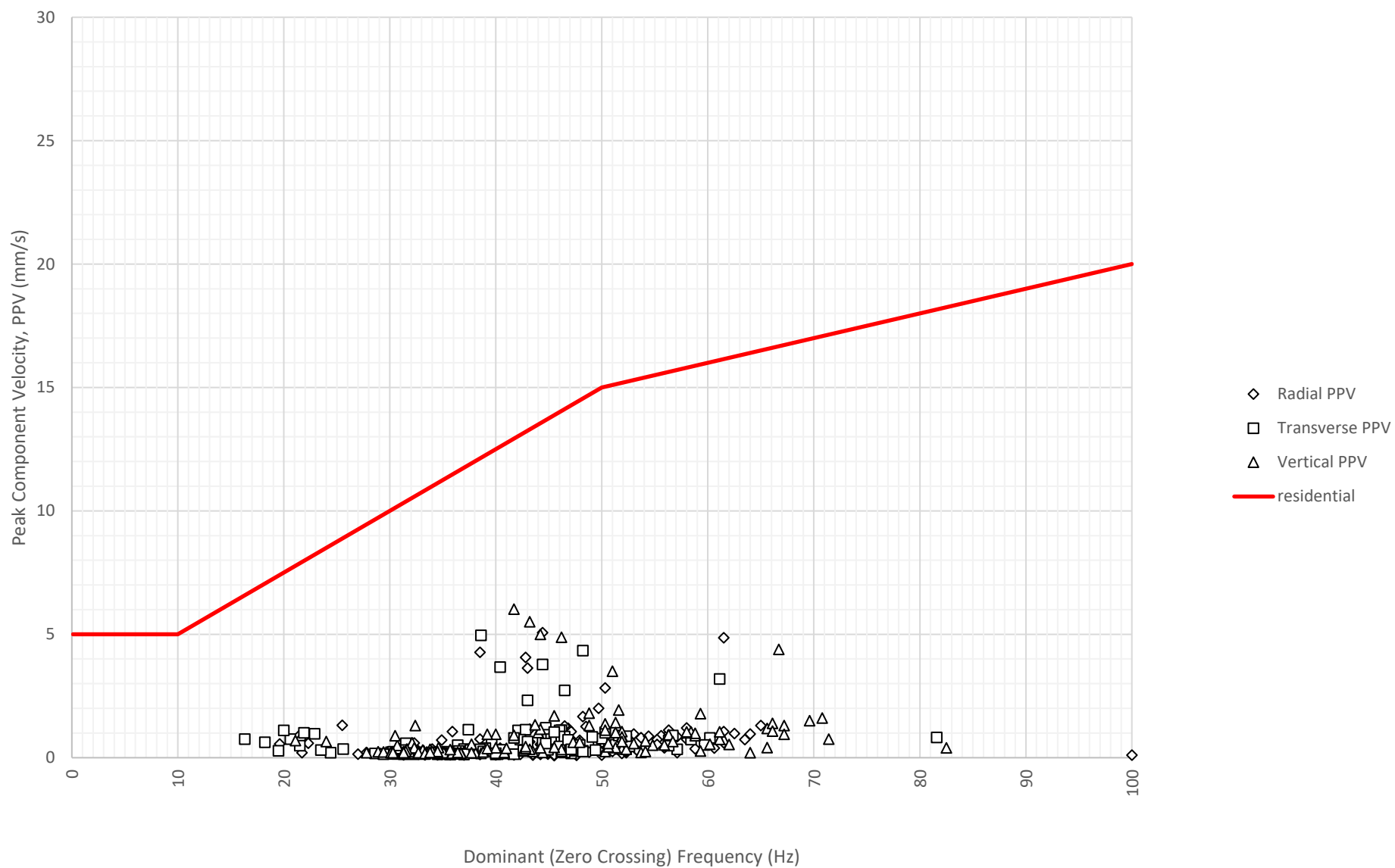
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 24-02-2025



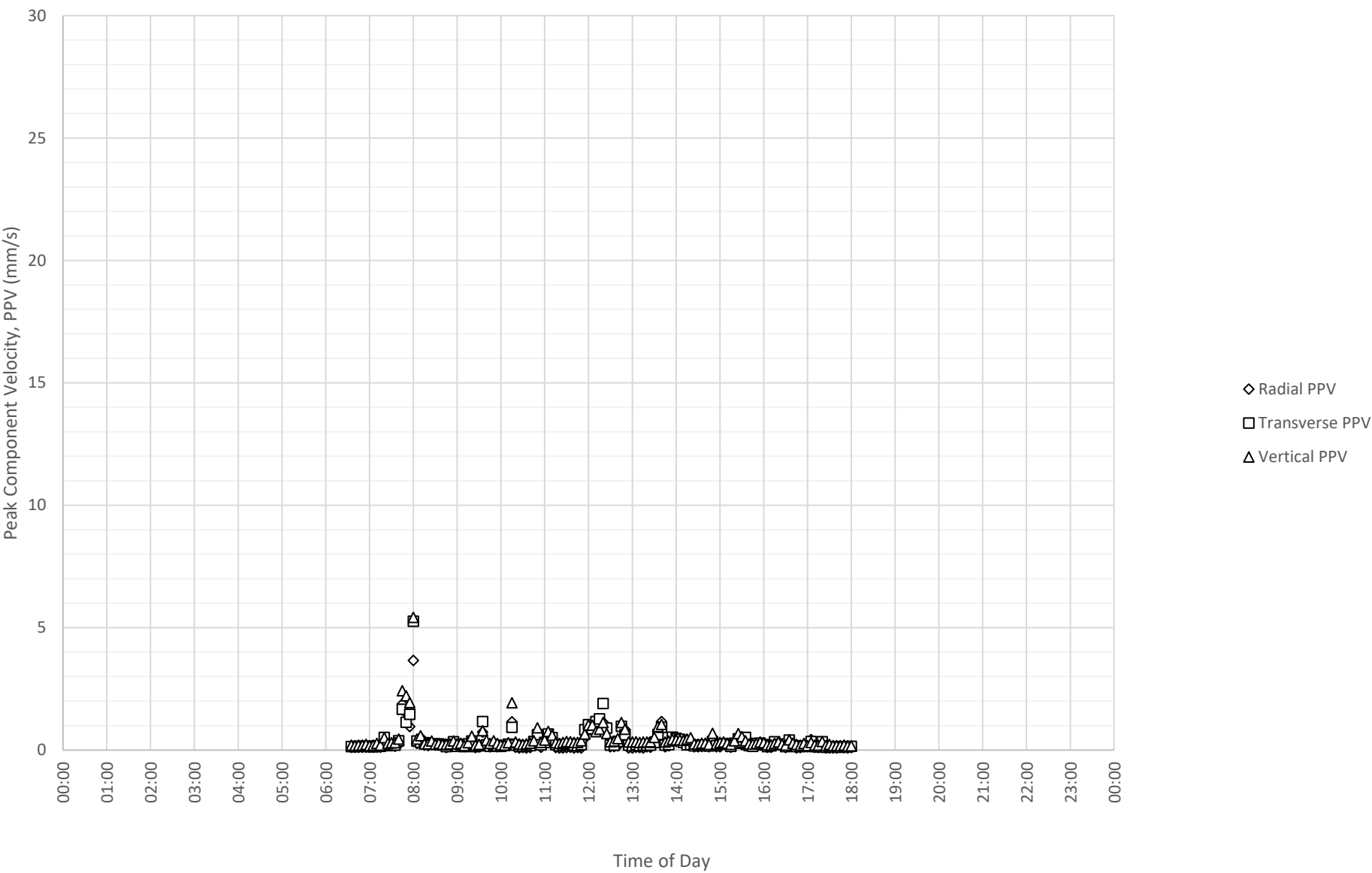
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 25-02-2025



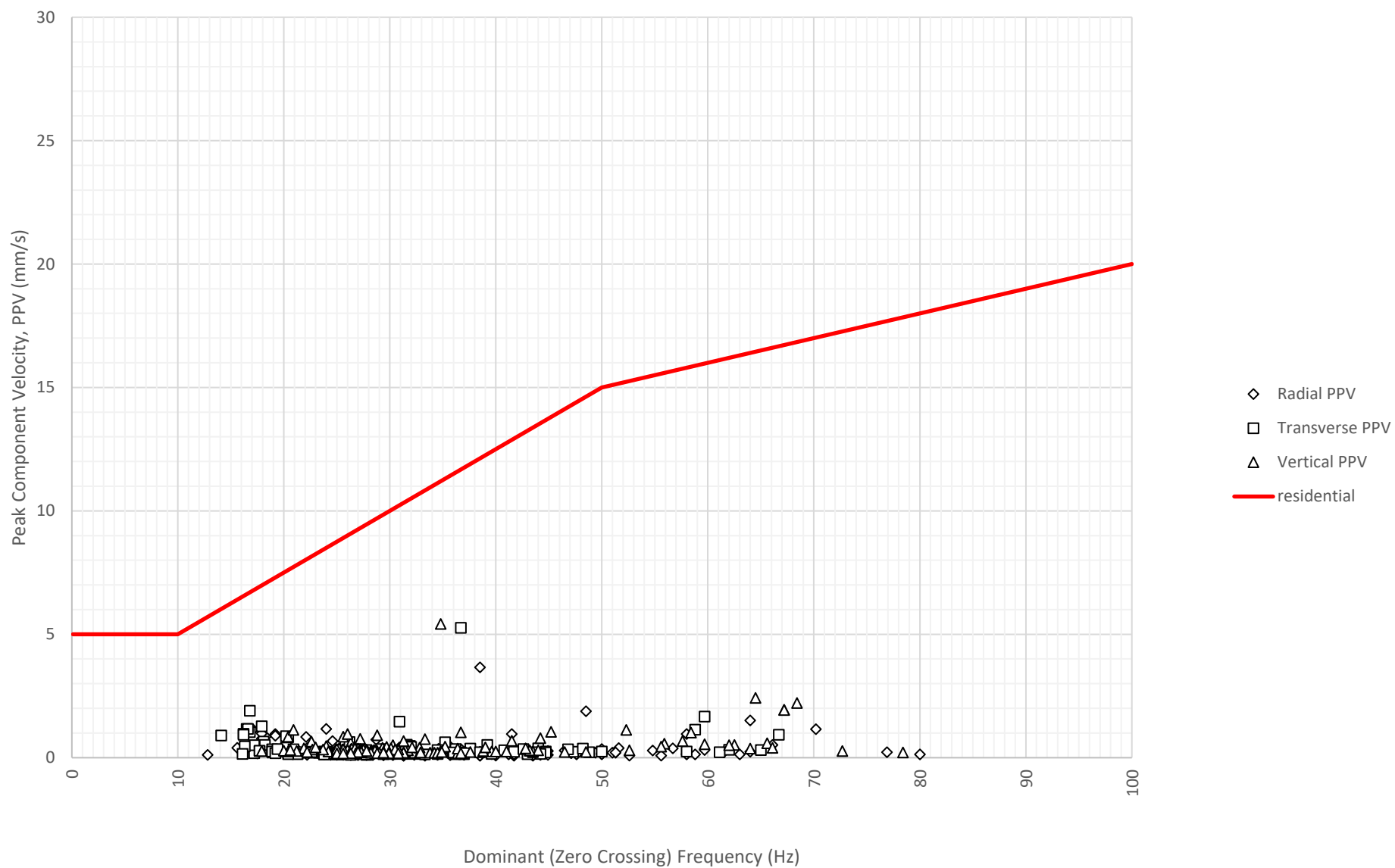
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 25-02-2025



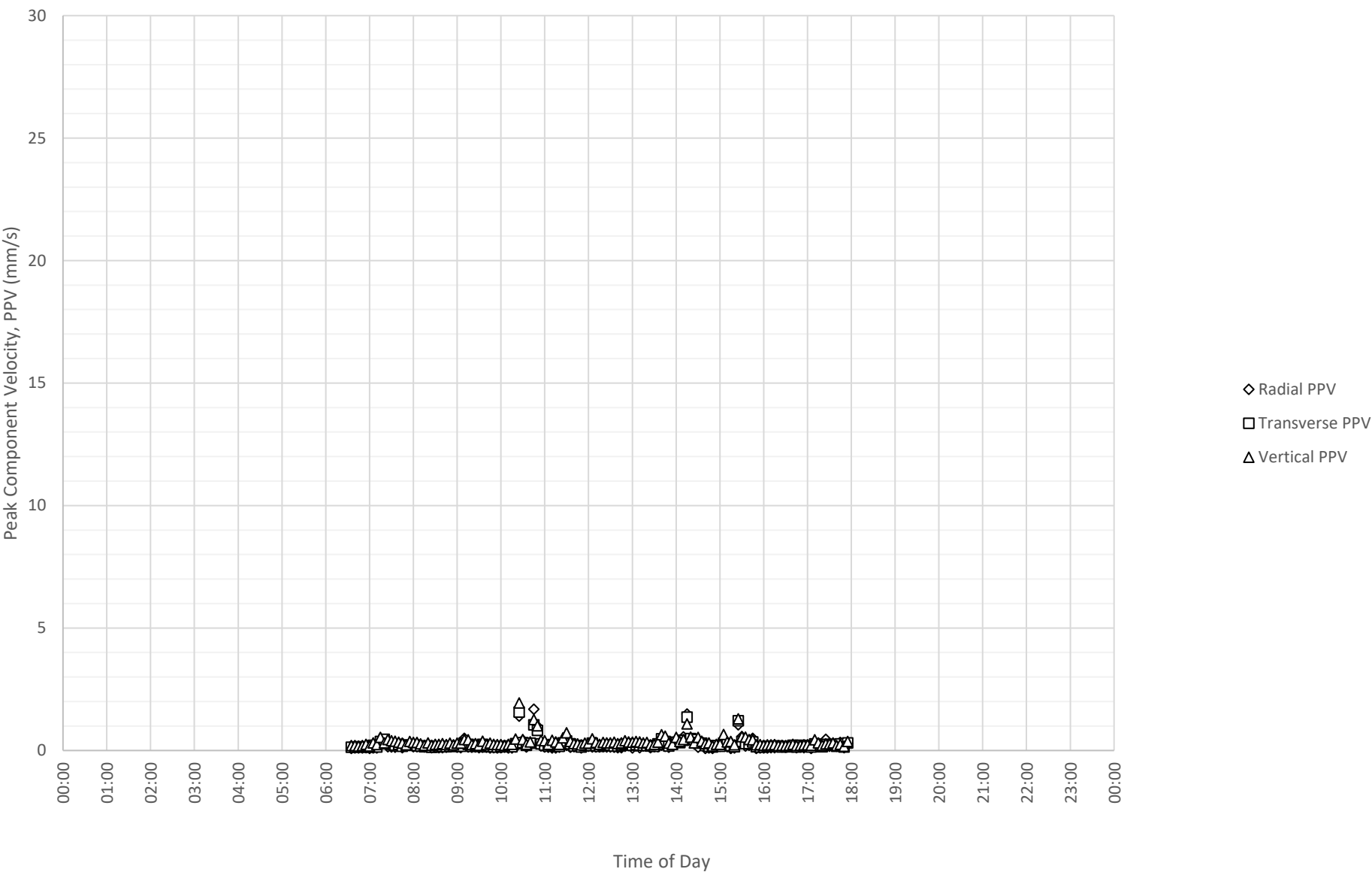
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 26-02-2025



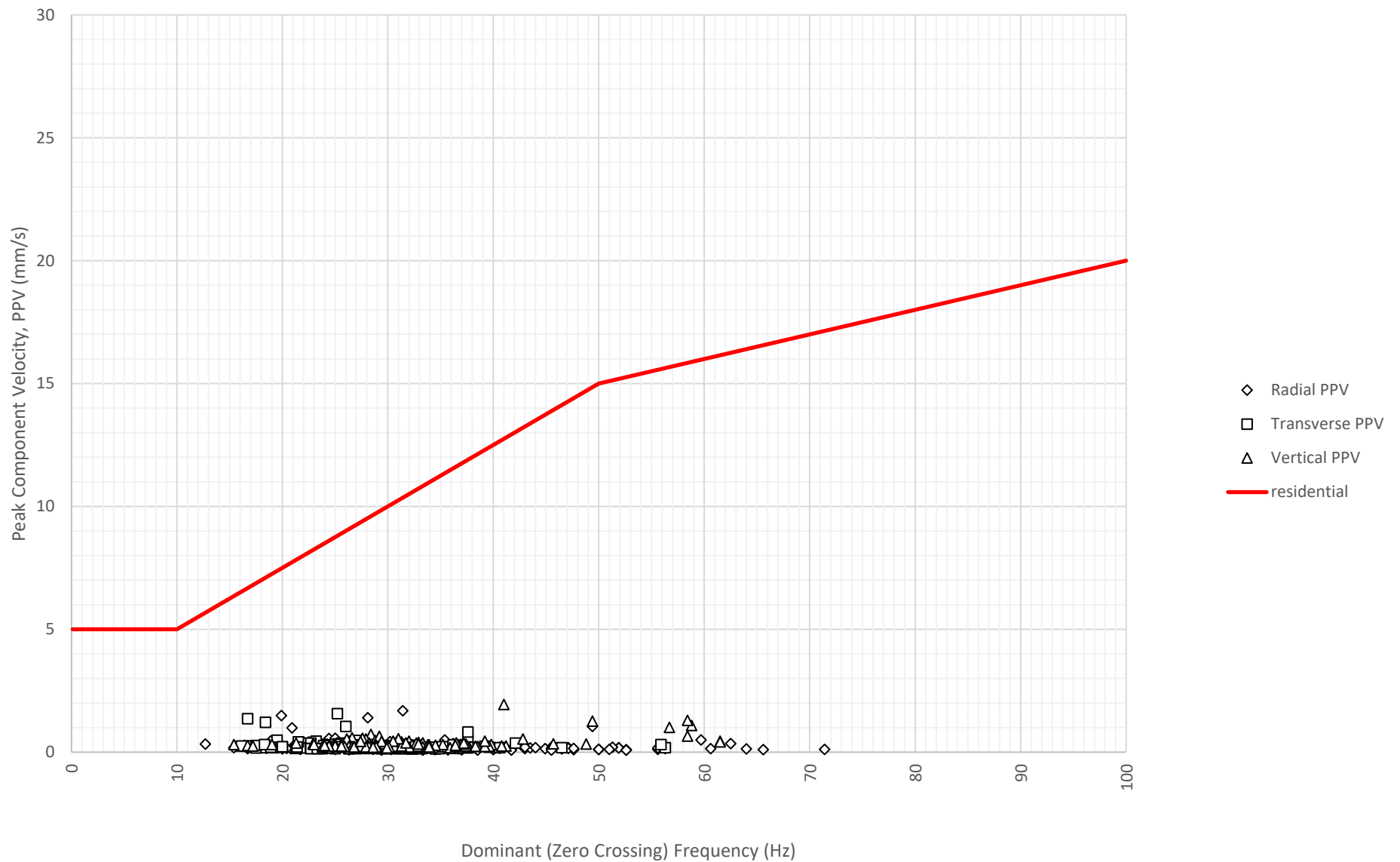
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 26-02-2025



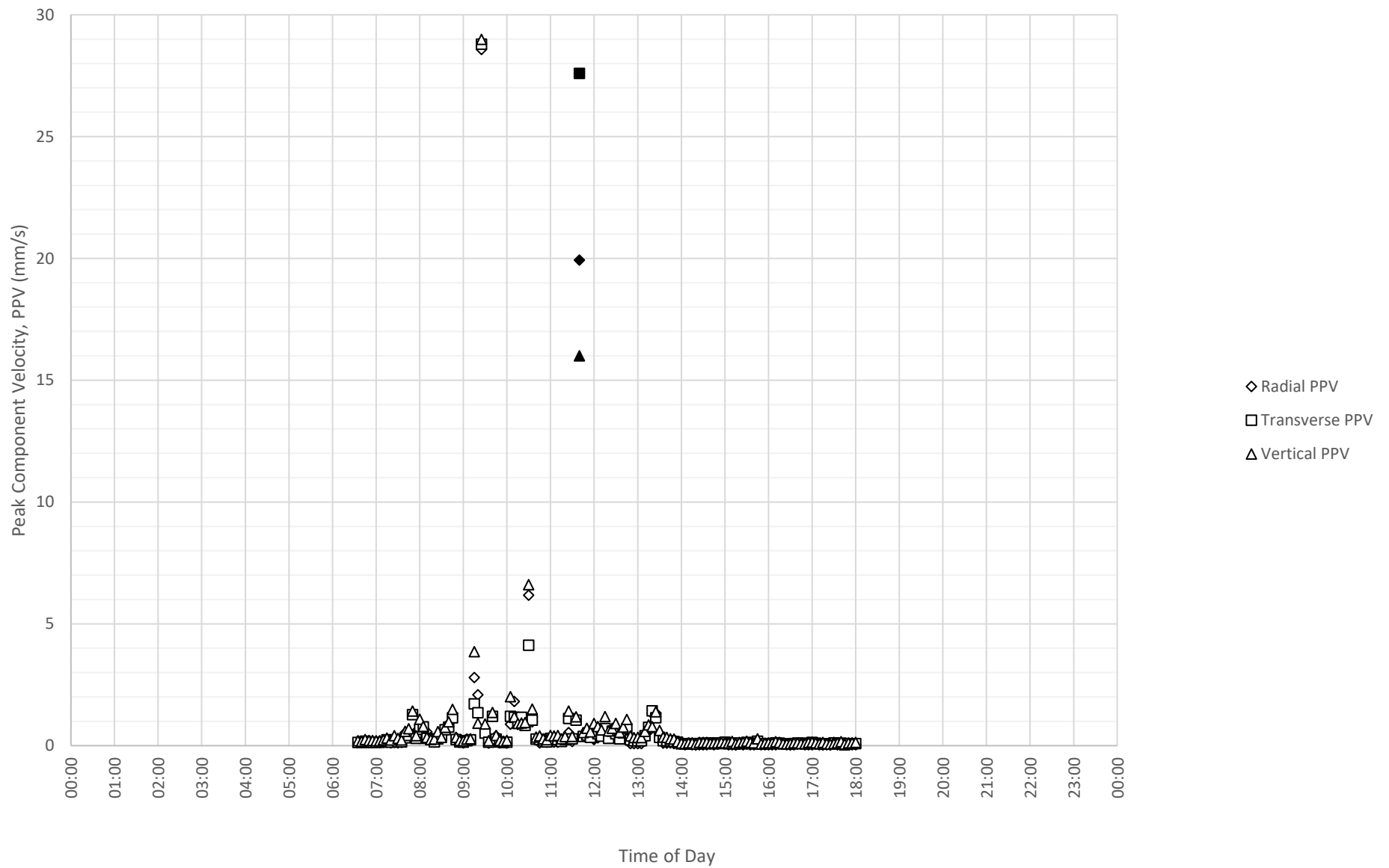
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 27-02-2025



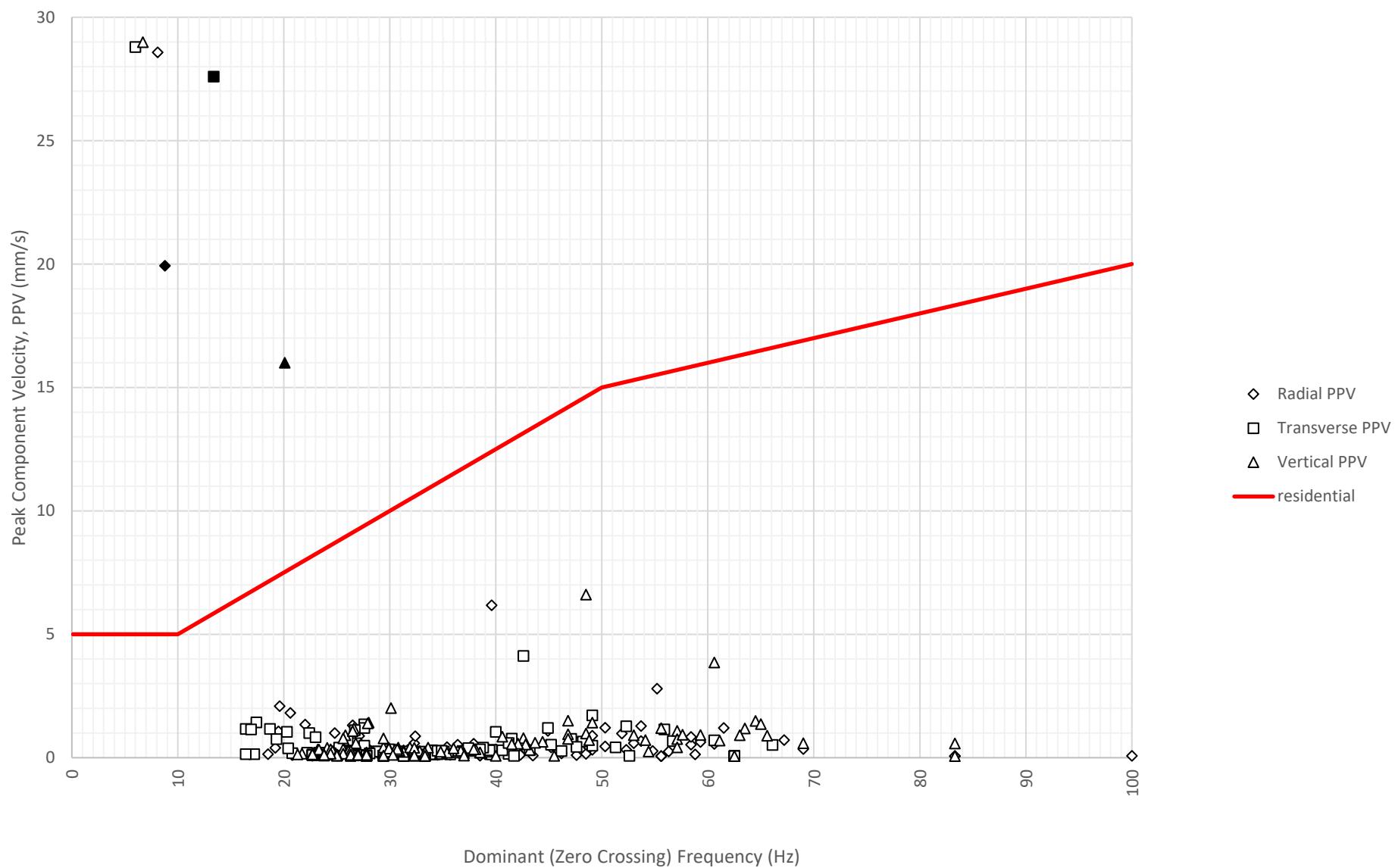
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 27-02-2025



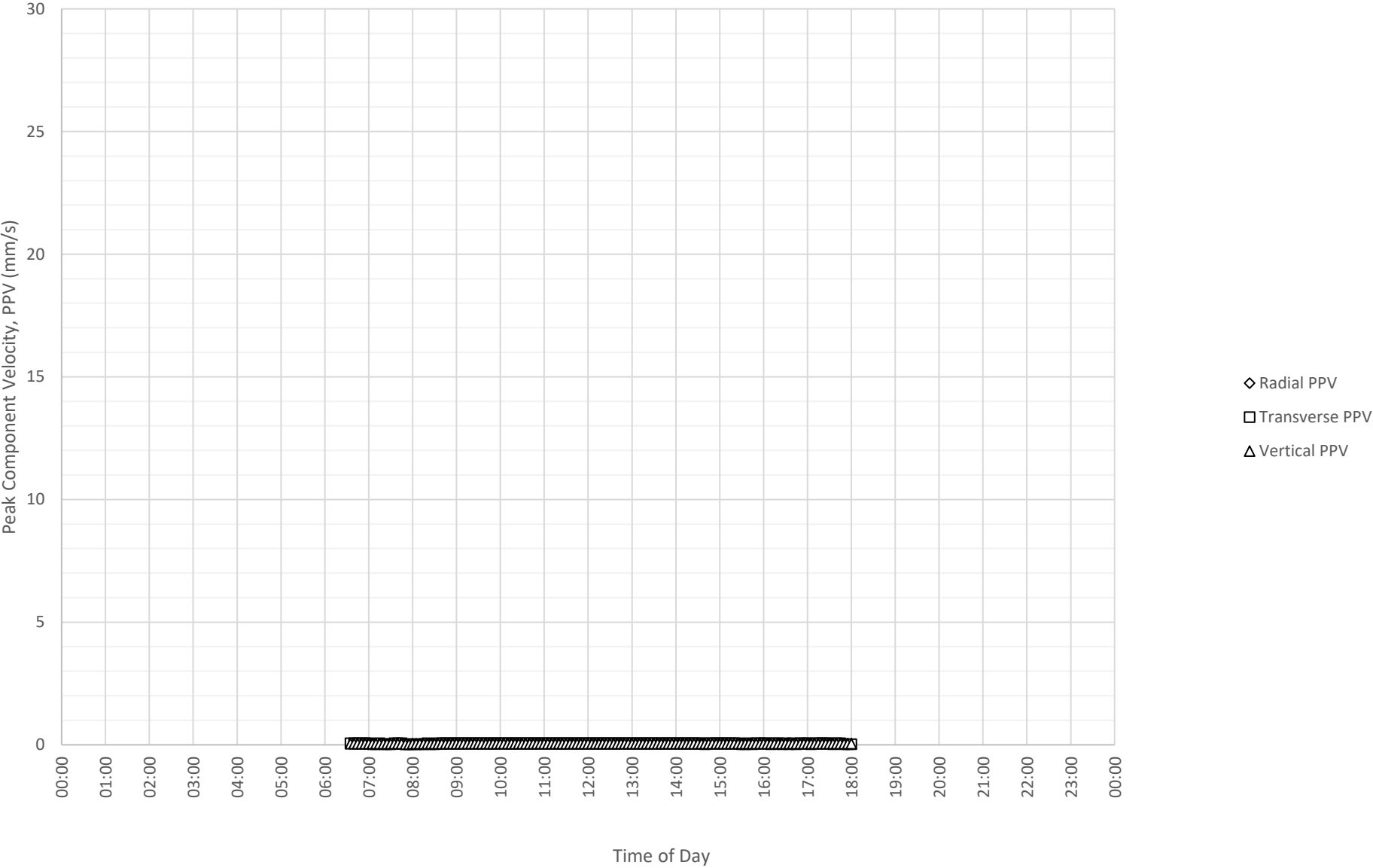
Daily Monitored Vibration Levels at North Boundary Near Block A and B (ETM7687) on 28-02-2025



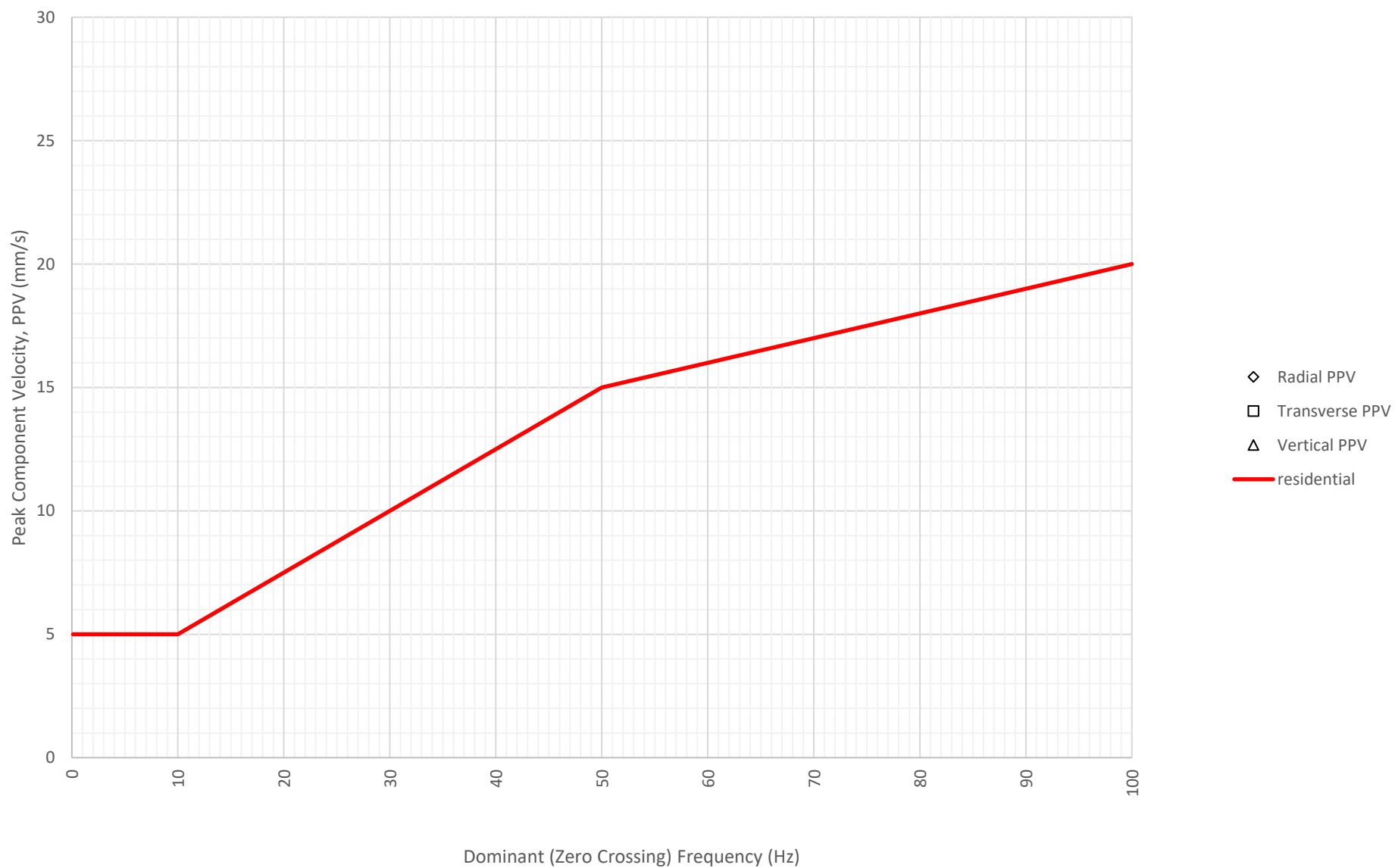
Frequency Content of Vibration Levels at North Boundary Near Block A and B (ETM7687) on 28-02-2025



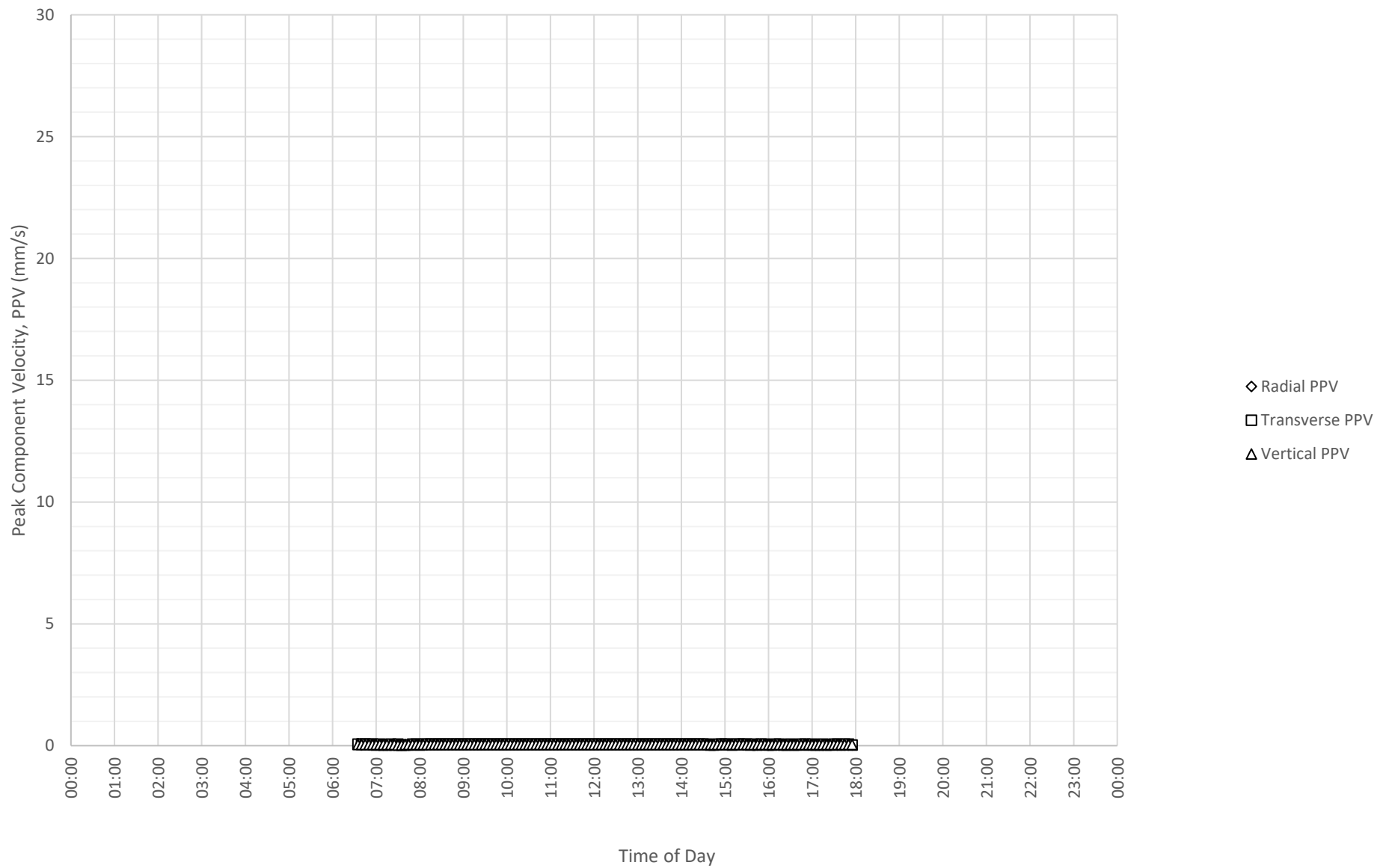
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 1-02-2025



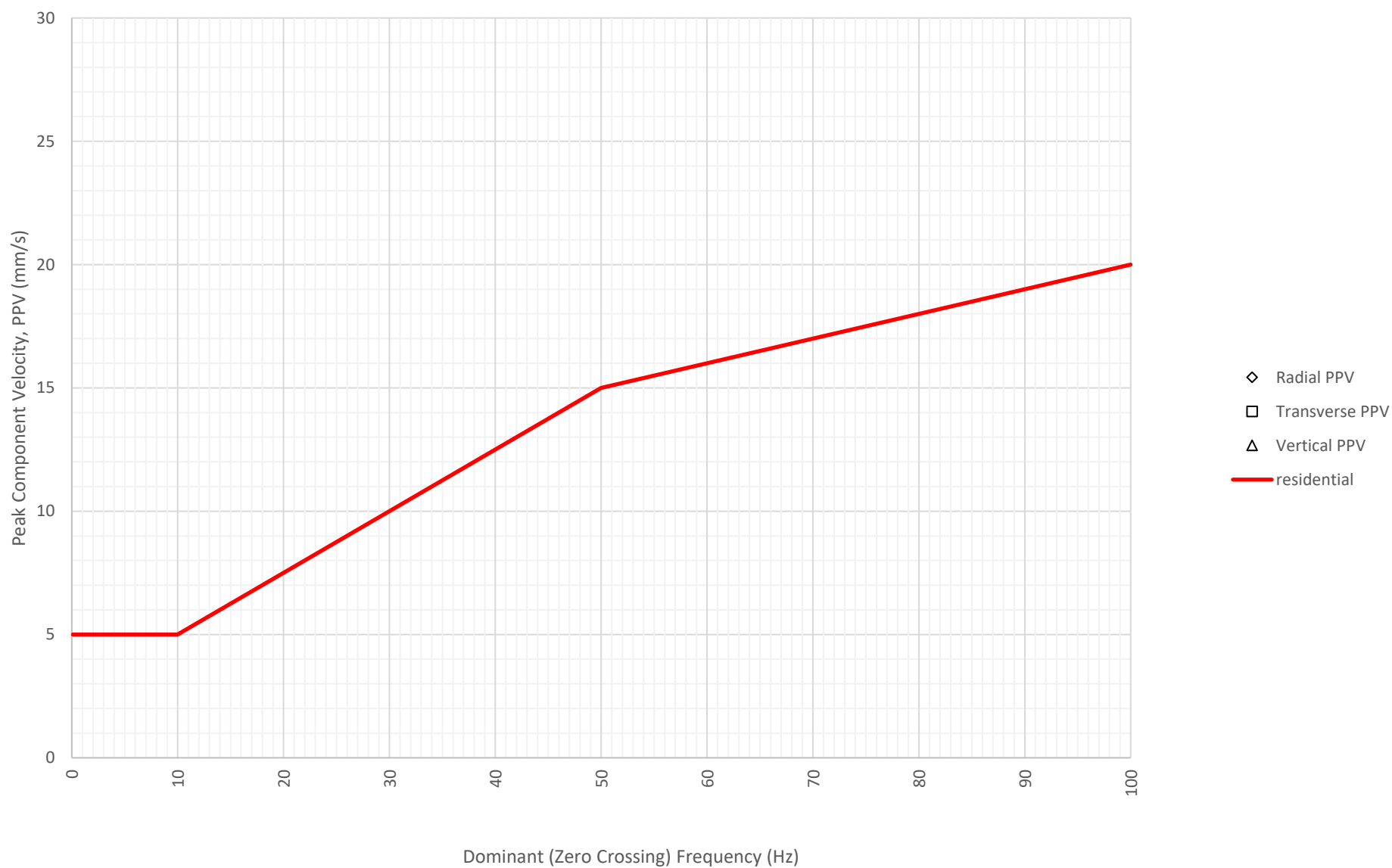
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 1-02-2025



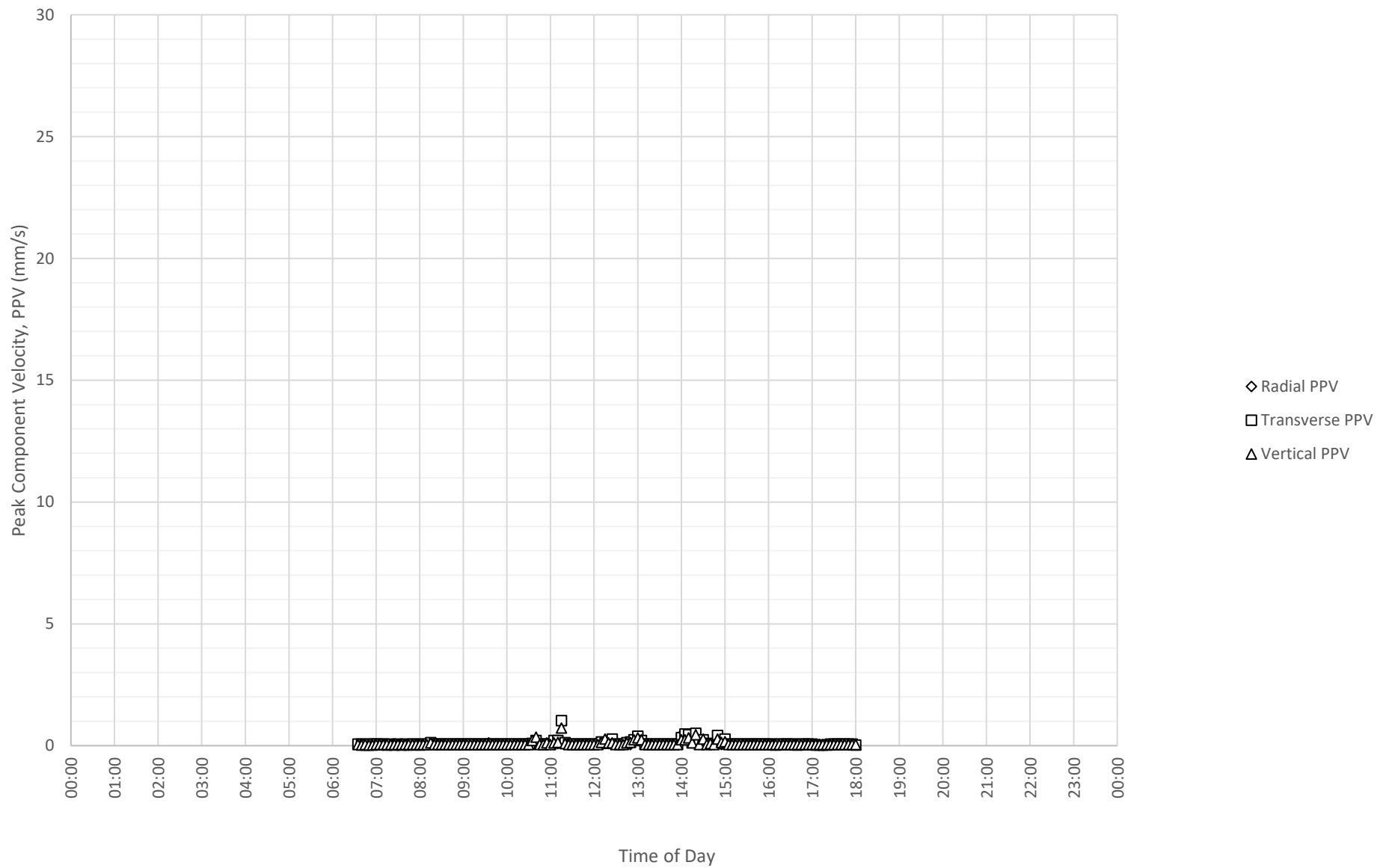
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 2-02-2025



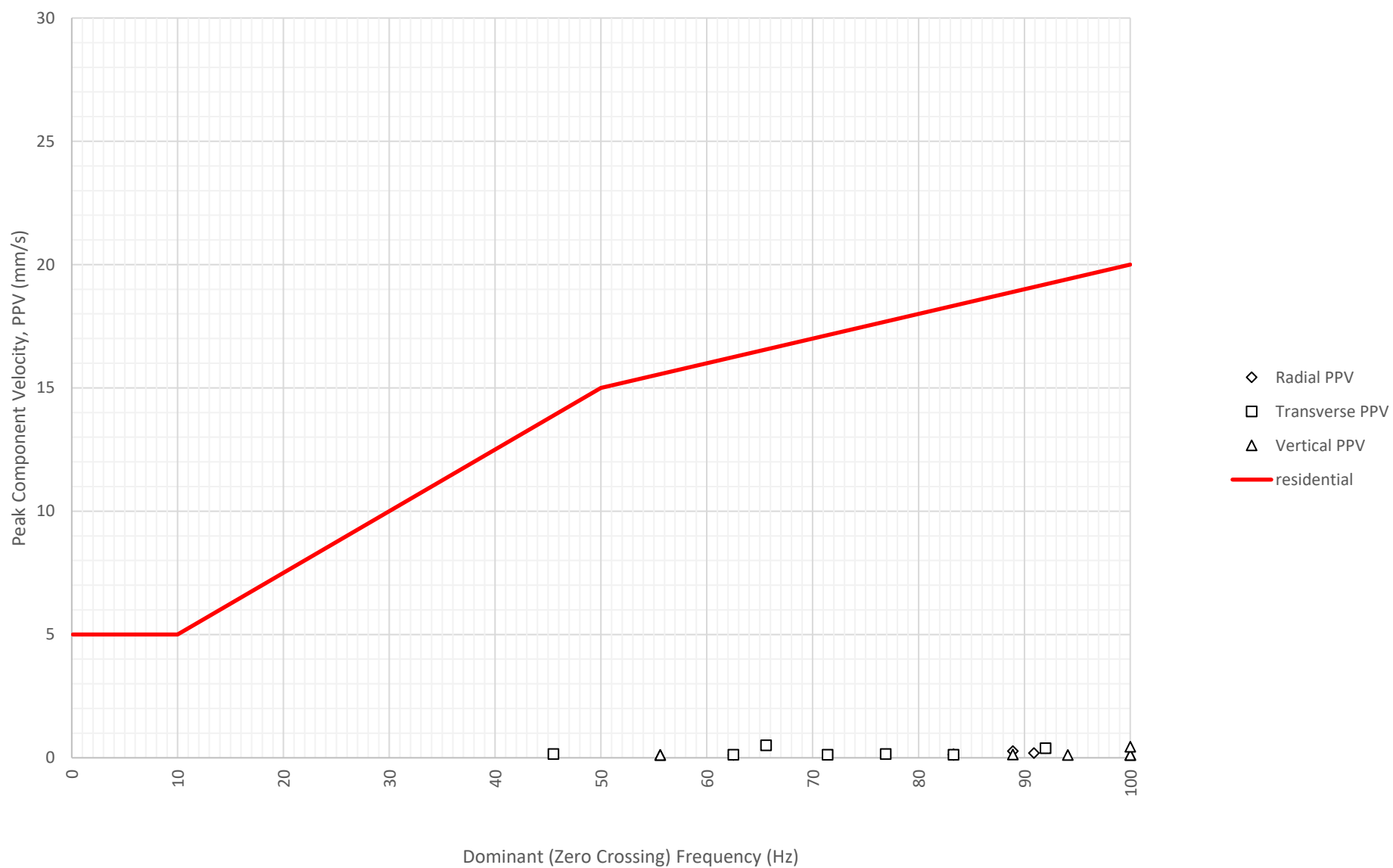
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 2-02-2025



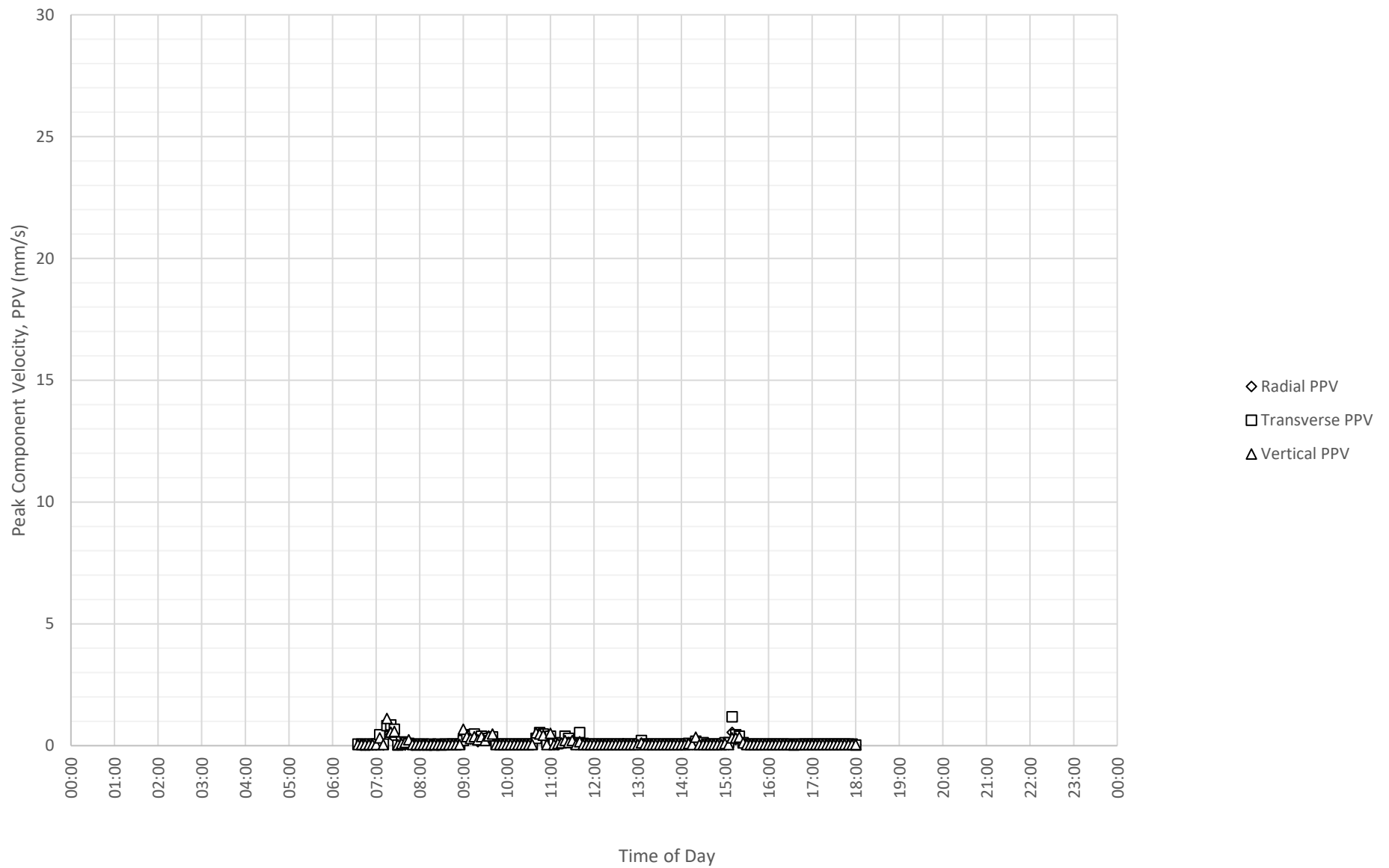
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 3-02-2025



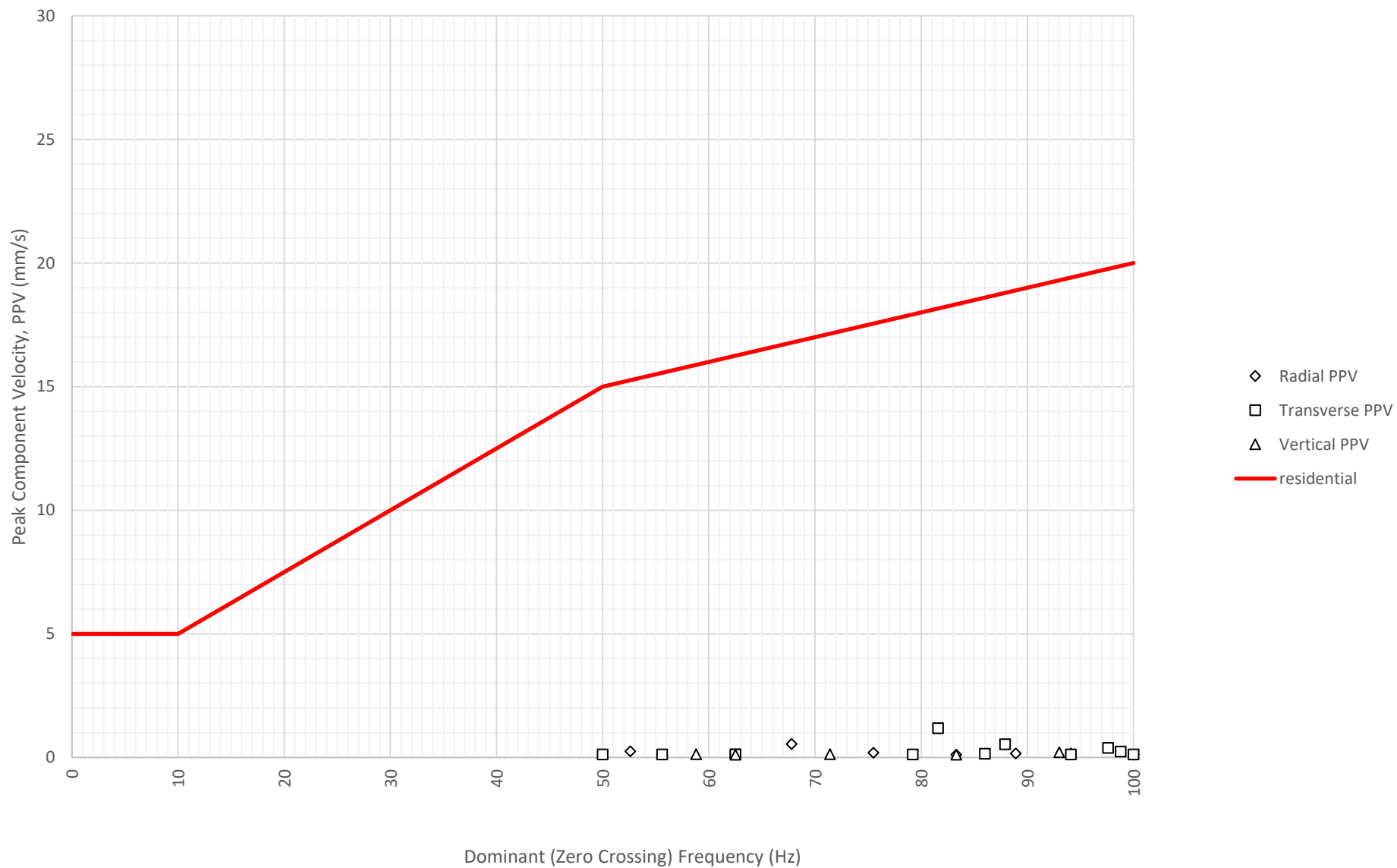
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 3-02-2025



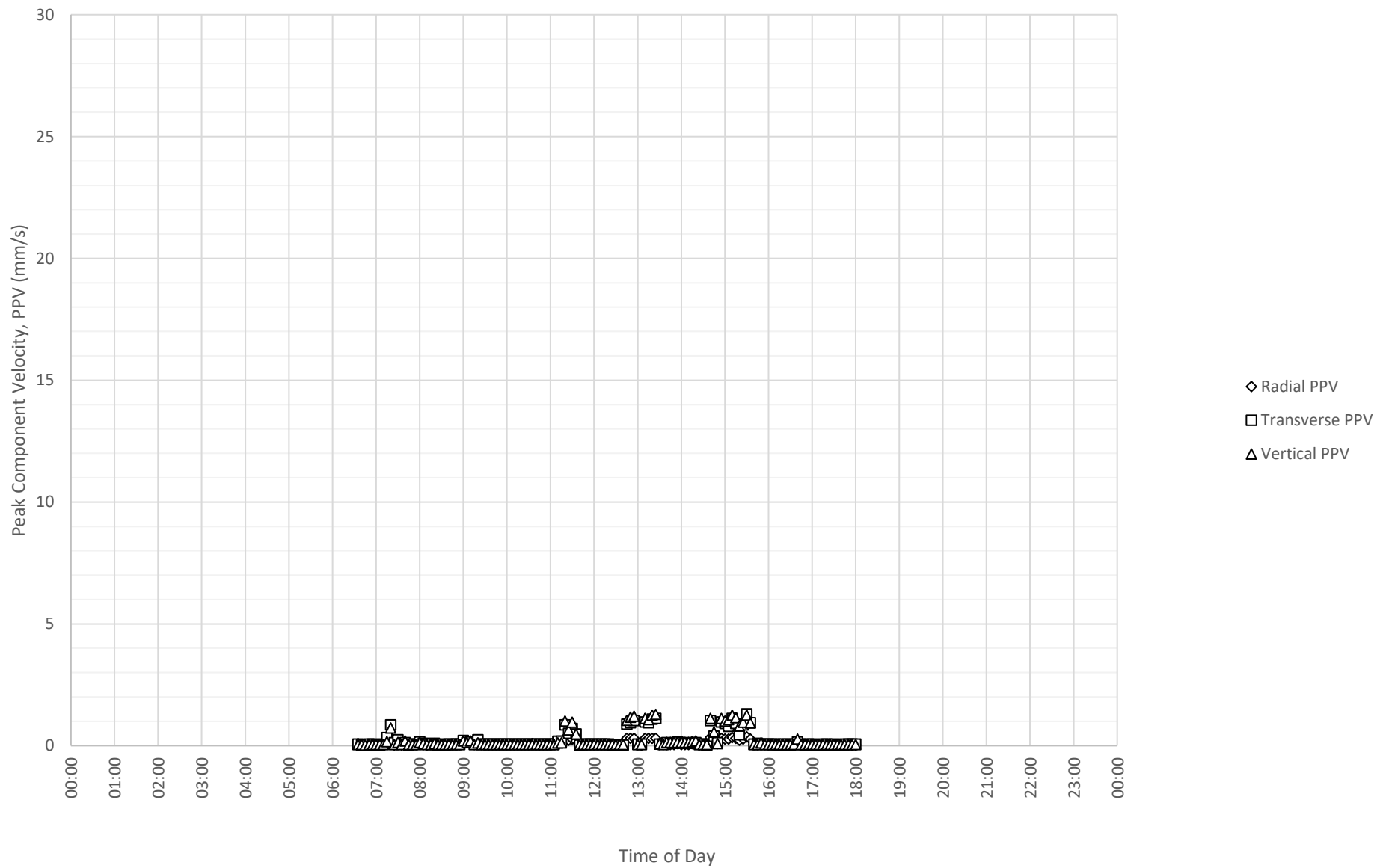
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 4-02-2025



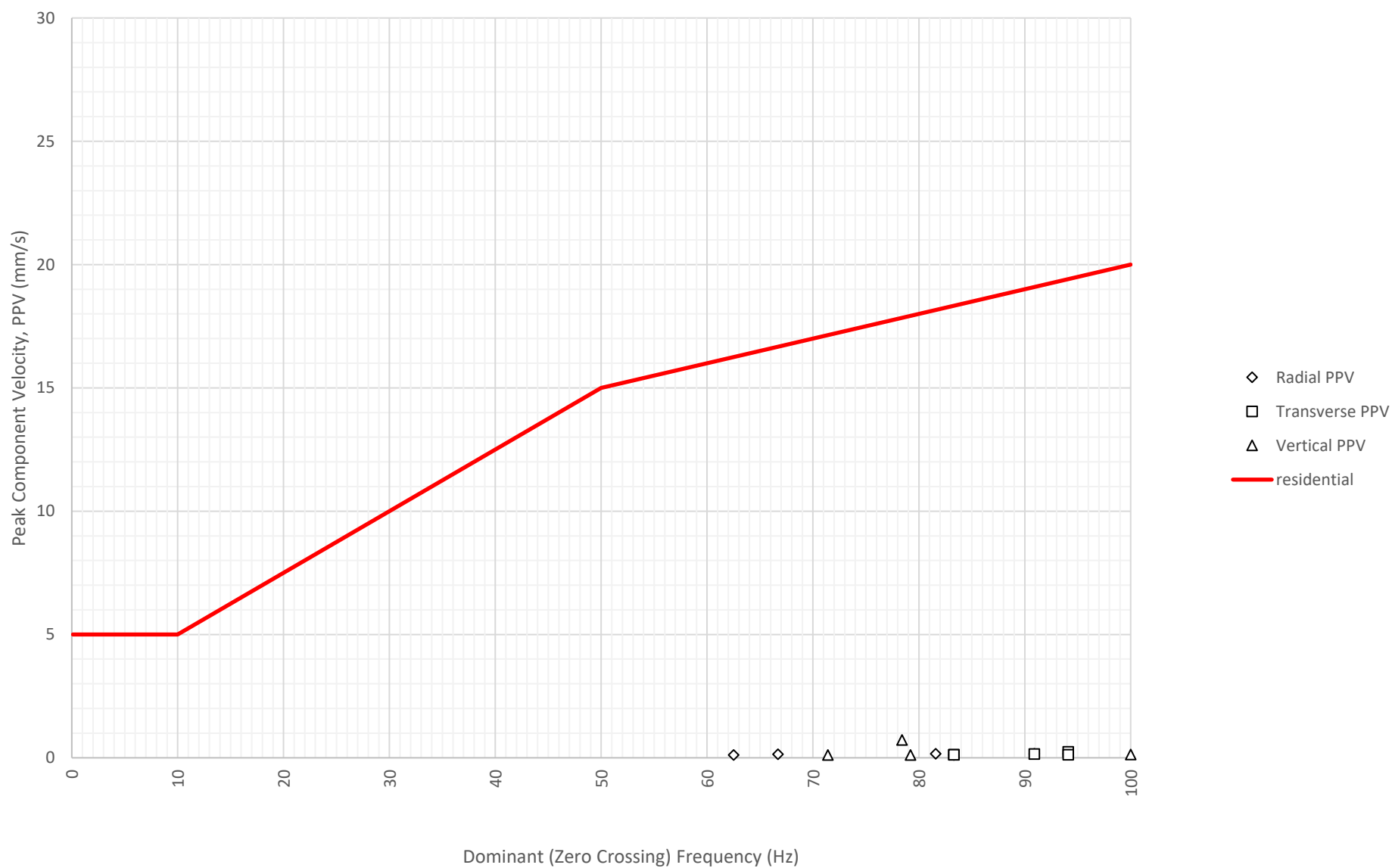
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 4-02-2025



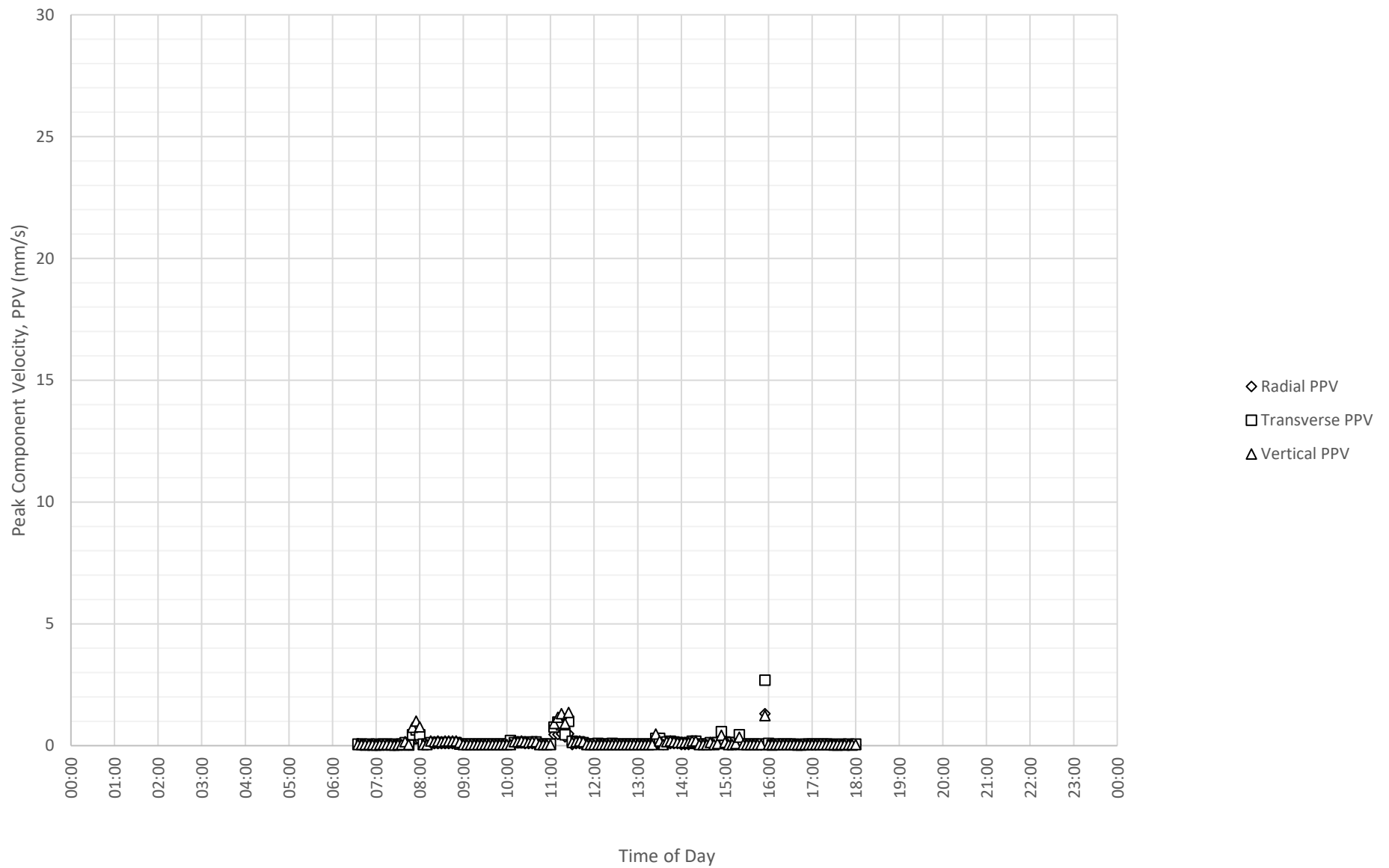
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 5-02-2025



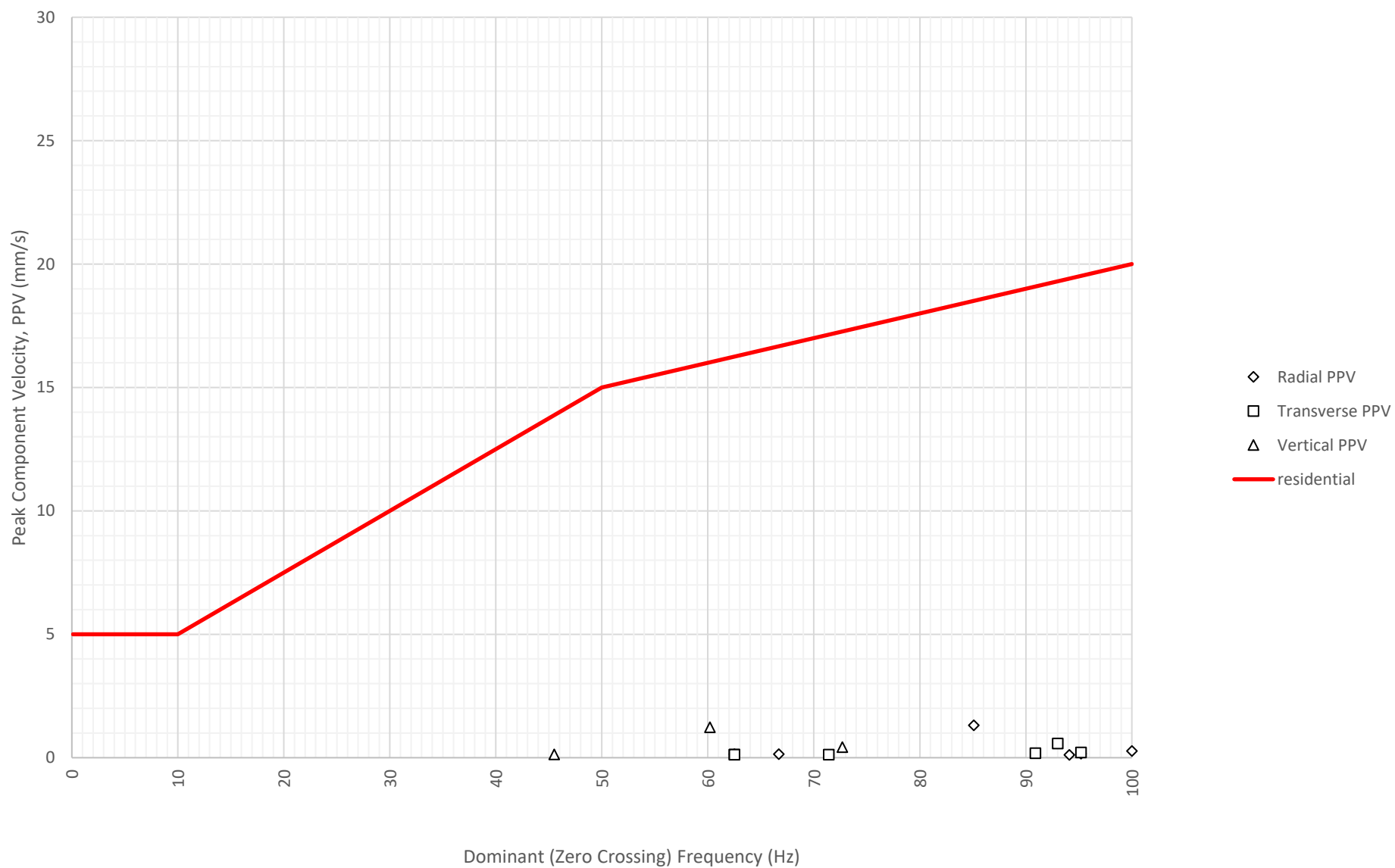
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 5-02-2025



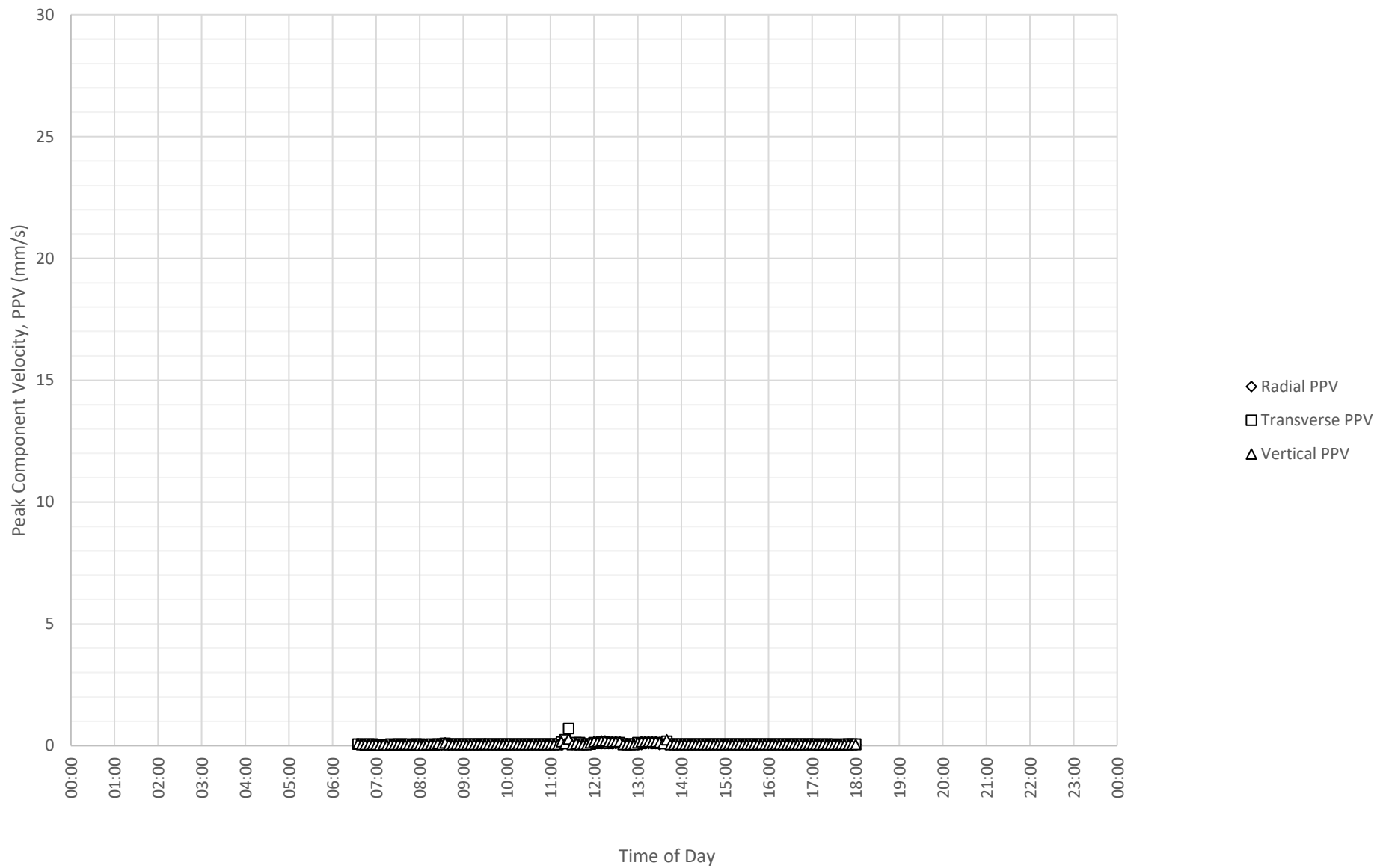
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 6-02-2025



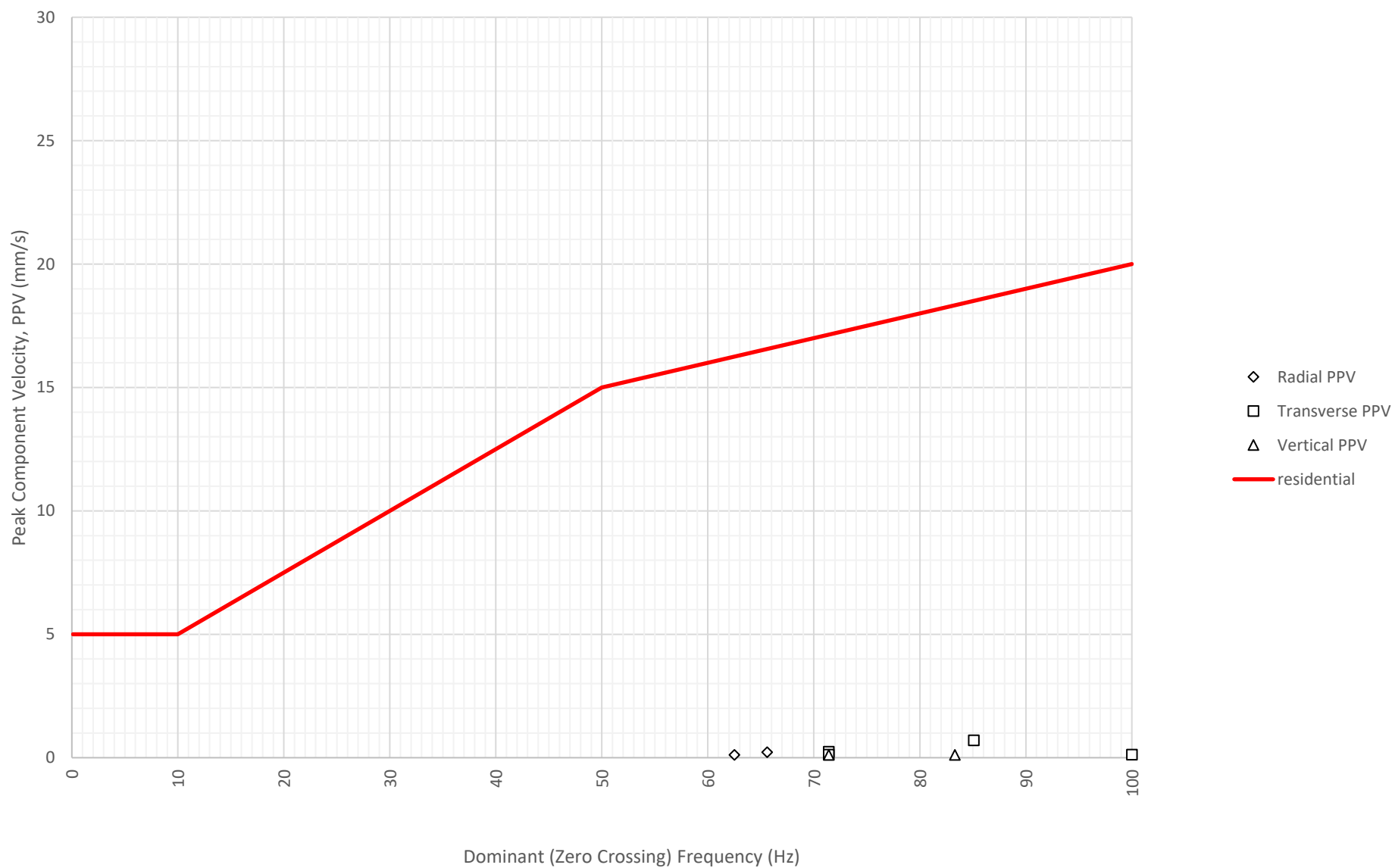
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 6-02-2025



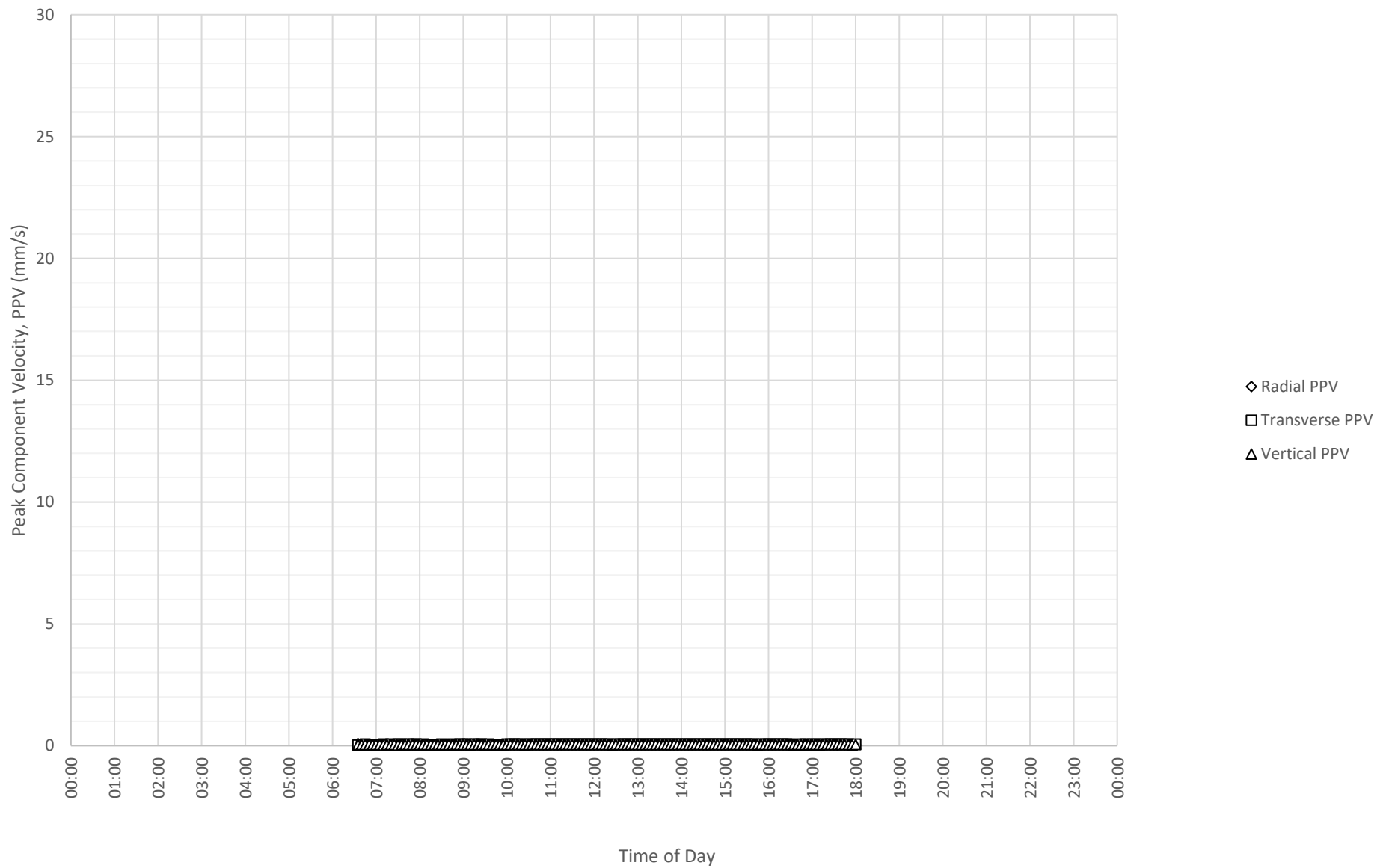
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 7-02-2025



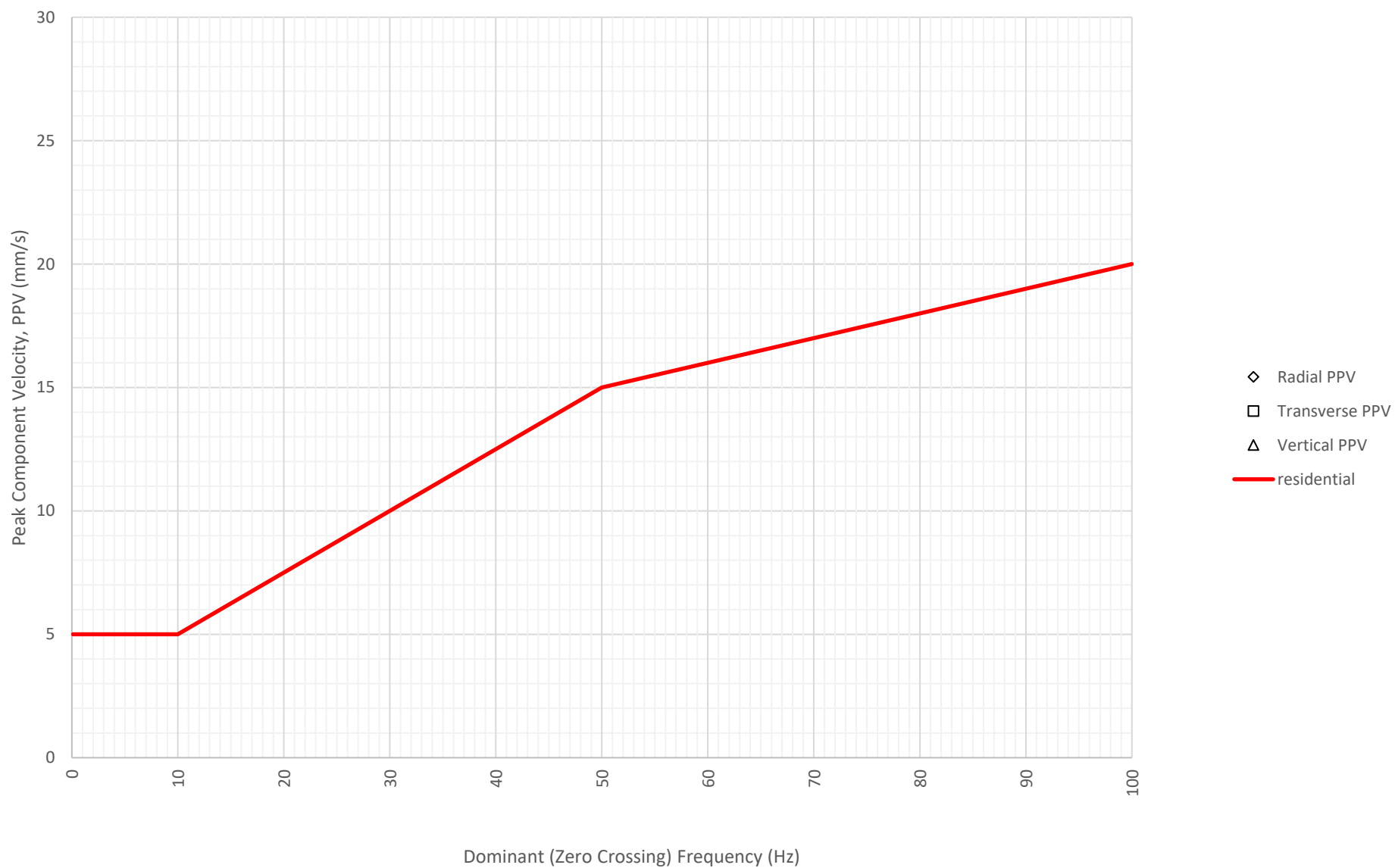
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 7-02-2025



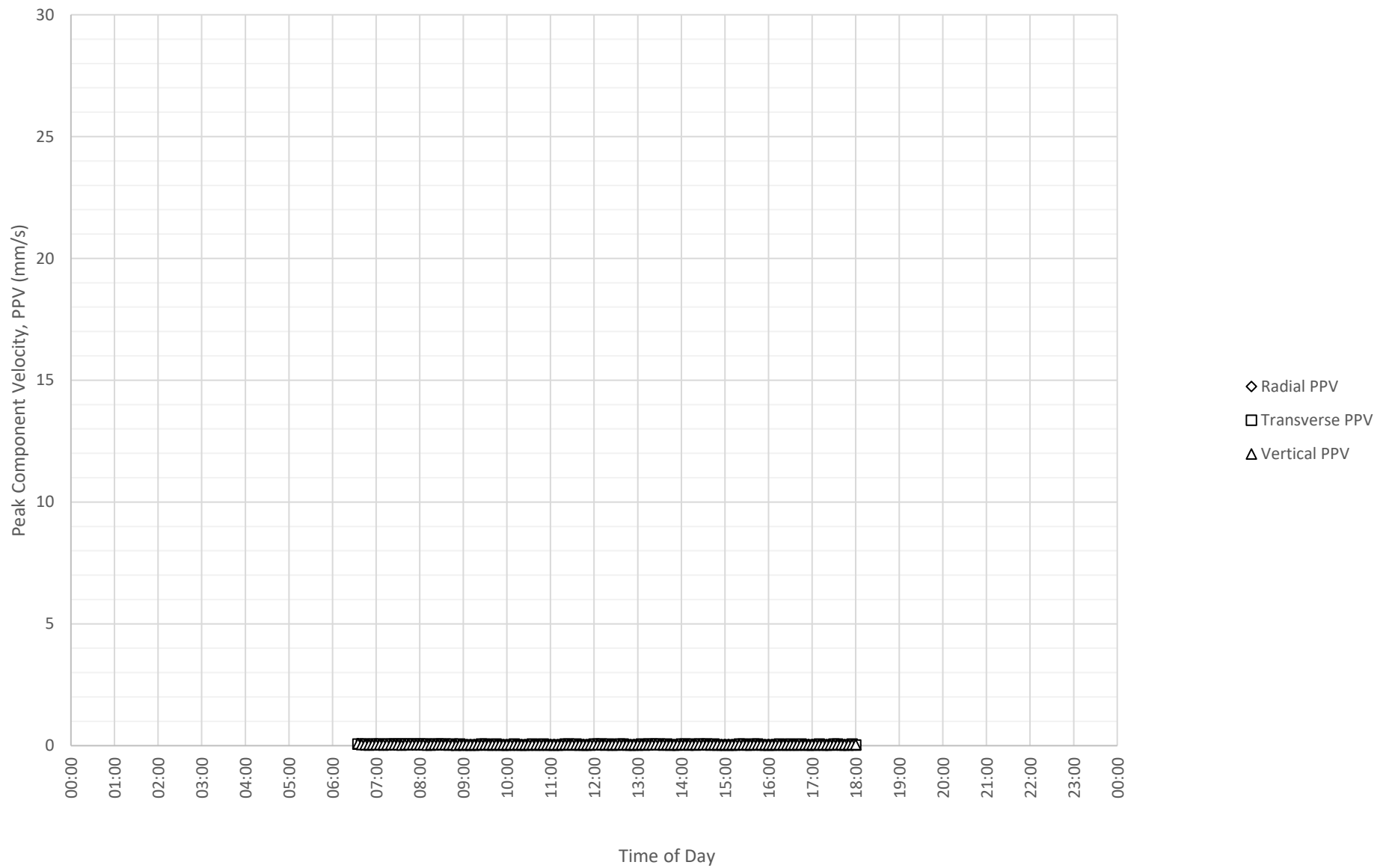
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 8-02-2025



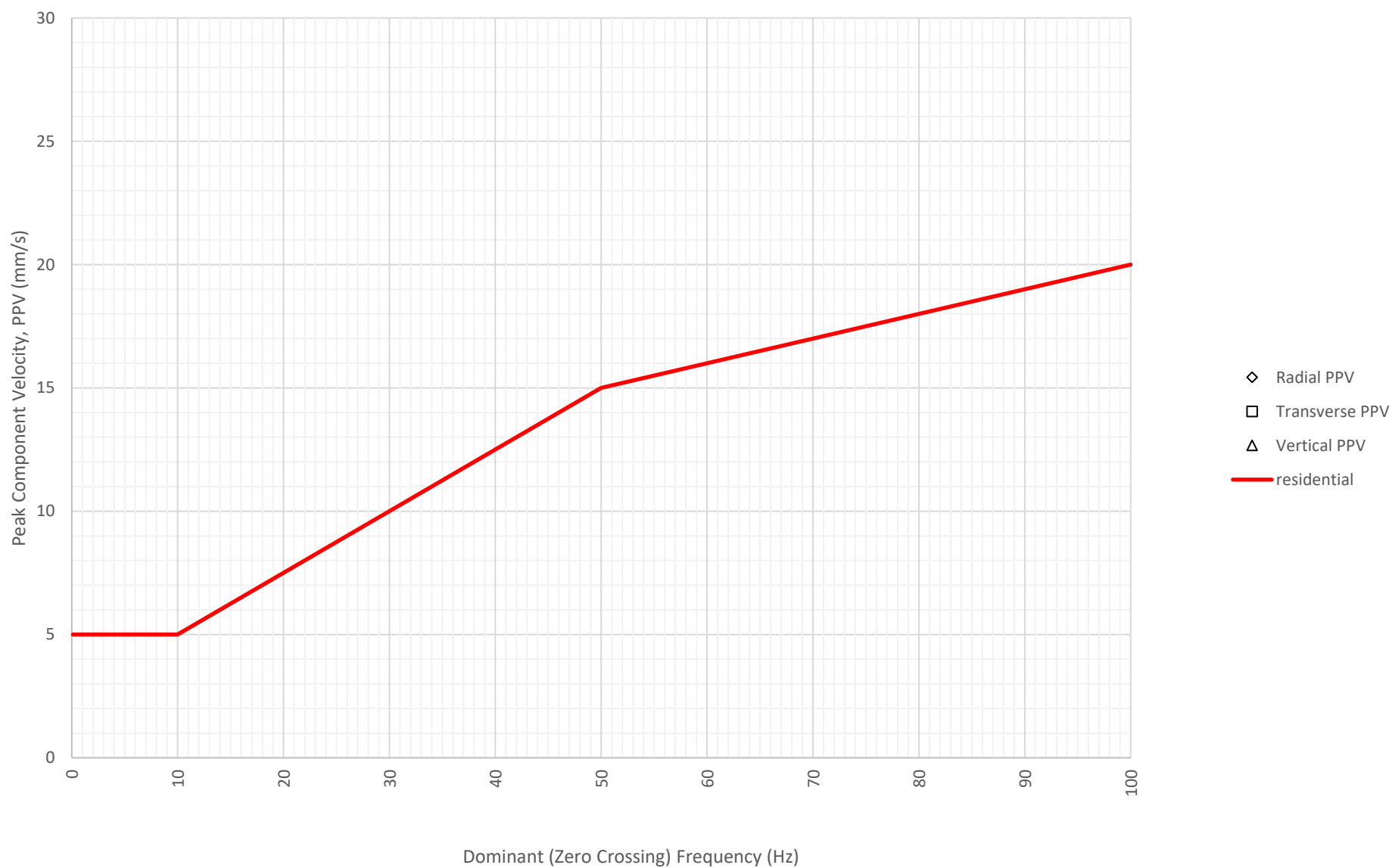
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 8-02-2025



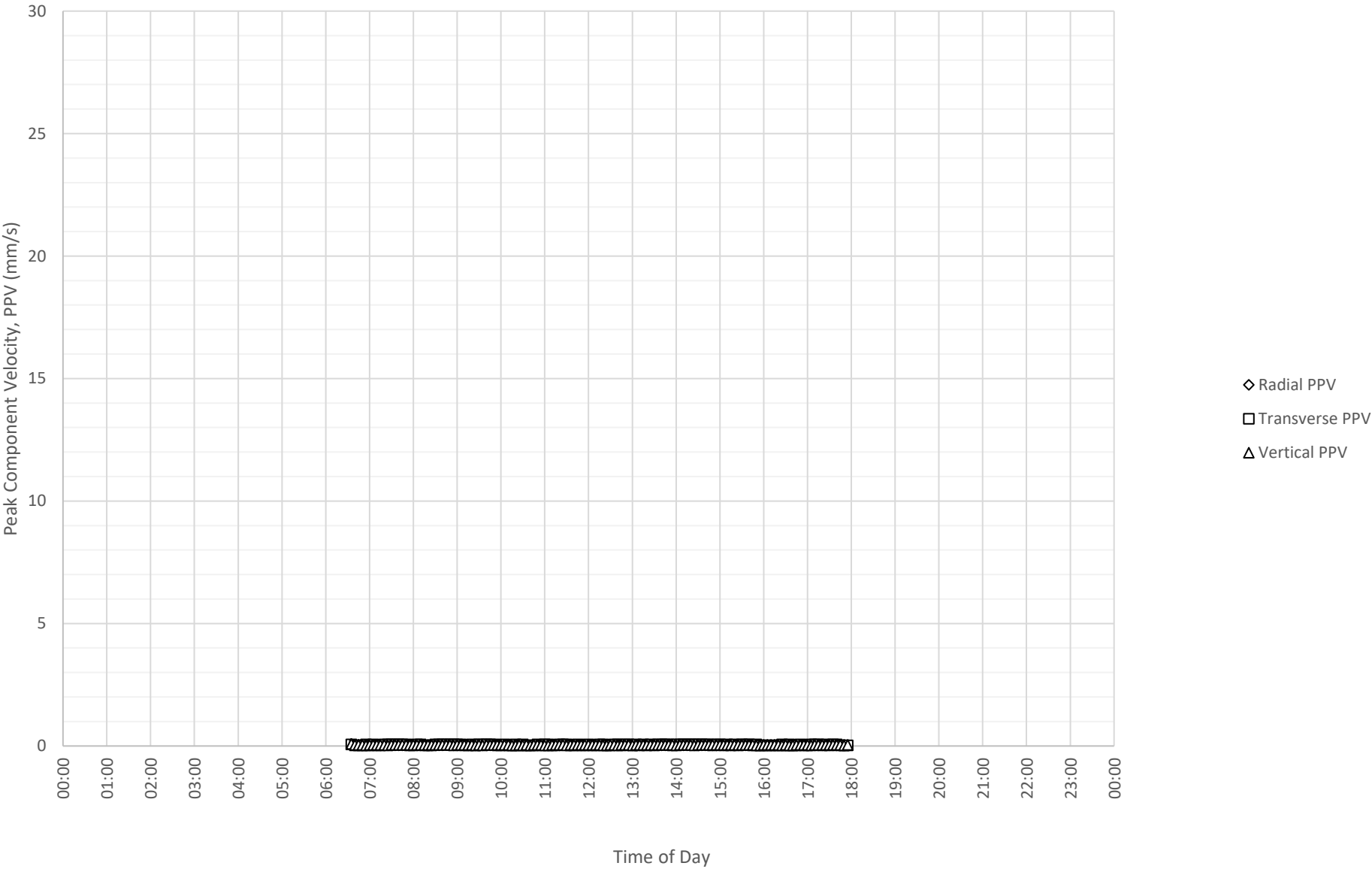
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 9-02-2025



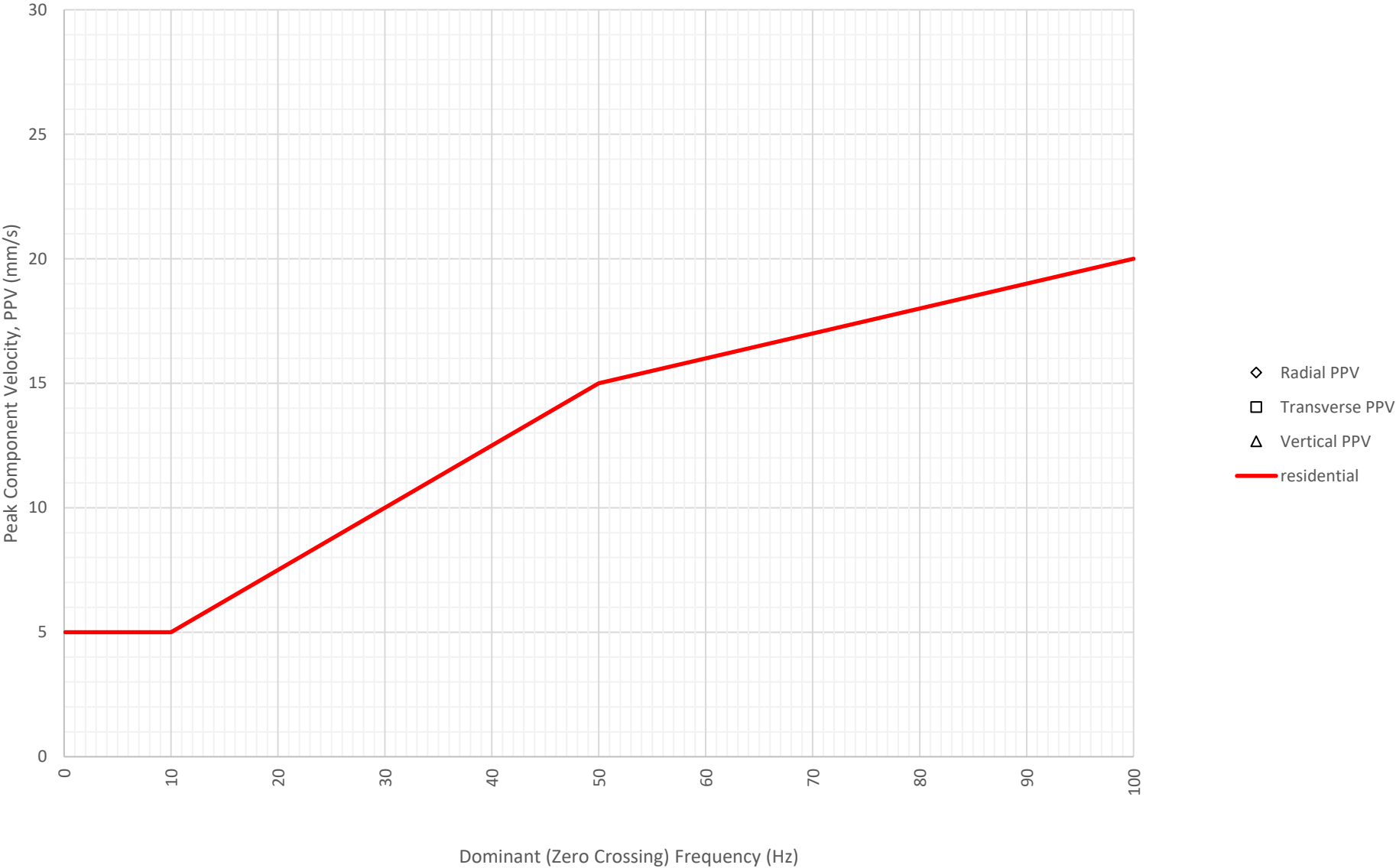
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 9-02-2025



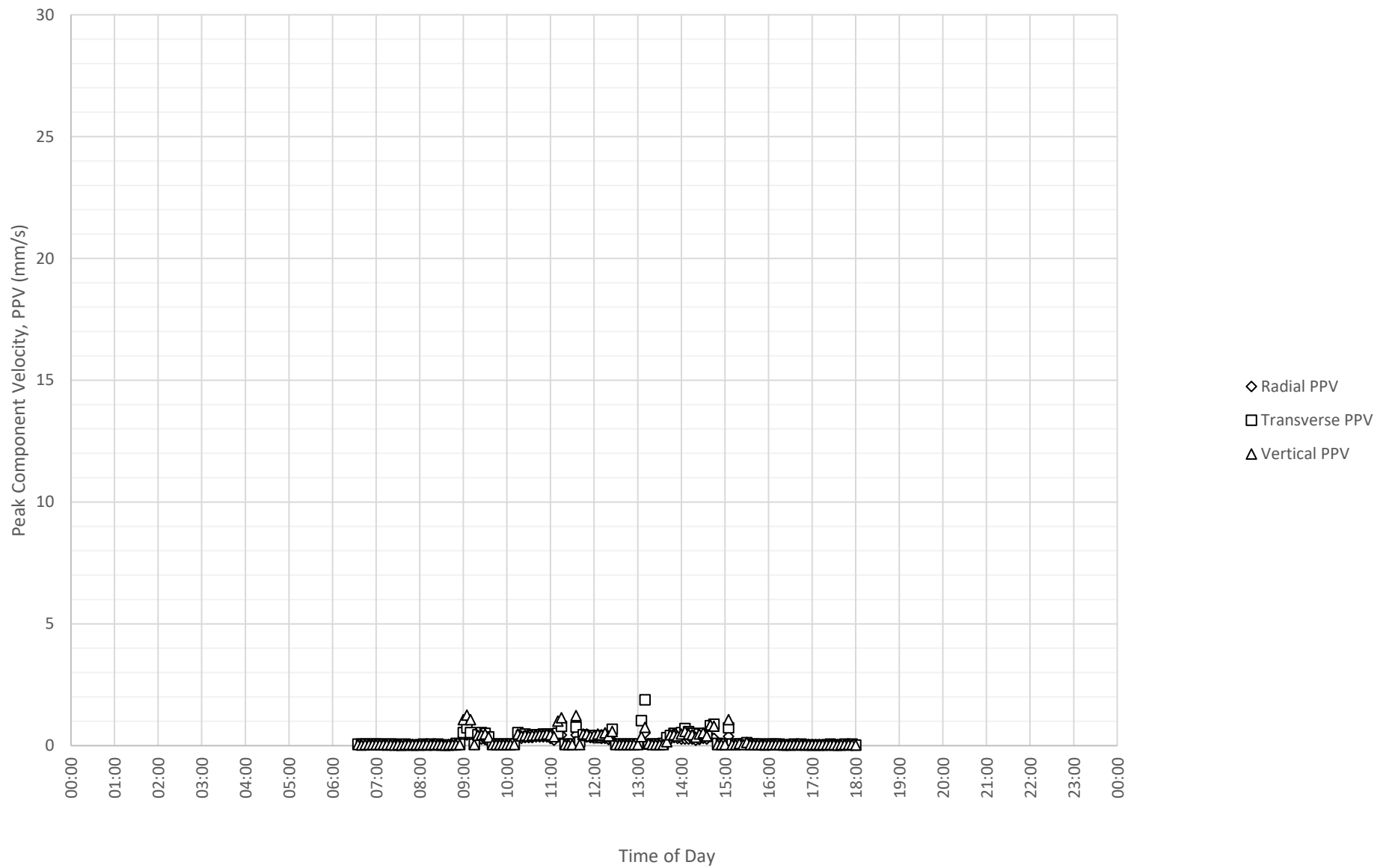
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 10-02-2025



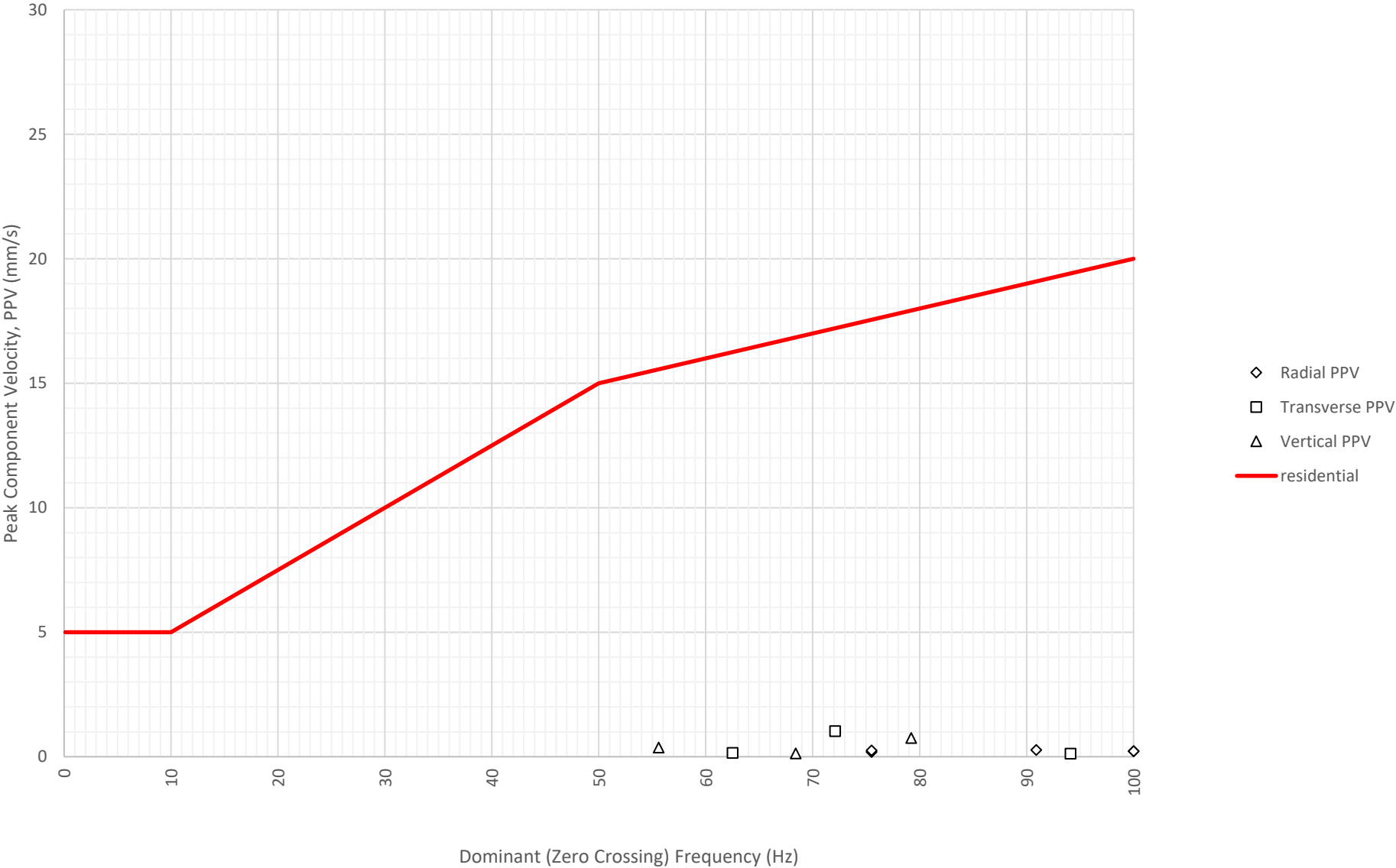
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 10-02-2025



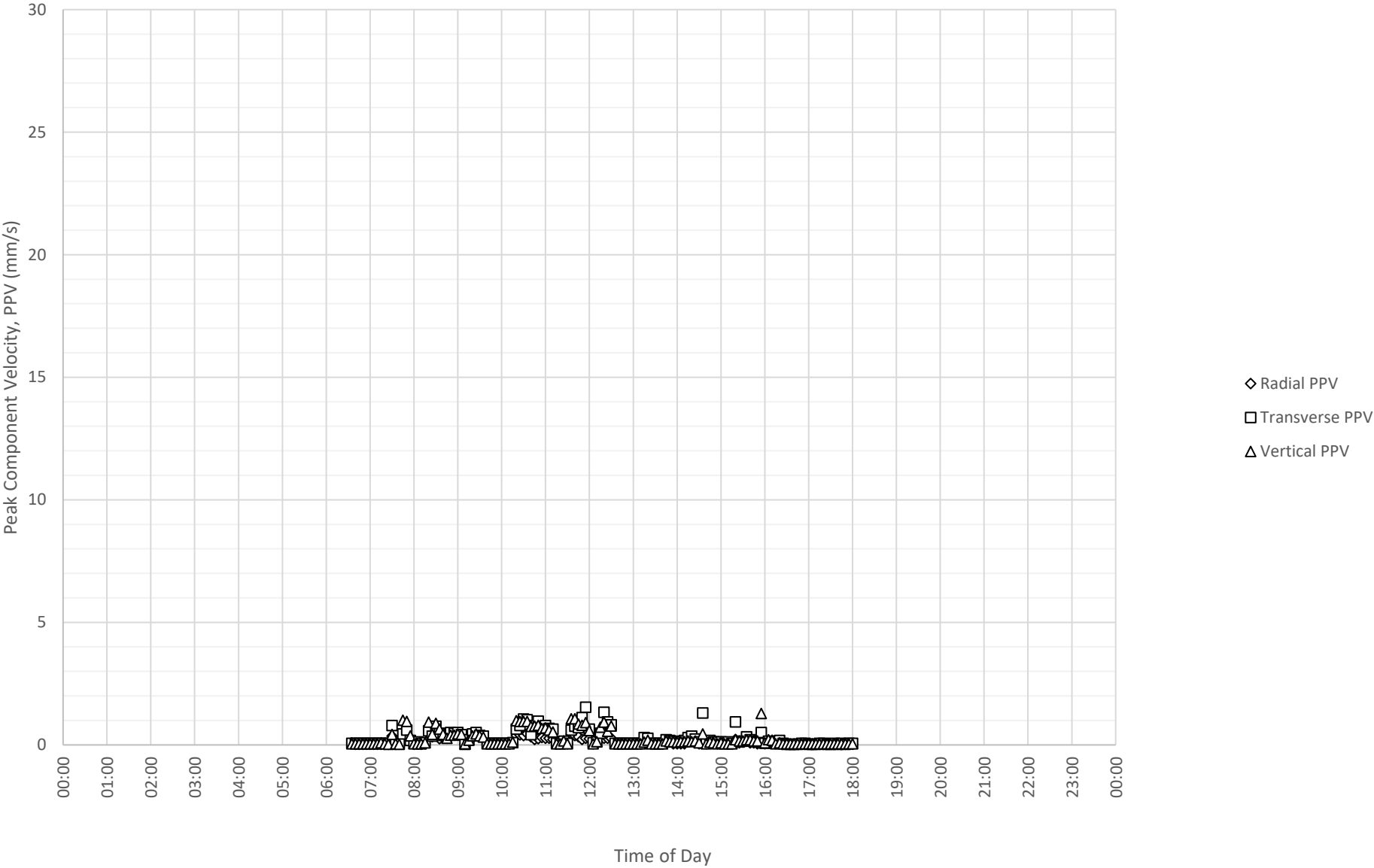
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 11-02-2025



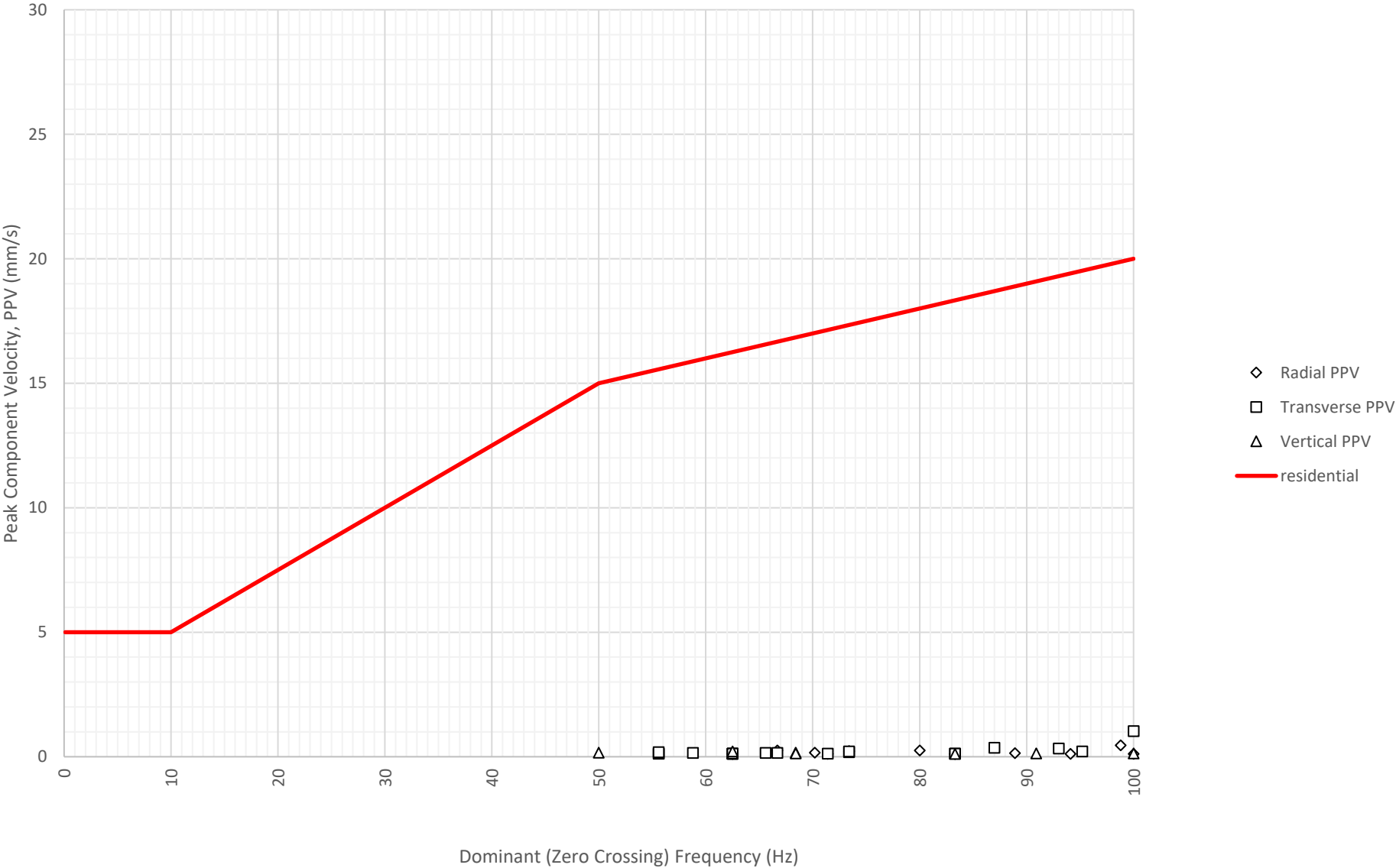
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 11-02-2025



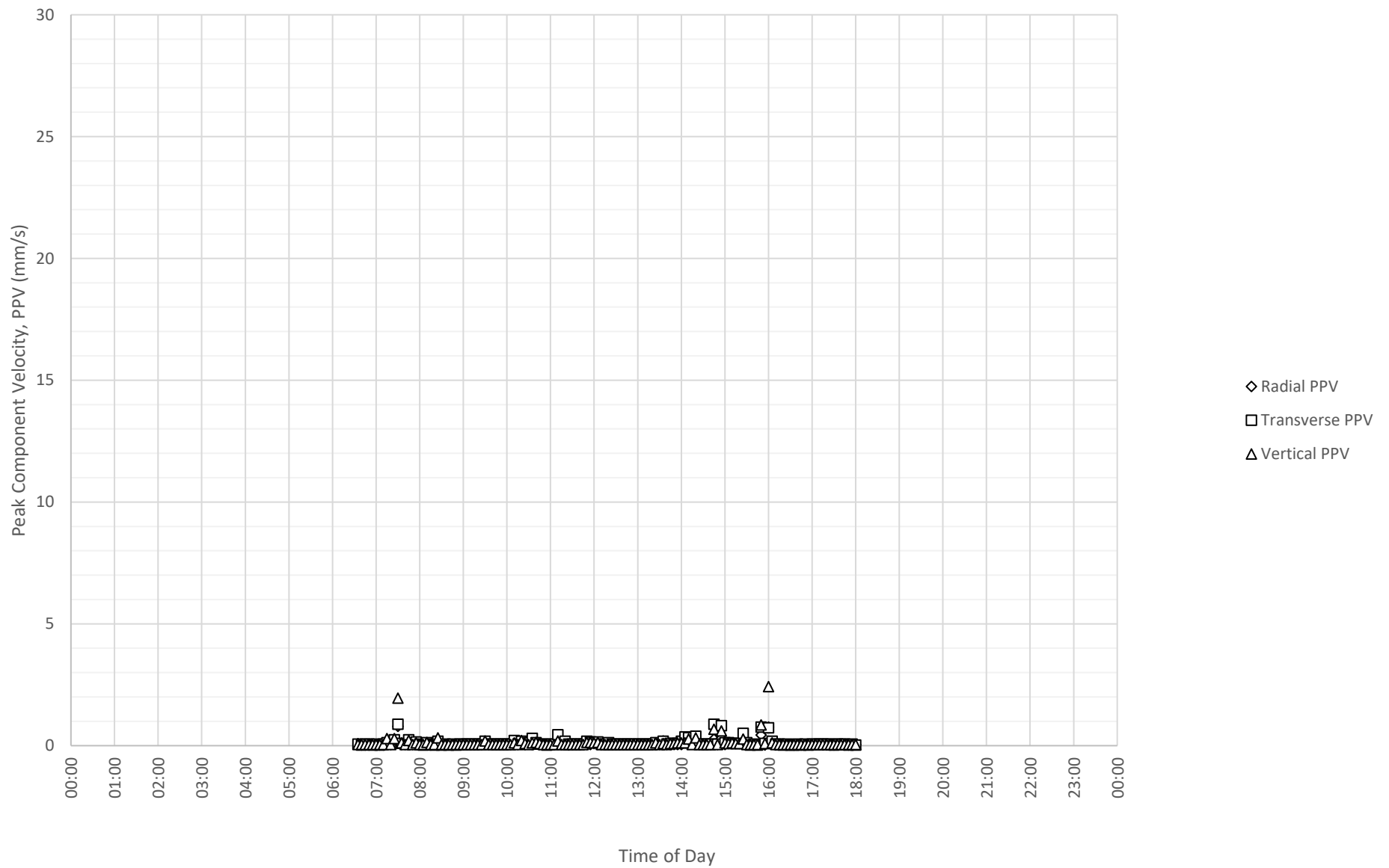
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 12-02-2025



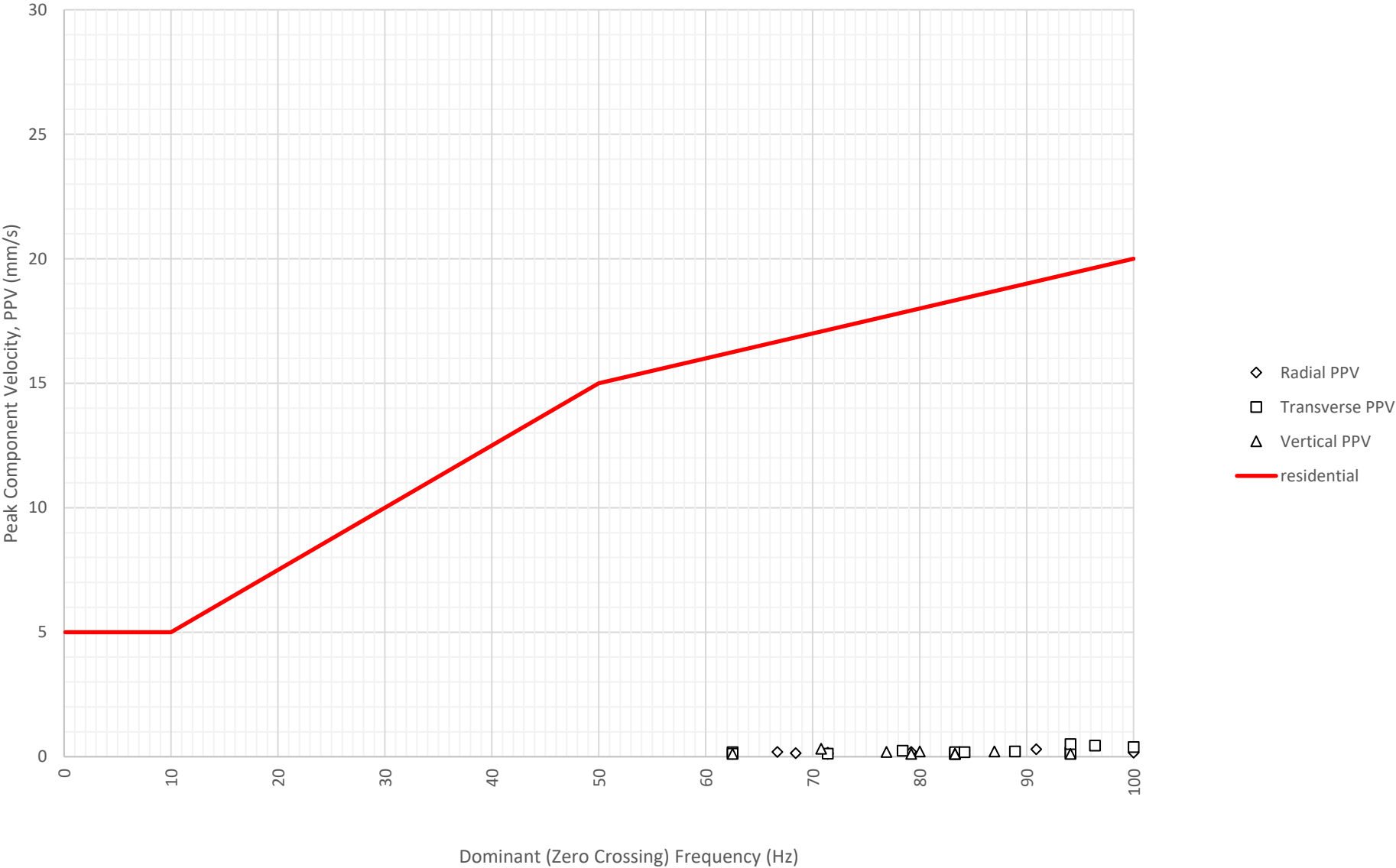
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 12-02-2025



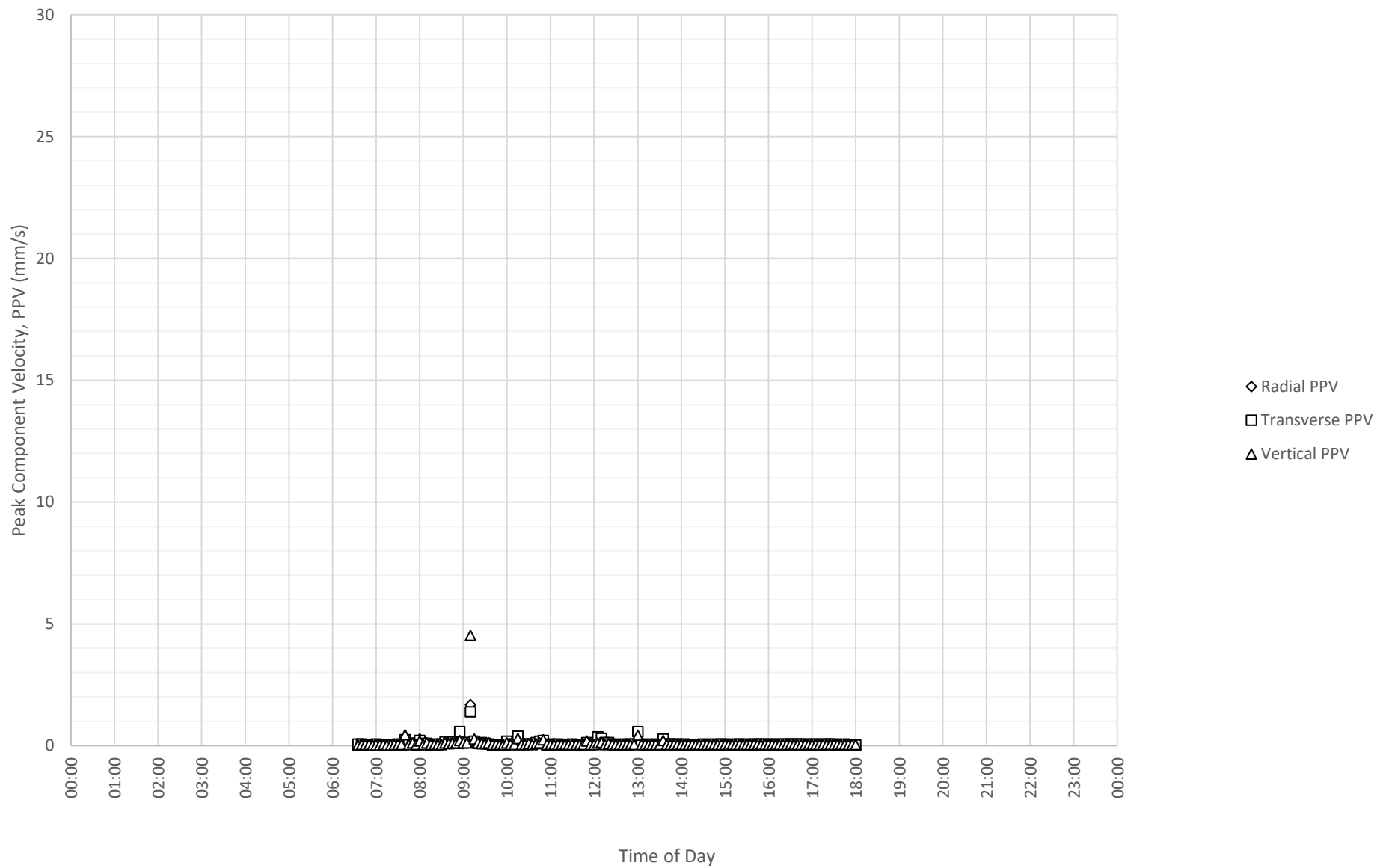
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 13-02-2025



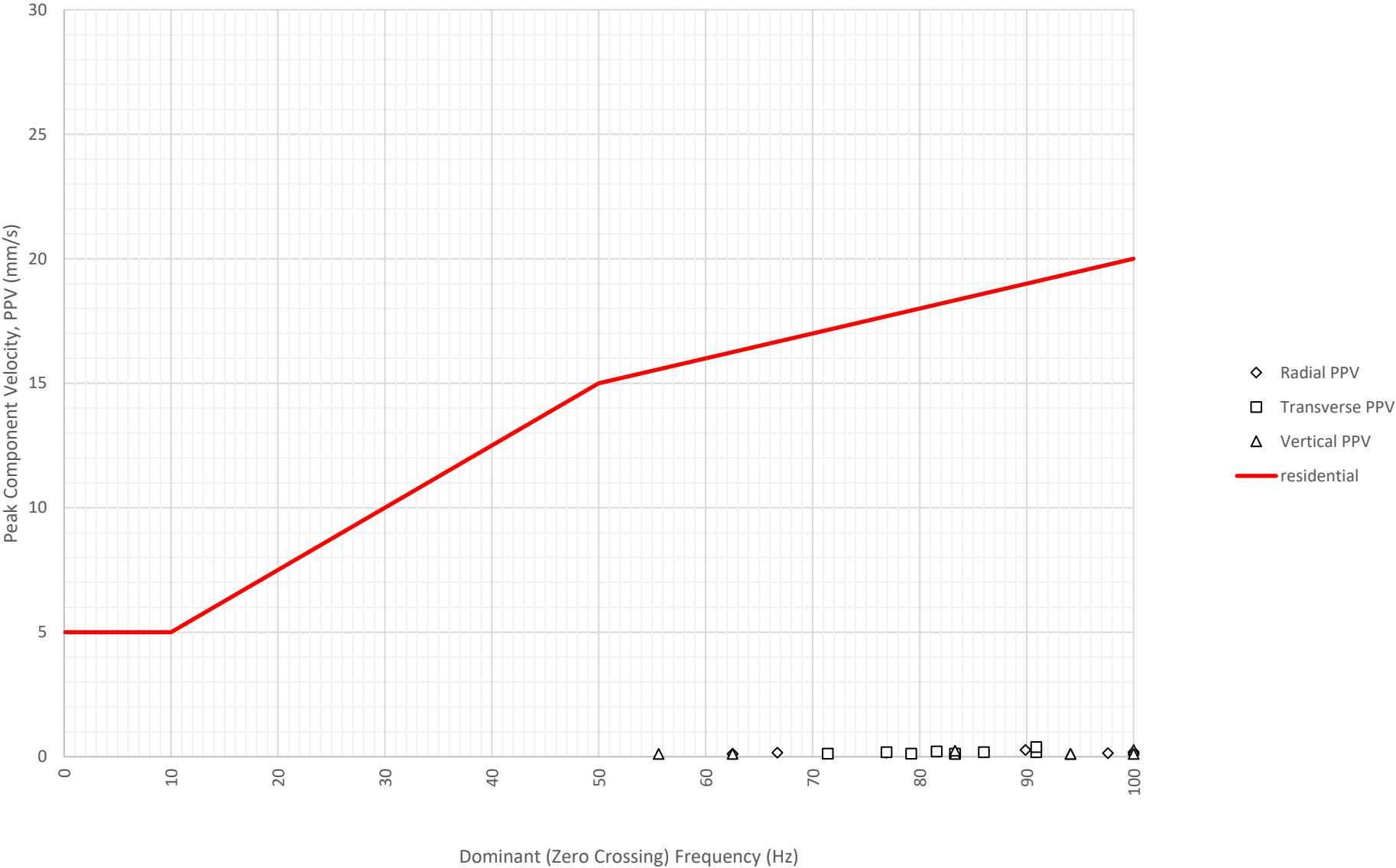
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 13-02-2025



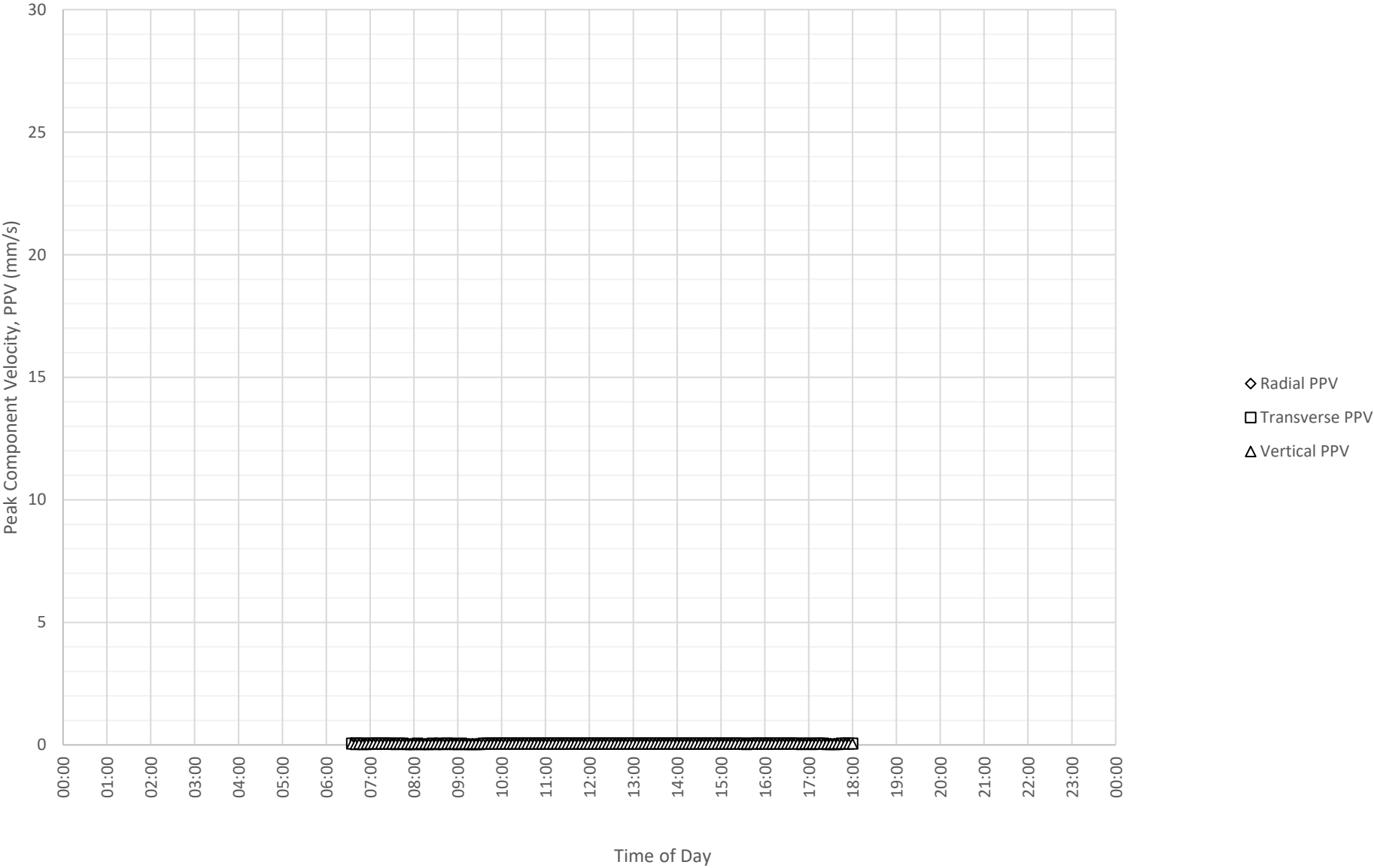
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 14-02-2025



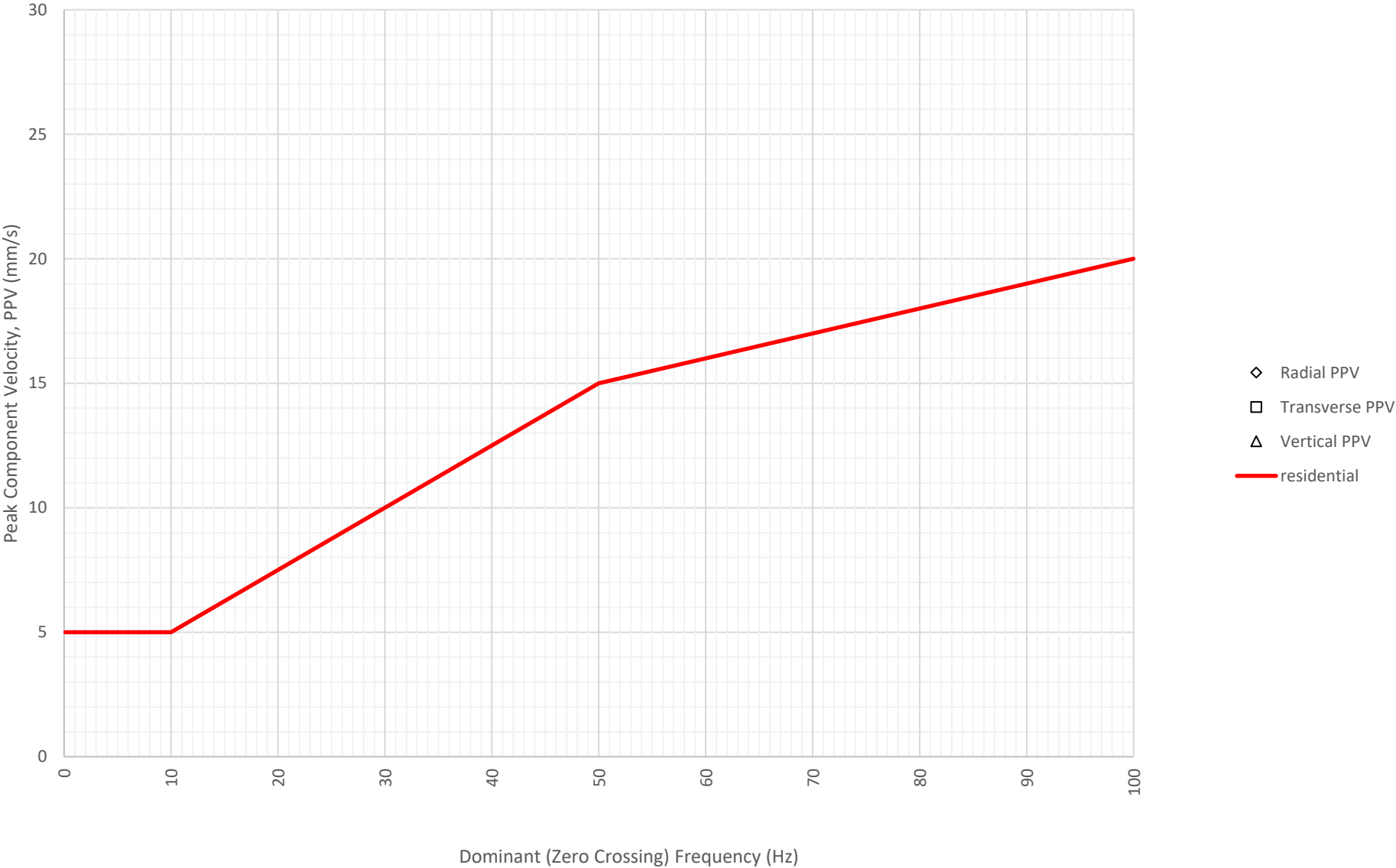
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 14-02-2025



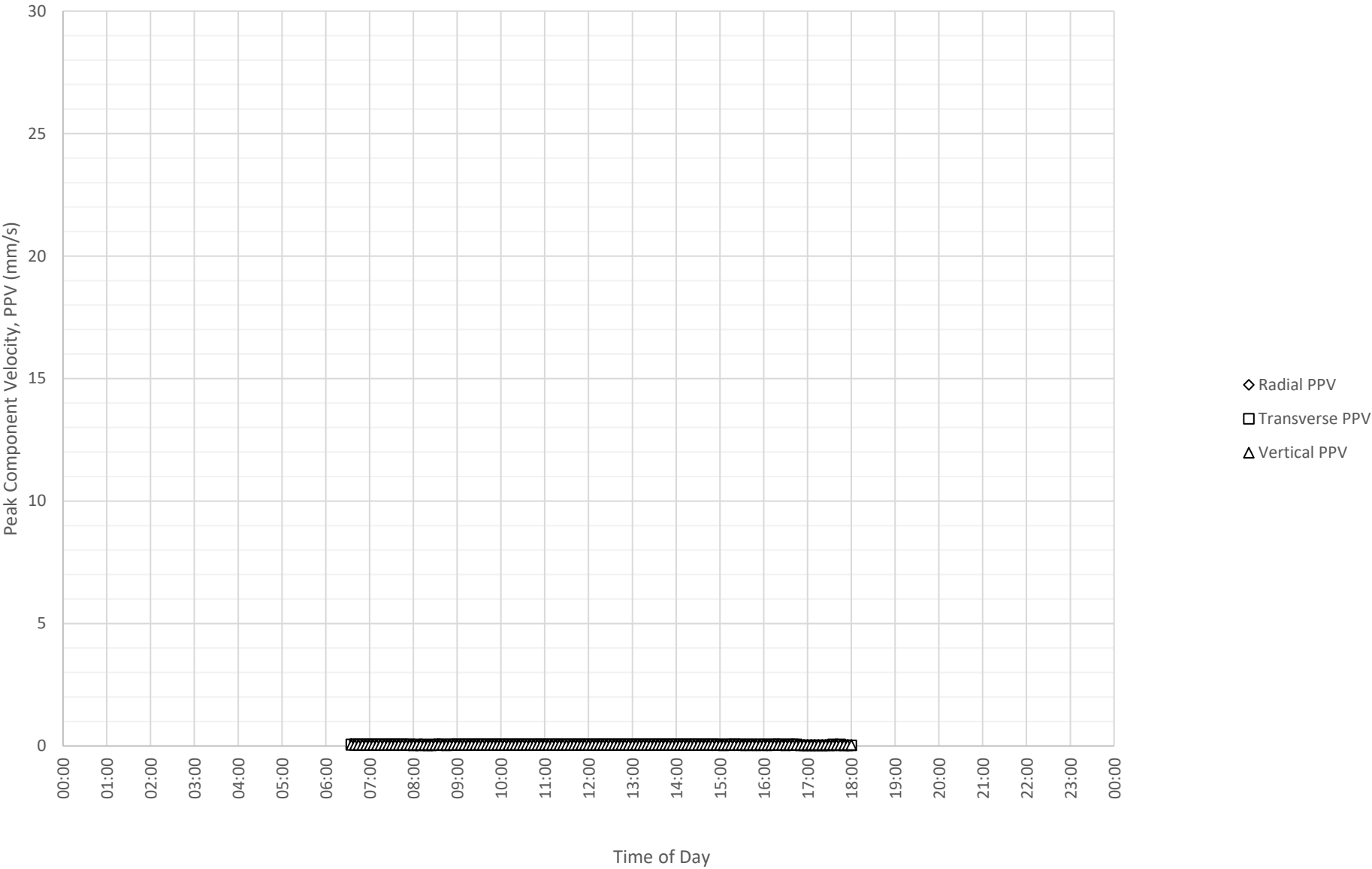
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 15-02-2025



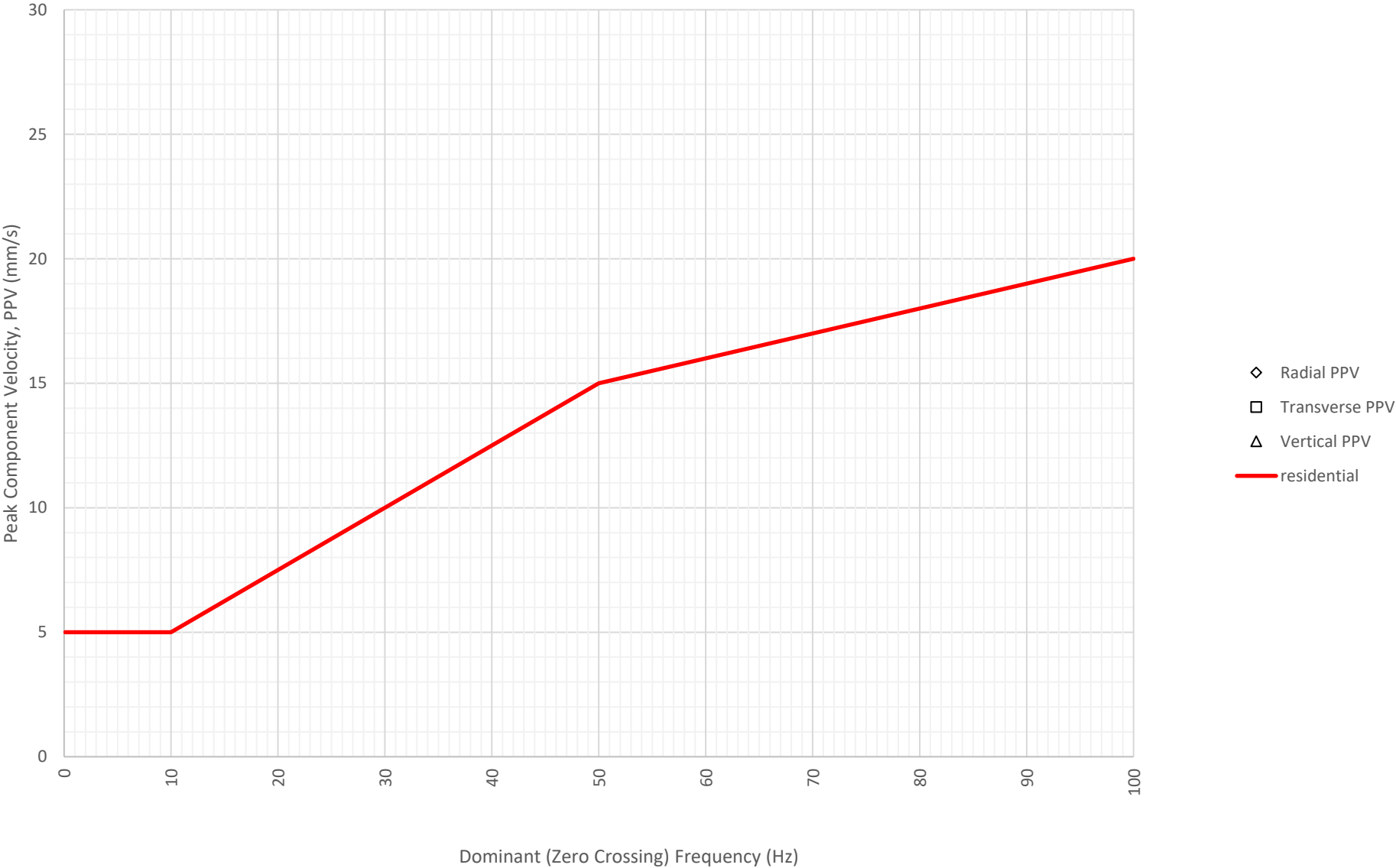
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 15-02-2025



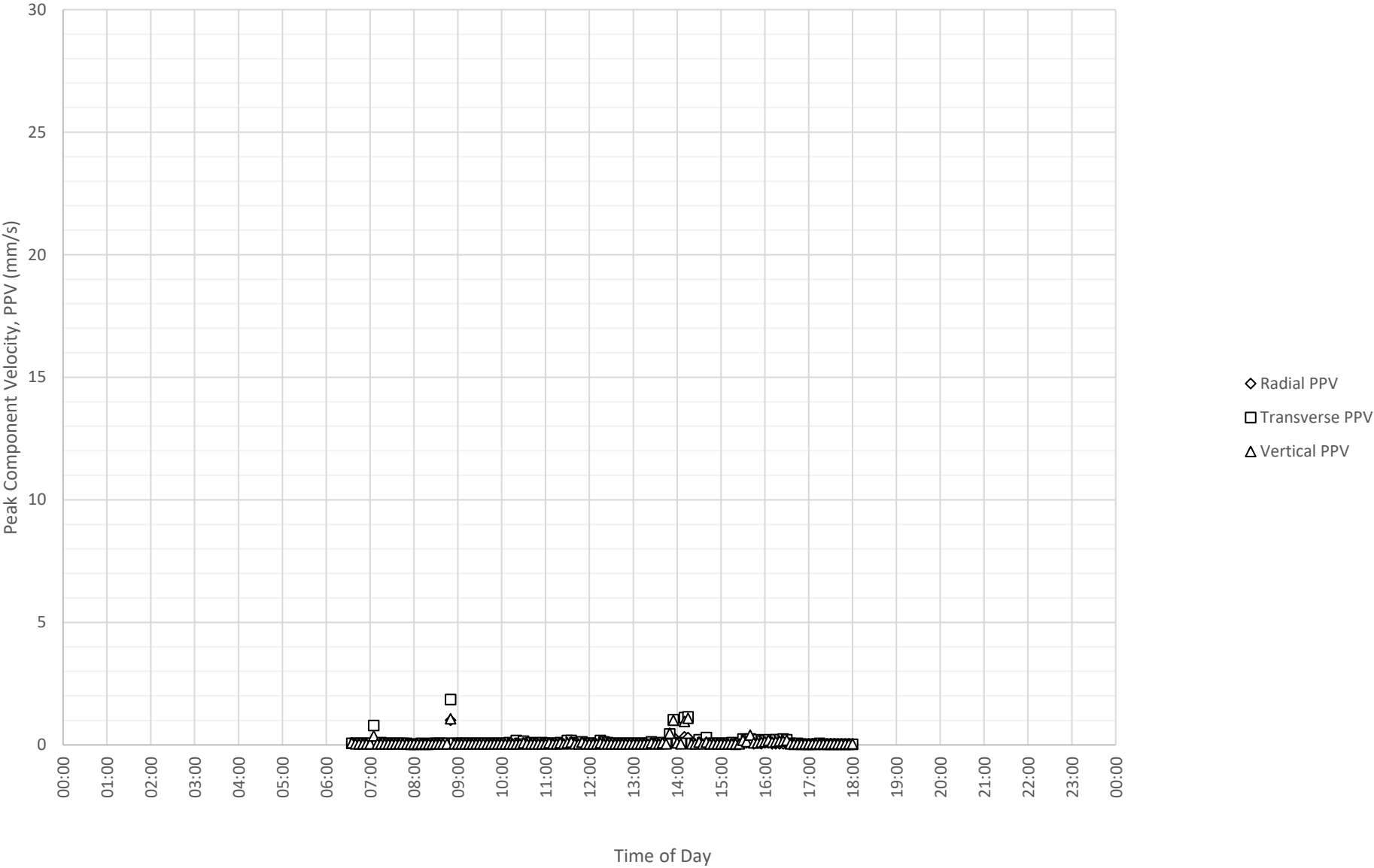
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 16-02-2025



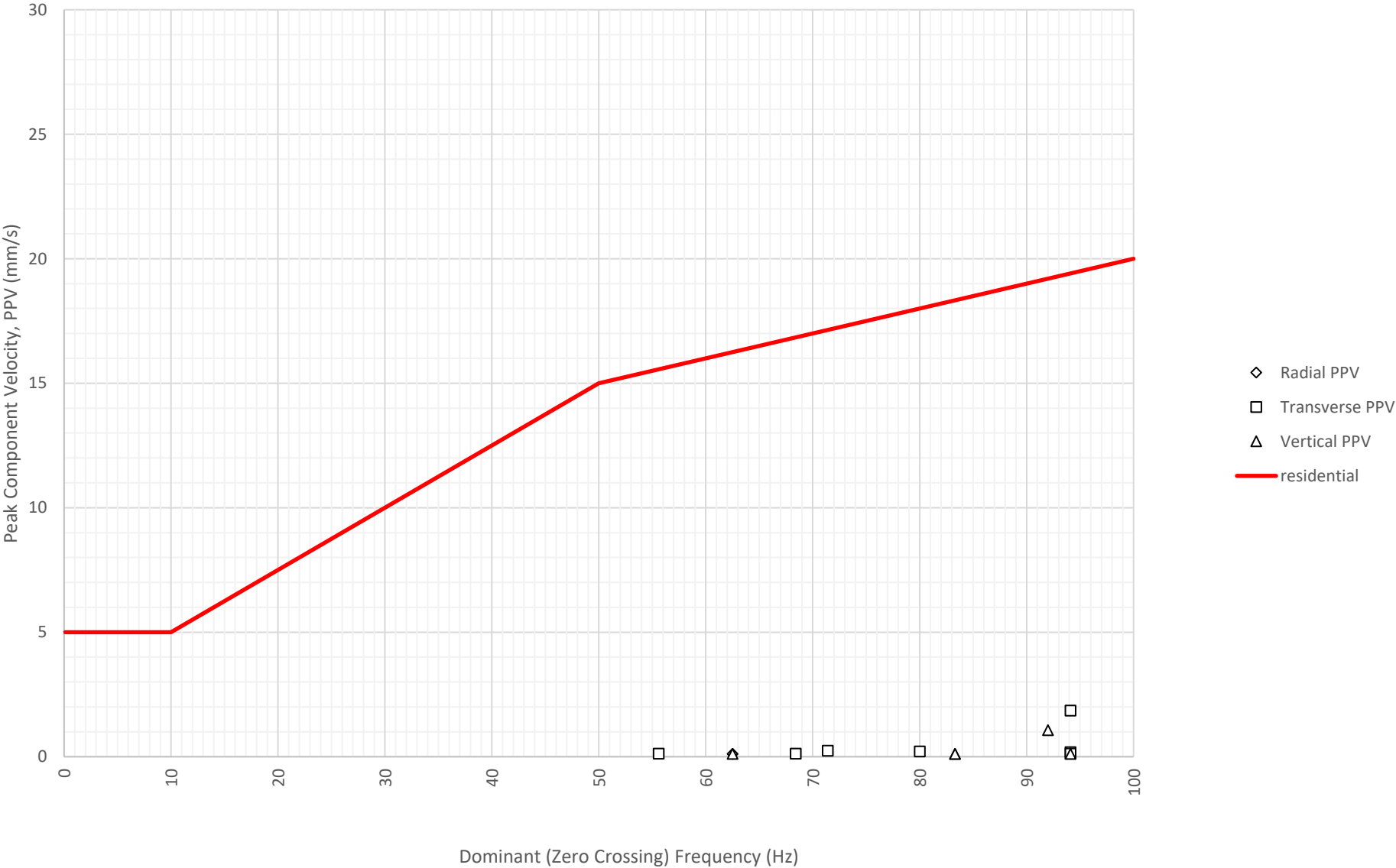
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 16-02-2025



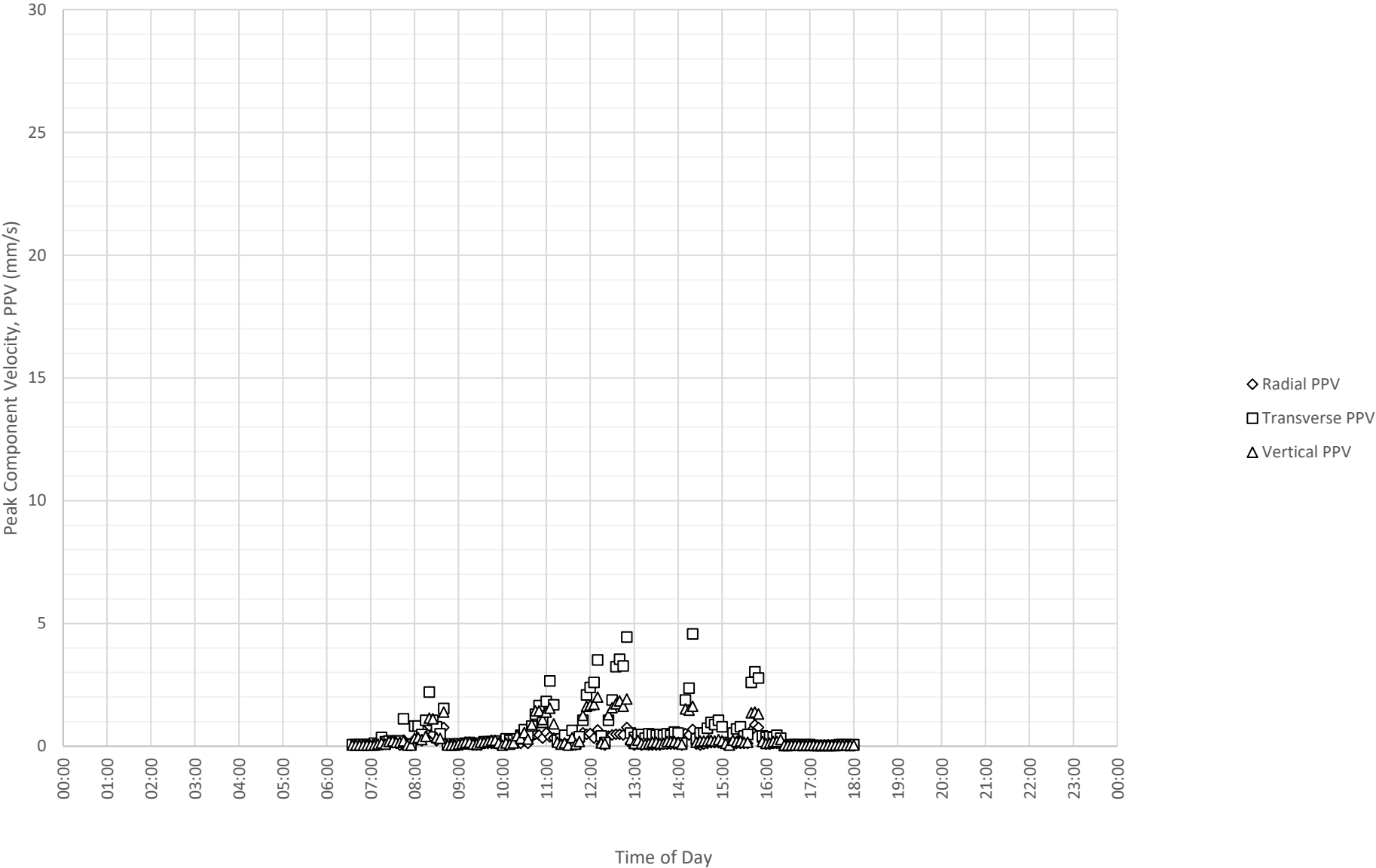
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 17-02-2025



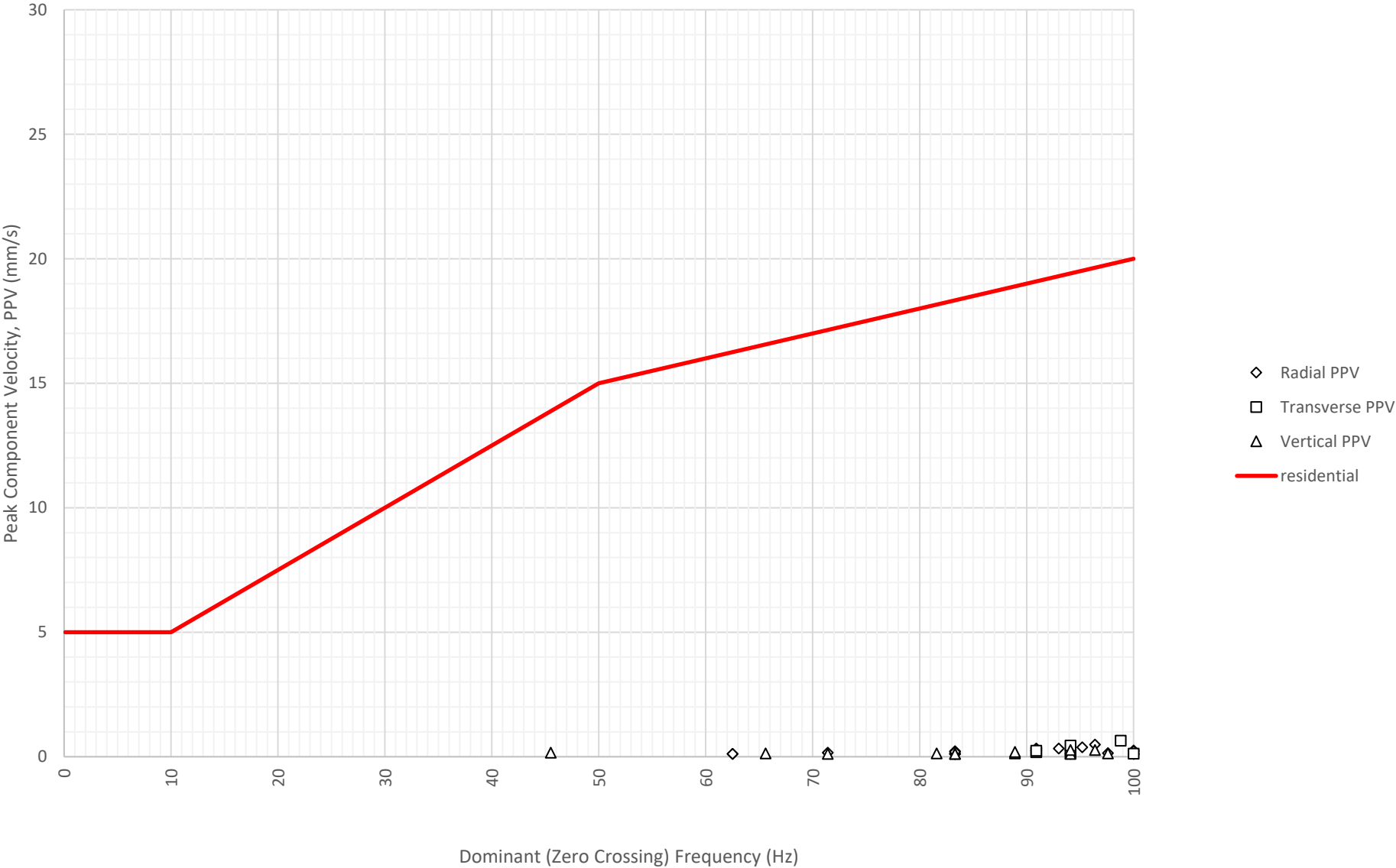
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 17-02-2025



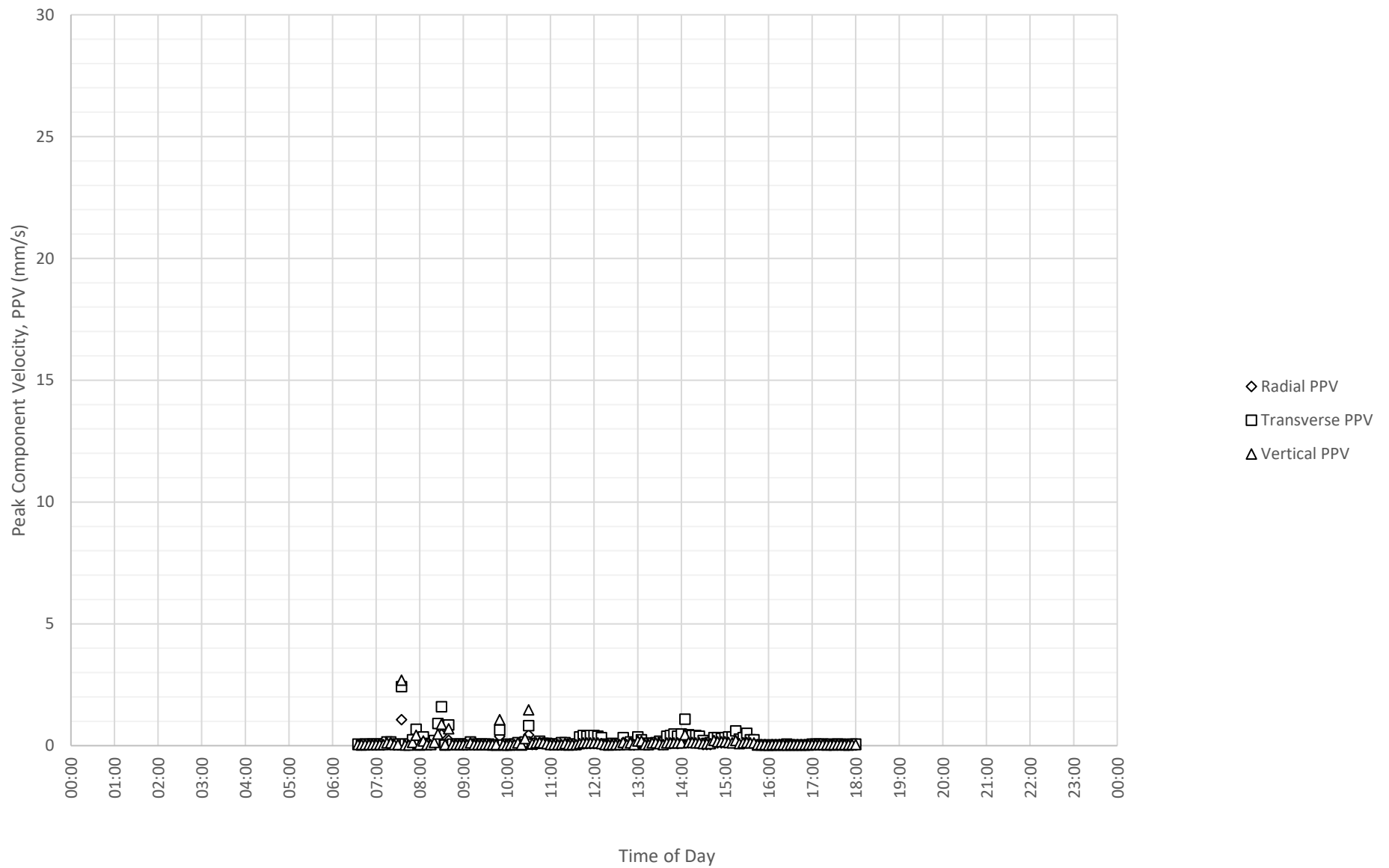
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 18-02-2025



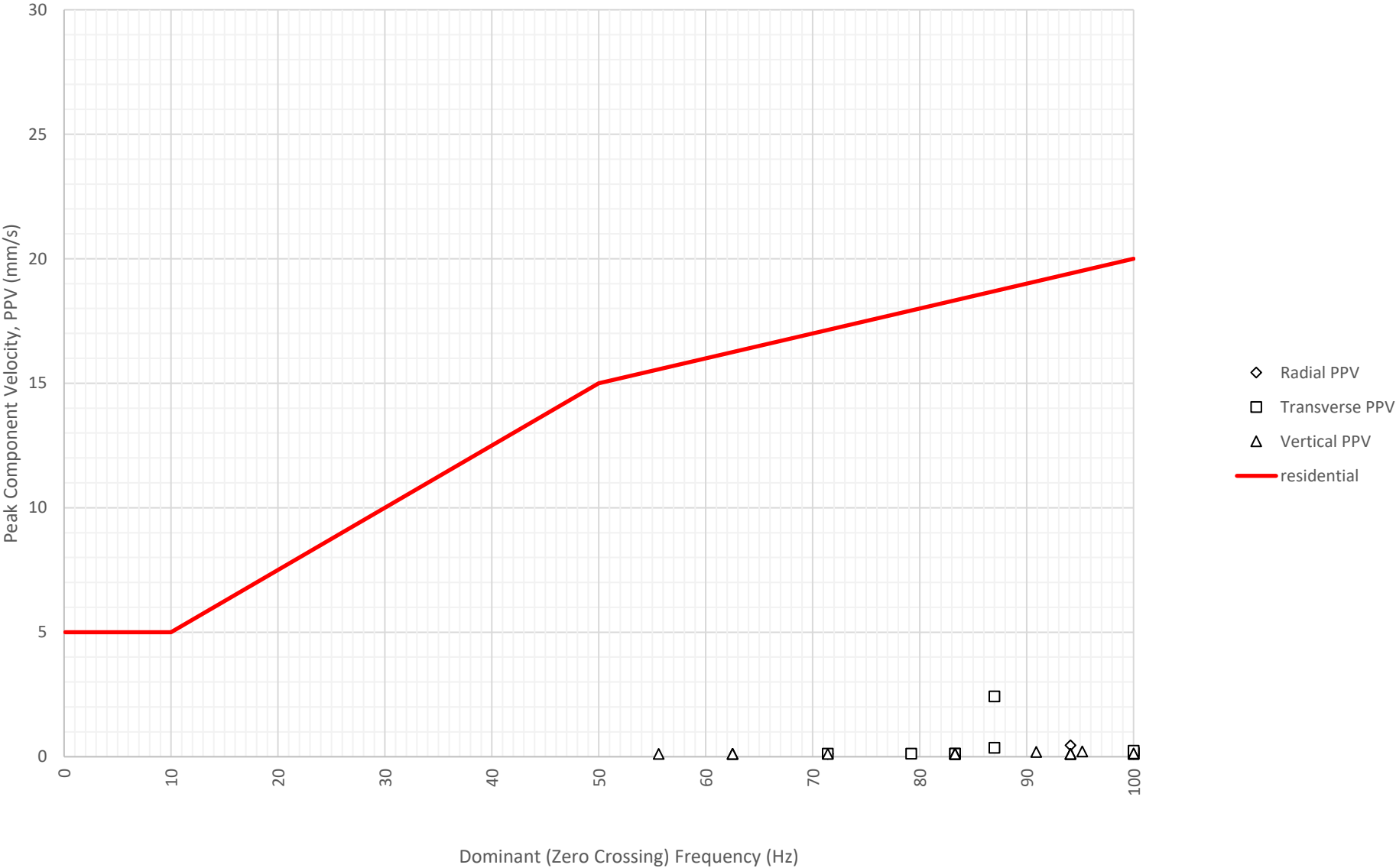
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 18-02-2025



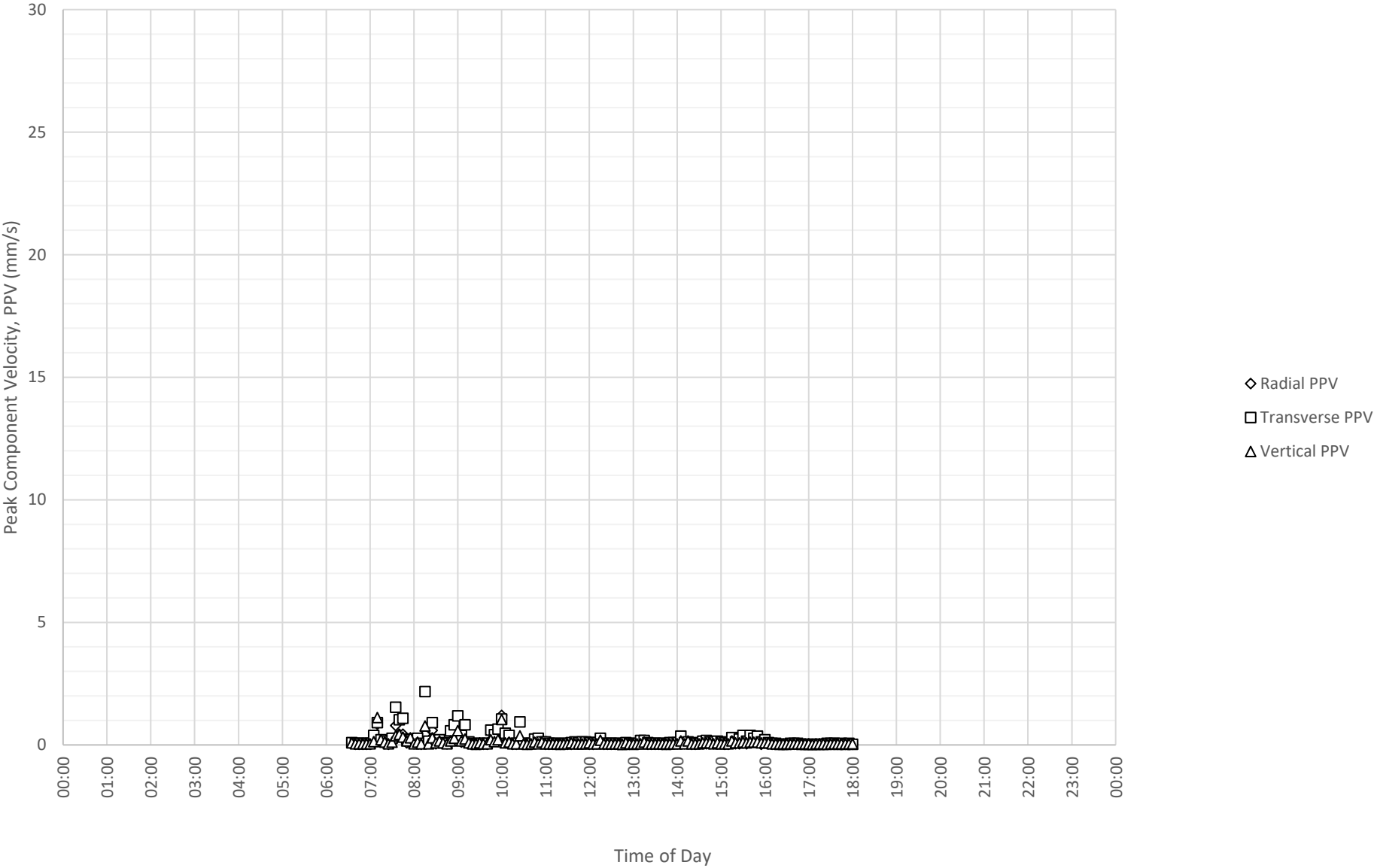
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 19-02-2025



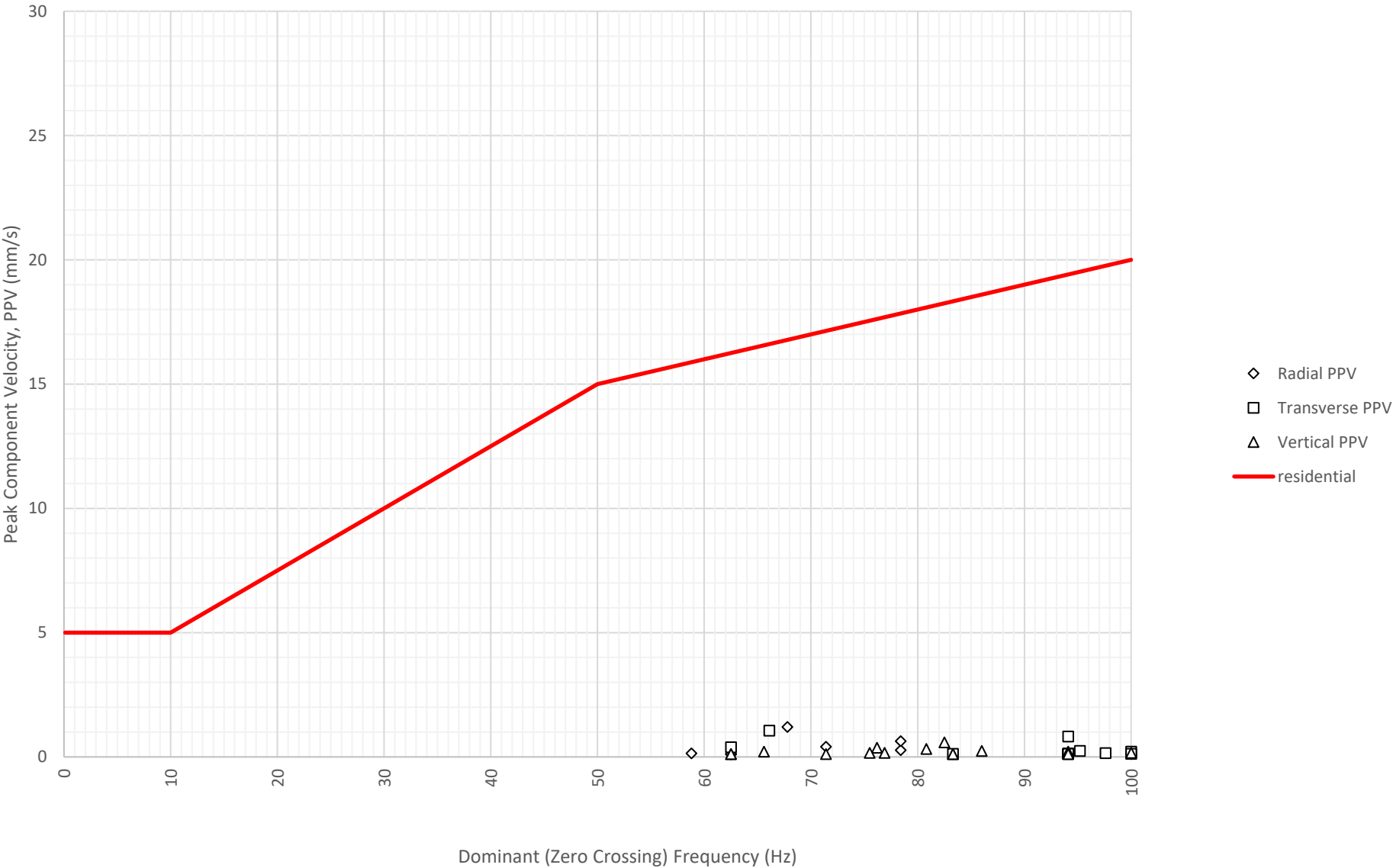
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 19-02-2025



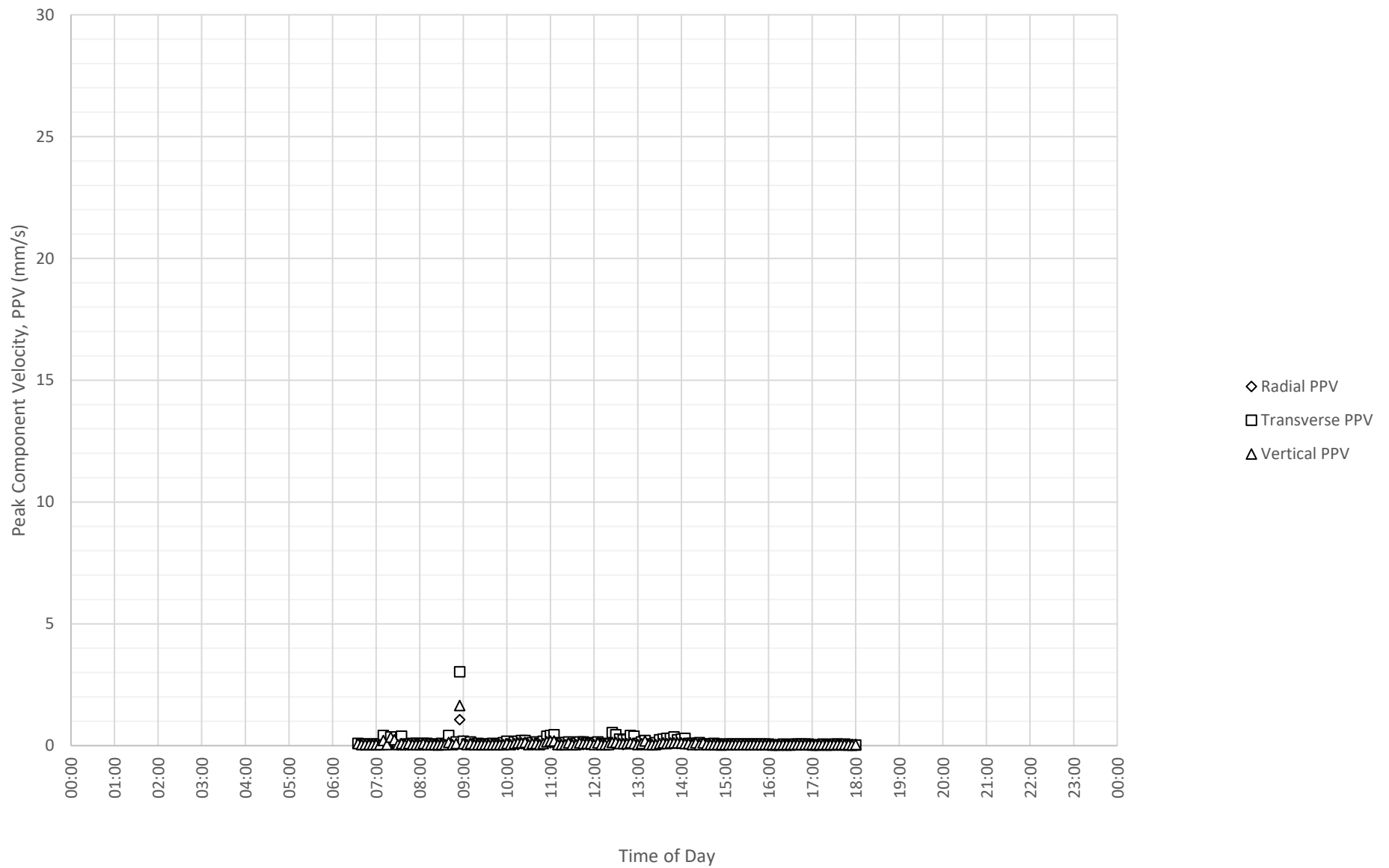
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 20-02-2025



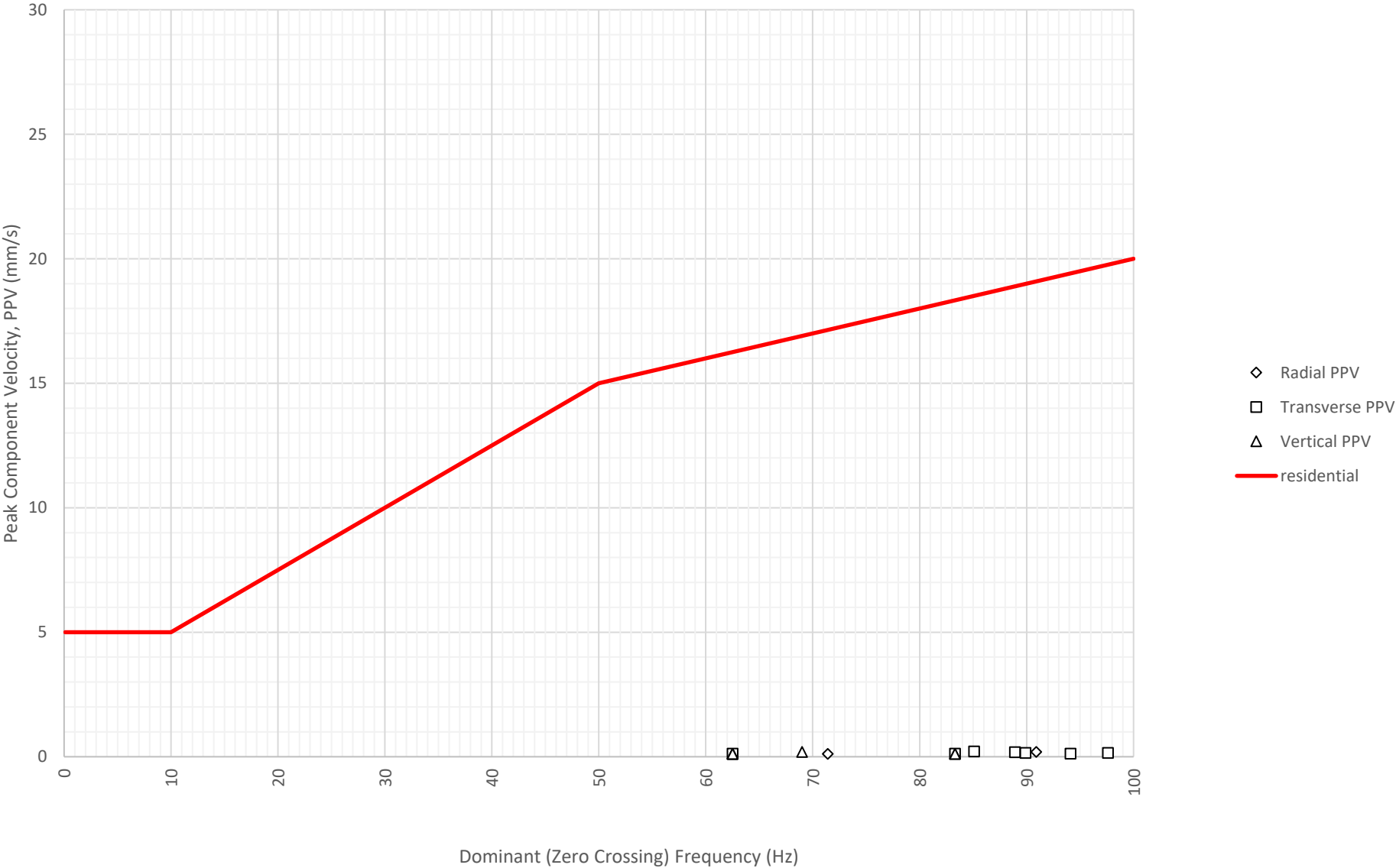
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 20-02-2025



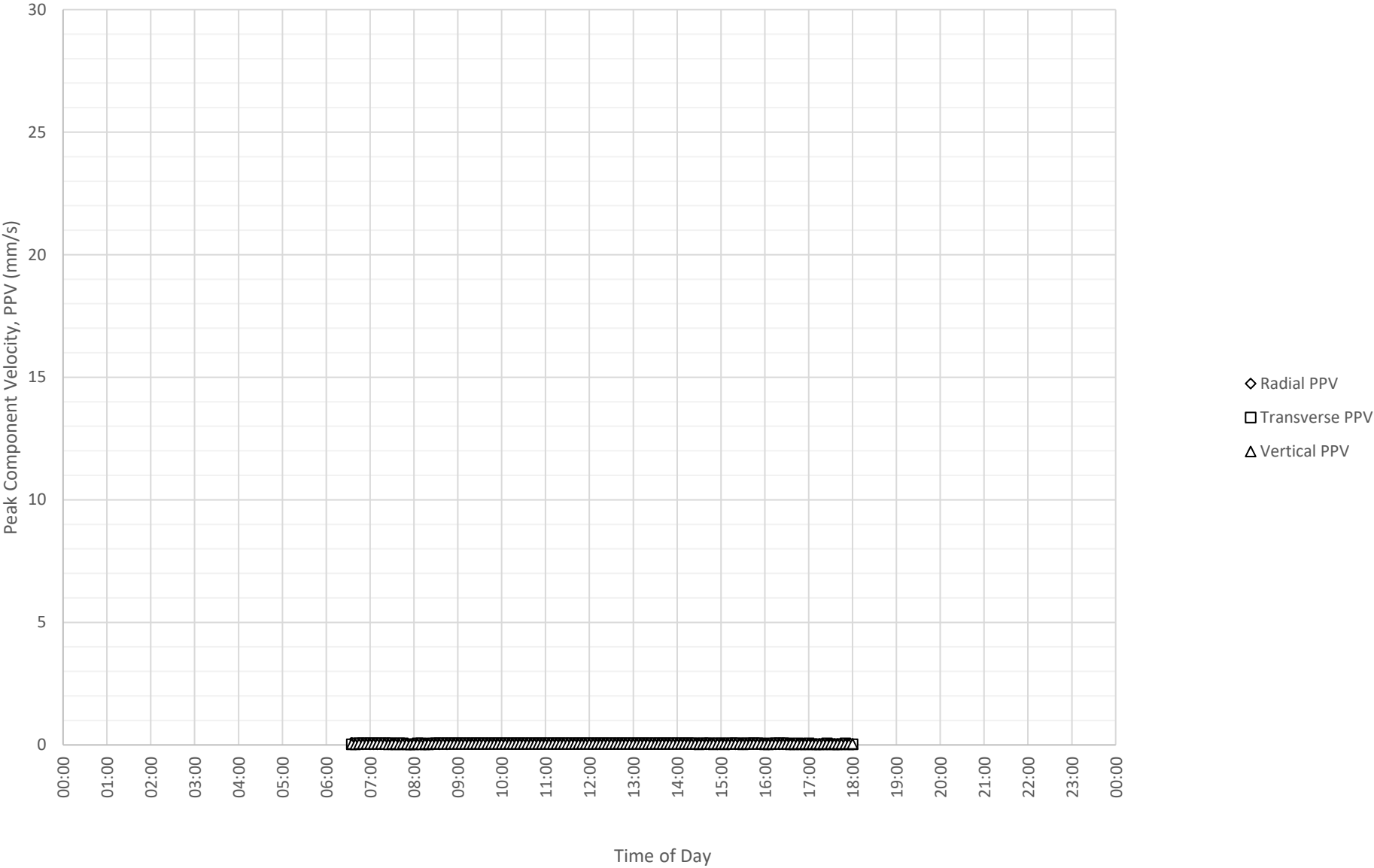
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 21-02-2025



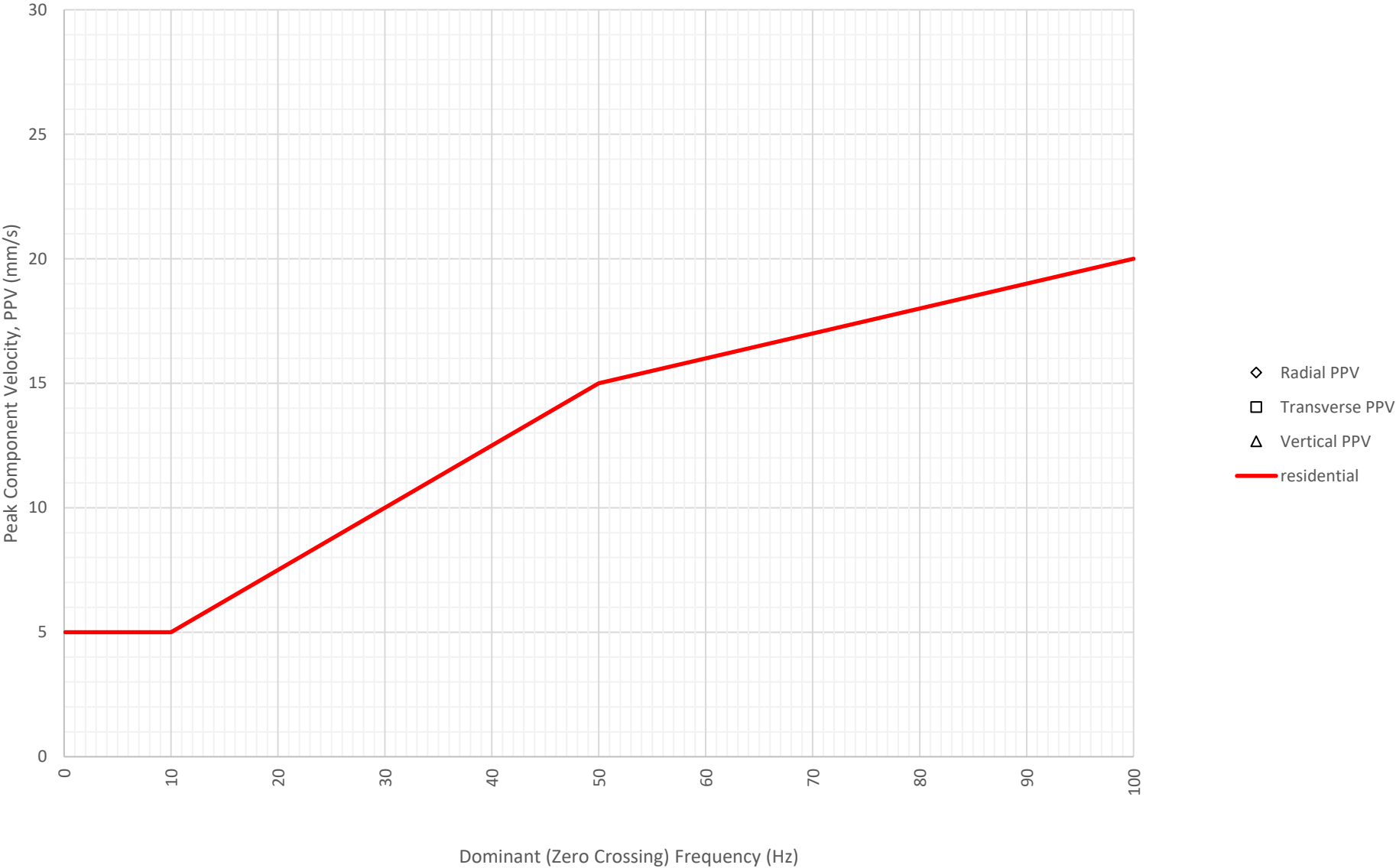
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 21-02-2025



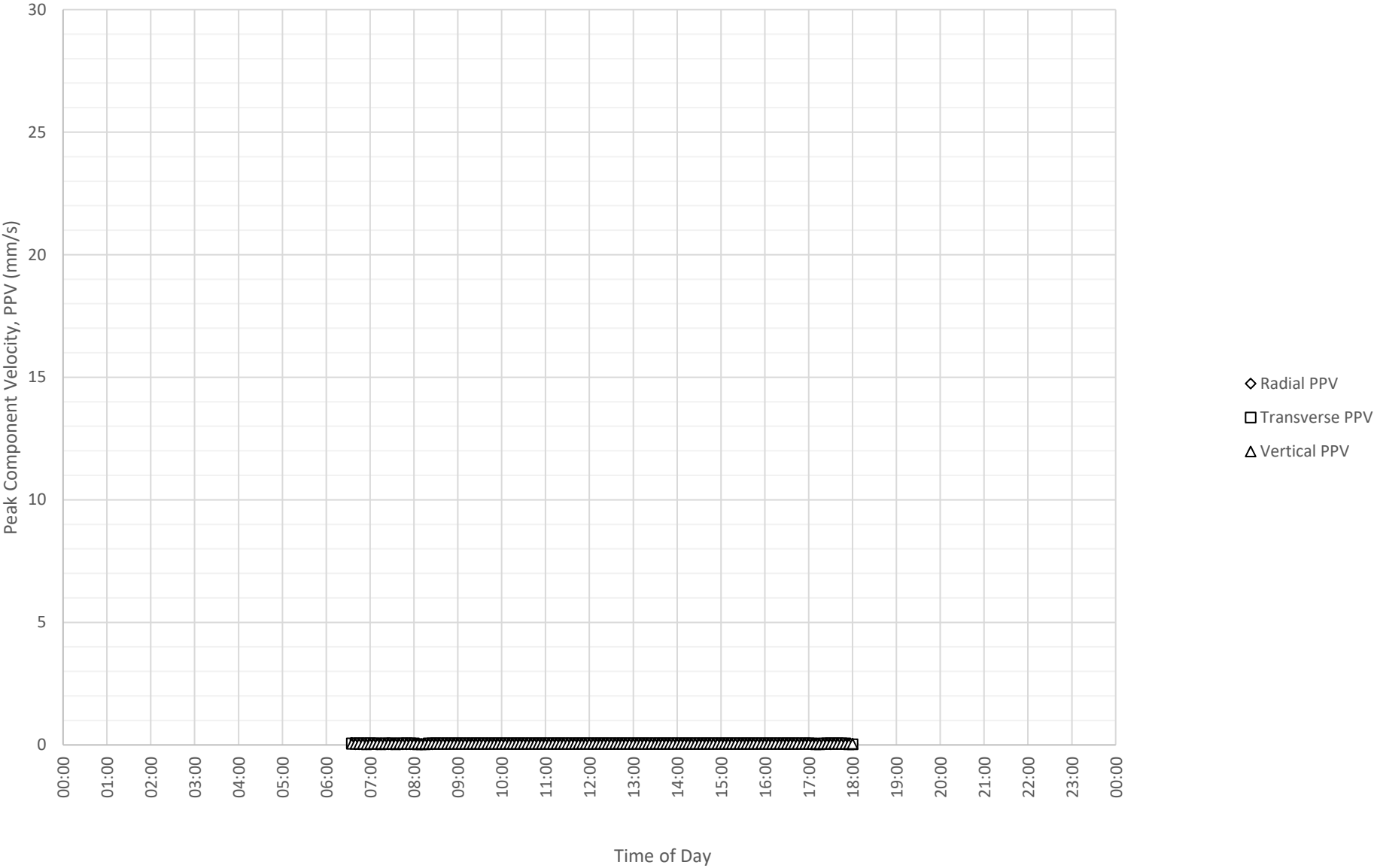
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 22-02-2025



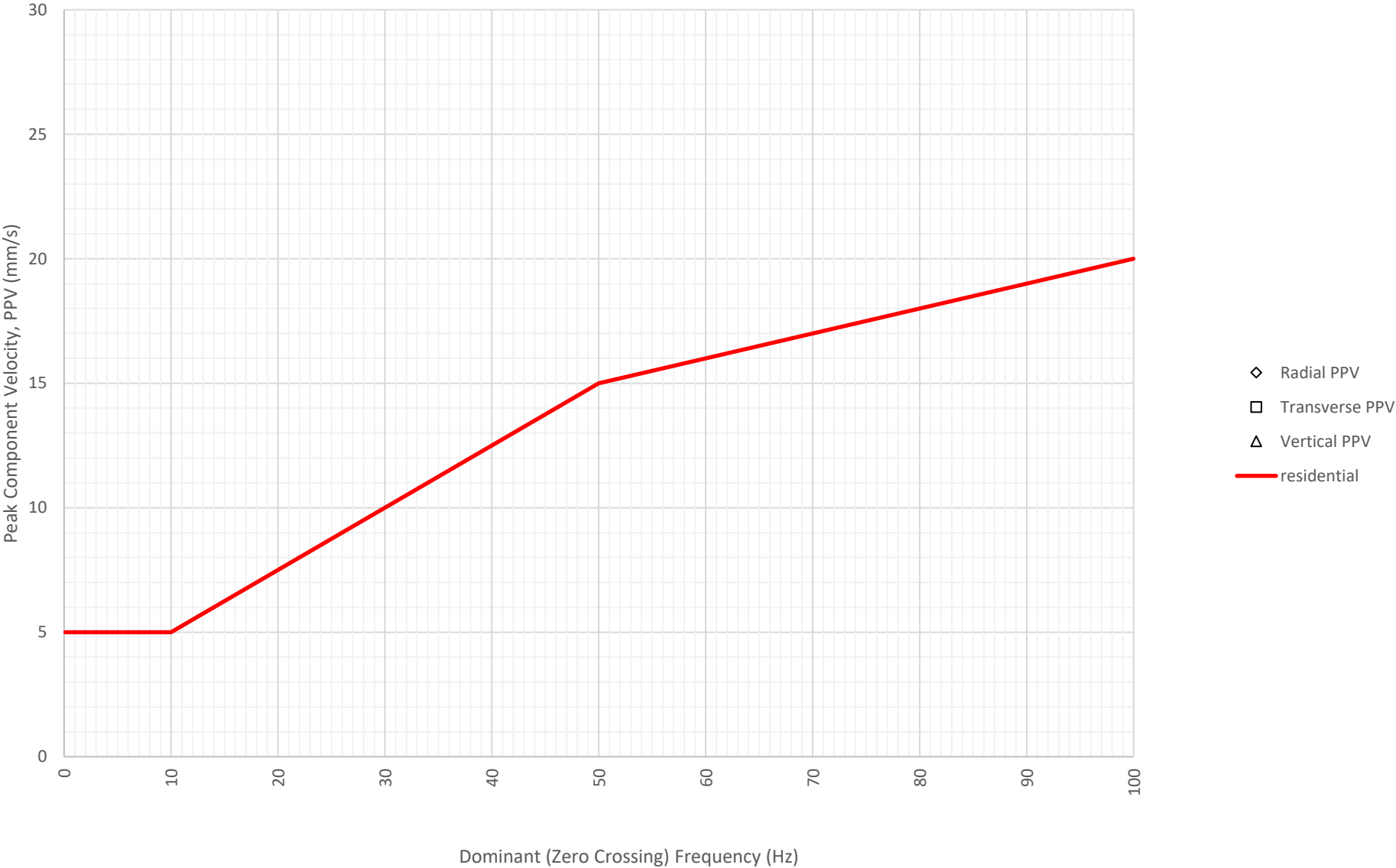
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 22-02-2025



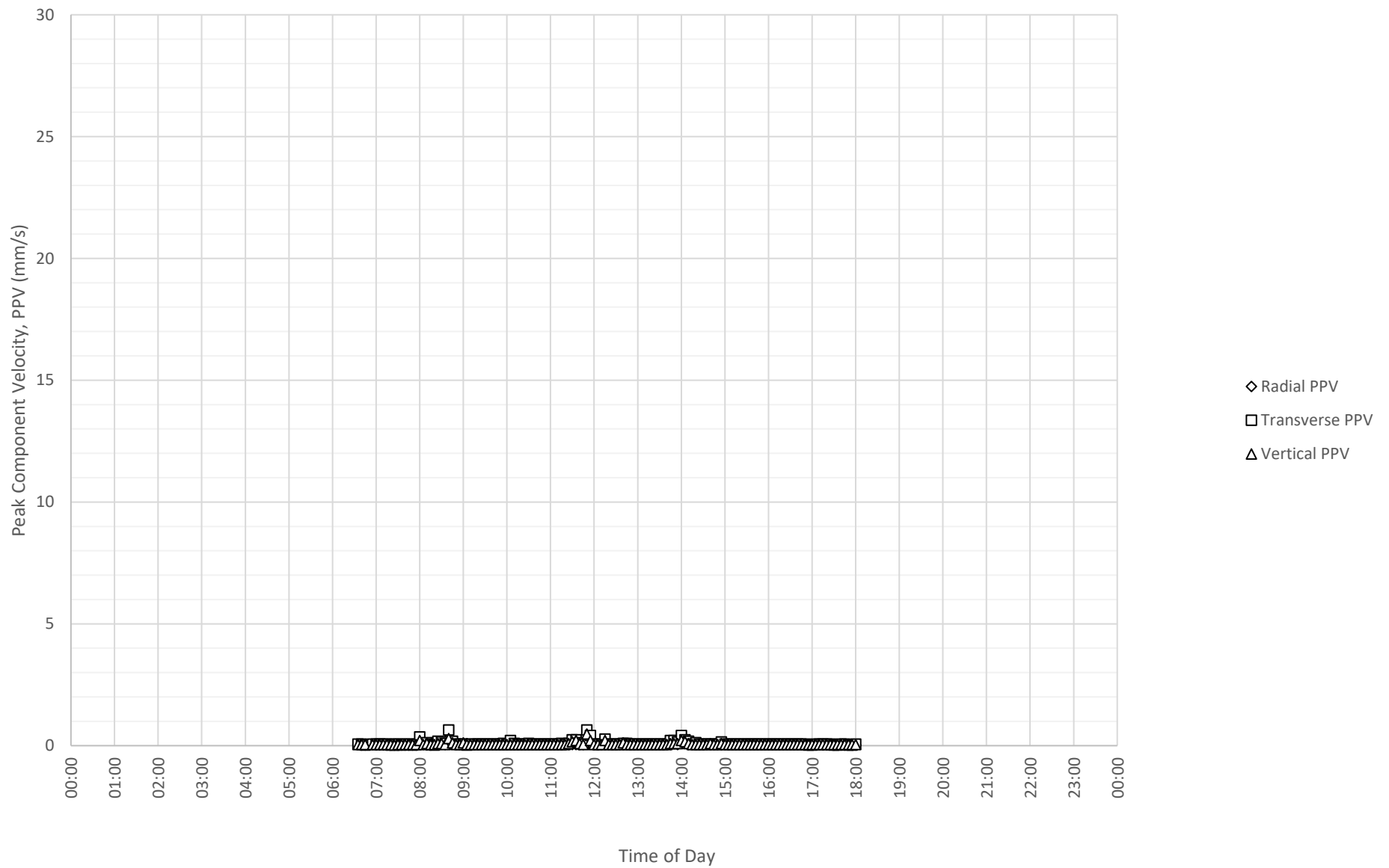
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 23-02-2025



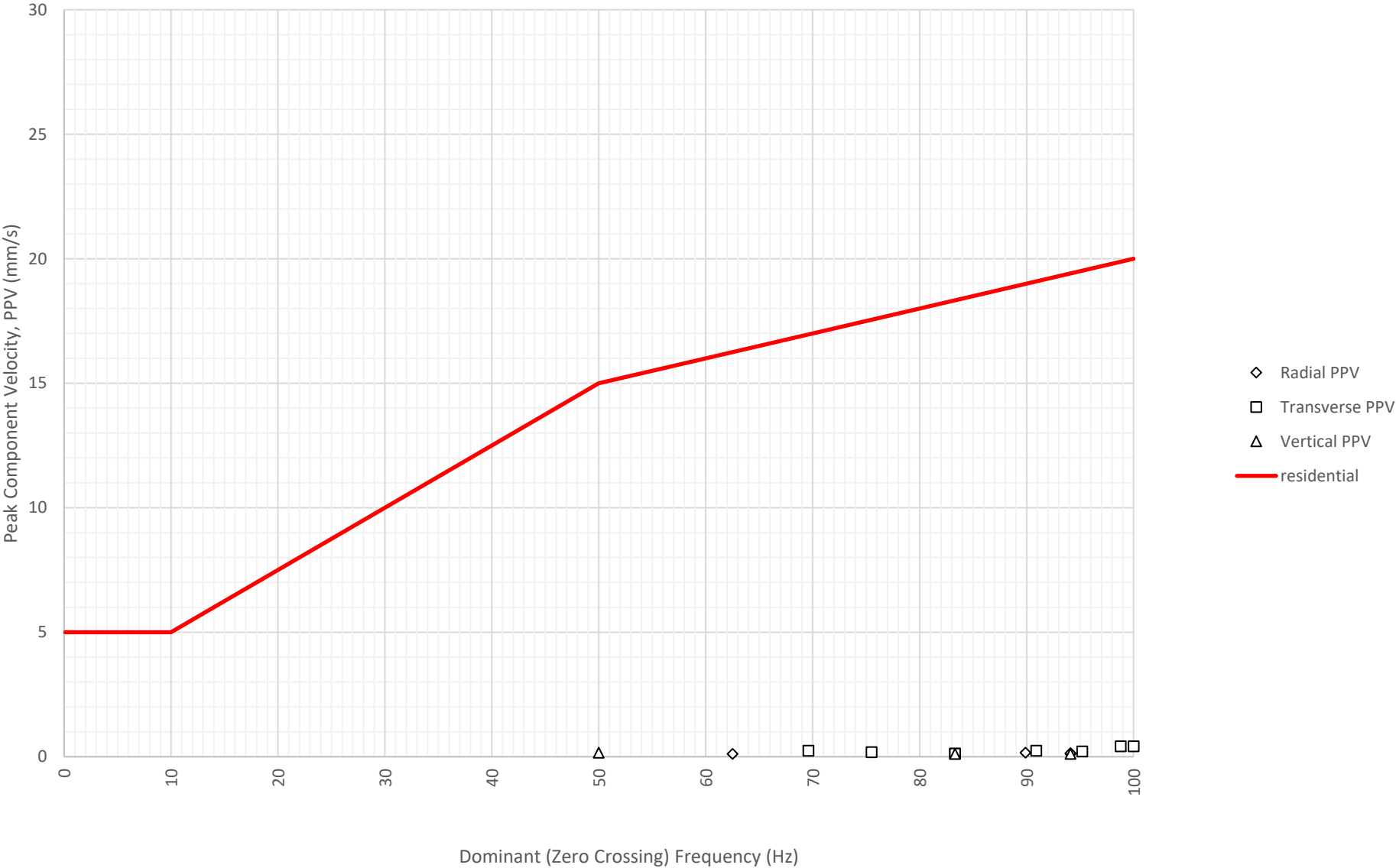
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 23-02-2025



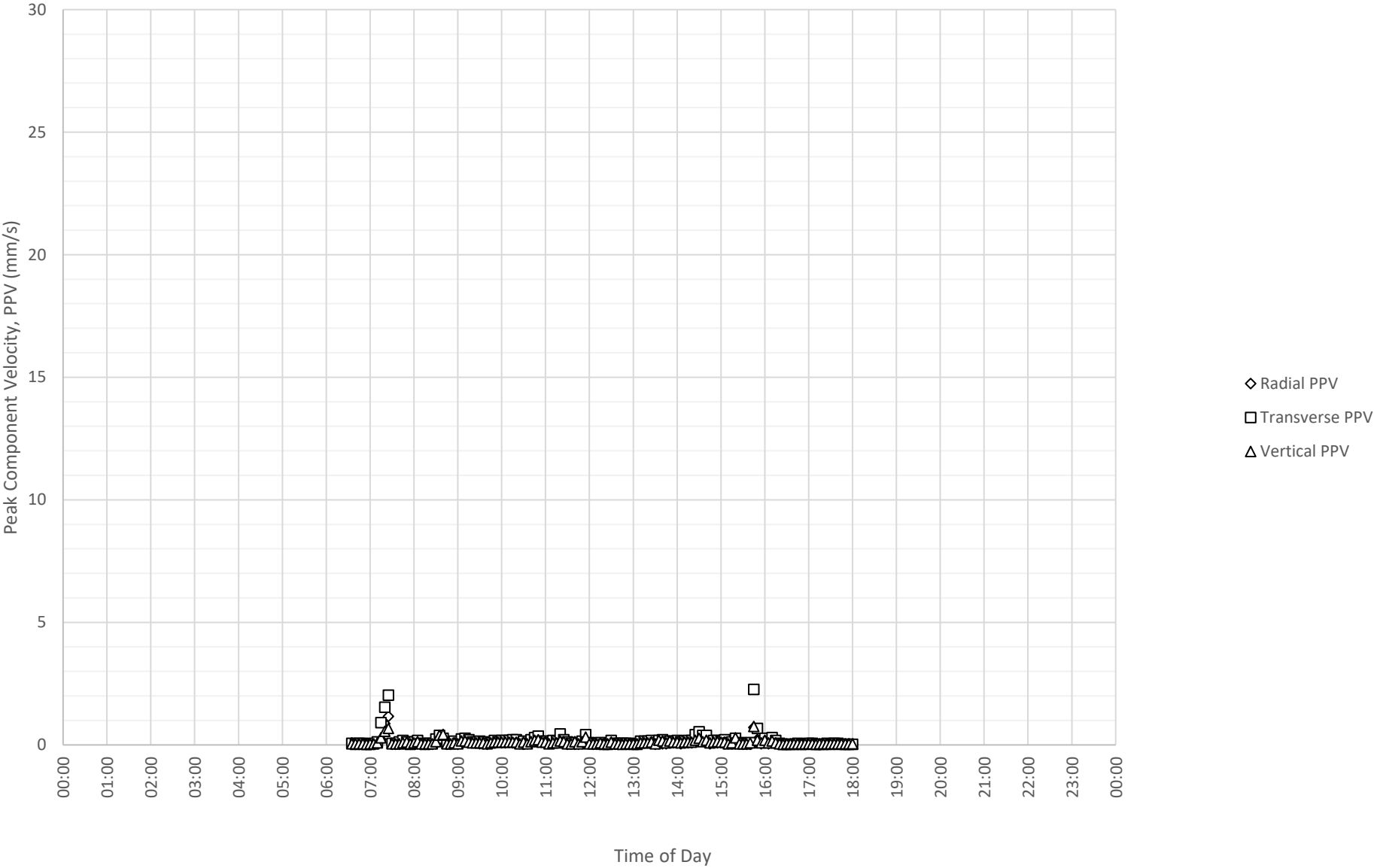
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 24-02-2025



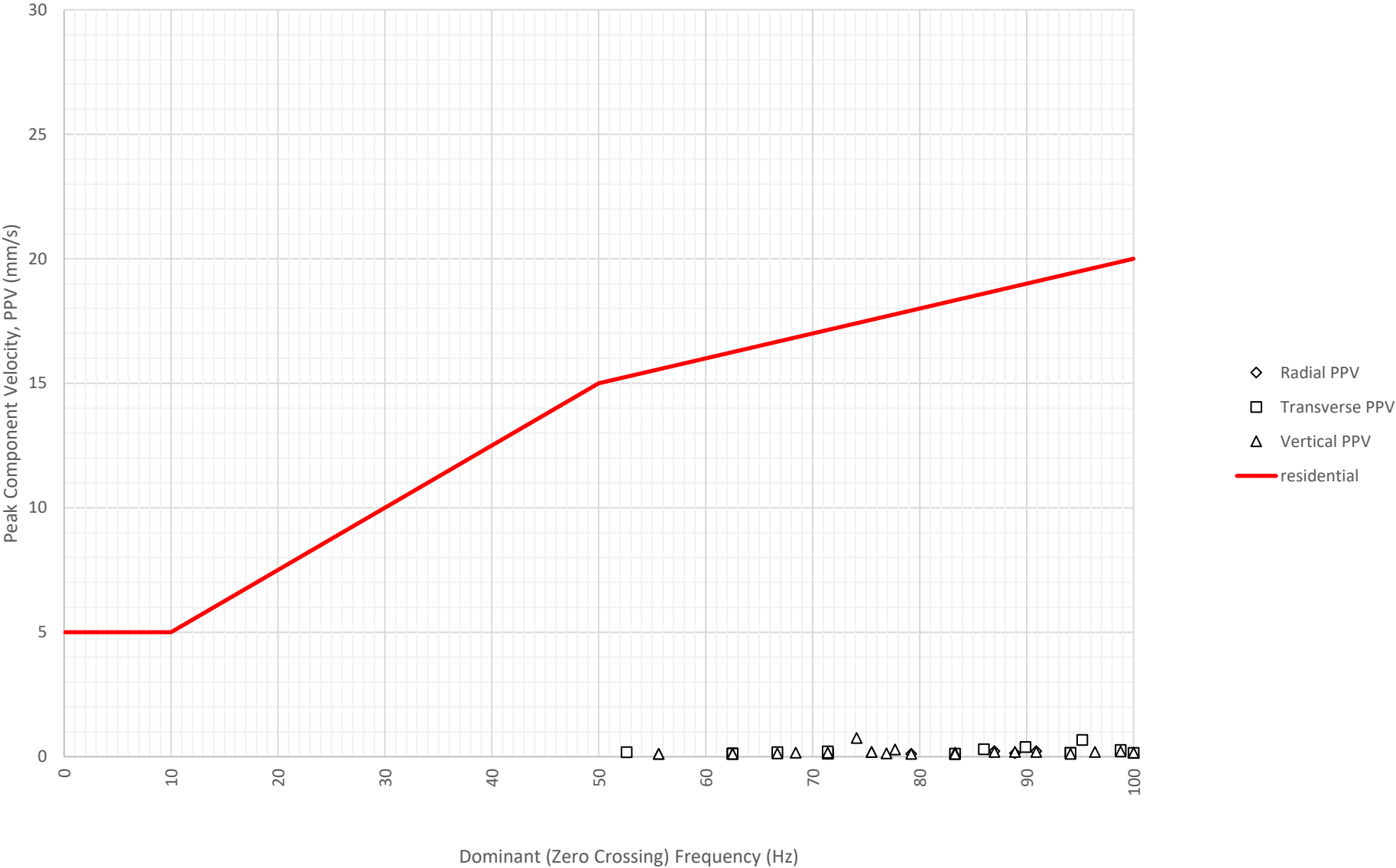
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 24-02-2025



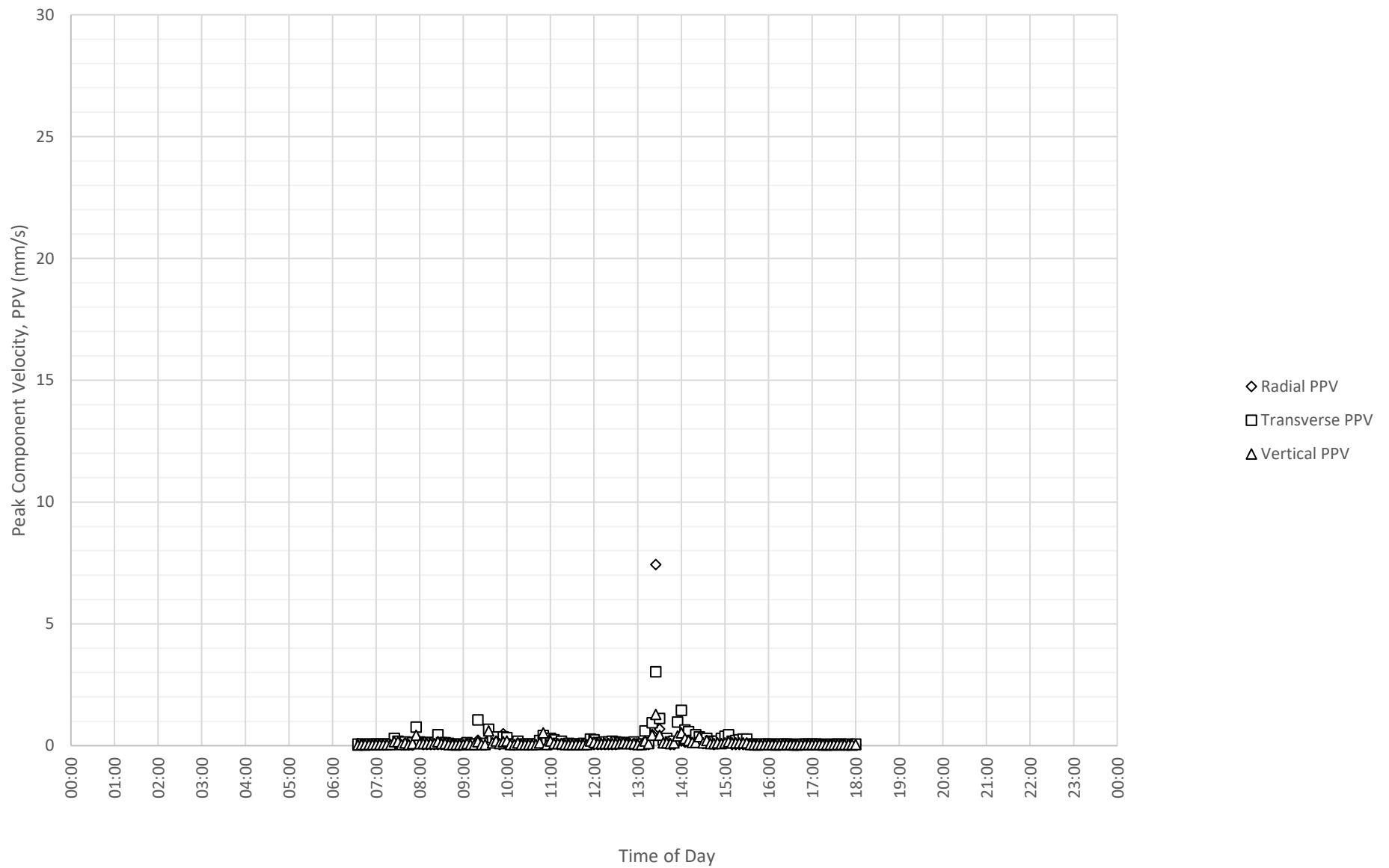
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 25-02-2025



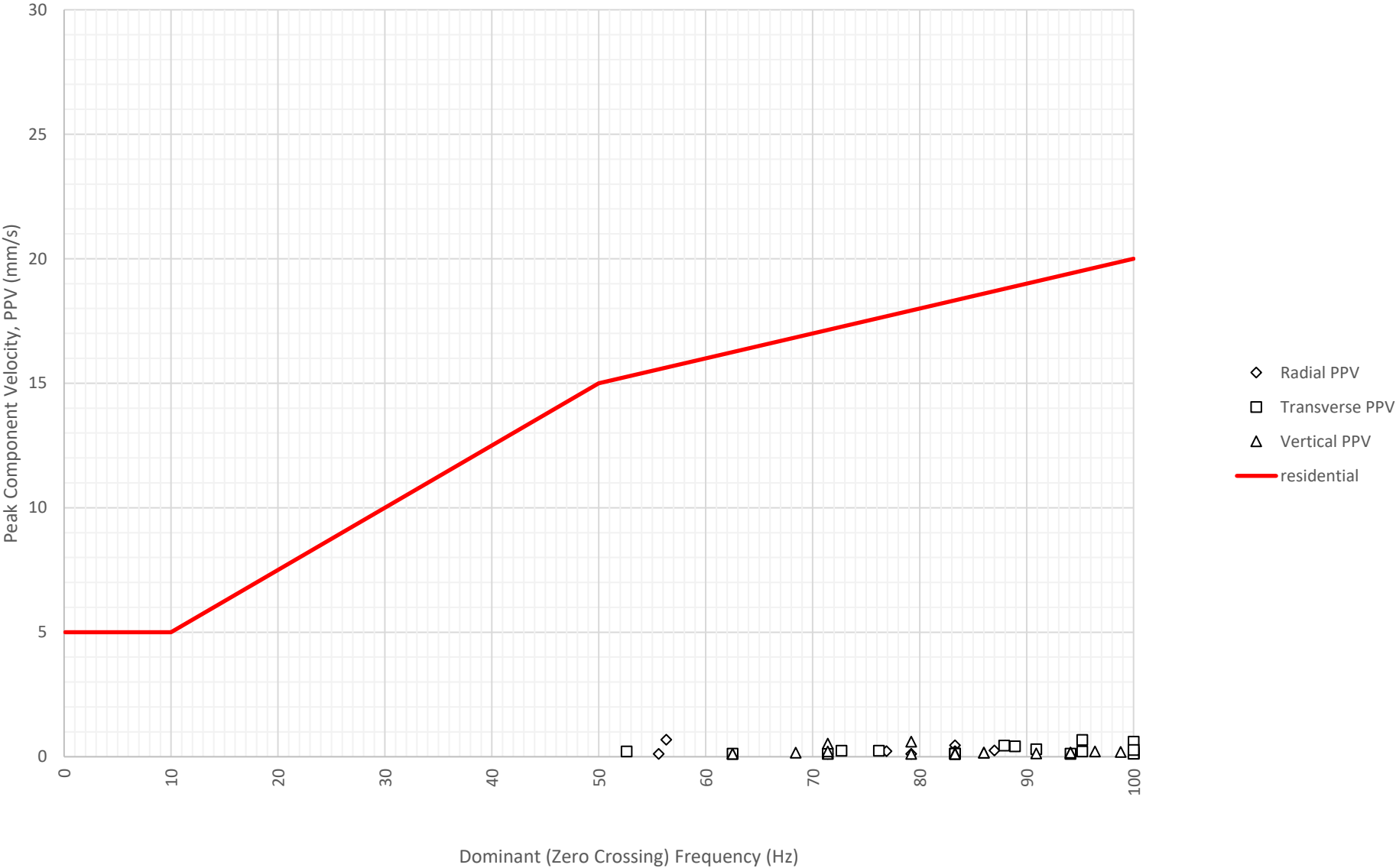
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 25-02-2025



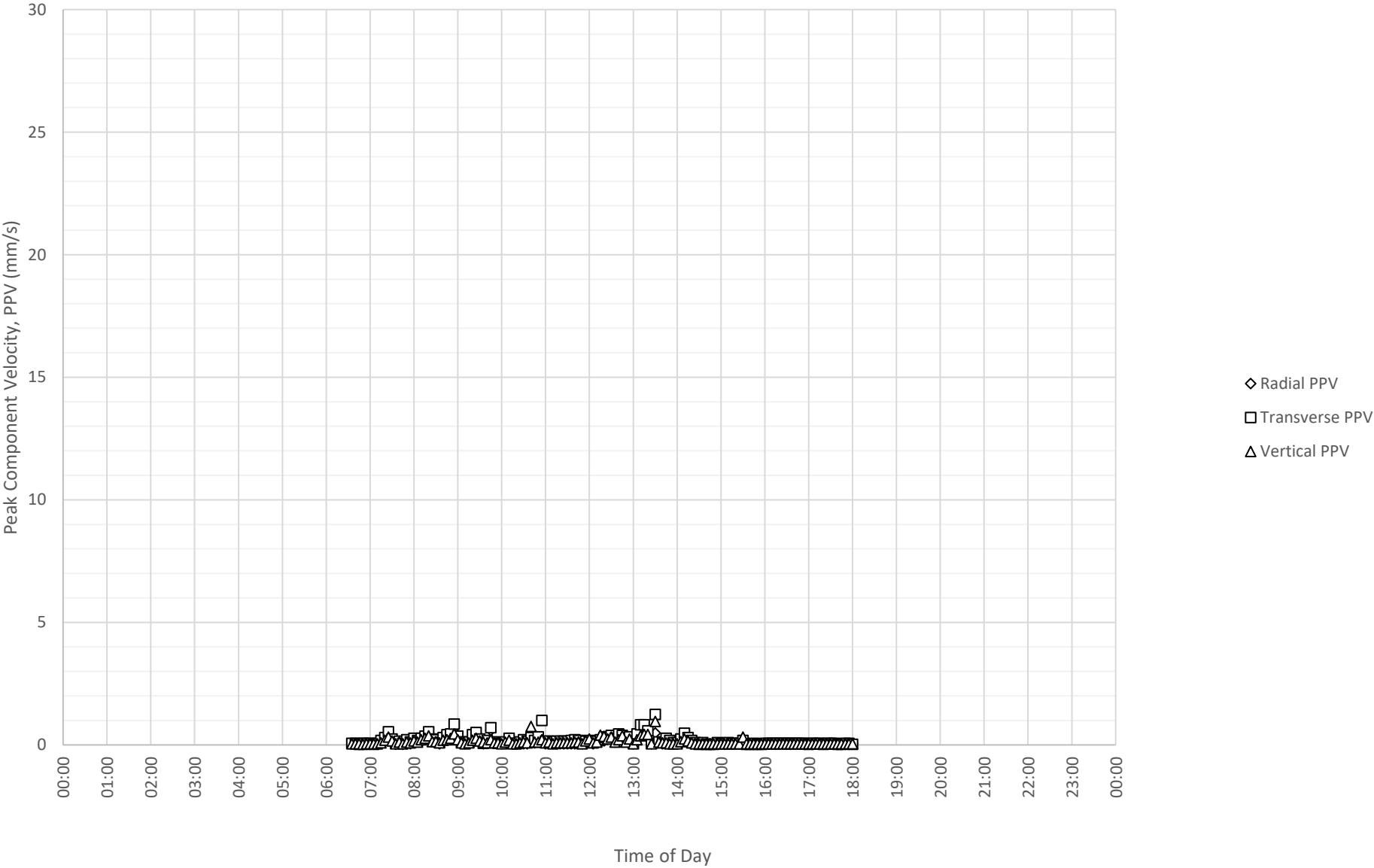
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 26-02-2025



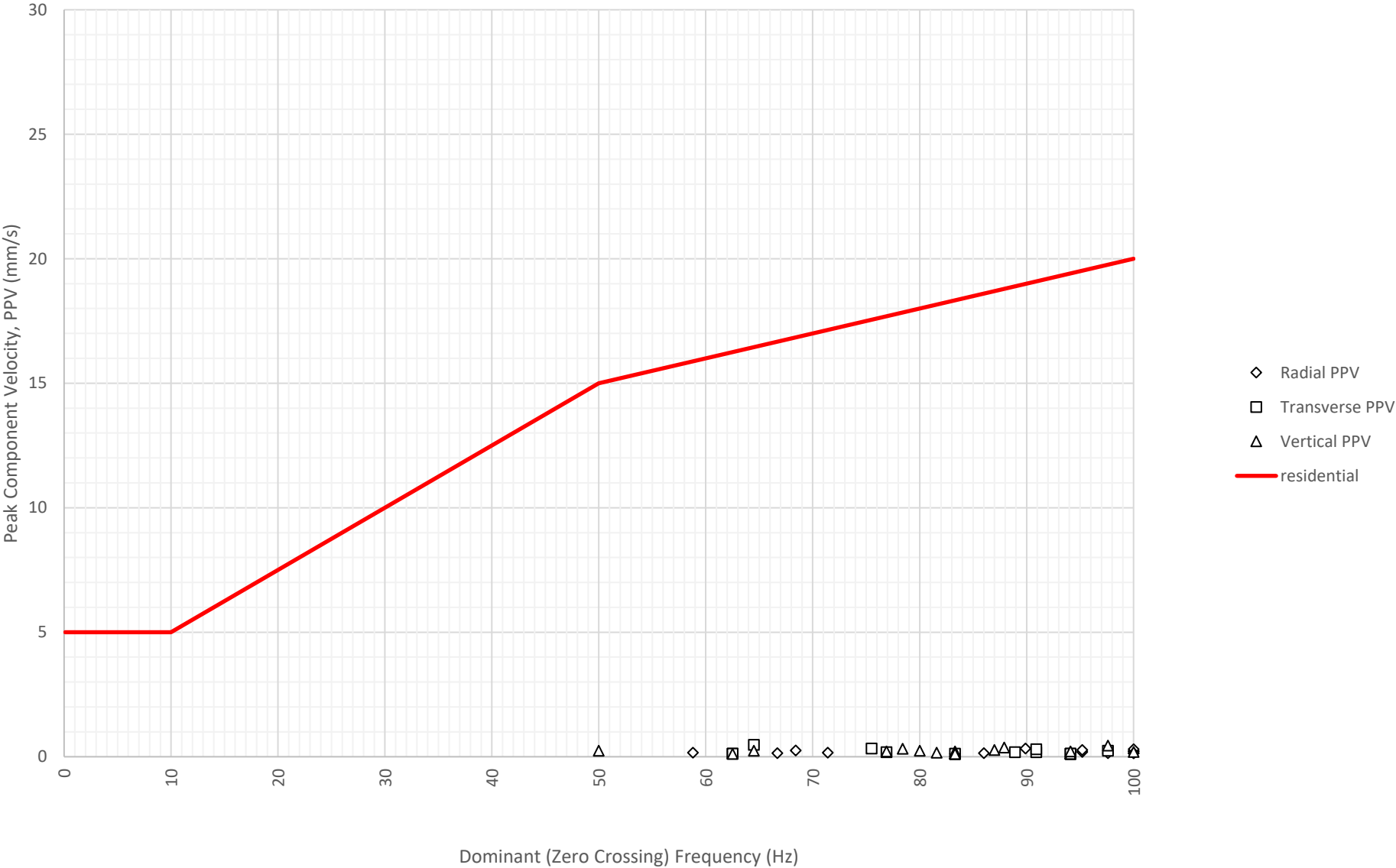
Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 26-02-2025



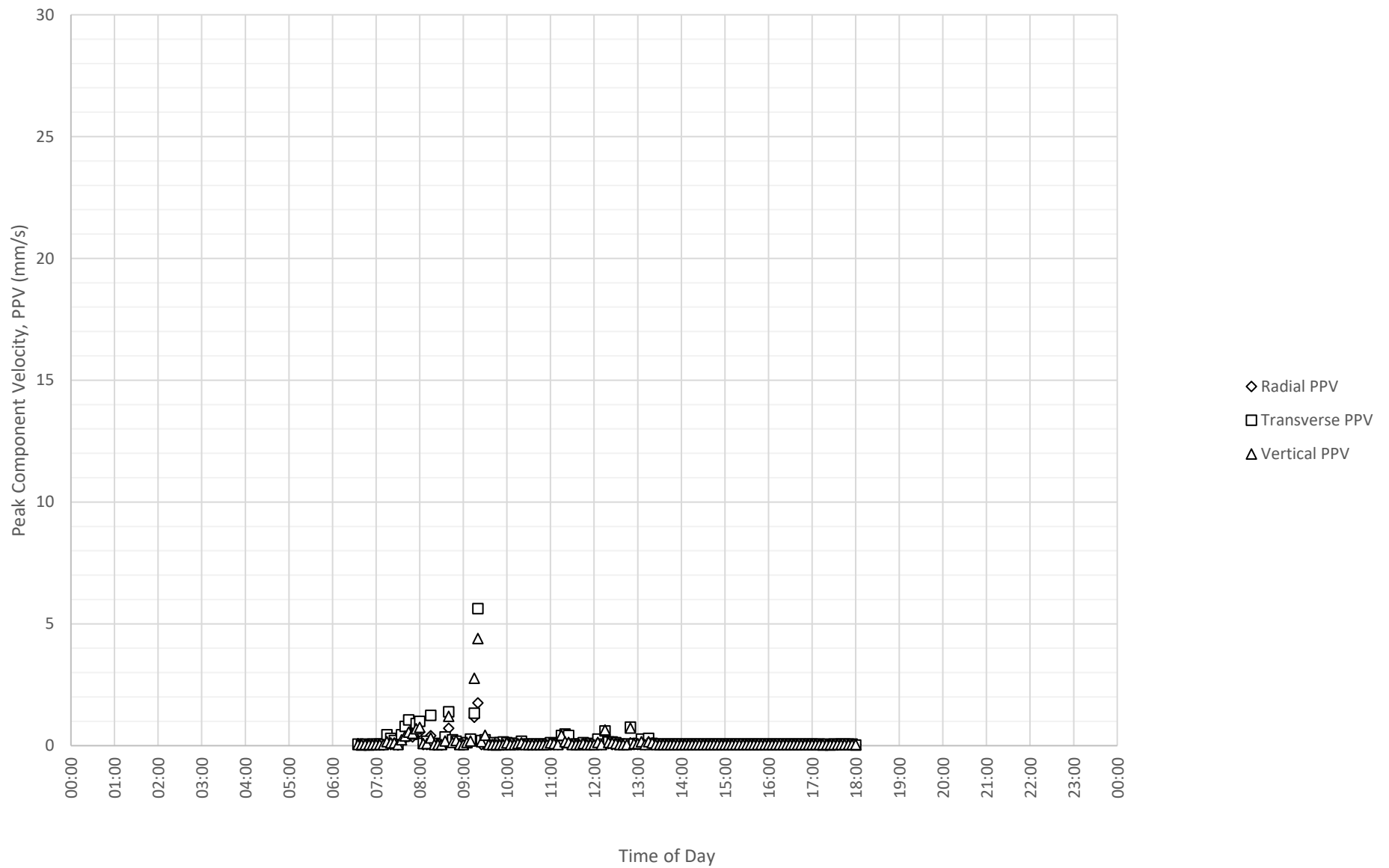
Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 27-02-2025



Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 27-02-2025



Daily Monitored Vibration Levels at Near ICU and Loading Dock (ETM7393) on 28-02-2025



Frequency Content of Vibration Levels at Near ICU and Loading Dock (ETM7393) on 28-02-2025

