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Loreto Kirribilli Innovation Centre

Vibration and Noise Monitoring - Report 2

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1 INTRODUCTION

Noise and vibration monitoring have been conducted at Loreto Kirribilli Innovation Centre for the demolition and excavation works of existing structures inside the school grounds. This report presents the relevant criteria for each component of monitoring, the measured levels over the monitoring period and comments on the results.

This report covers the monitoring period between 25/11/2020 to 09/12/2020.

2 SITE DESCRIPTION

The site is located at Loreto Kirribilli Innovation Centre which is a single-sex primary and secondary day school. Surrounding the site are residential properties.

The proposed development involves the demolition and excavation of an existing school building (B Block), construction of the Loreto Kirribilli Innovation Centre (LKIC), extension of the existing gymnasium and additional landscaping.

In accordance with Condition D3 of the development's *Consolidated consent* (ref: SSD-7919), the approved construction hours on site are as follows:

- Monday to Friday: 7:00am – 6:00pm
- Saturday: 8:00am – 1:00pm
- Sundays or Public Holidays: No work.

In accordance with Condition D5 of the development's *Consolidated consent* (ref: SSD-7919), the approved hours for "rock breaking, rock hammering, sheet piling, pile driving and similar activities" as follows:

- Monday to Friday: 9:00am – 12:00pm and 1:00pm – 5:00pm
- Saturday: 9:00am – 12:00pm
- Sundays or Public Holidays: No work.

Noise and vibration monitoring have been conducted around the project site to safeguard the surrounding structures from damage and amenity of community in the area.

See Figure 1 below for aerial overview of the project site and monitoring locations.

Figure 2 – Nearest Noise Receiver around Project Site (Source: SIX Maps NSW)

School Grounds

Project Site

Residential Receiver

School Receiver

Noise Monitor

Vibration Monitor

3 VIBRATION MONITORING

3.1 ASSESSMENT CRITERIA

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 5.1.

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 5.1:

"Exceeding the values in table 5.1 does not necessarily lead to damage; should they be significantly exceeded; however, further investigations are necessary".

This criterion will be used to assess the impact of construction vibration levels on the structural integrity of the monitored site.

Table 1 - (Table 5.1 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration)

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Monitored receivers have been treated as a Type 2 structure, including the educational buildings, in order to adopt a conservative assessment.

3.2 MONITORING EQUIPMENT

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

3.3 MONITORING LOCATIONS

A total of three vibration monitors were installed around the project site

One location was at the adjacent residential properties to the west of the project site.

Figure 1 – Vibration Monitor Placement at R1

One location was at The Marian Centre, belonging to Loreto Kirribilli, south of the project site.

Figure 2 – Vibration Monitor Placement at R2

One location was at Gonzaga Barry Centre, belonging to Loreto Kirribilli, south-east of the project site.

Figure 3 – Vibration Monitor Placement at R3

3.4 MONITORING PERIOD

The monitoring period presented in this report is from 25/11/2020 to 09/12/2020.

3.5 MONITORED VIBRATION LEVELS

The highest vibration levels – peak particle velocity (PPV) mm/s and frequency content of the vibration monitors during the measurement period have been presented below.

Table 2 – Measured Max PPV @ E7427 (Western Residential Receivers)

Period	Measured Max PPV	Structural Damage Criteria (DIN4150-3)	Comments
Wednesday 25/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	Vibration levels satisfy DIN4150-3 'Type 2' criteria on all dates.
Thursday 26/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 27/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 28/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 29/11/2020	No Works		
Monday 30/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 01/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 02/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Thursday 03/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 04/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 05/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 06/12/2020	No Works		
Monday 07/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 08/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 09/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	

Table 3 – Measured Max PPV @ E7458 (The Marian Centre)

Period	Measured Max PPV	Structural Damage Criteria (DIN4150-3)	Comments
Wednesday 25/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	Vibration levels satisfy DIN4150-3 'Type 2' criteria on all dates.
Thursday 26/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 27/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 28/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 29/11/2020	No Works		
Monday 30/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 01/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 02/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Thursday 03/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 04/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 05/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 06/12/2020	No Works		
Monday 07/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 08/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 09/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	

Table 4 – Measured Max PPV @ R3 (Gonzaga Barry Centre)

Period	Measured Max PPV	Structural Damage Criteria (DIN4150-3)	Comments
Wednesday 25/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	Vibration levels satisfy DIN4150-3 'Type 2' criteria on all dates.
Thursday 26/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 27/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 28/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 29/11/2020	No Works		
Monday 30/11/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 01/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 02/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Thursday 03/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Friday 04/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Saturday 05/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Sunday 06/12/2020	No Works		
Monday 07/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Tuesday 08/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	
Wednesday 09/12/2020	<3mm/s	0 - 5mm/s @ 1Hz to 10Hz	

4 NOISE MONITORING

Access to the noise monitor has not been be granted since the date of installation due to lack of a safe path to reach the equipment.

Subsequently, this report will not present any noise monitoring data, but will be carried over to the next report (if noise monitor is accessible then). Nonetheless, the noise management levels which construction noise will be assessed against are presented and summarised below.

4.1 BACKGROUND NOISE MEASUREMENTS

Long-term noise monitoring was conducted for the project prior to start of any demolition, excavation or construction work. Background noise levels have been established and are presented in report *Construction Noise and Vibration Management Plan* (ref: 20200031.1/0511A/R1/KNM).

These noise levels are summarised below.

Table 5 – Measured Rating Background Noise Levels

Time of Day	Rating Background Noise Level dB(A)$L_{90(Period)}$
Day (7am – 6pm)	38
Evening (6pm – 10pm)	39
Night (10pm – 7am)	30

4.2 NOISE MANAGEMENT LEVELS

4.2.1 EPA – Interim Construction Noise Guideline (ICNG)

In relation to airborne construction noise impact at residential receivers, the ICNG adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise affected" level*. Where construction noise is predicted to exceed the "noise effected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For residential properties, the "noise effected" level occurs when construction noise exceeds ambient levels by more than 10dB(A)$L_{eq(15min)}$.
- "*Highly noise affected level*". Where noise emissions are such that nearby properties are "highly noise effected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A)$L_{eq(15min)}$ at nearby residences.

In addition to the above goals for residential receivers, the ICNG nominates a Management Level of 45dB(A) $L_{eq(15min)}$ internally for School Classrooms.

A summary of relevant construction noise management levels is presented below.

Table 6 – Summarised Noise Management Levels

Receiver	Noise Management Level - dB(A)$L_{eq(15min)}$	
	"Noise Affected" Level	**"Highly Noise Affected" Level**
Residential	48 (externally)	75 (externally)
School	45 (internally)	

5 CONCLUSION

Noise and vibration monitoring has been conducted at Loreto Kirribilli Innovation Centre for the demolition and excavation works of existing structures inside the school grounds. Monitored levels have been processed and presented for the period between 11/11/2020 to 25/11/2020.

During this period vibration levels at all monitors were found to satisfy DIN 4150-3 'Type 2' criteria (for dwellings or similar use buildings).

Moise monitoring results will be carried over and presented in the next report once safe access is granted.

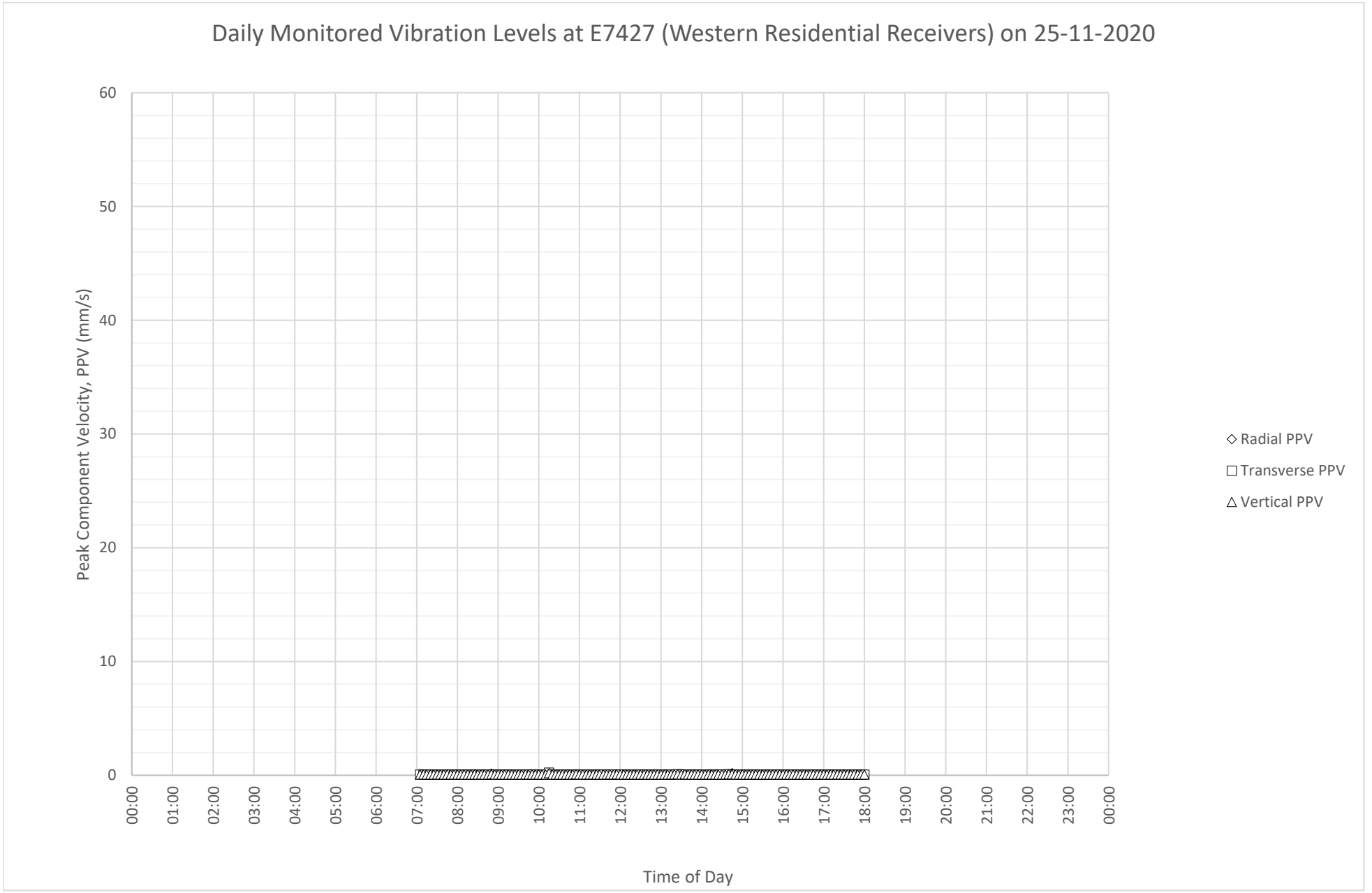
Monitoring graphs have been presented in the Appendix.

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

Yours faithfully,

Acoustic Logic Pty Ltd
Kanin Mungkarndee

APPENDIX A – VIBRATION MONITORING DATA @ E7427 (RESIDENTIAL RECEIVERS)


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
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22:00
23:00
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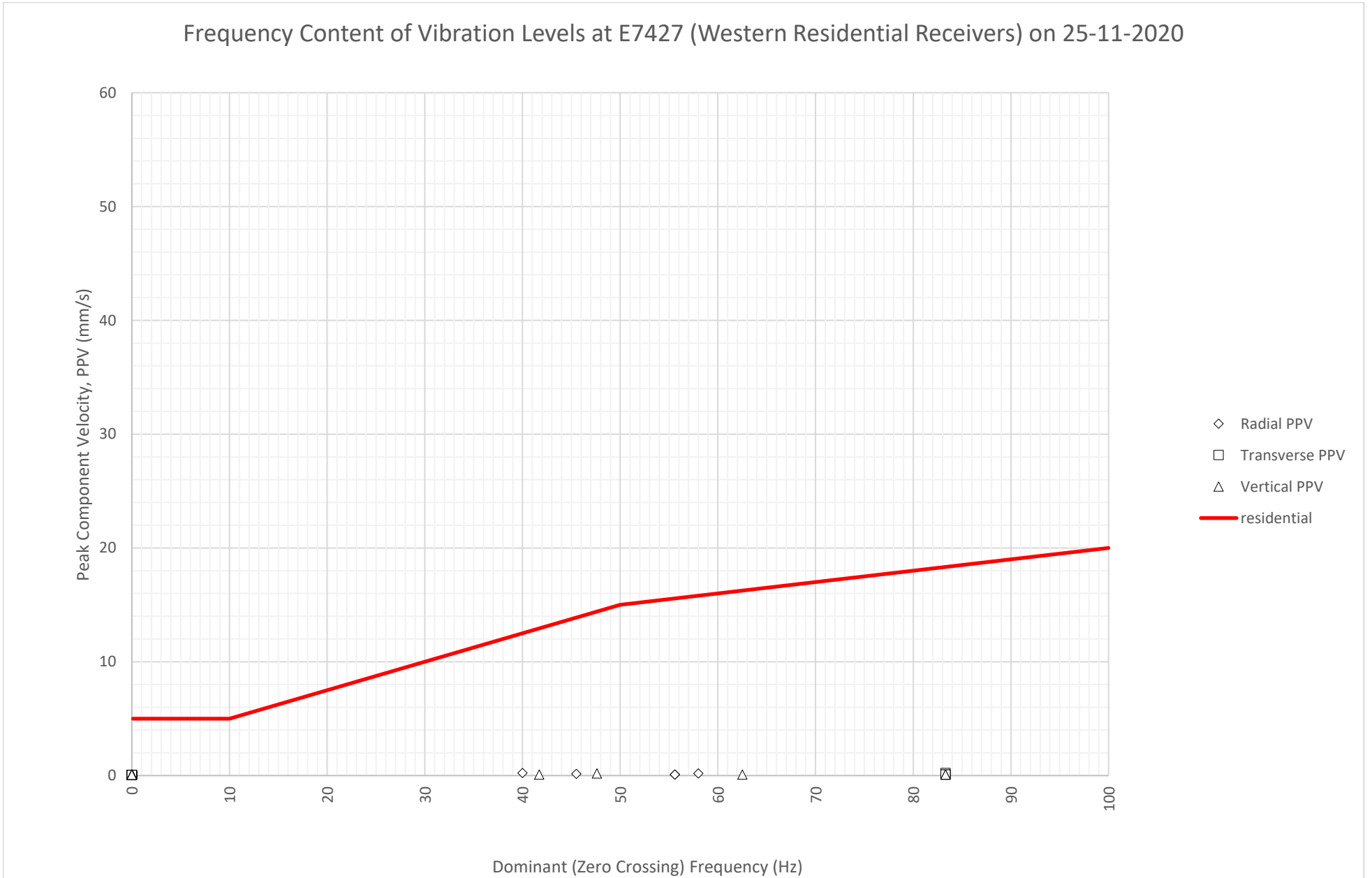
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
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50
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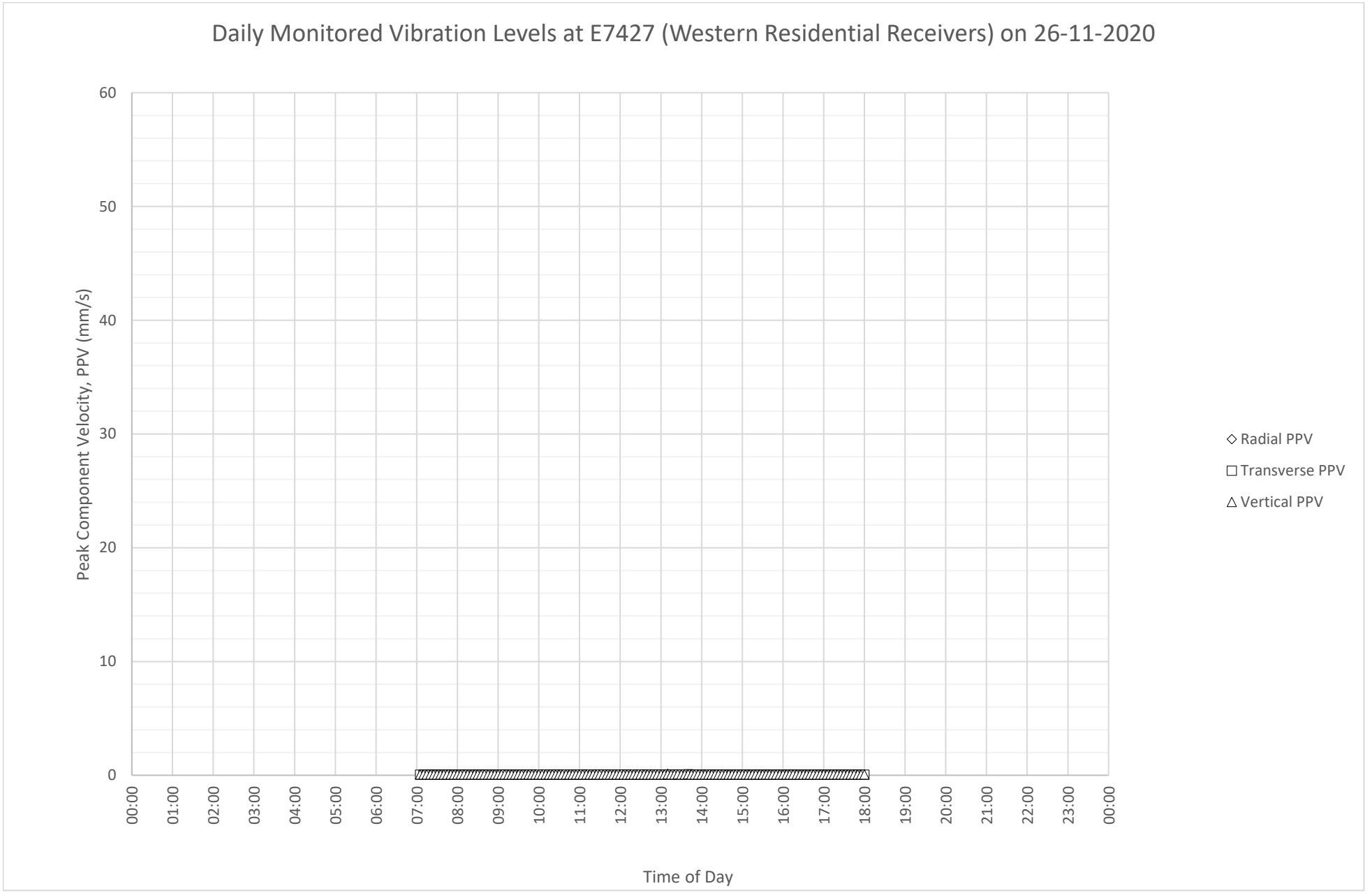
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 26-11-2020
Peak Component Velocity, PPV (mm/s)
60
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00:00
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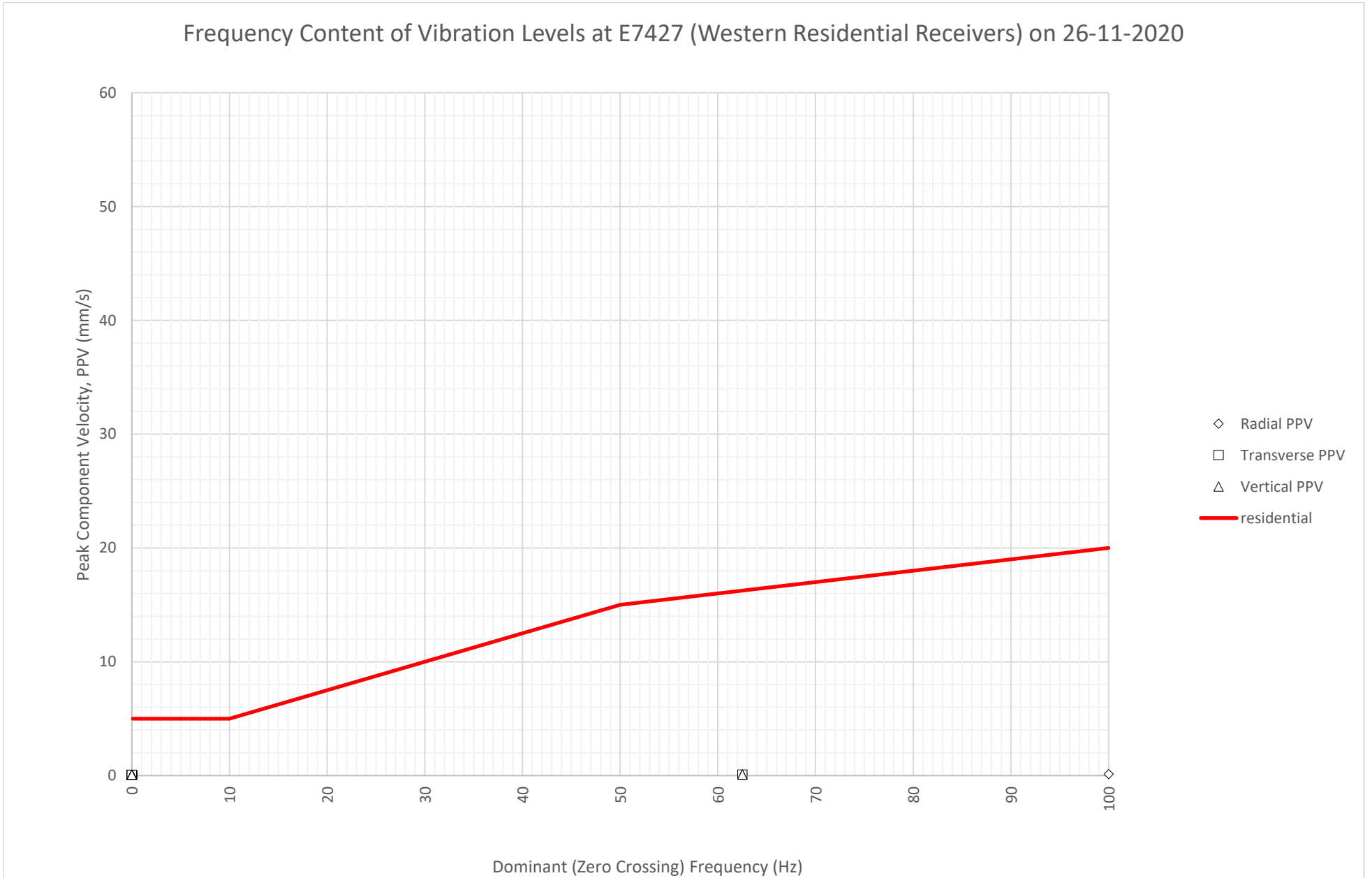
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 26-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
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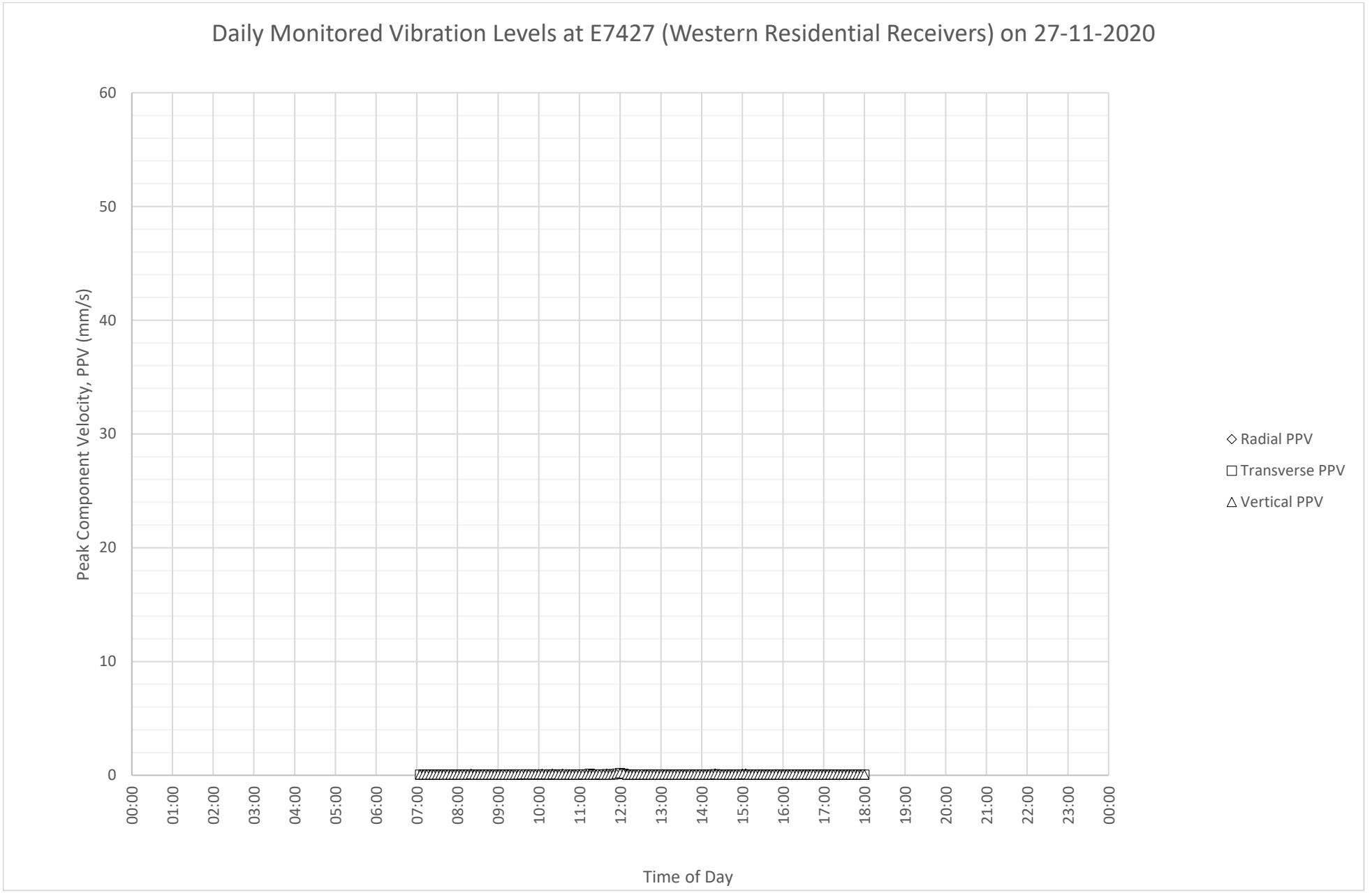
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
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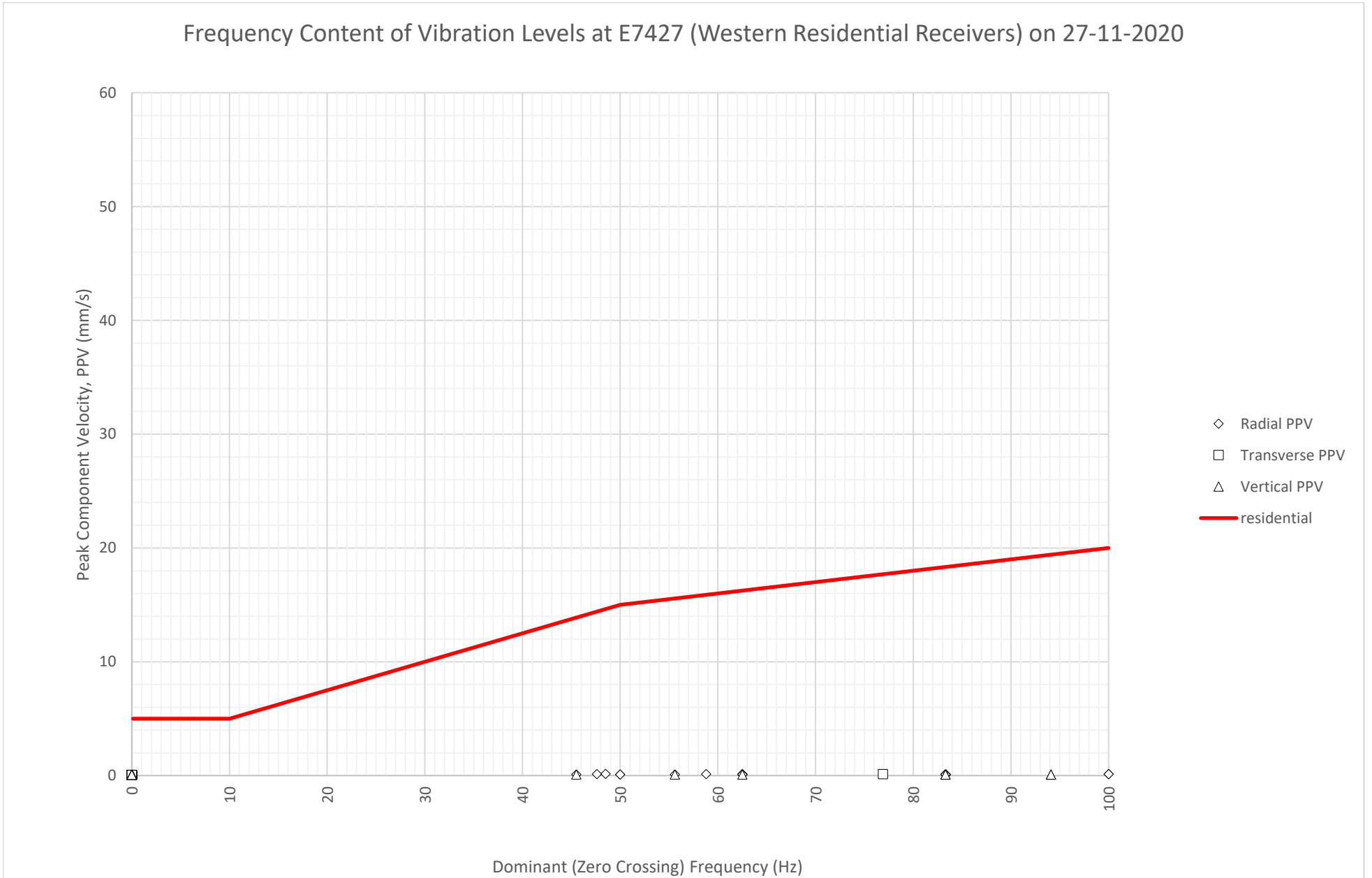
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
60
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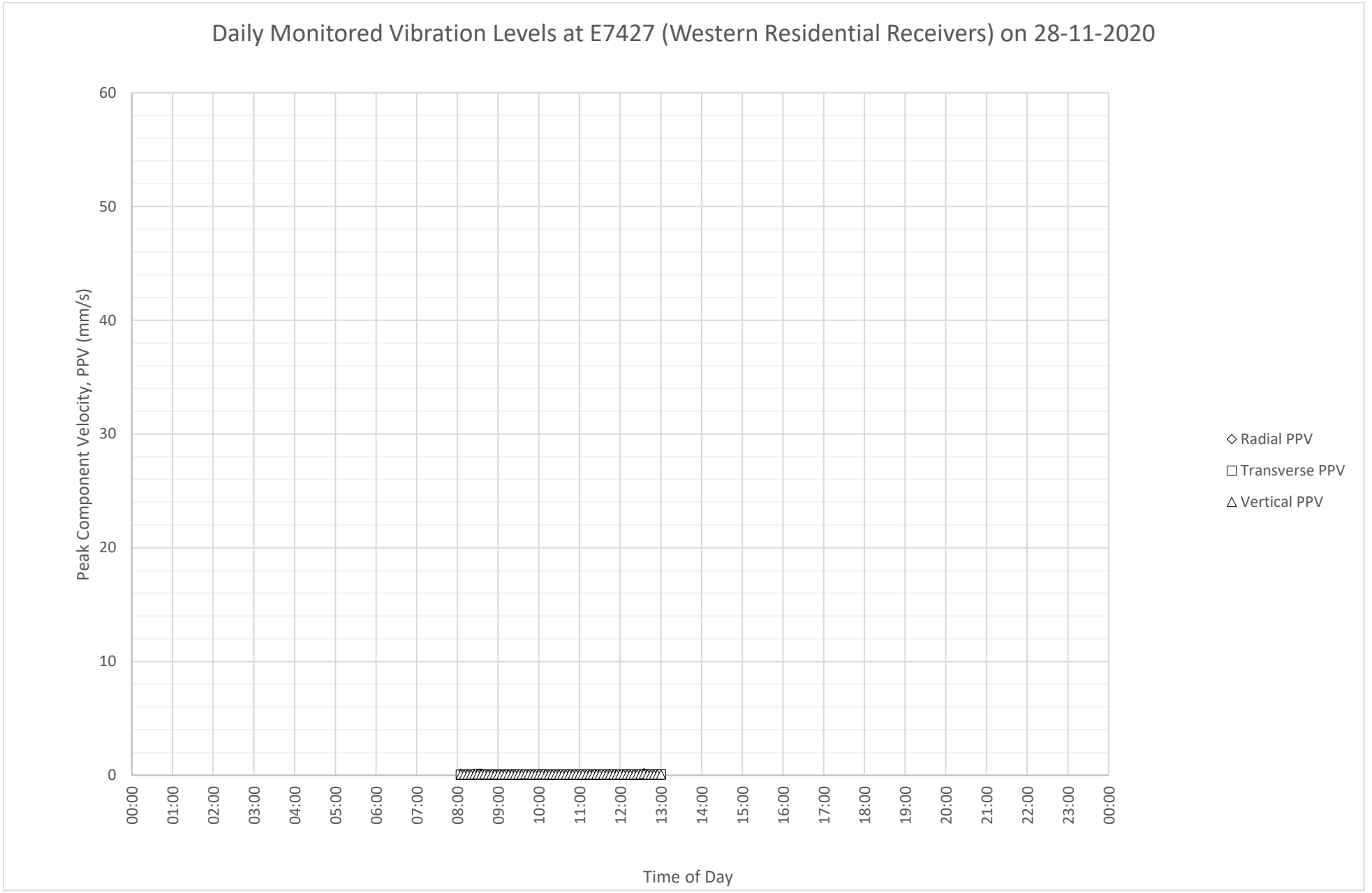
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
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02:00
03:00
04:00
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23:00
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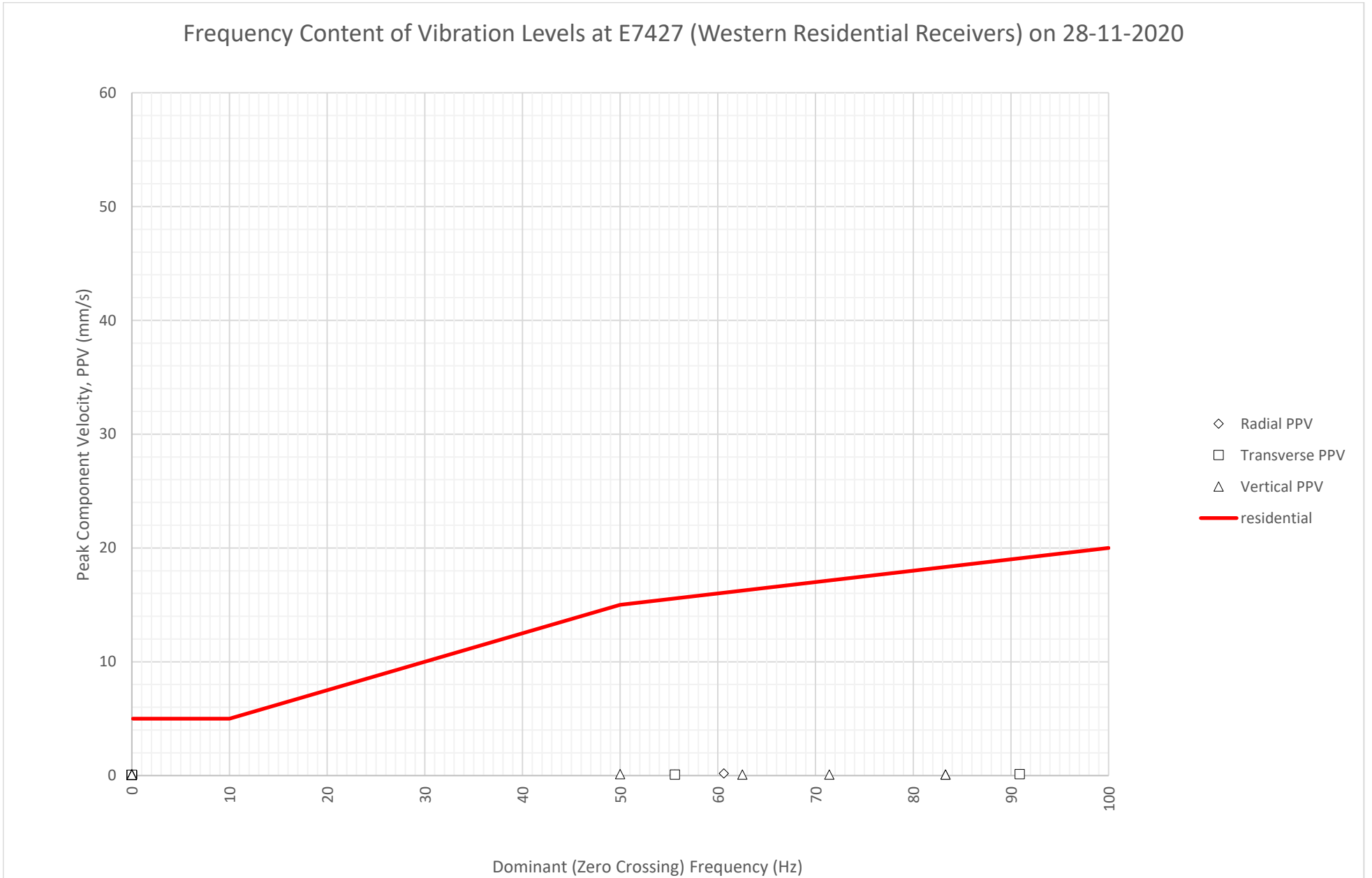
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
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22:00
23:00
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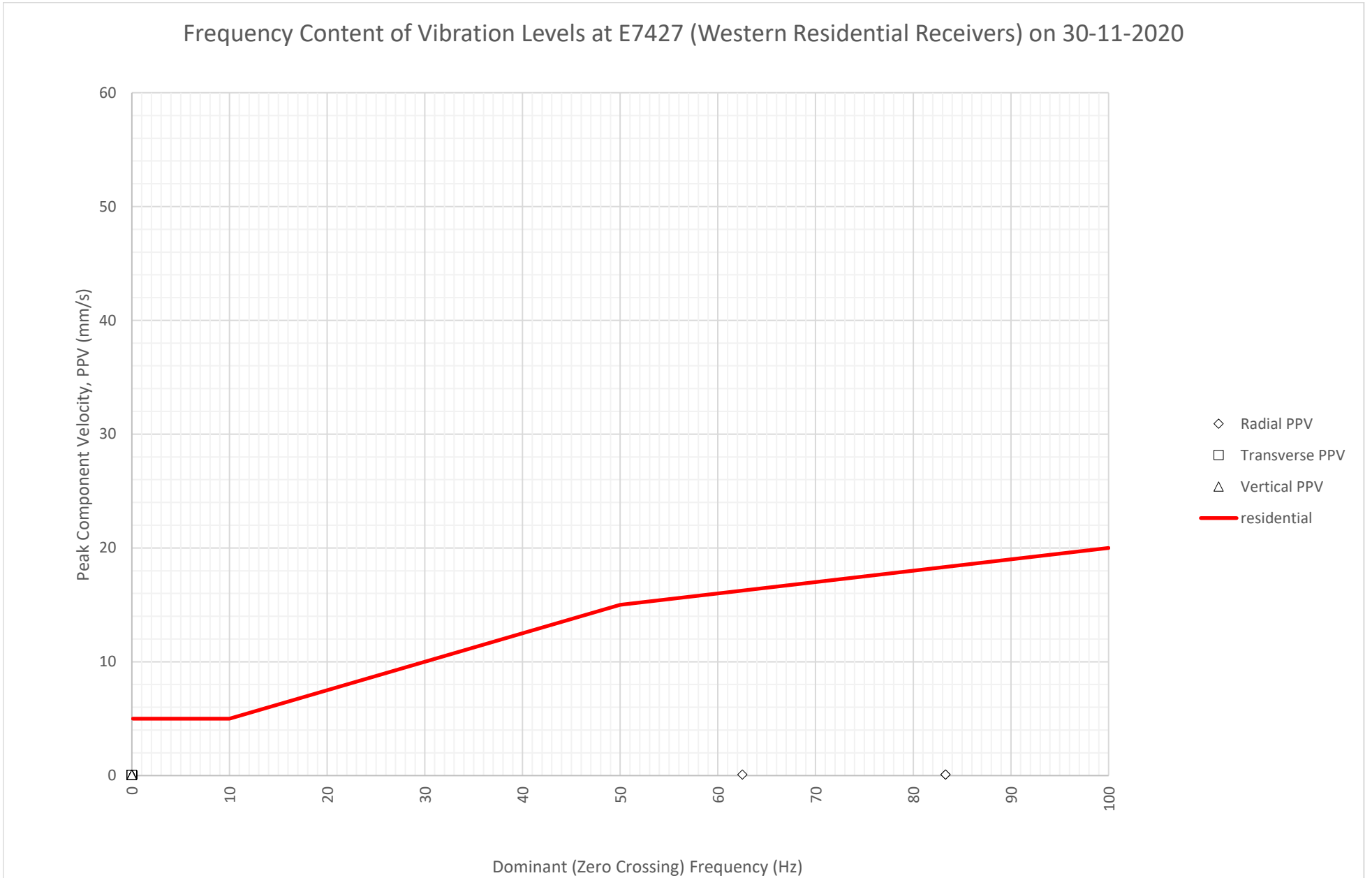
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
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50
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0
0
10
20
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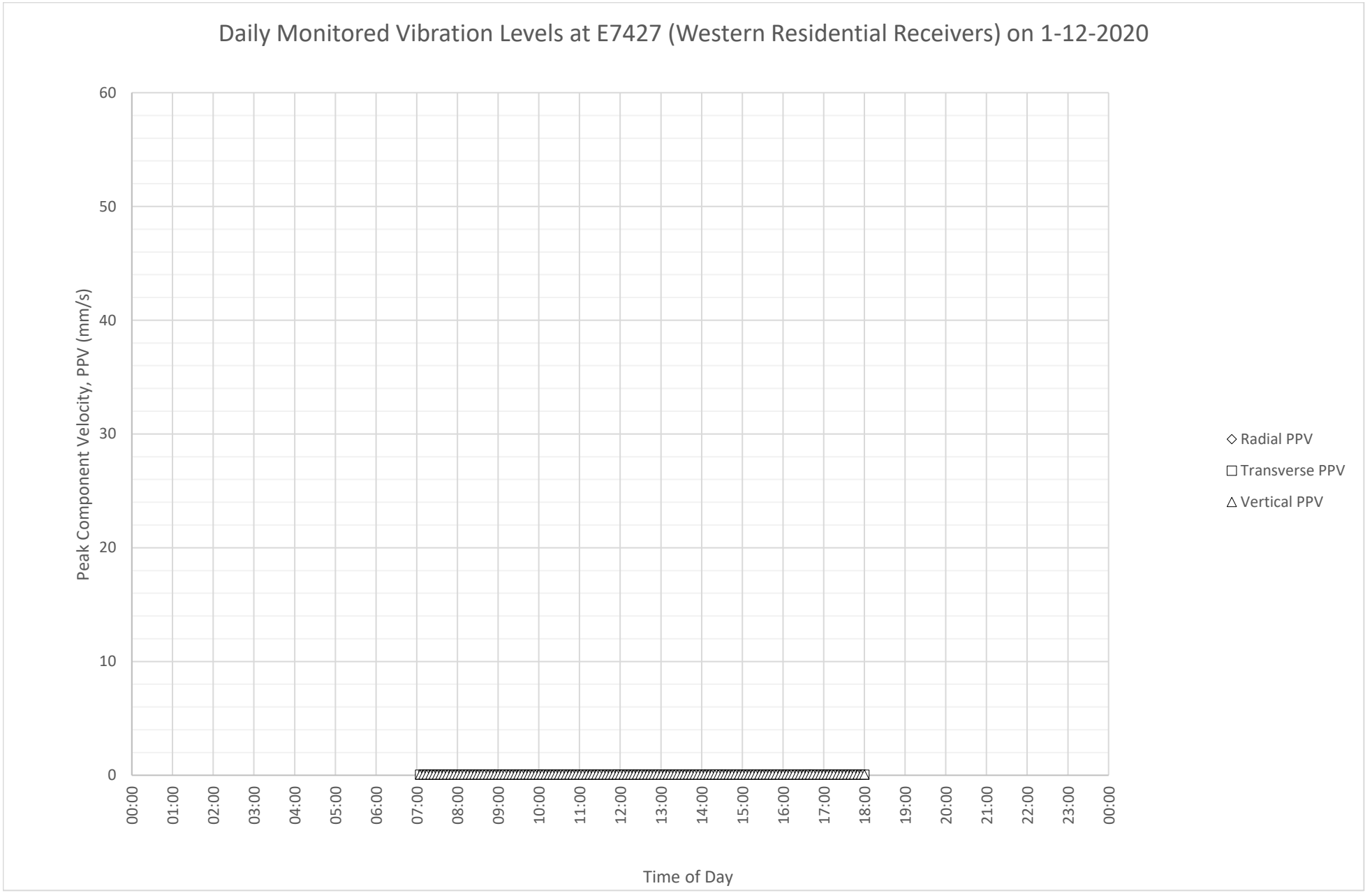
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 1-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
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16:00
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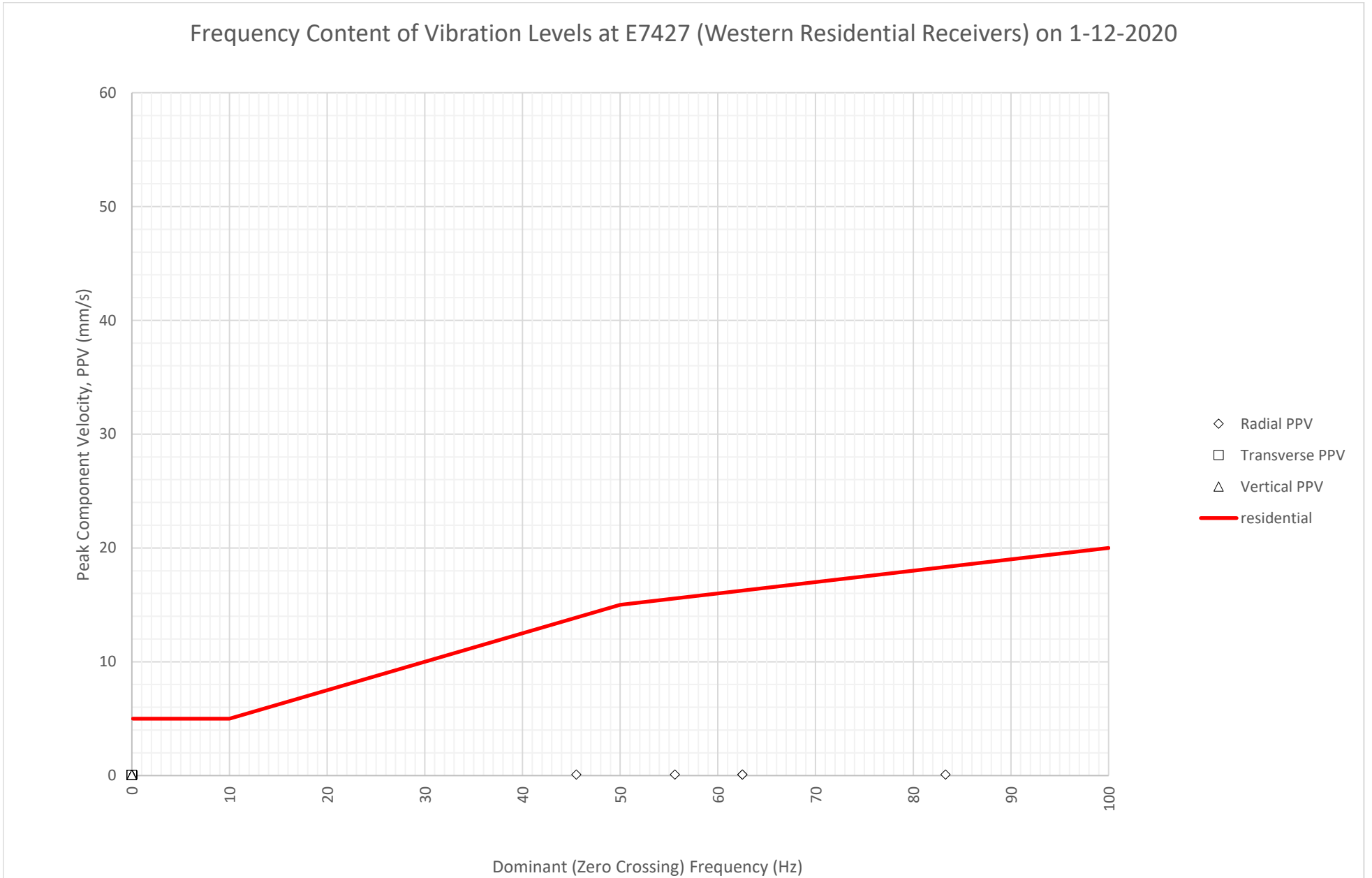
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 1-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
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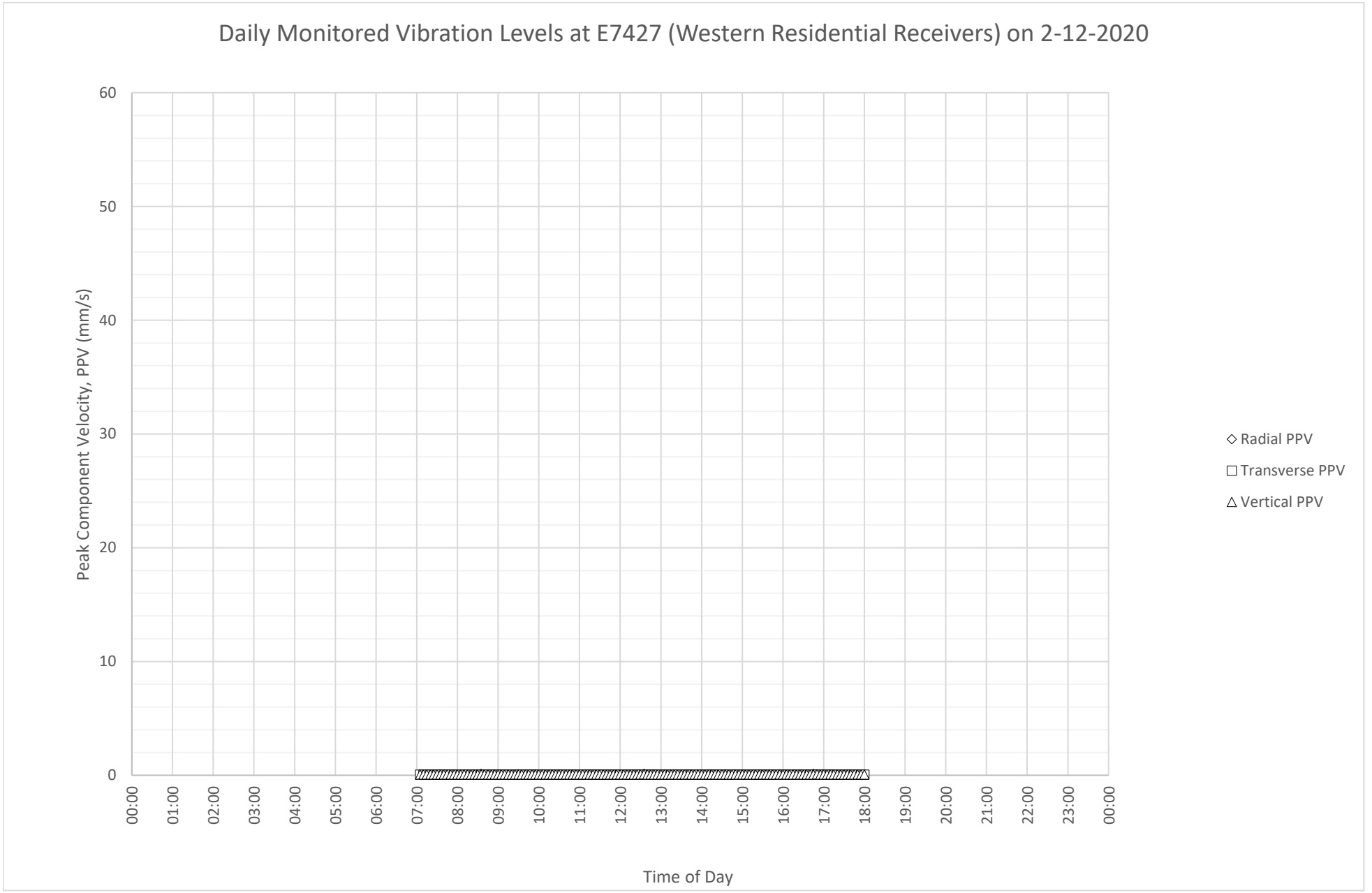
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
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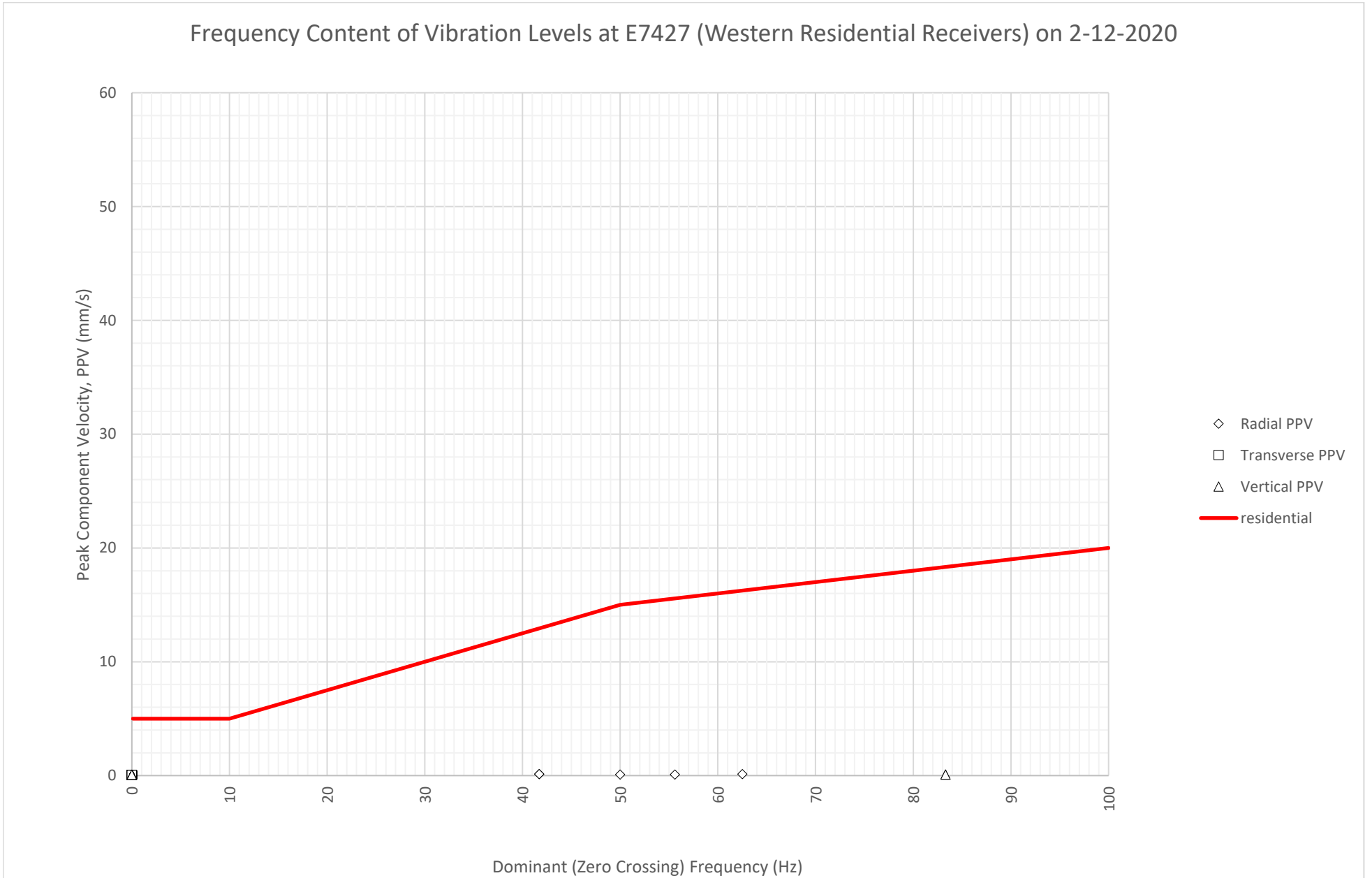
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
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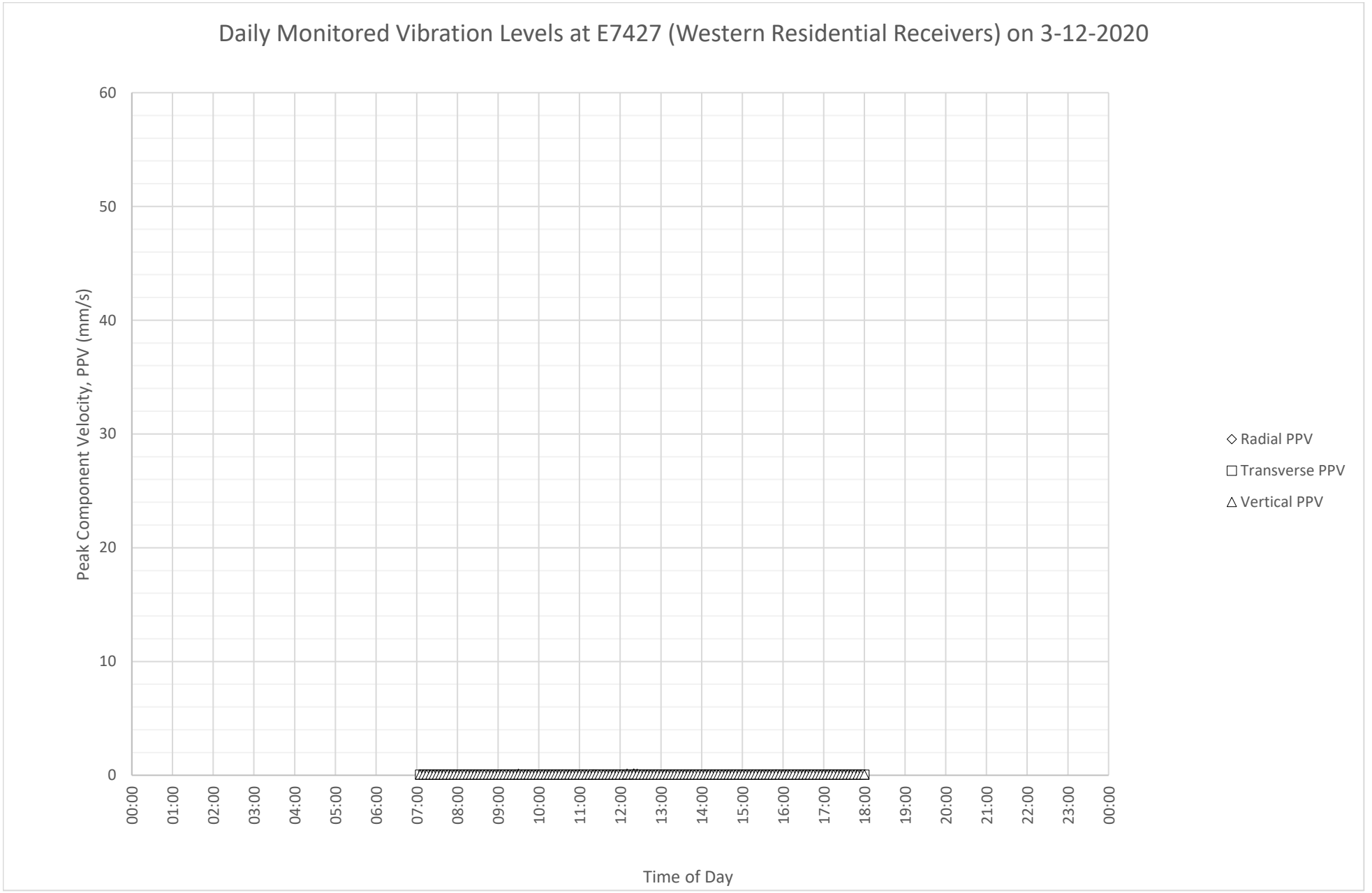
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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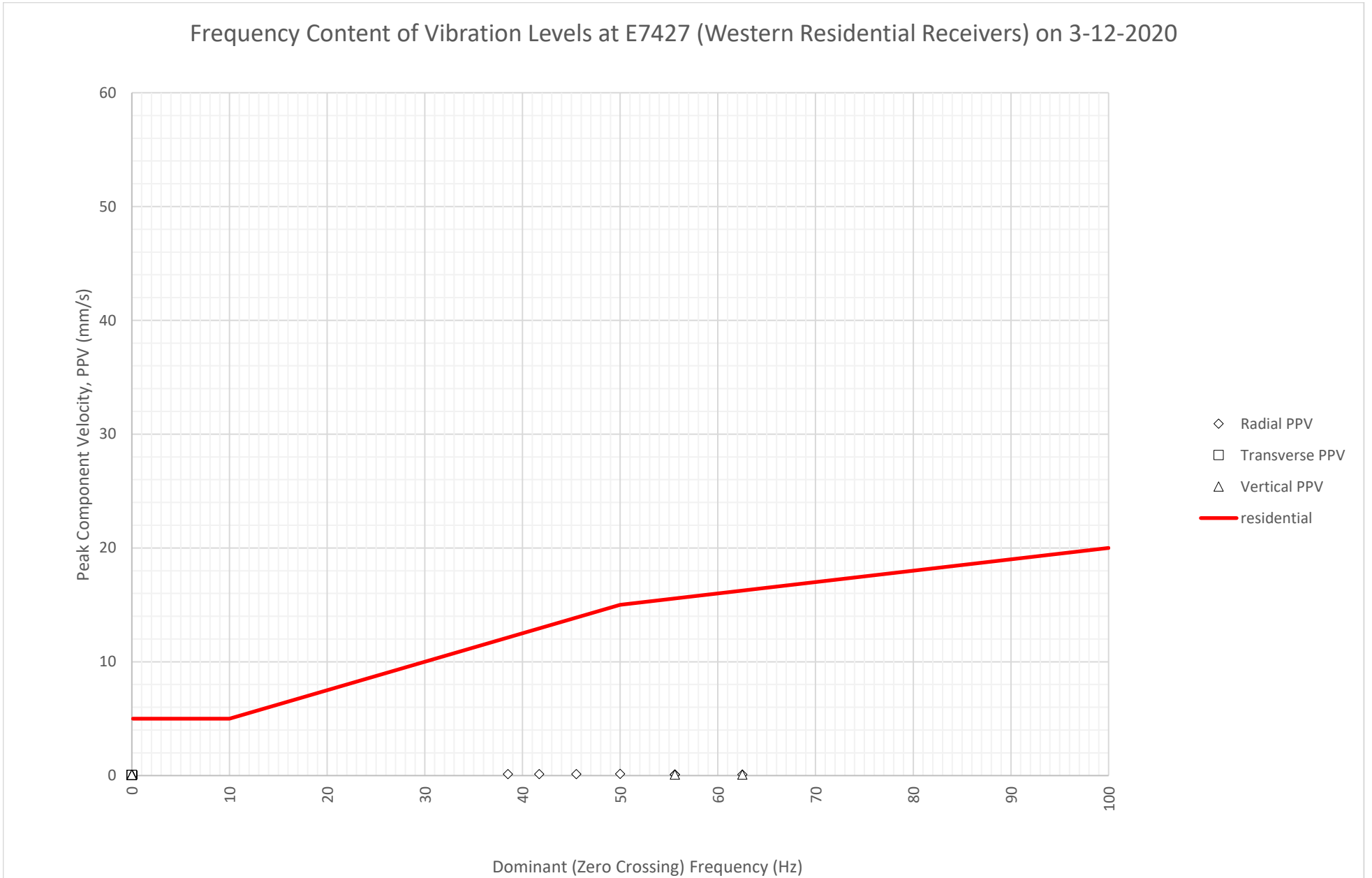
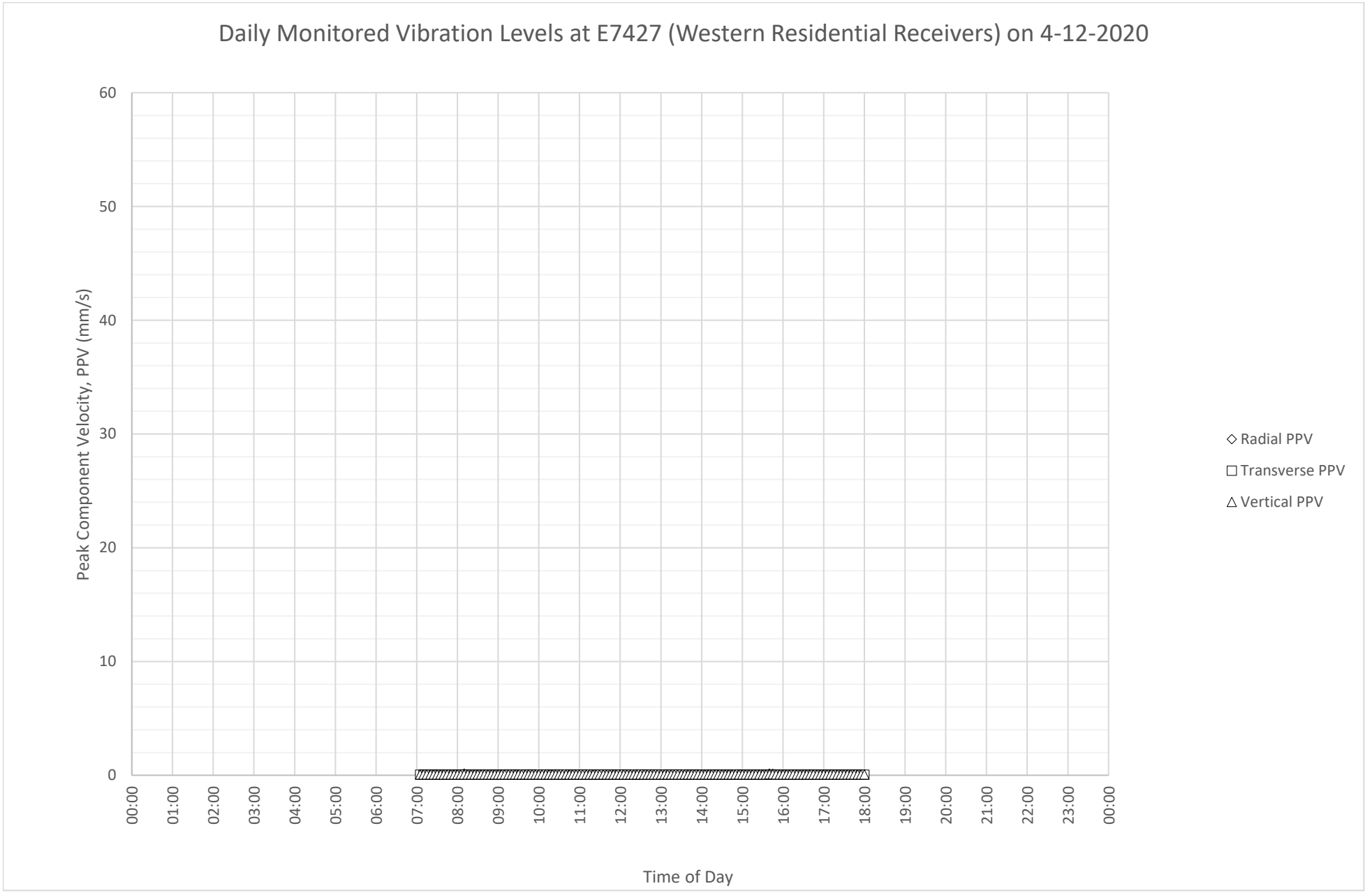
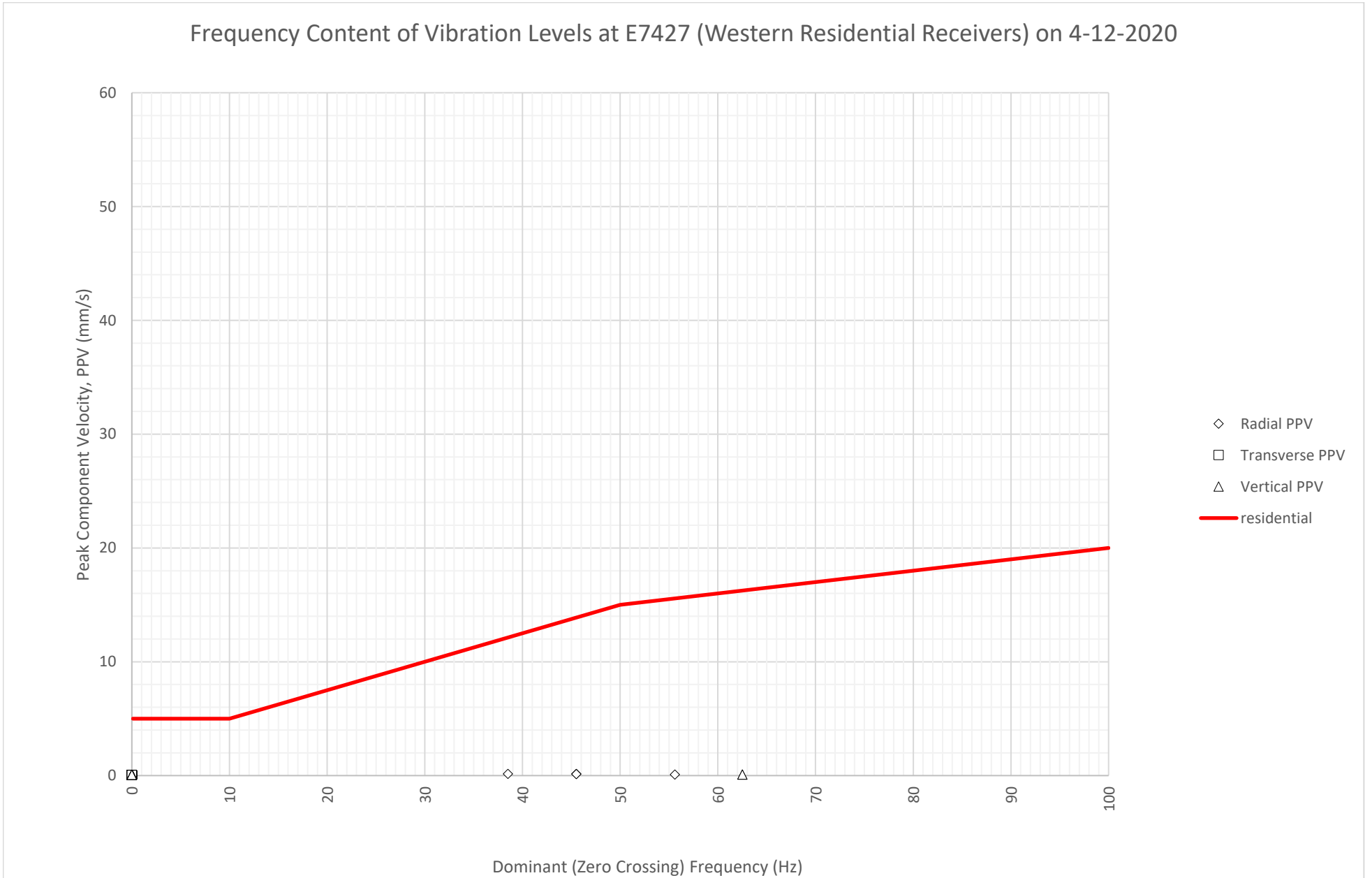
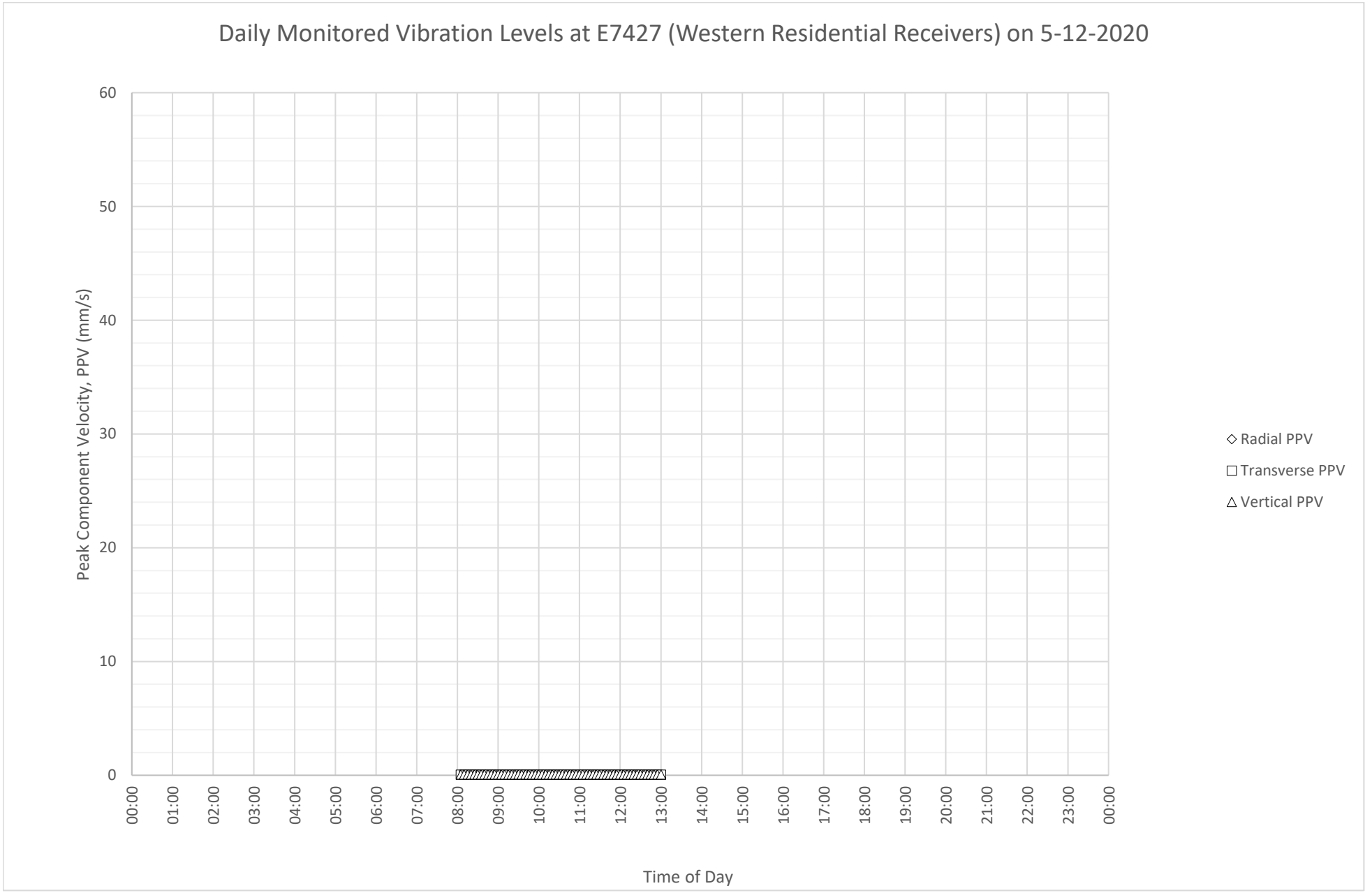
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
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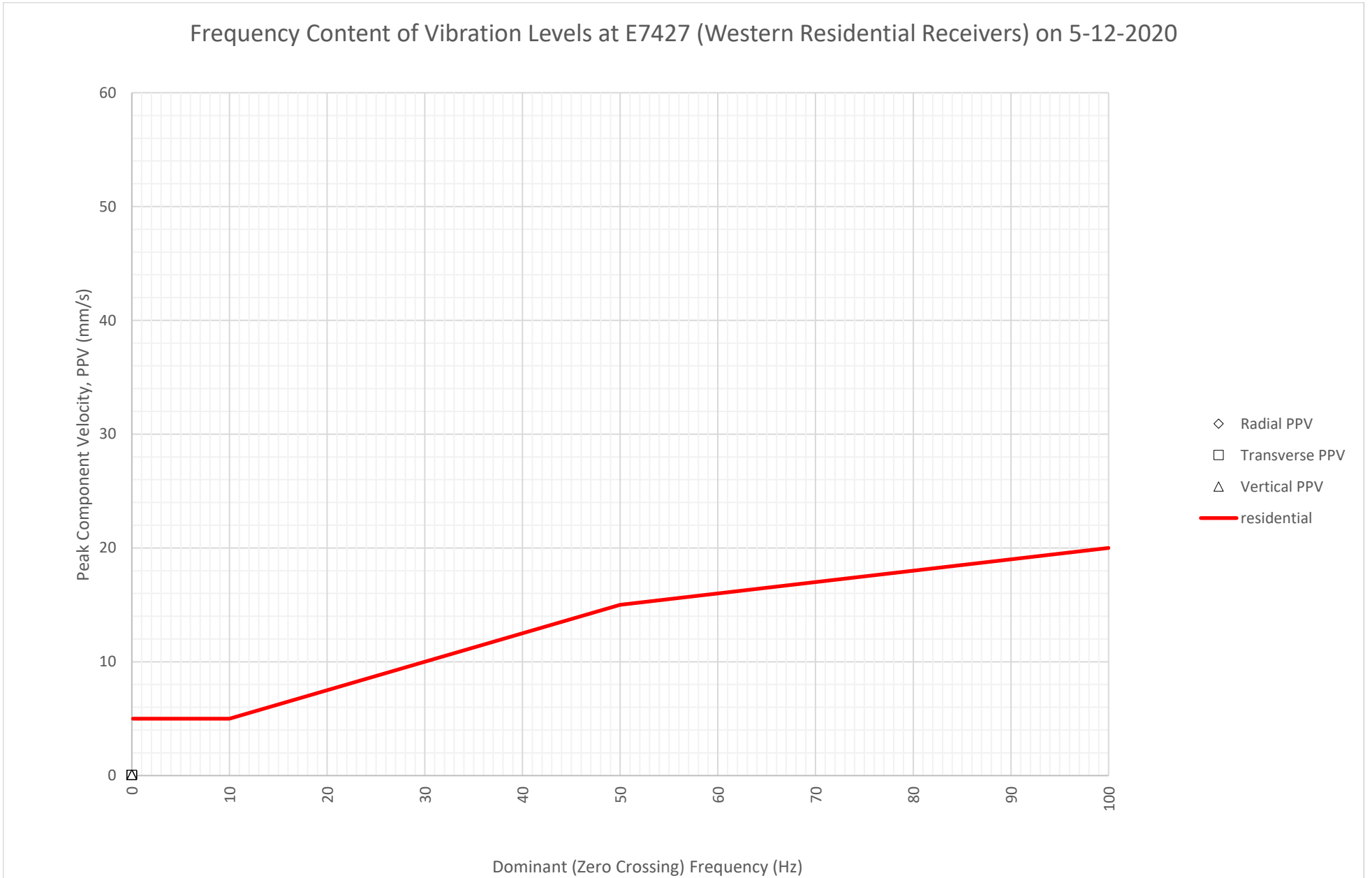
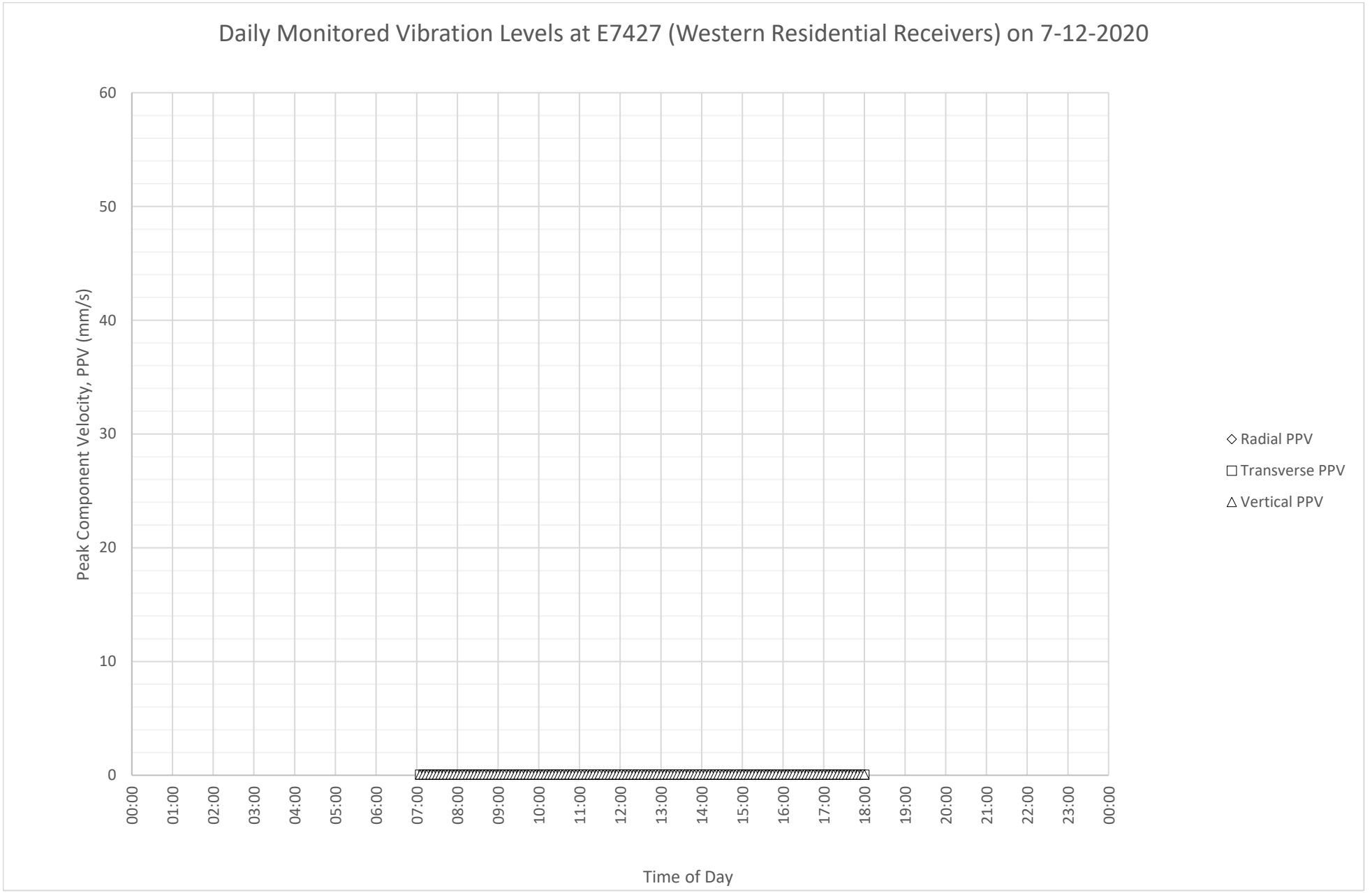
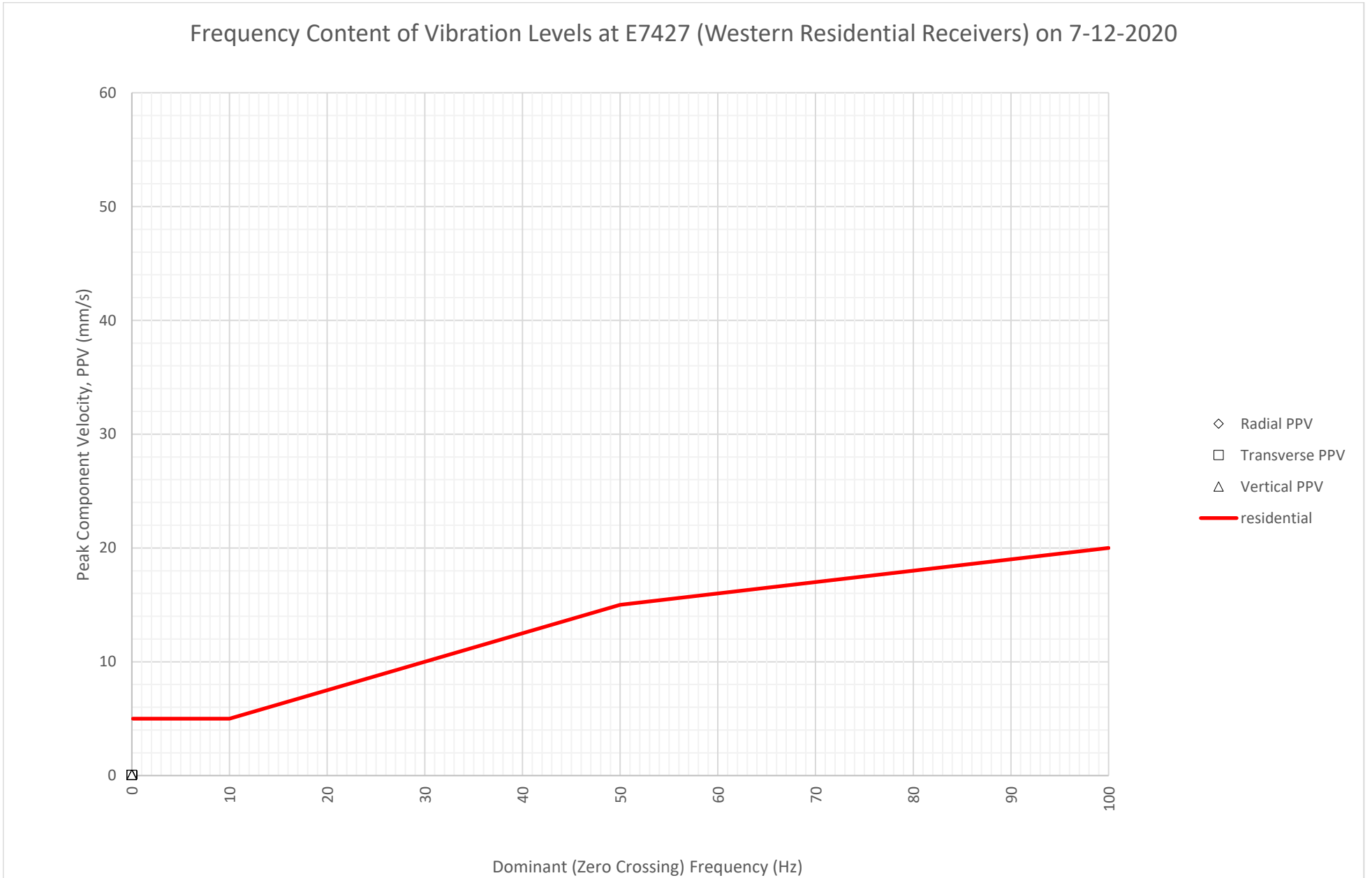
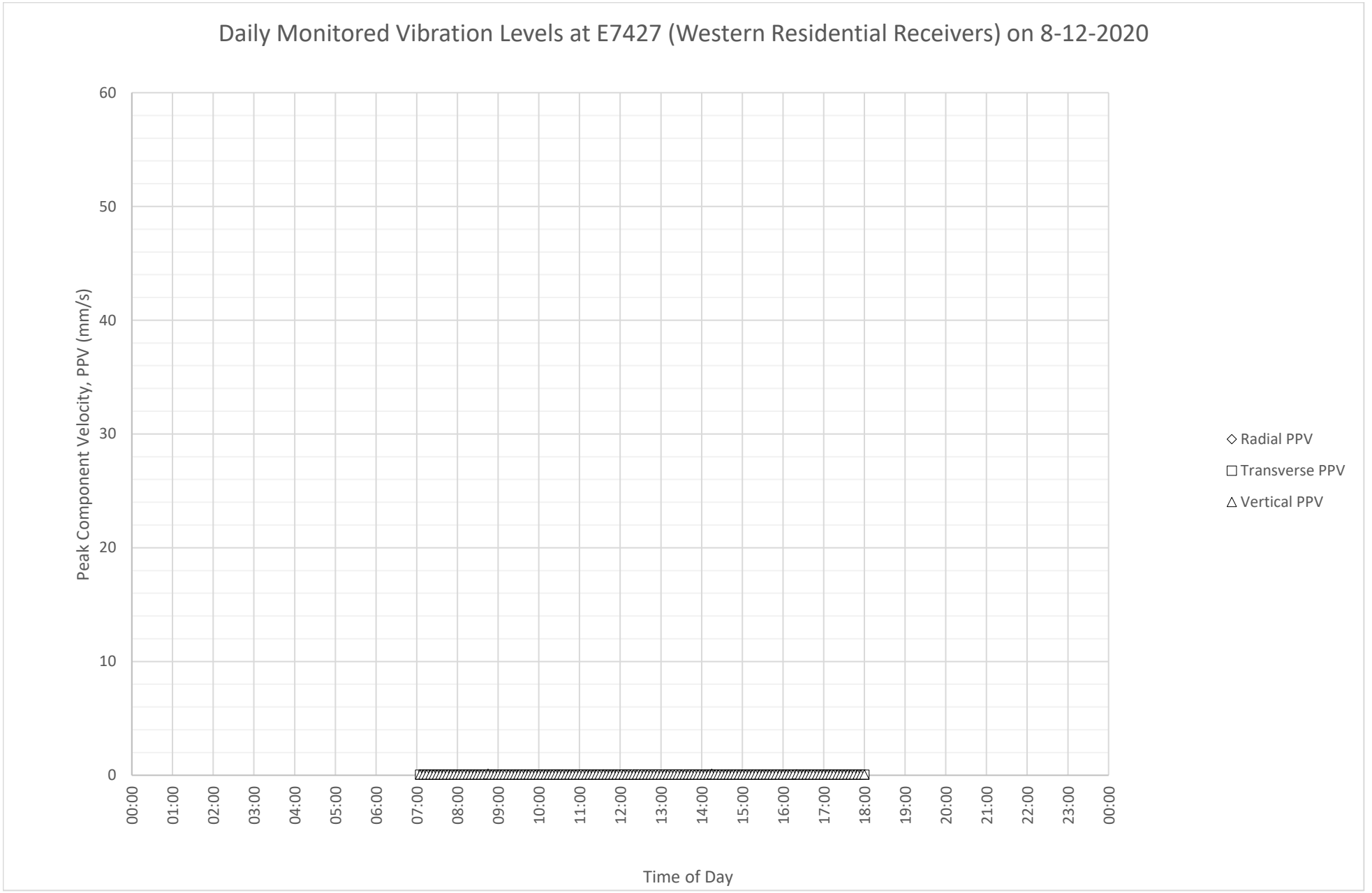
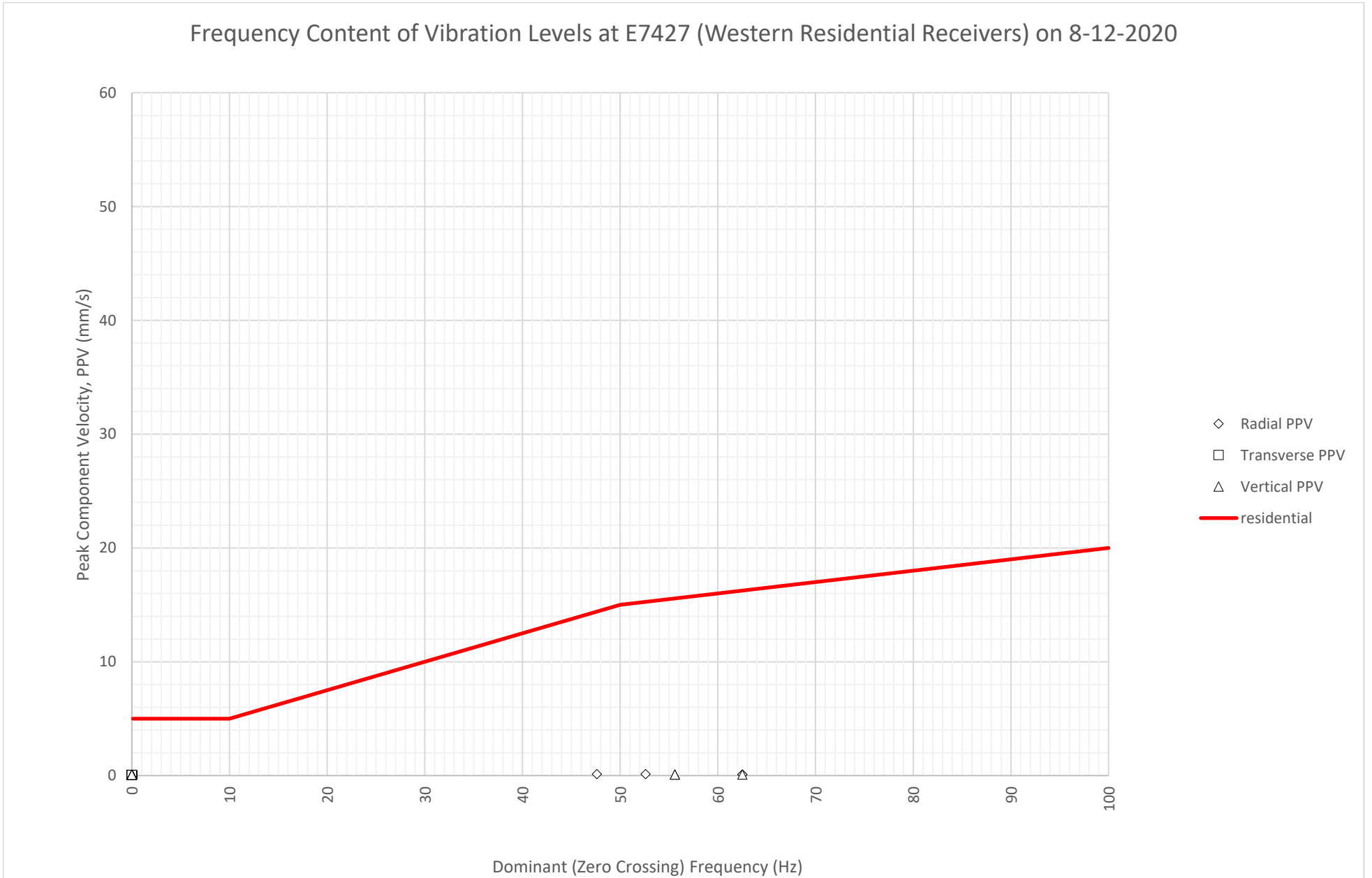
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV

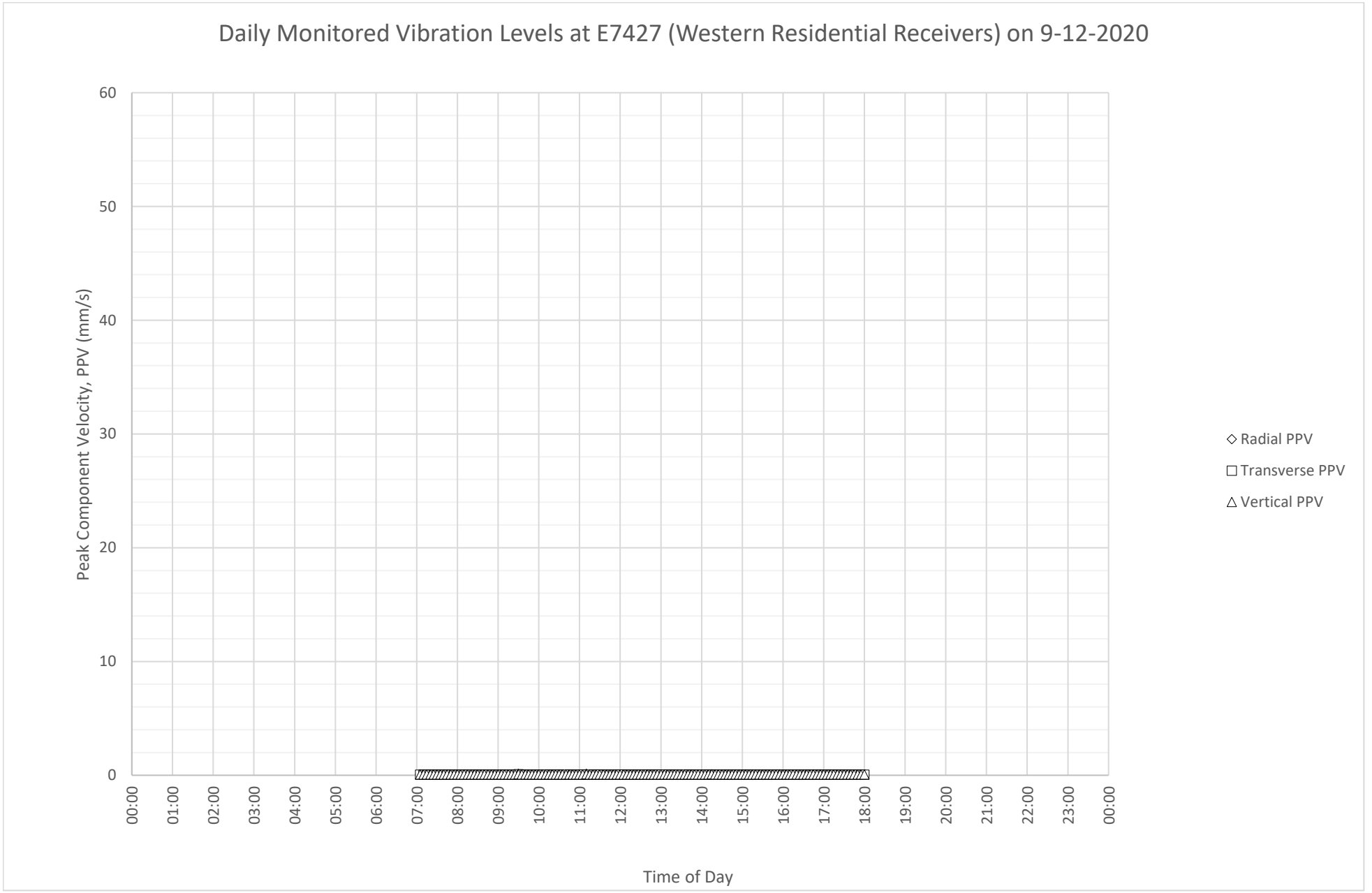

Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential

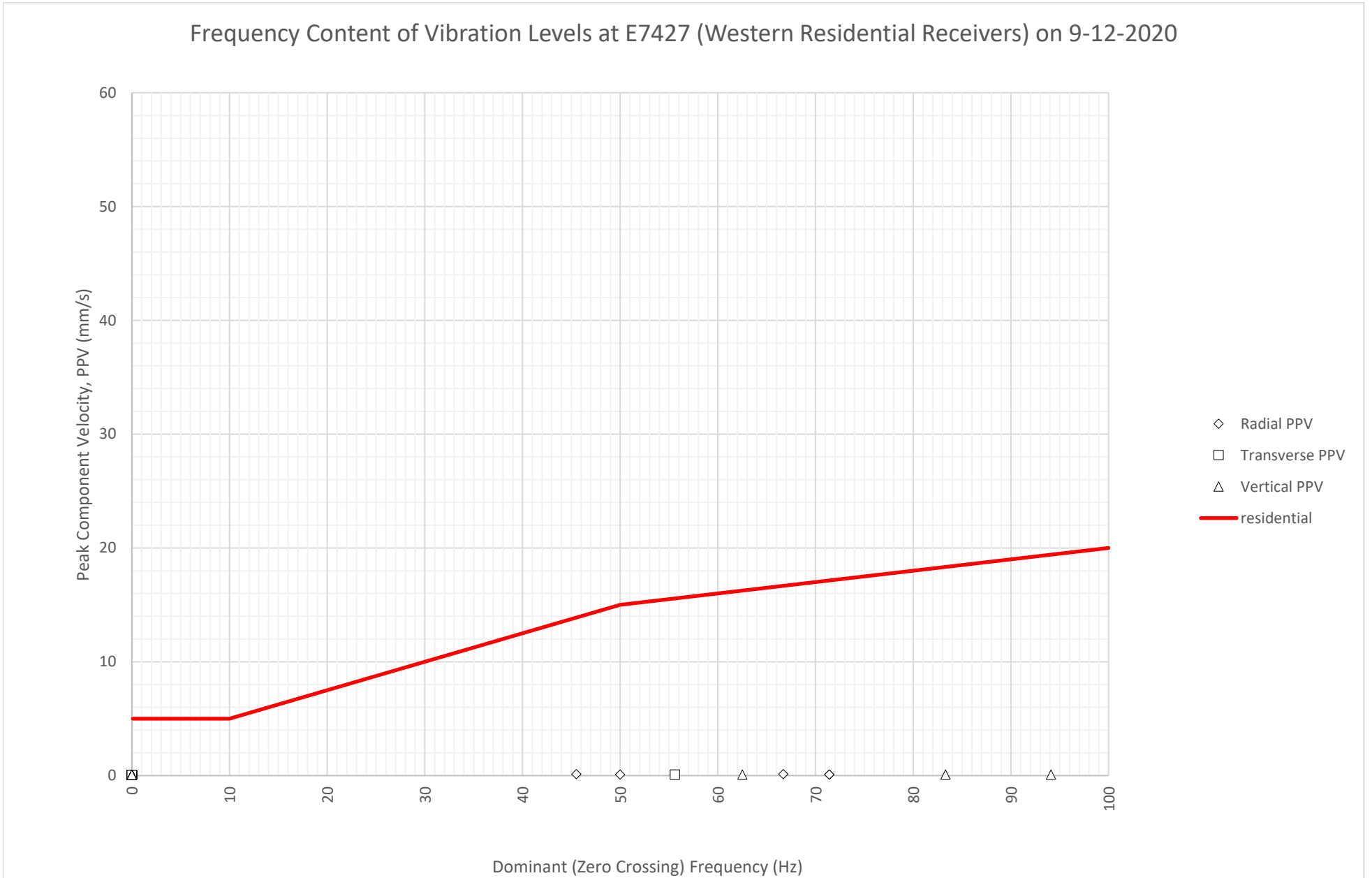

Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential

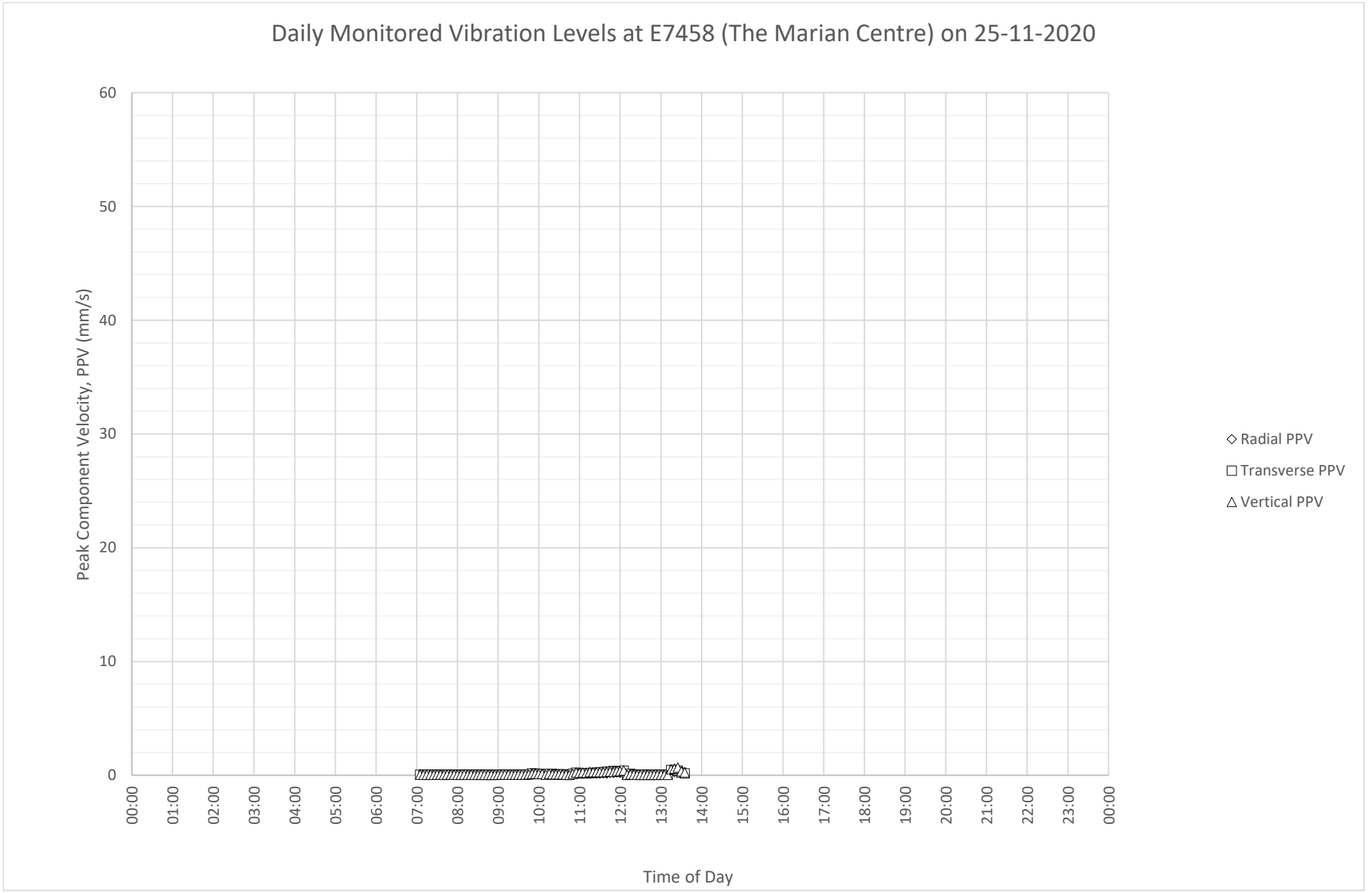

Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7427 (Western Residential Receivers) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7427 (Western Residential Receivers) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential

APPENDIX B – VIBRATION MONITORING DATA @ E7458 (THE MARIAN CENTRE)


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
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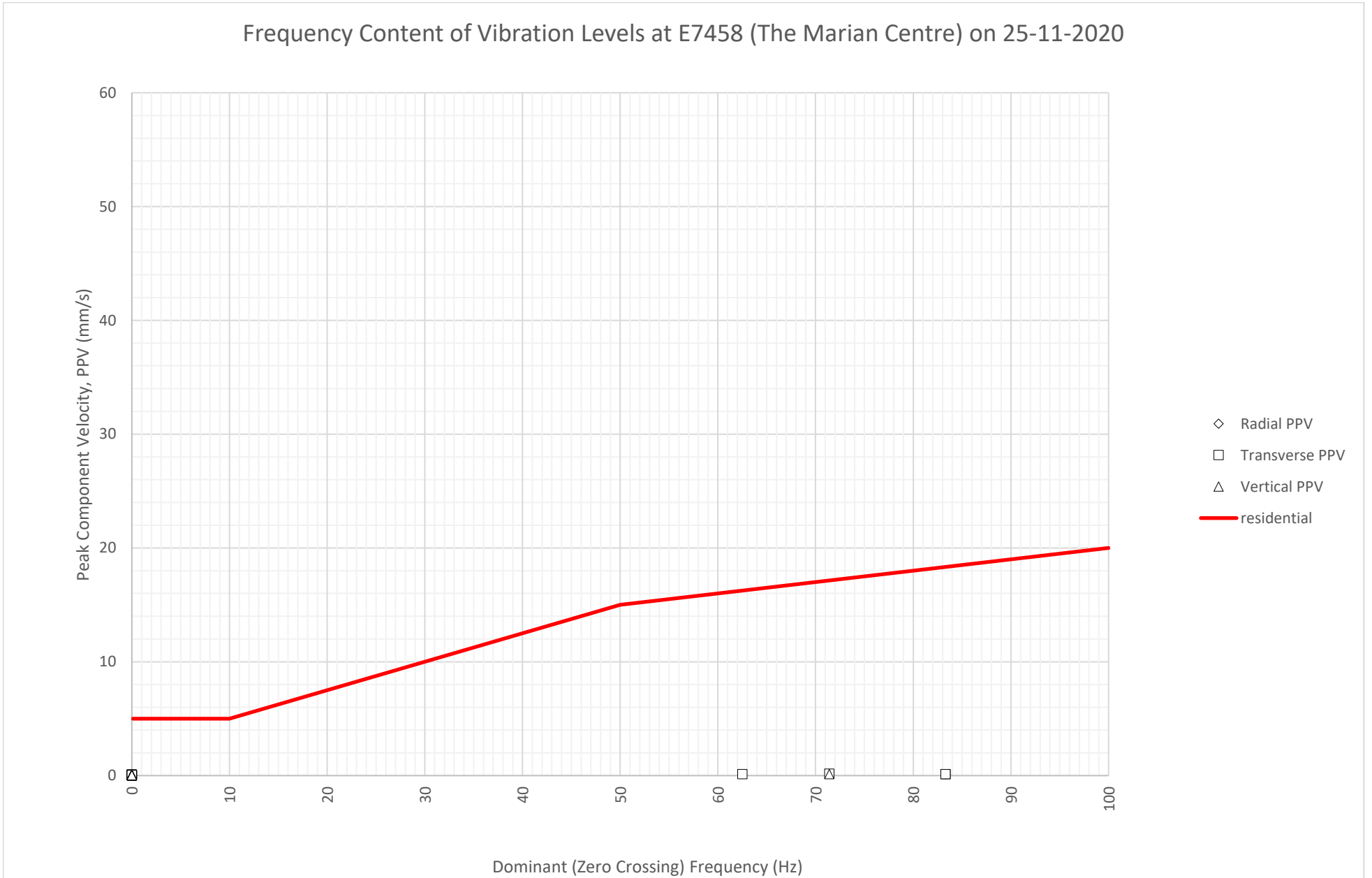
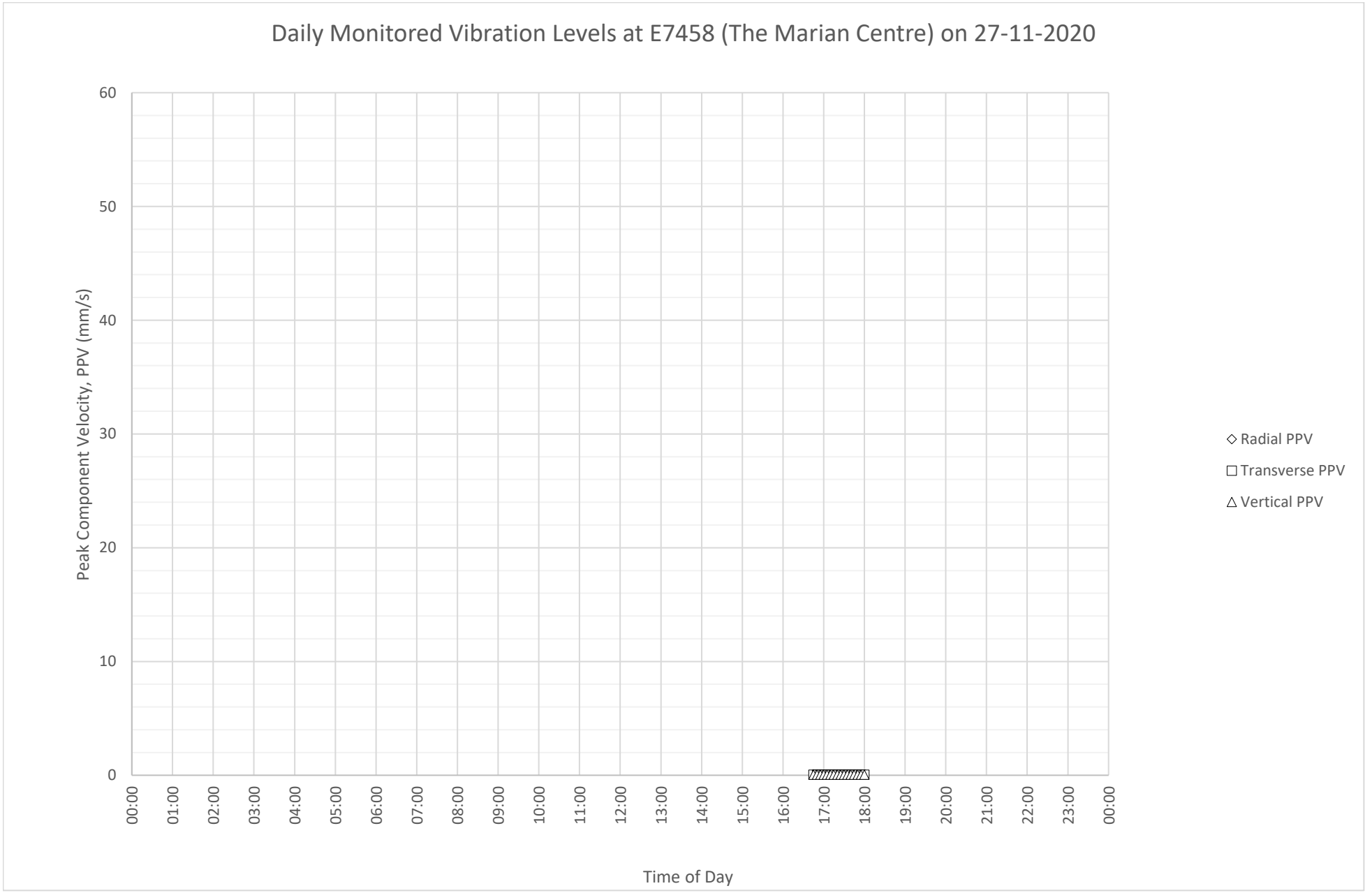
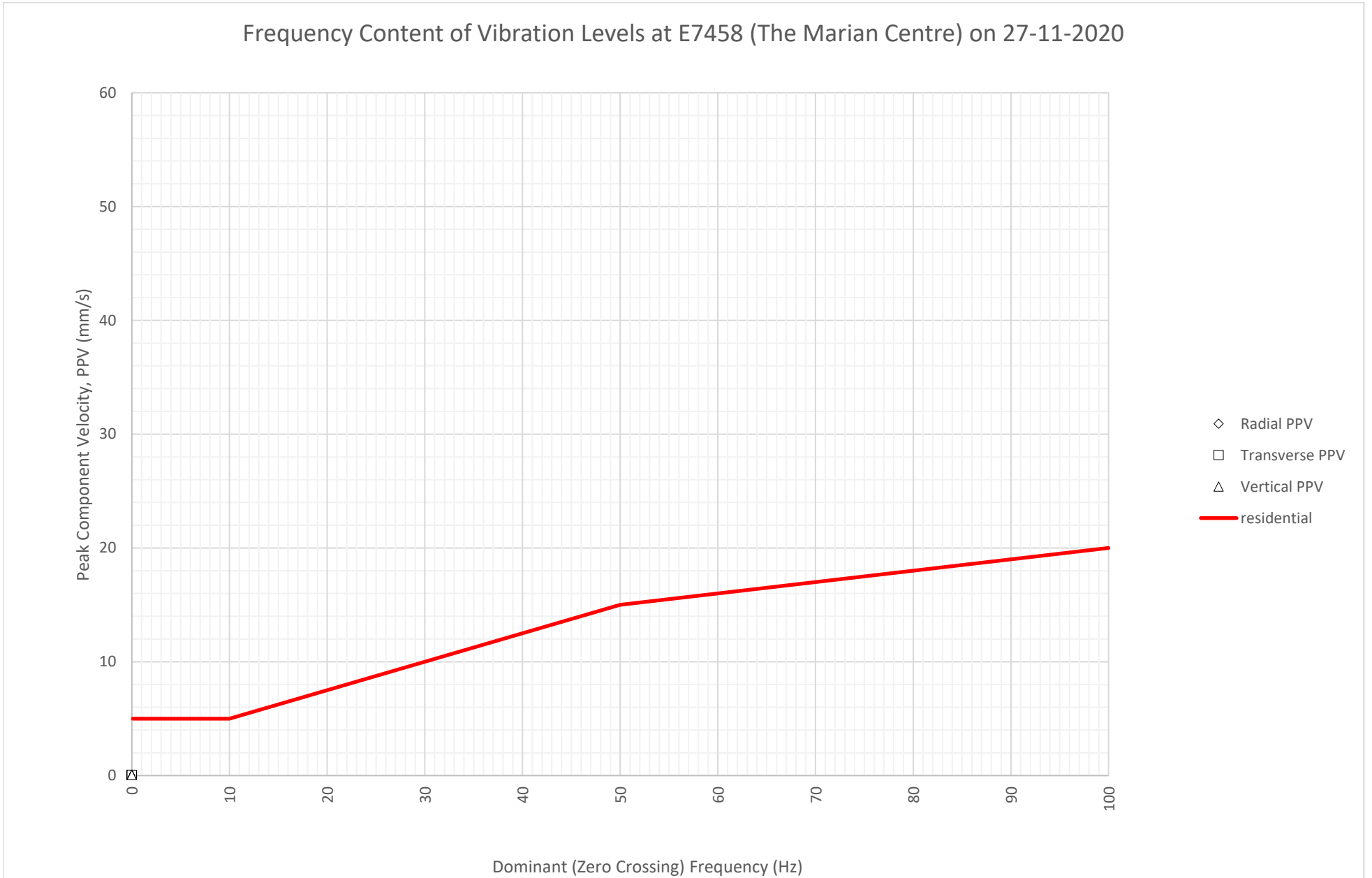
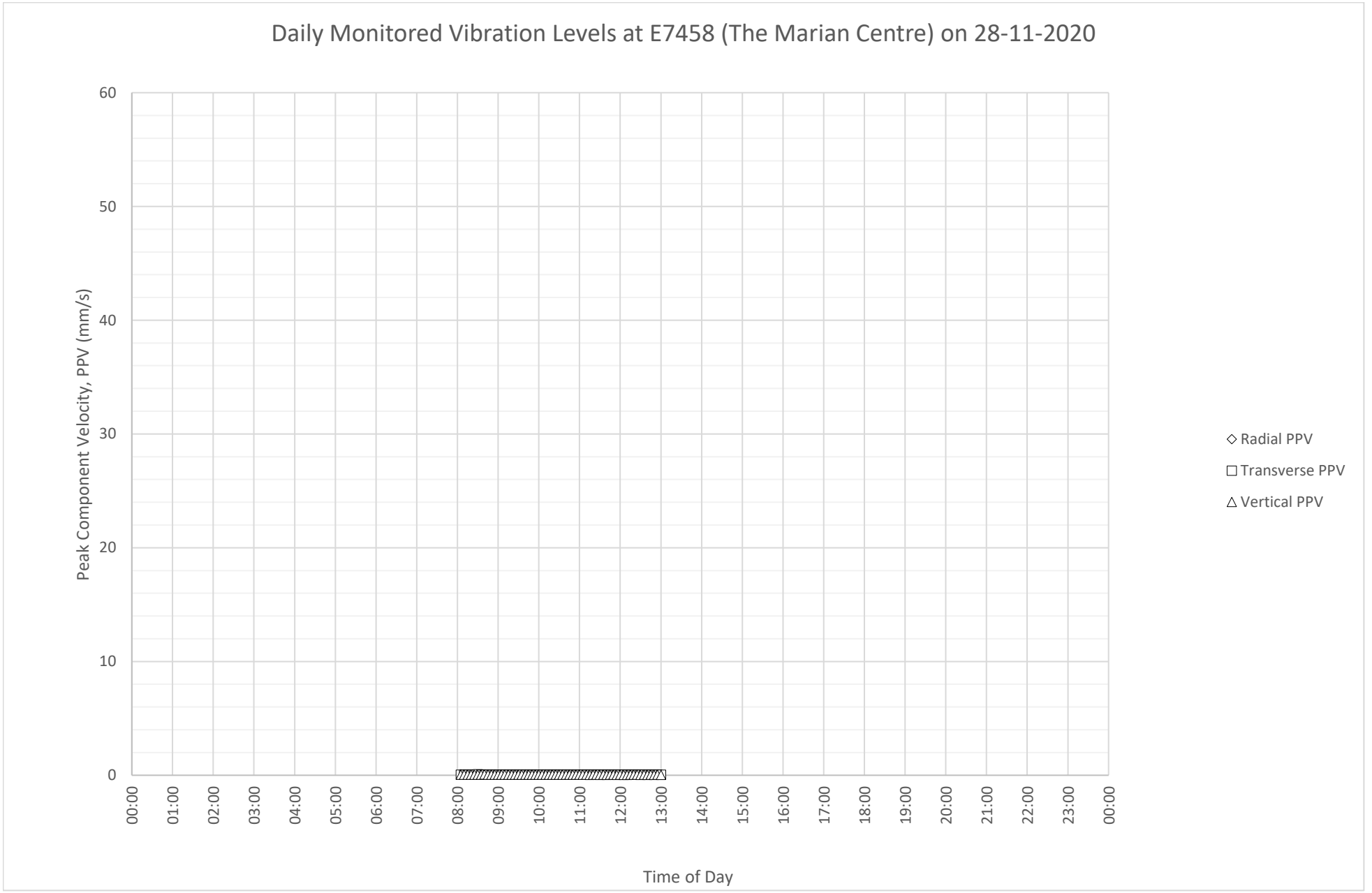
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
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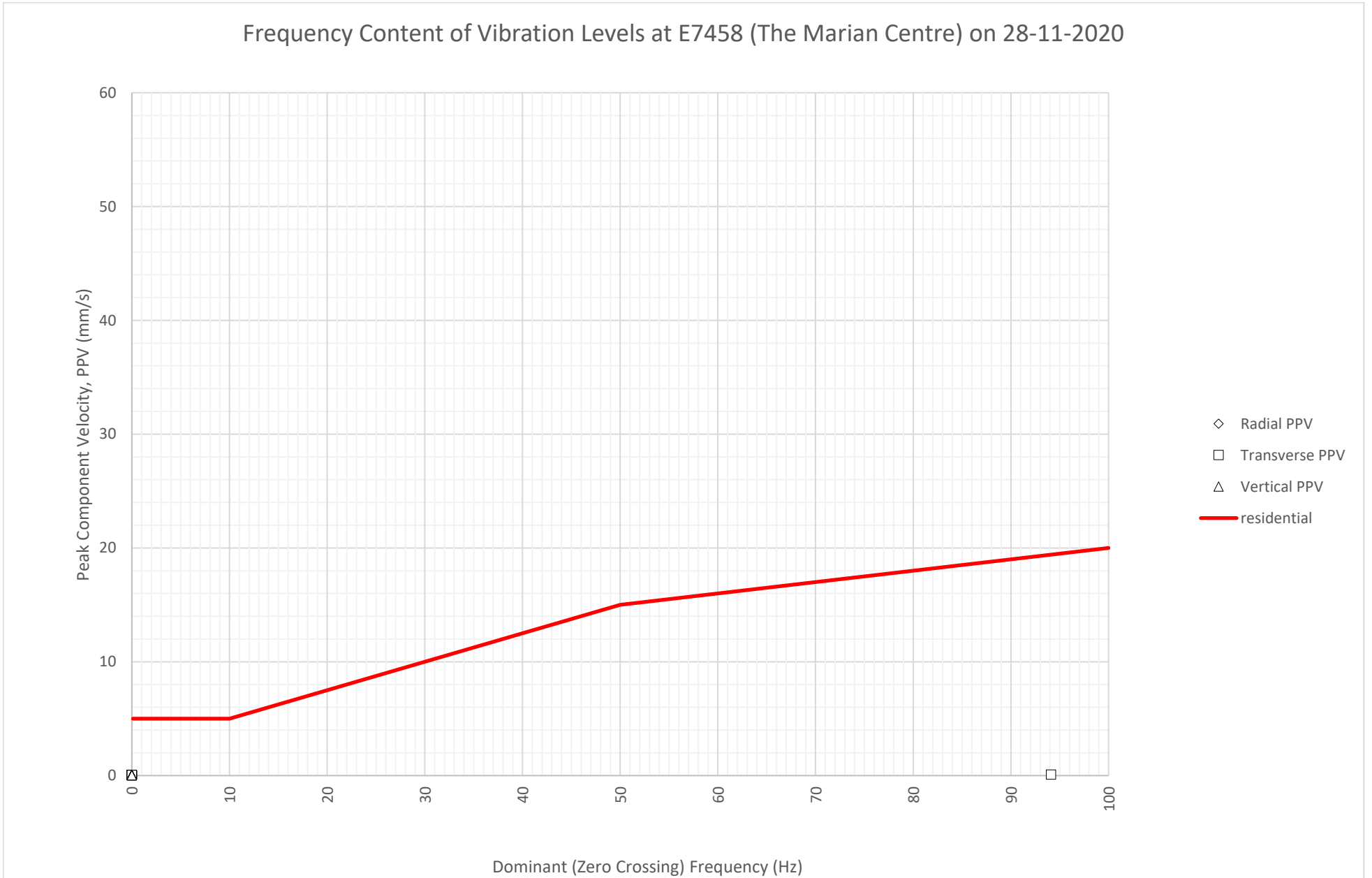
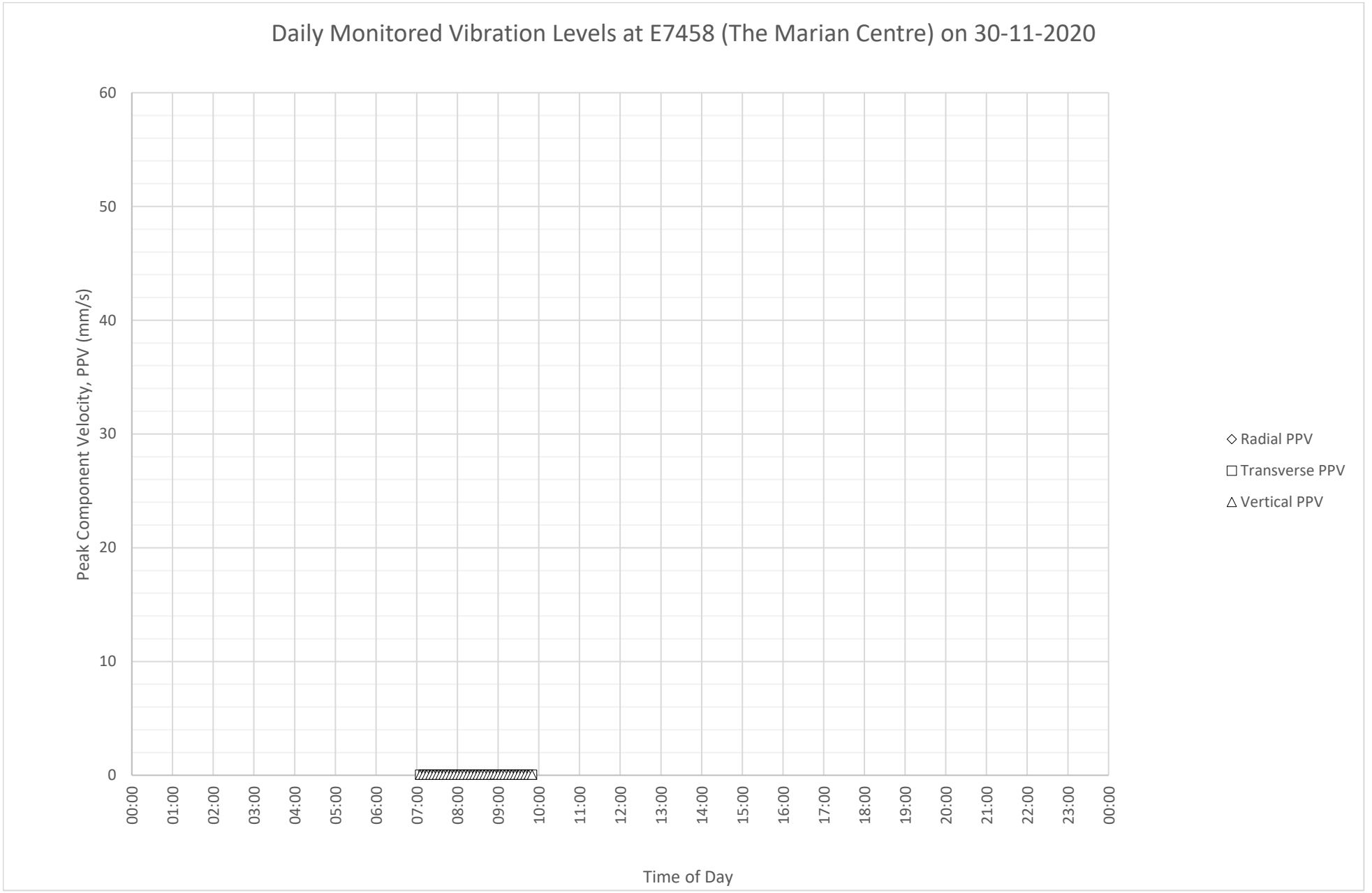
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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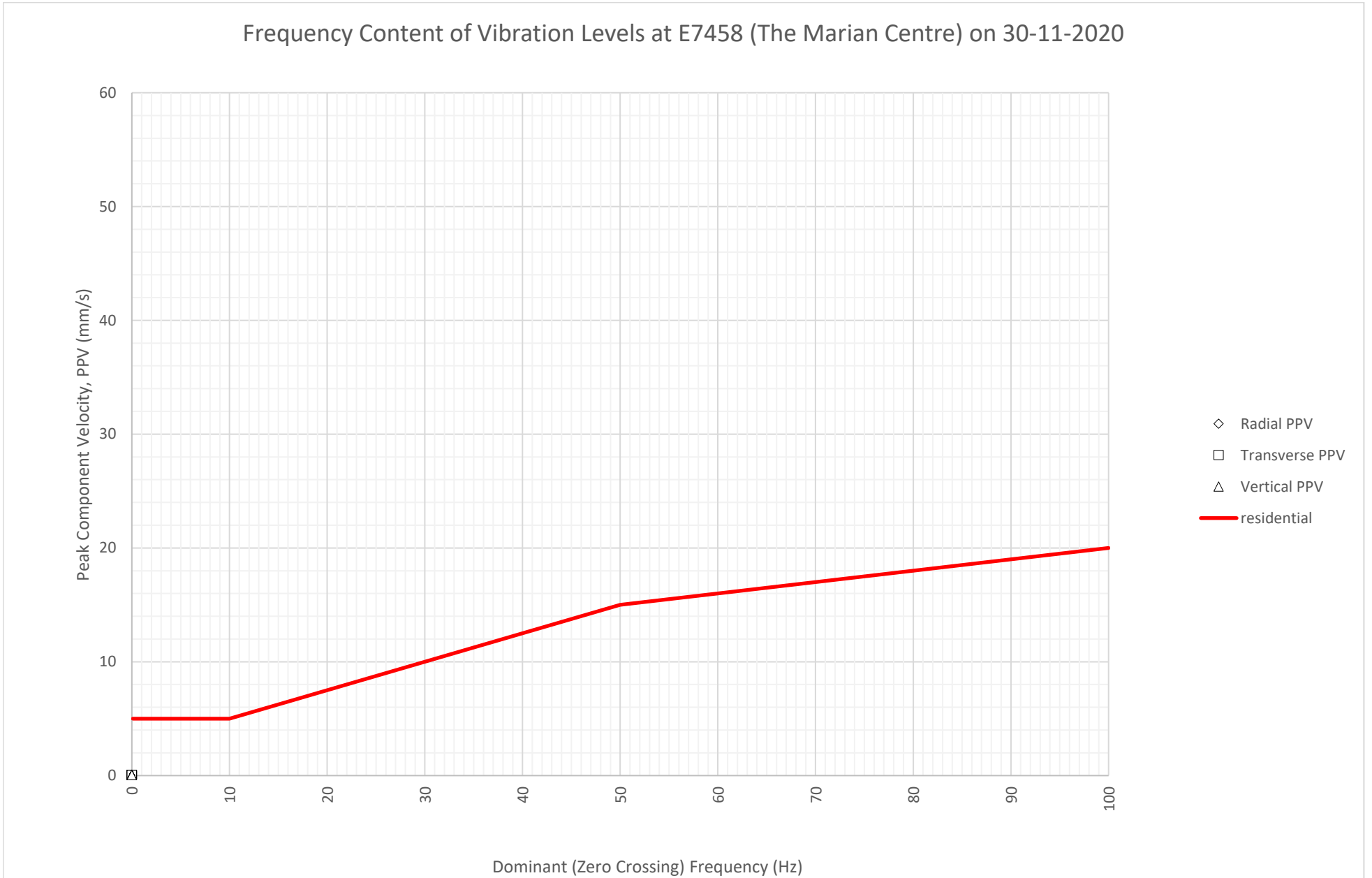
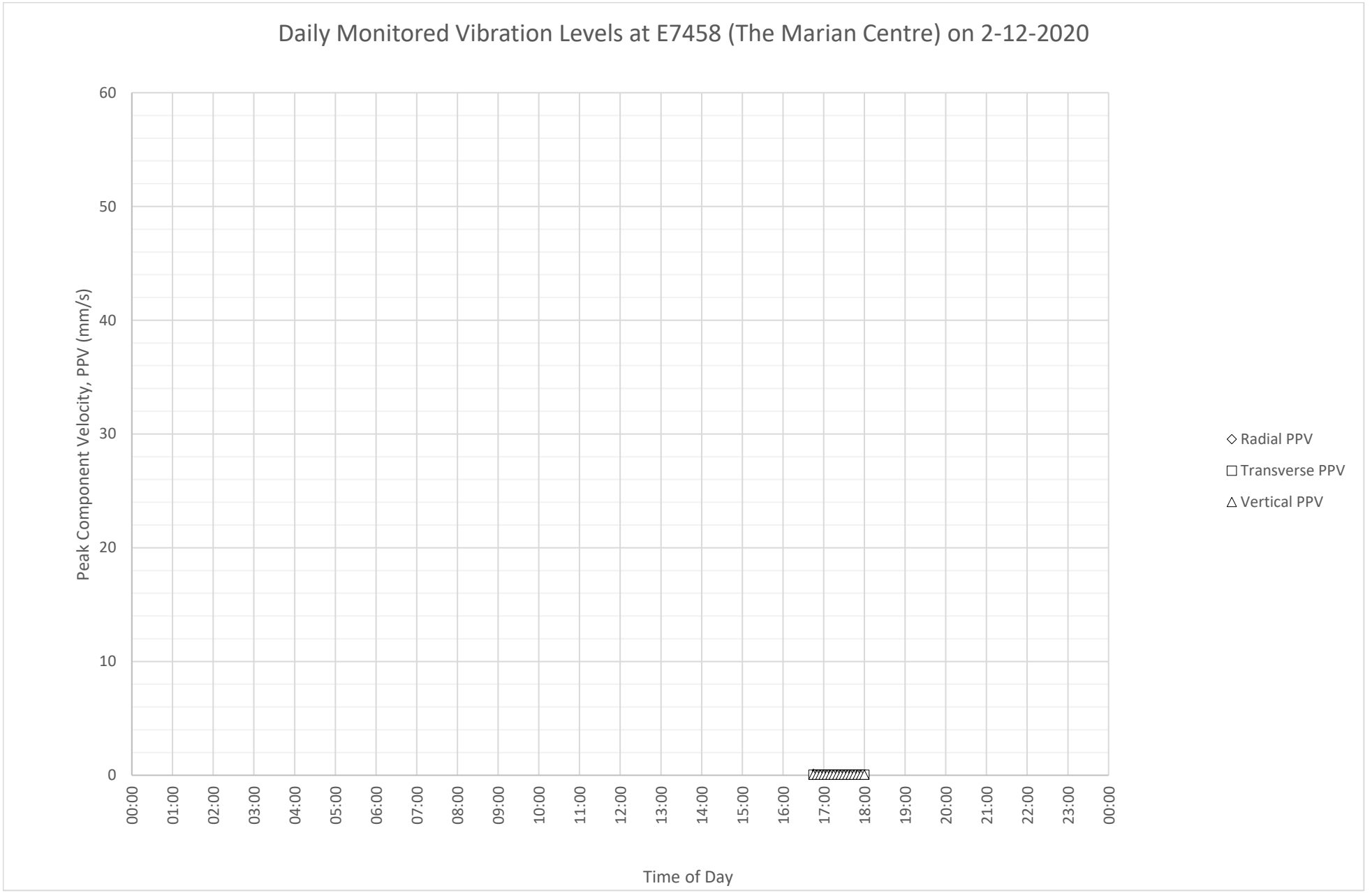
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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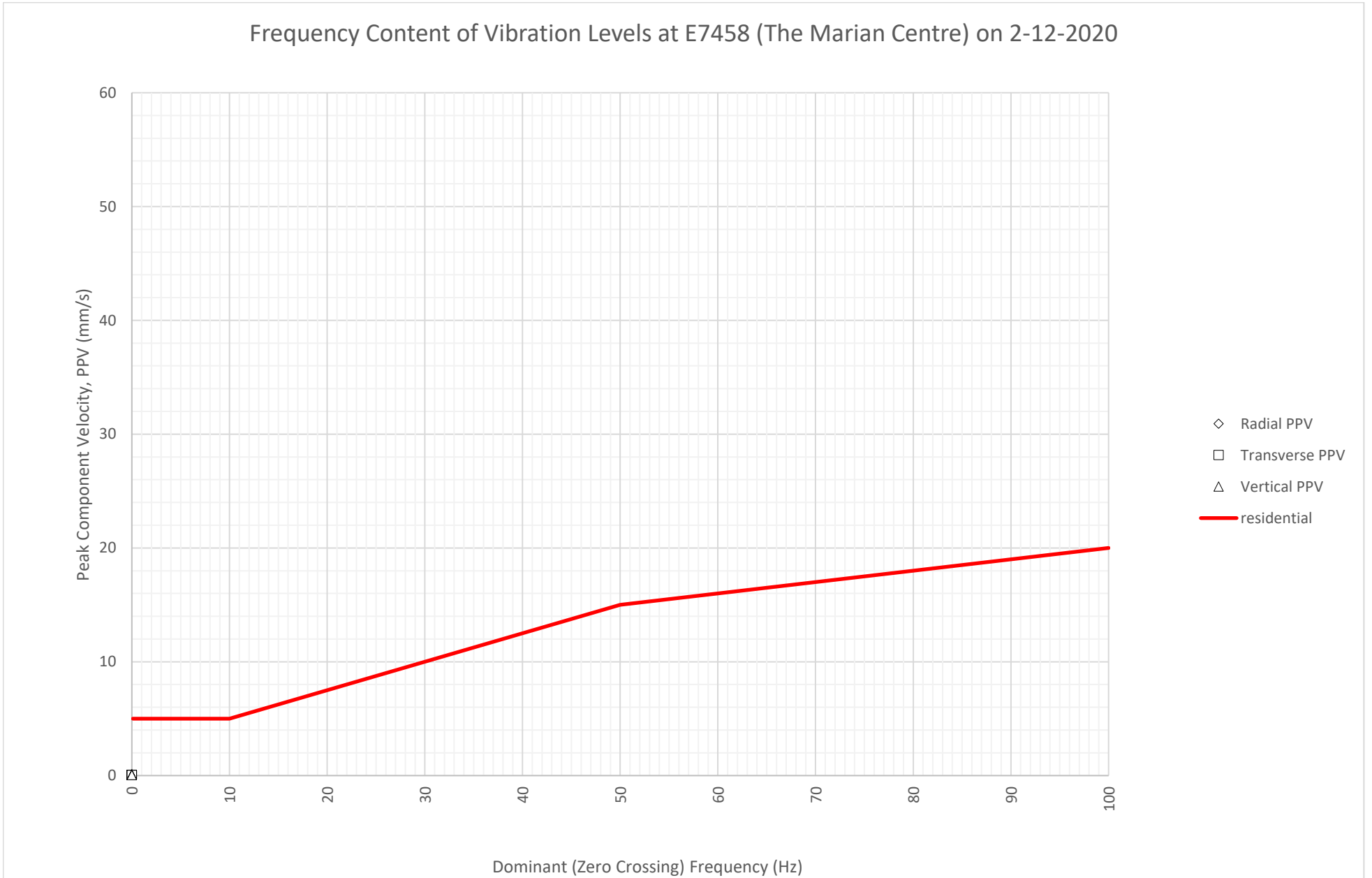
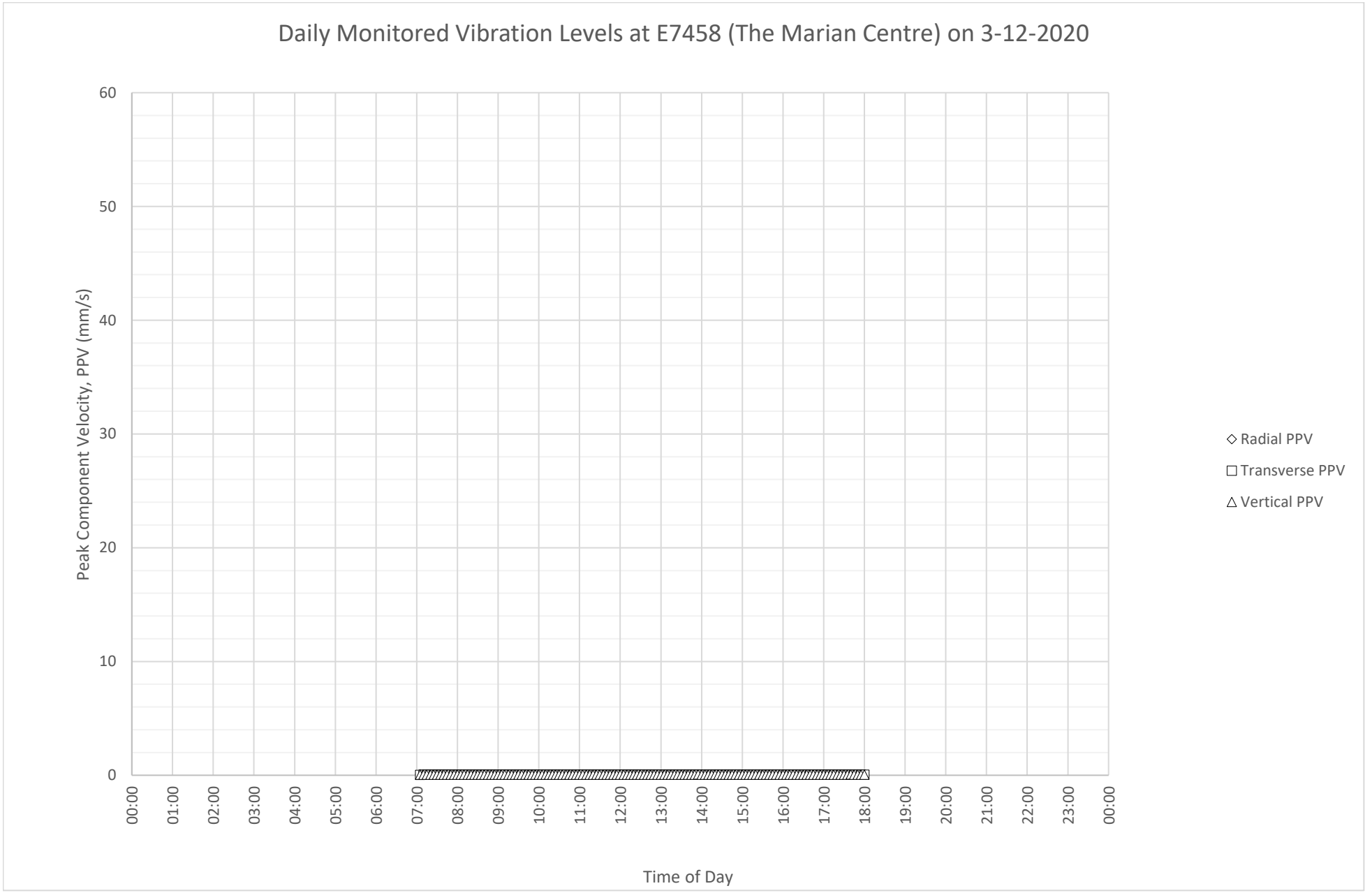
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
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40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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13:00
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16:00
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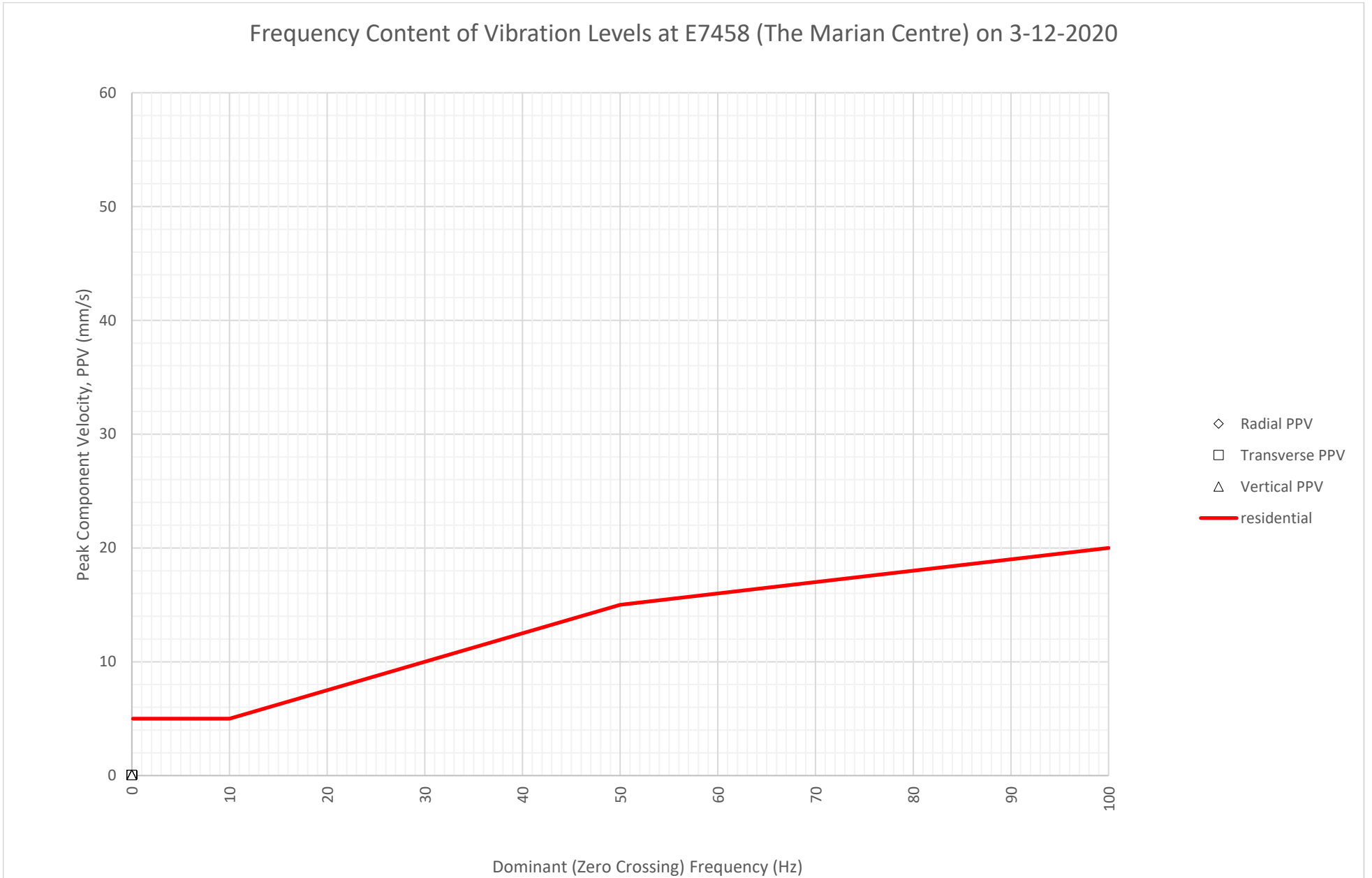
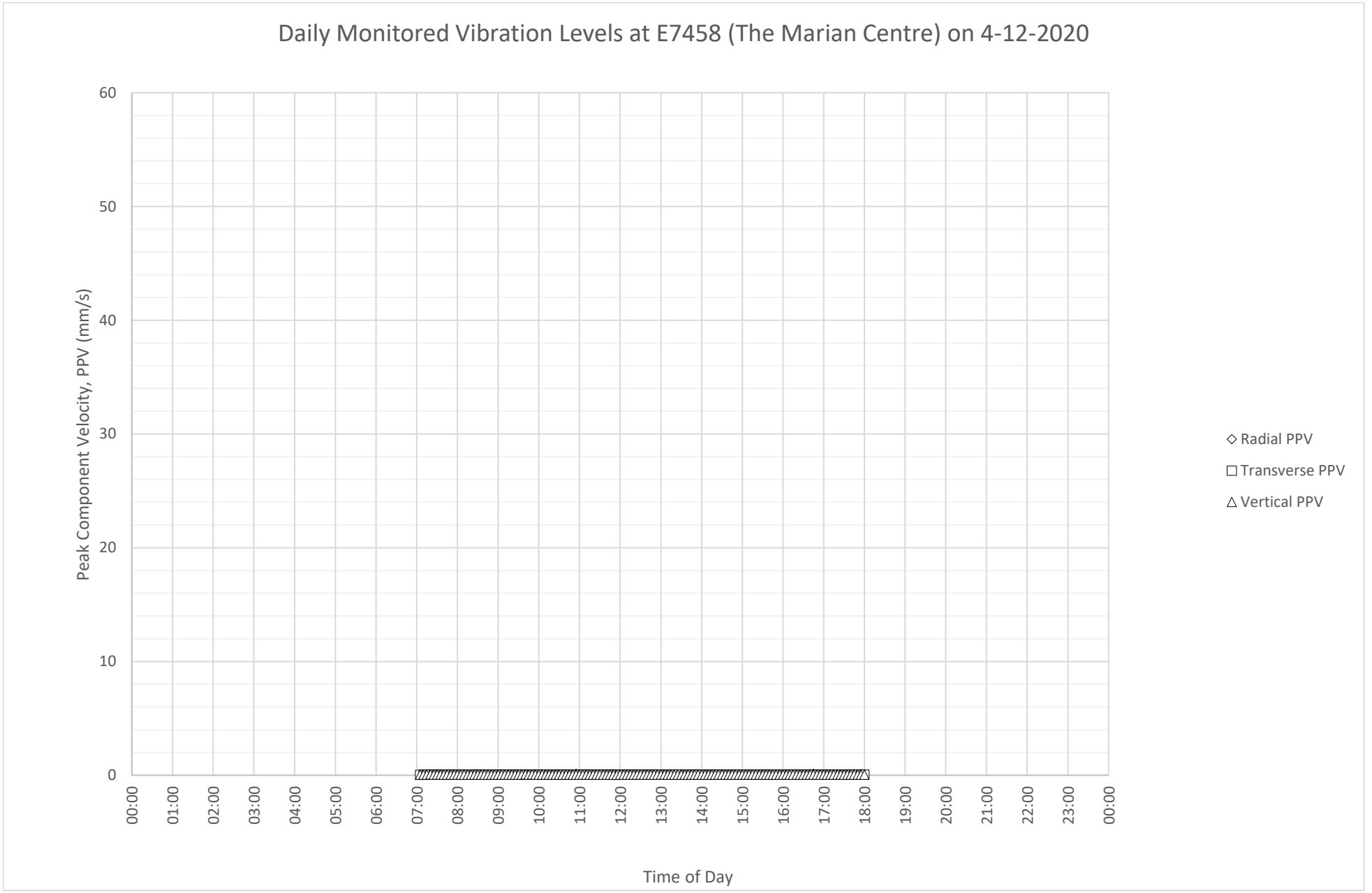
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
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30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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13:00
14:00
15:00
16:00
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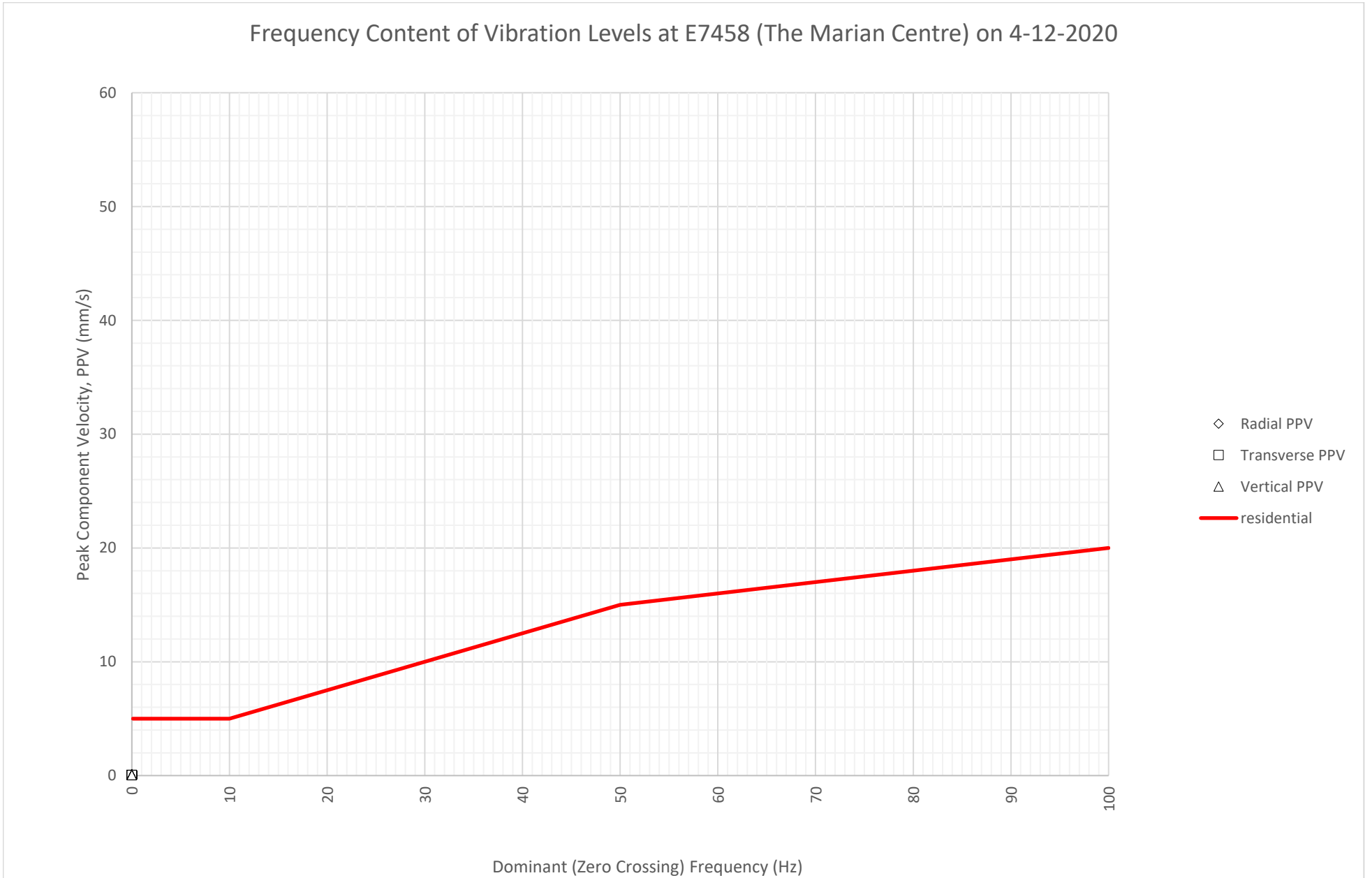
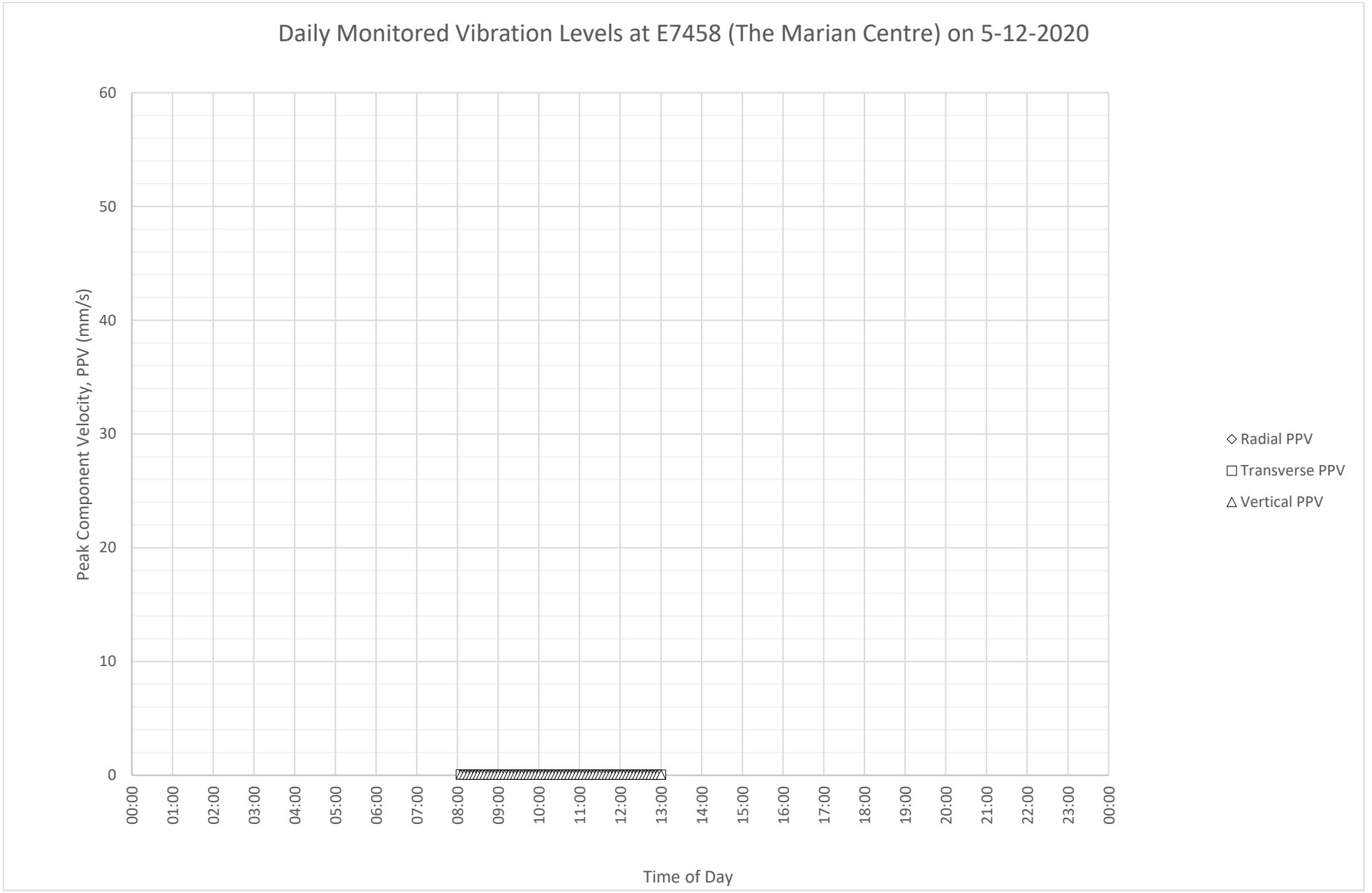
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
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40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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13:00
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15:00
16:00
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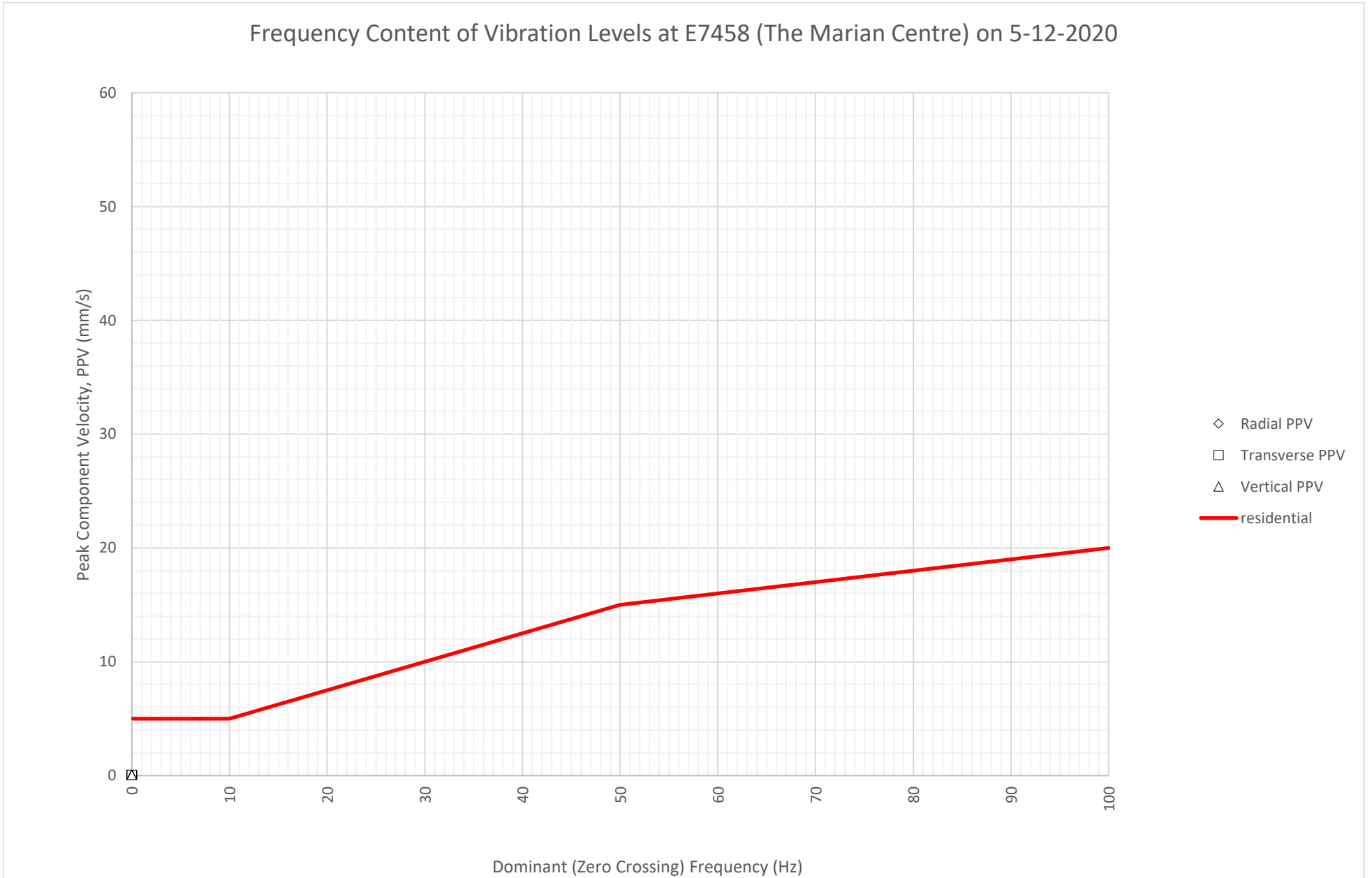
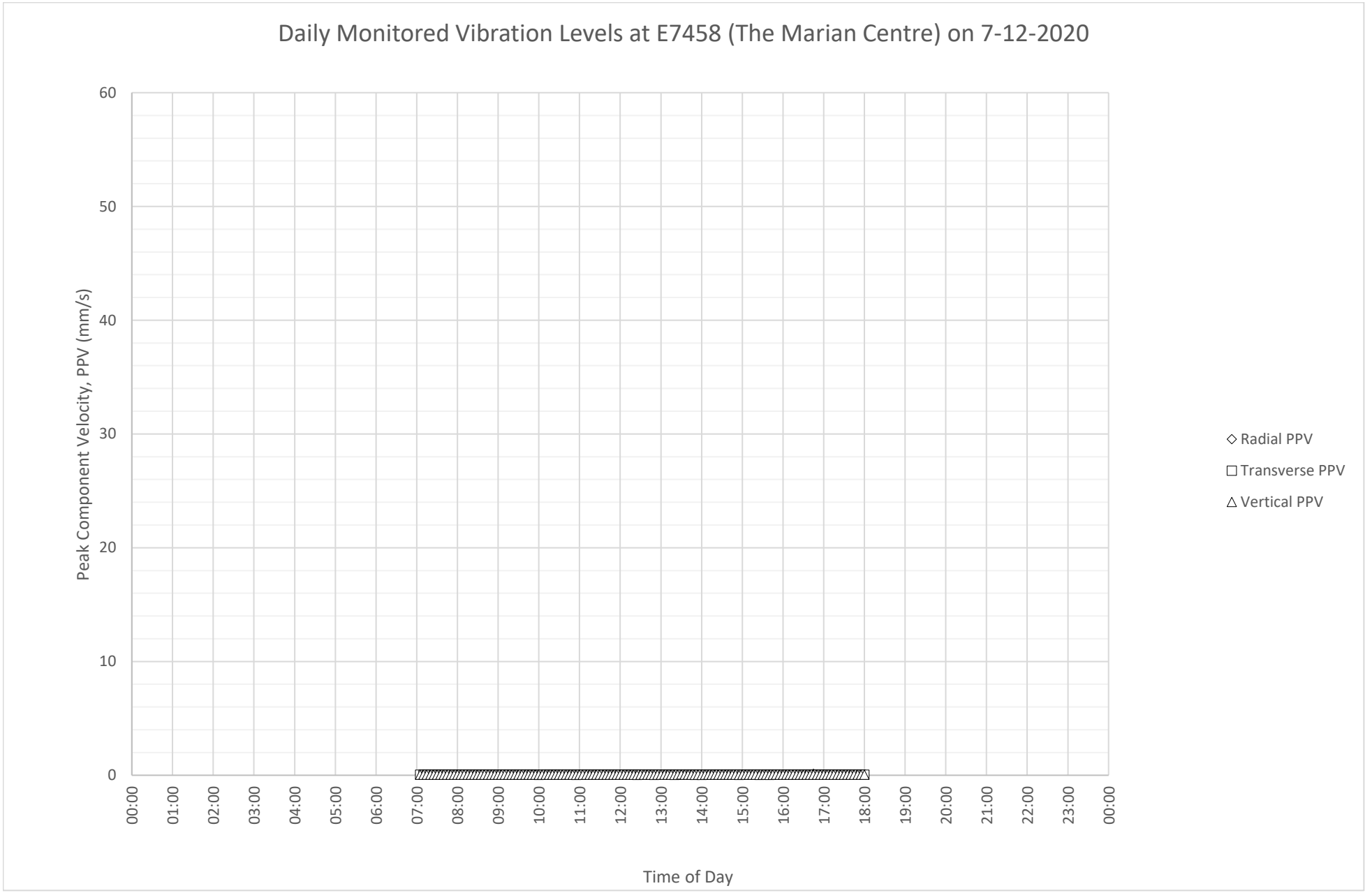
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
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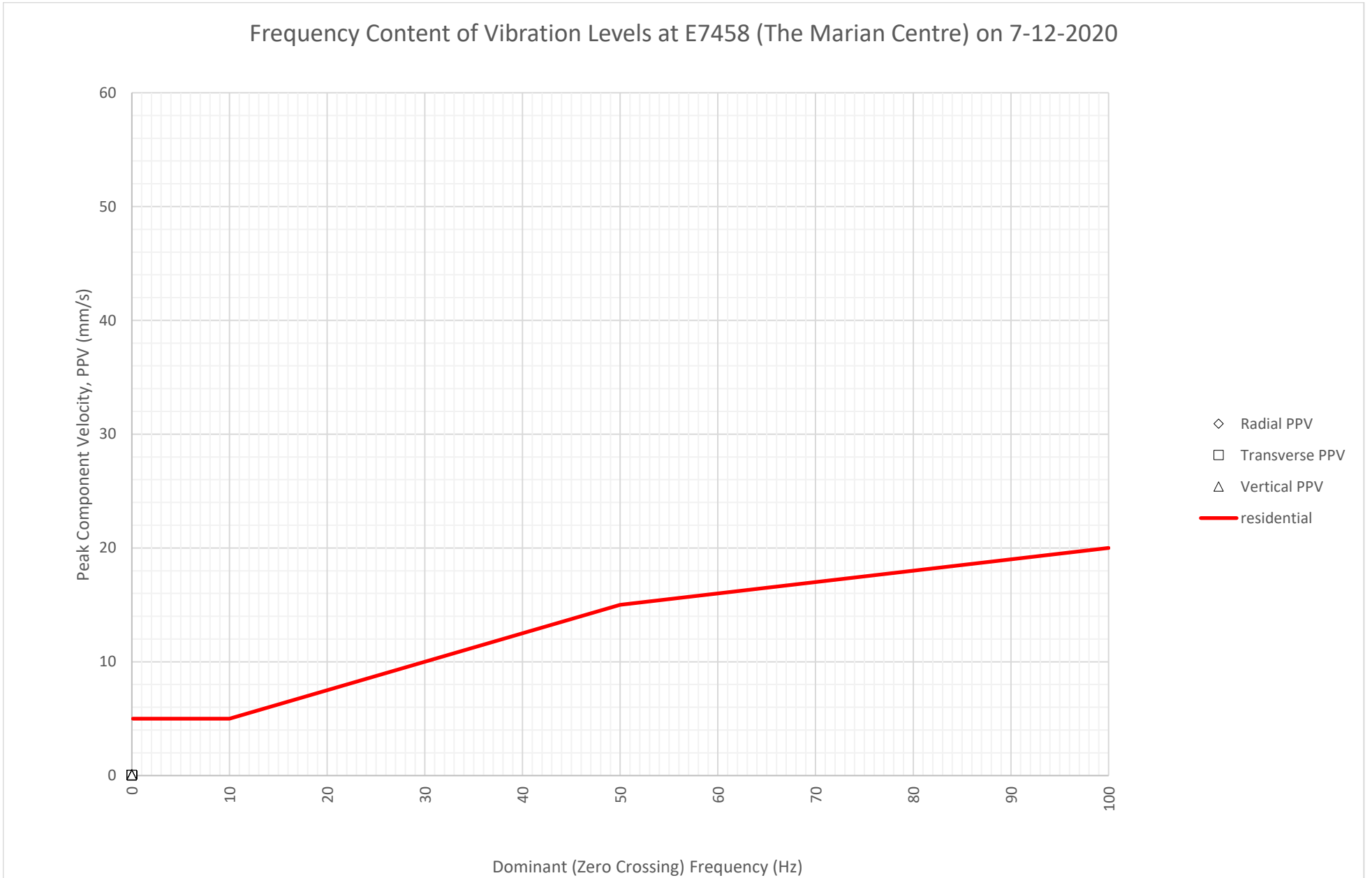
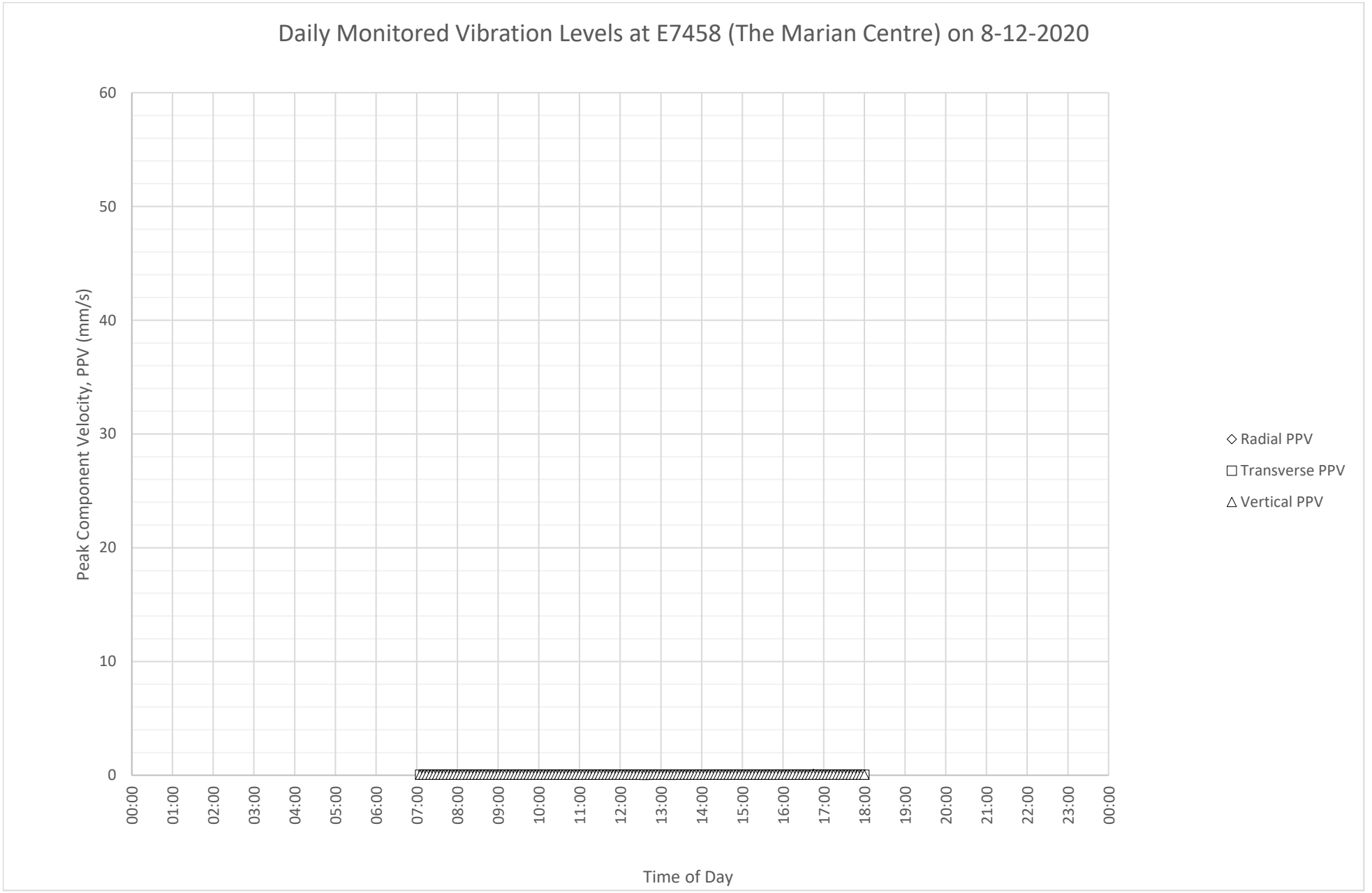
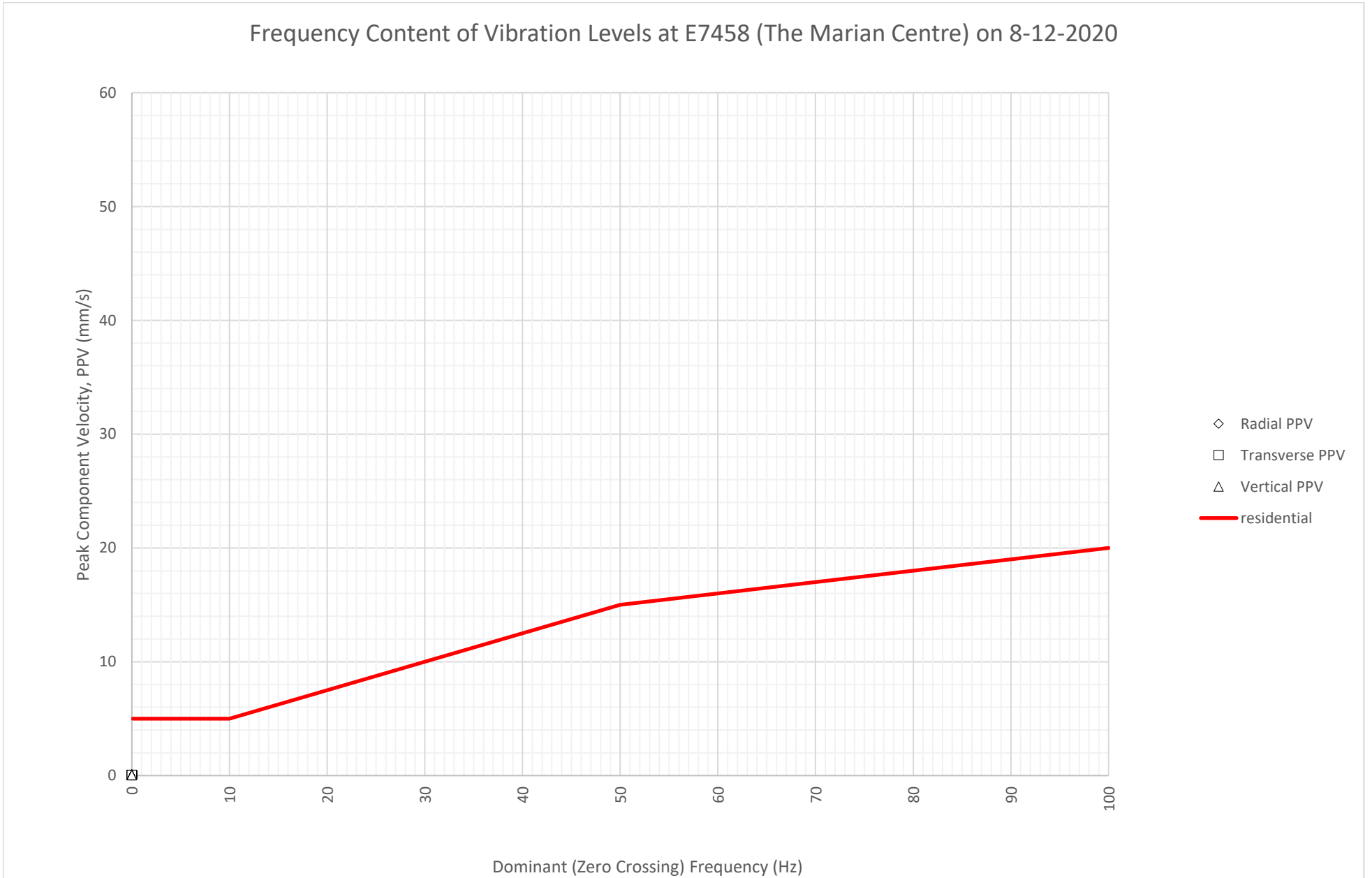
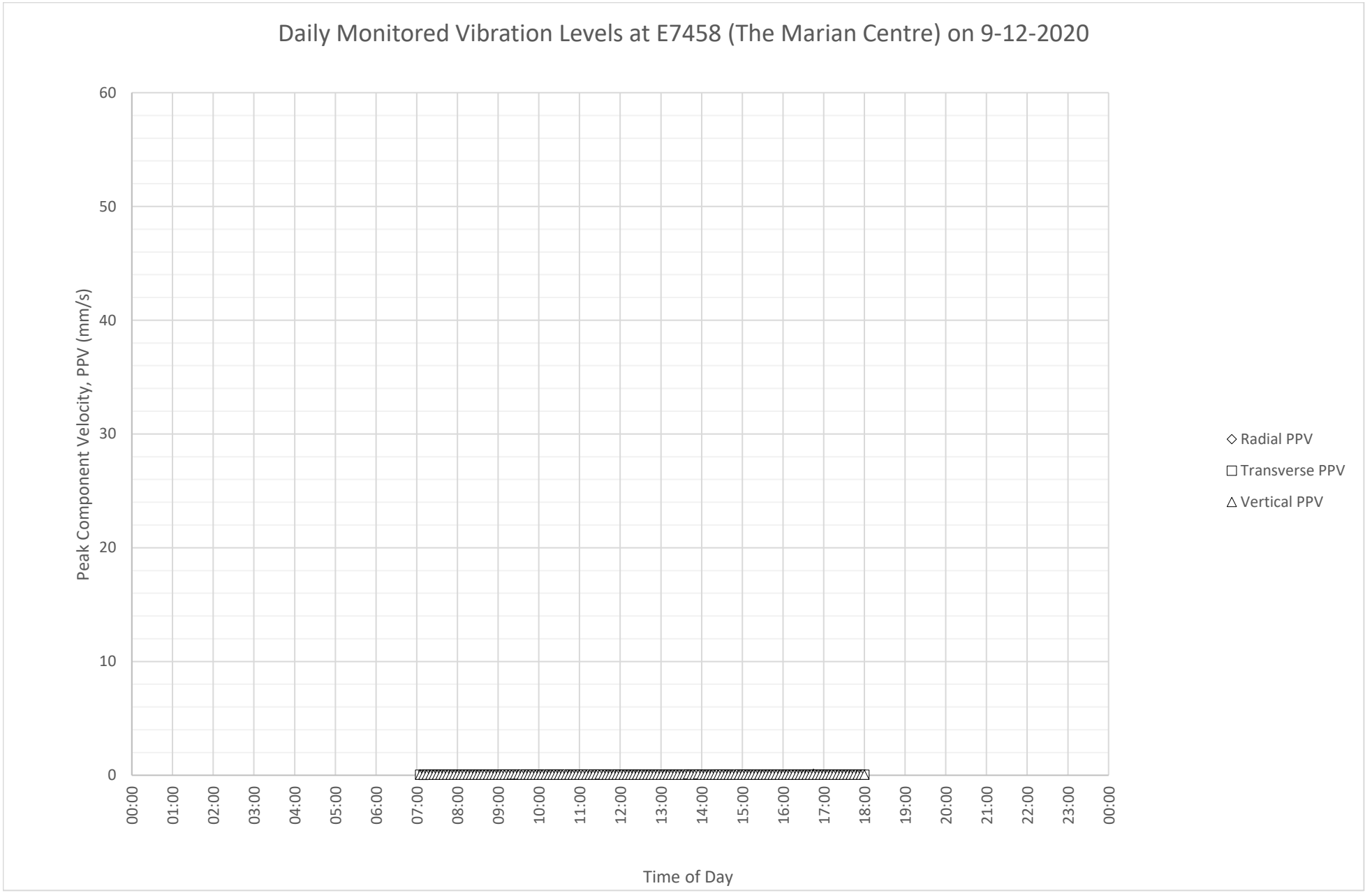
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at E7458 (The Marian Centre) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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13:00
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16:00
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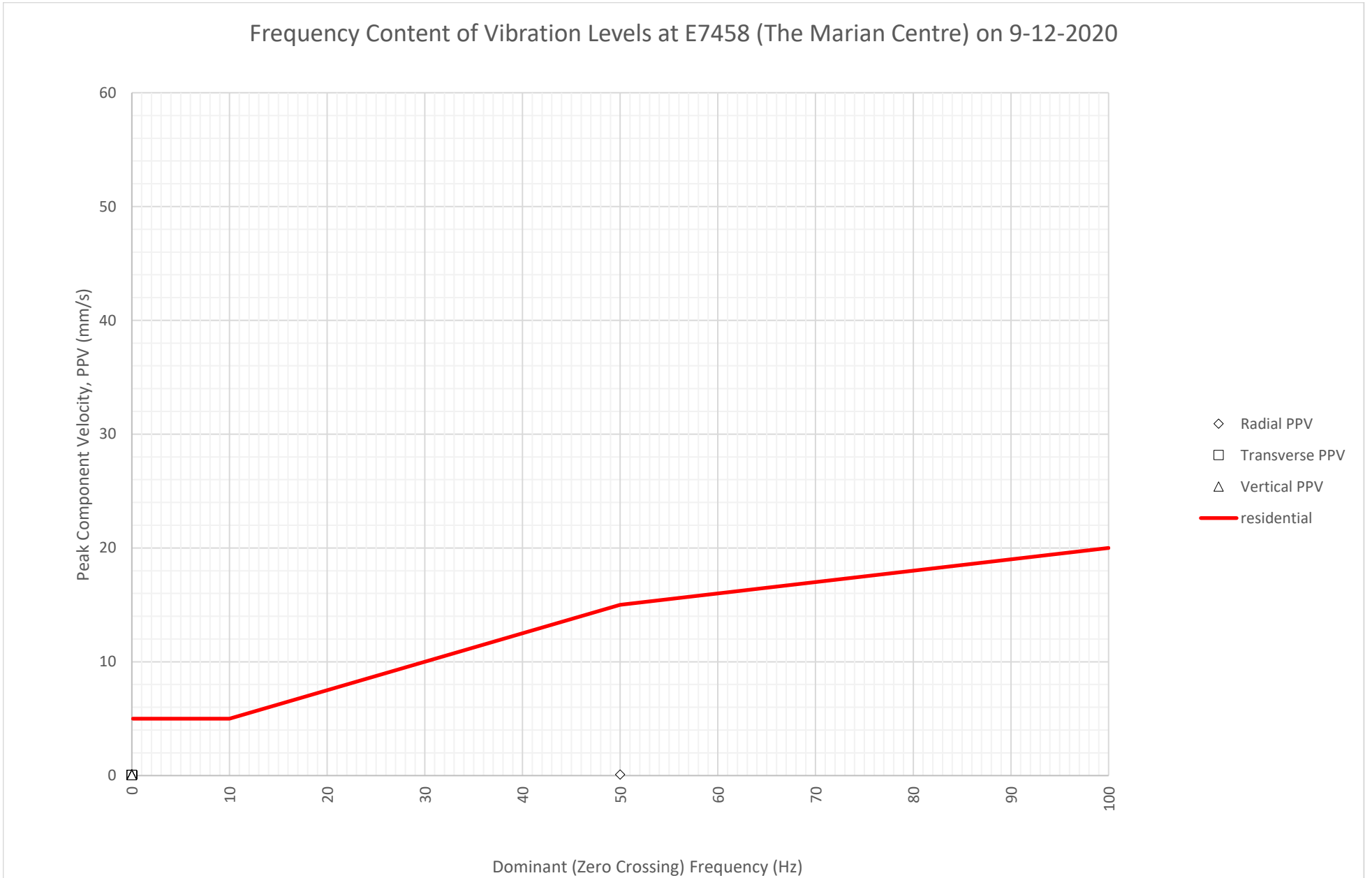
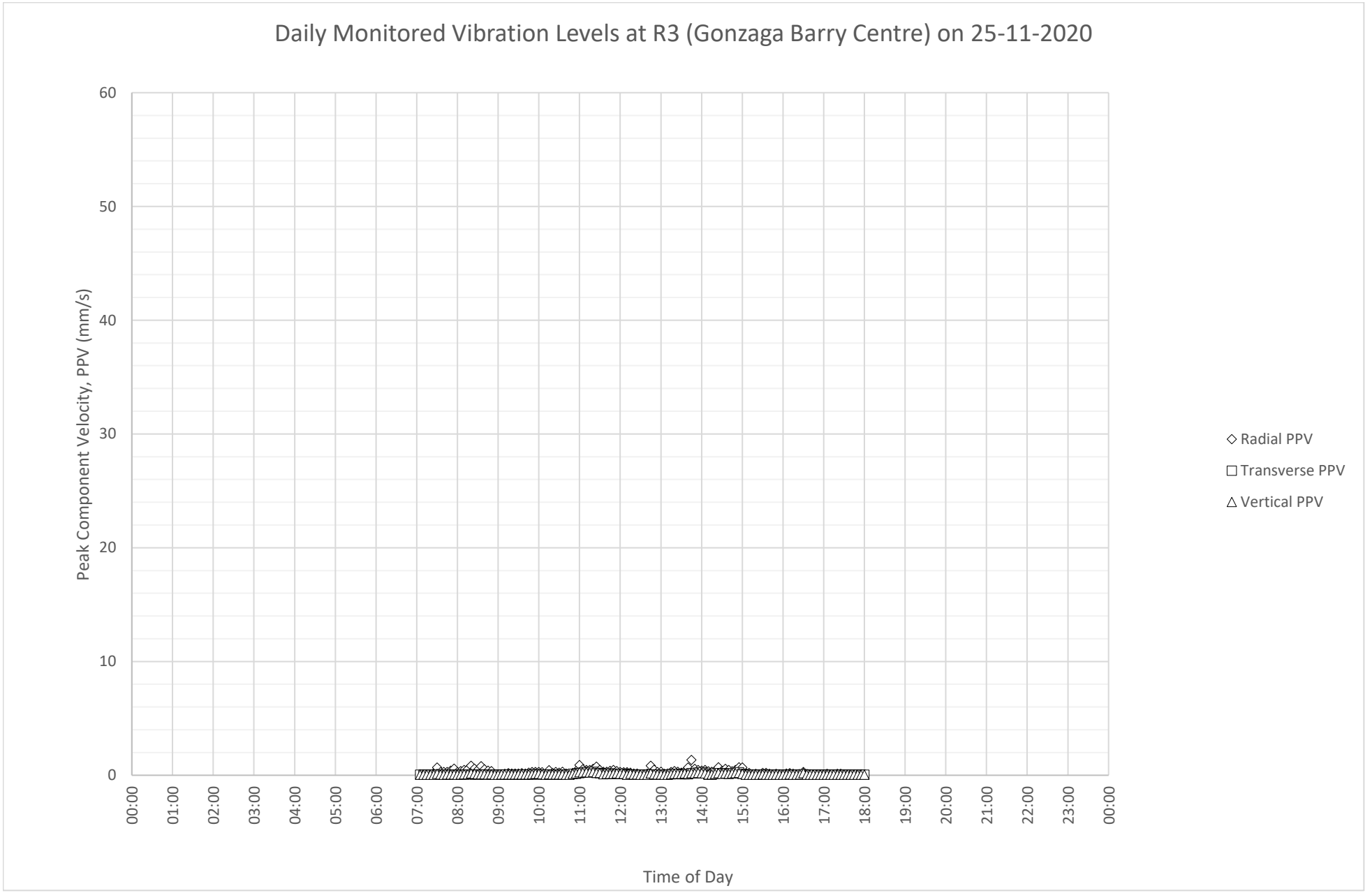
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at E7458 (The Marian Centre) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential

APPENDIX C – VIBRATION MONITORING DATA @ E7005 (GONZAGA BARRY CENTRE)


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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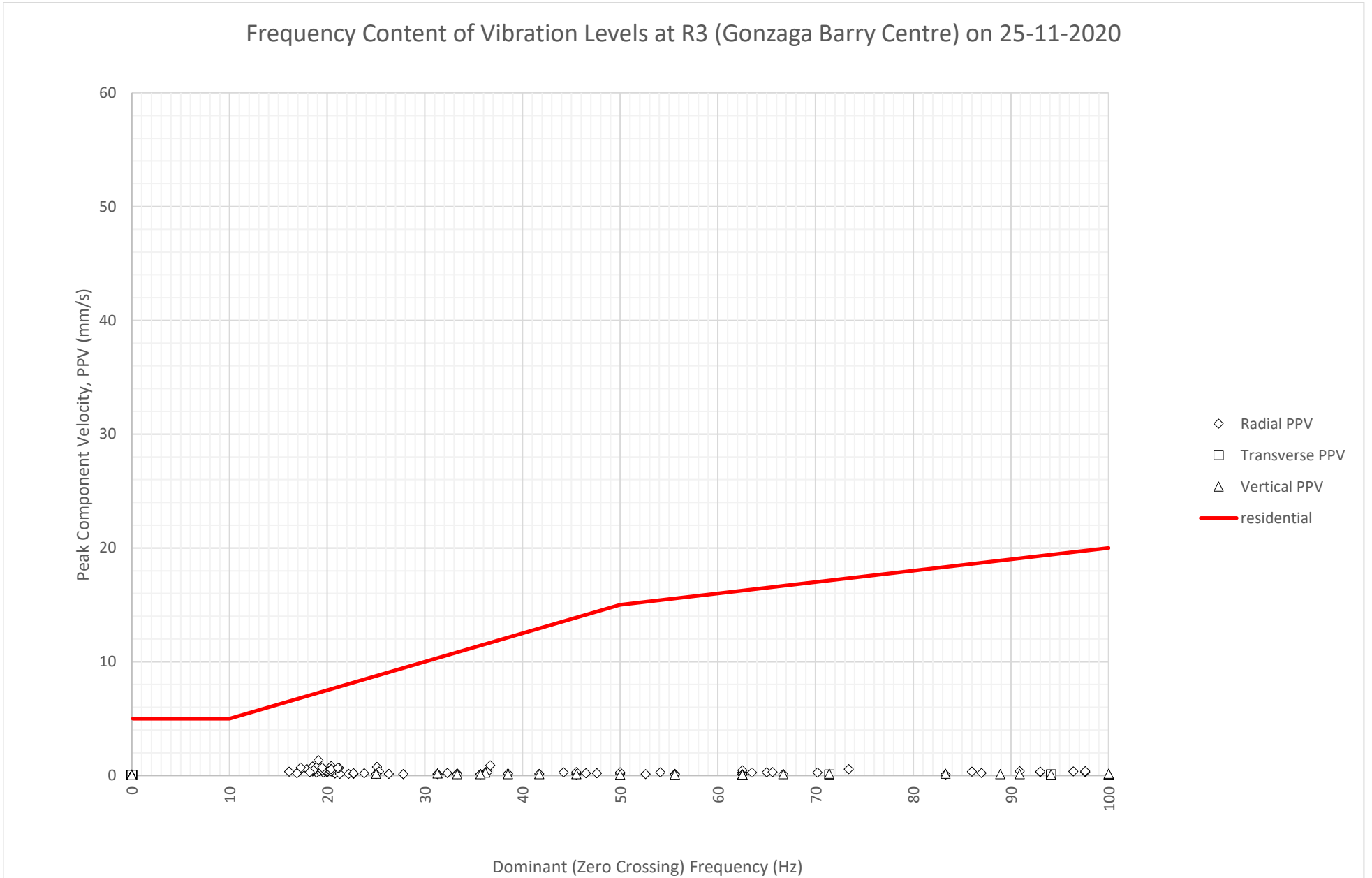
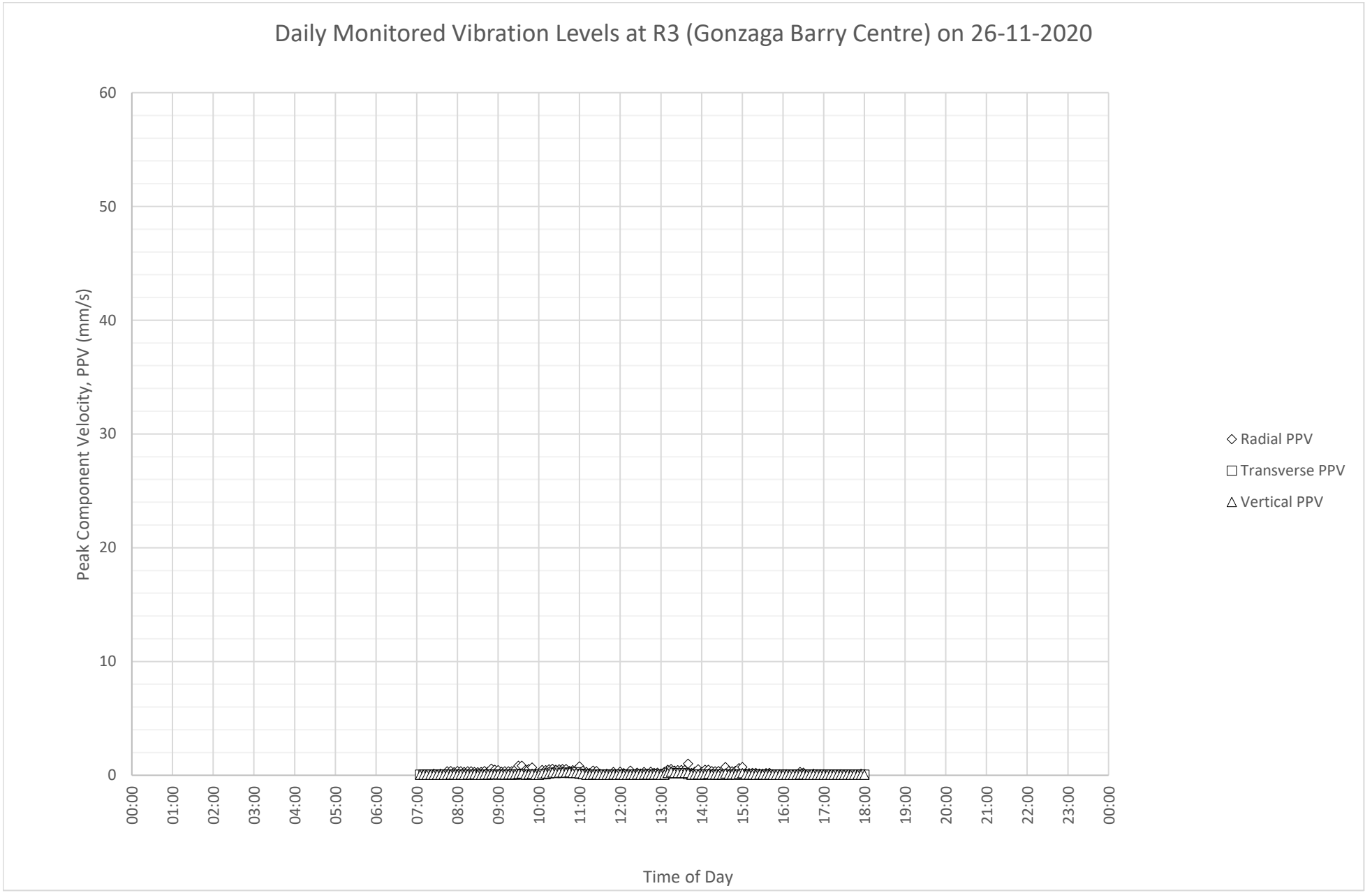
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 25-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 26-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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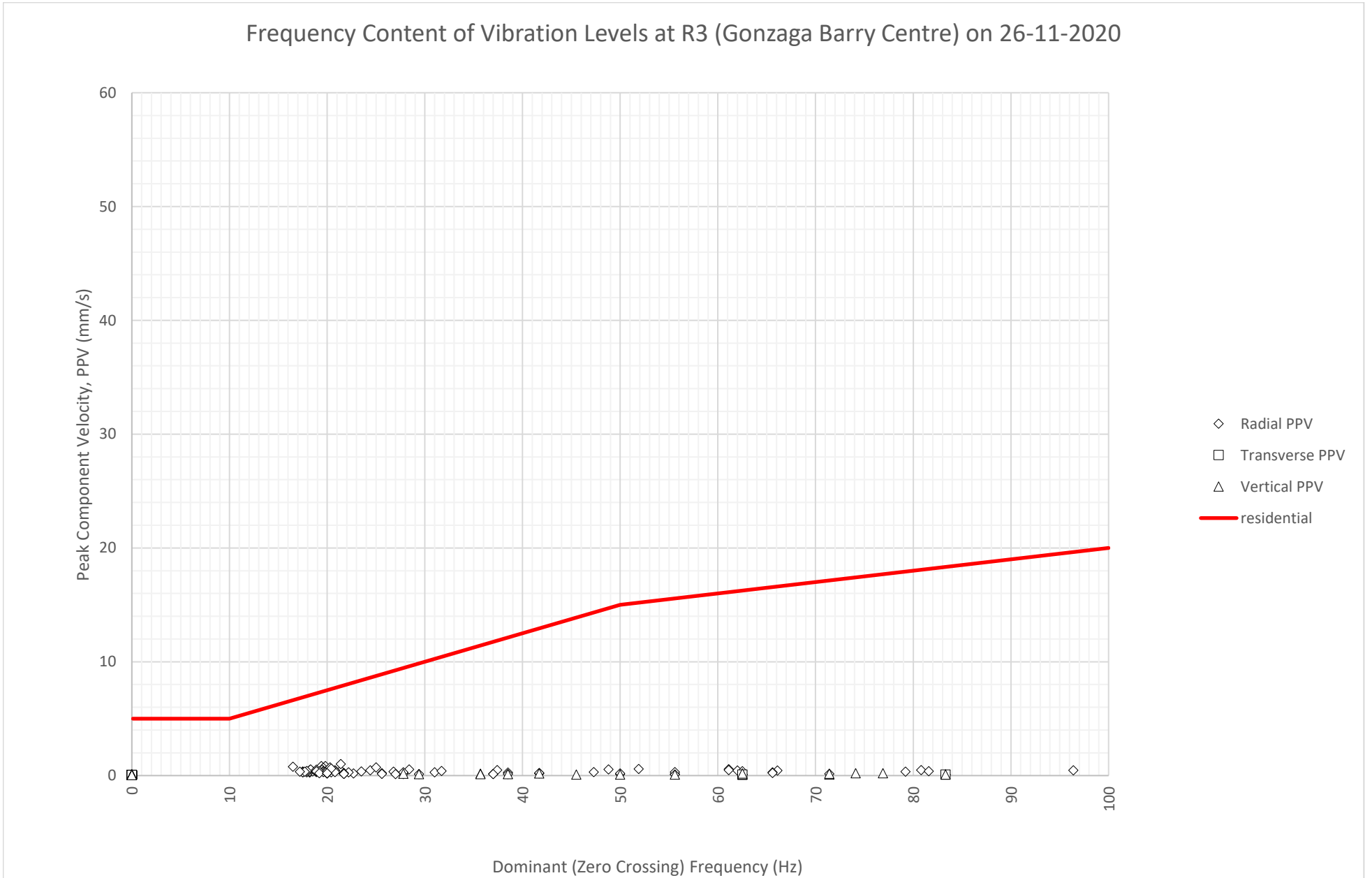
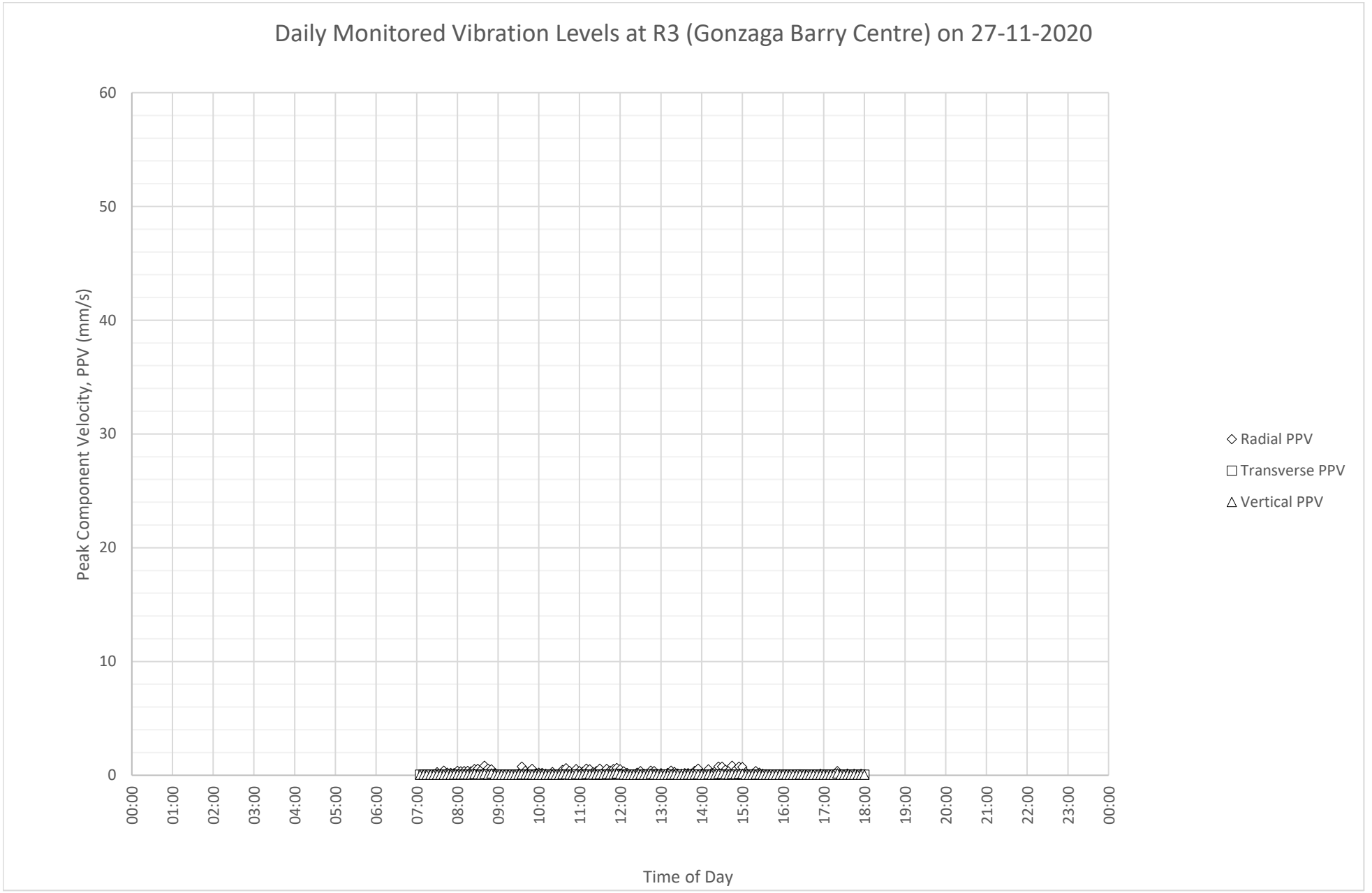
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 26-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
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05:00
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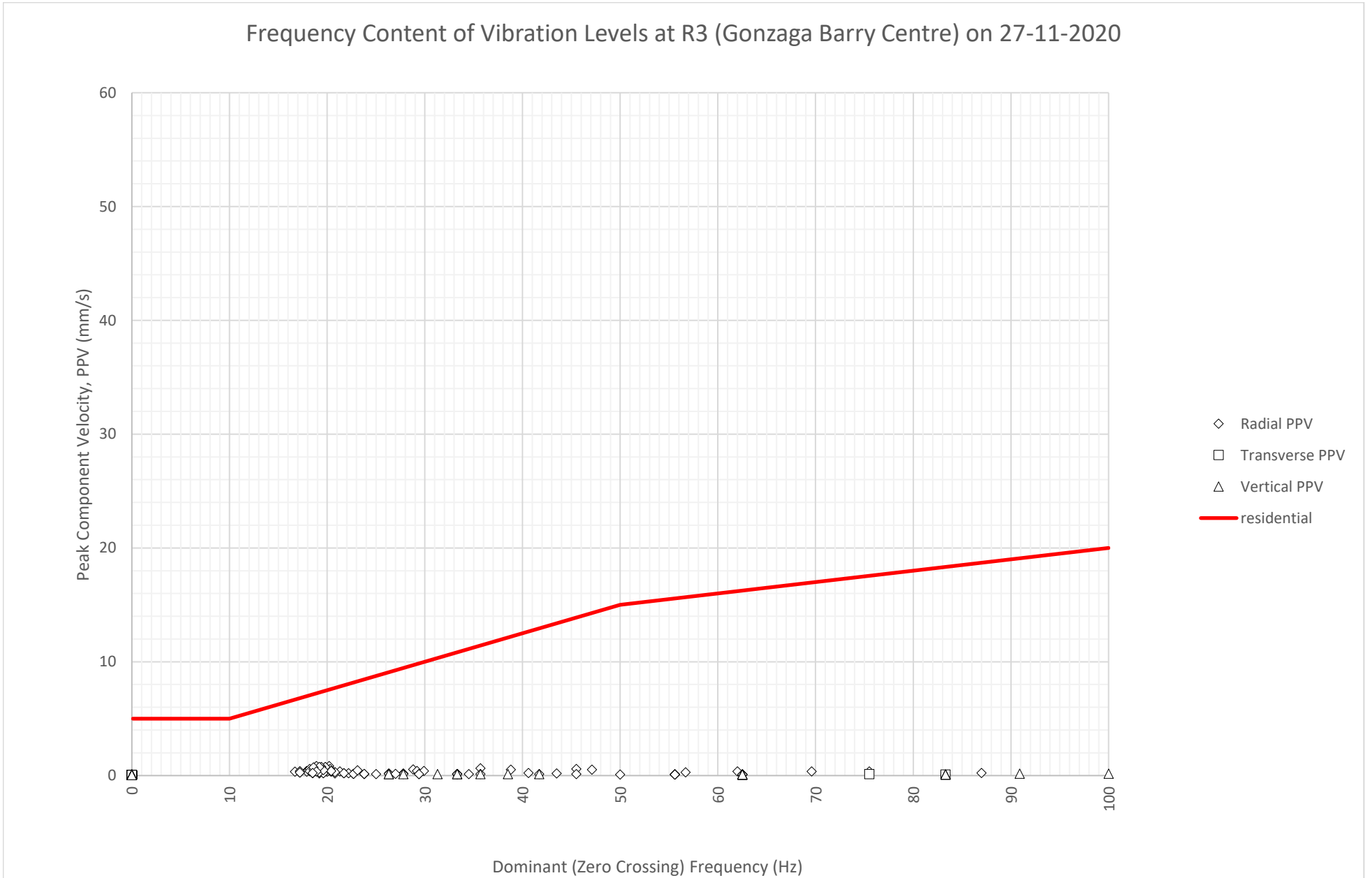
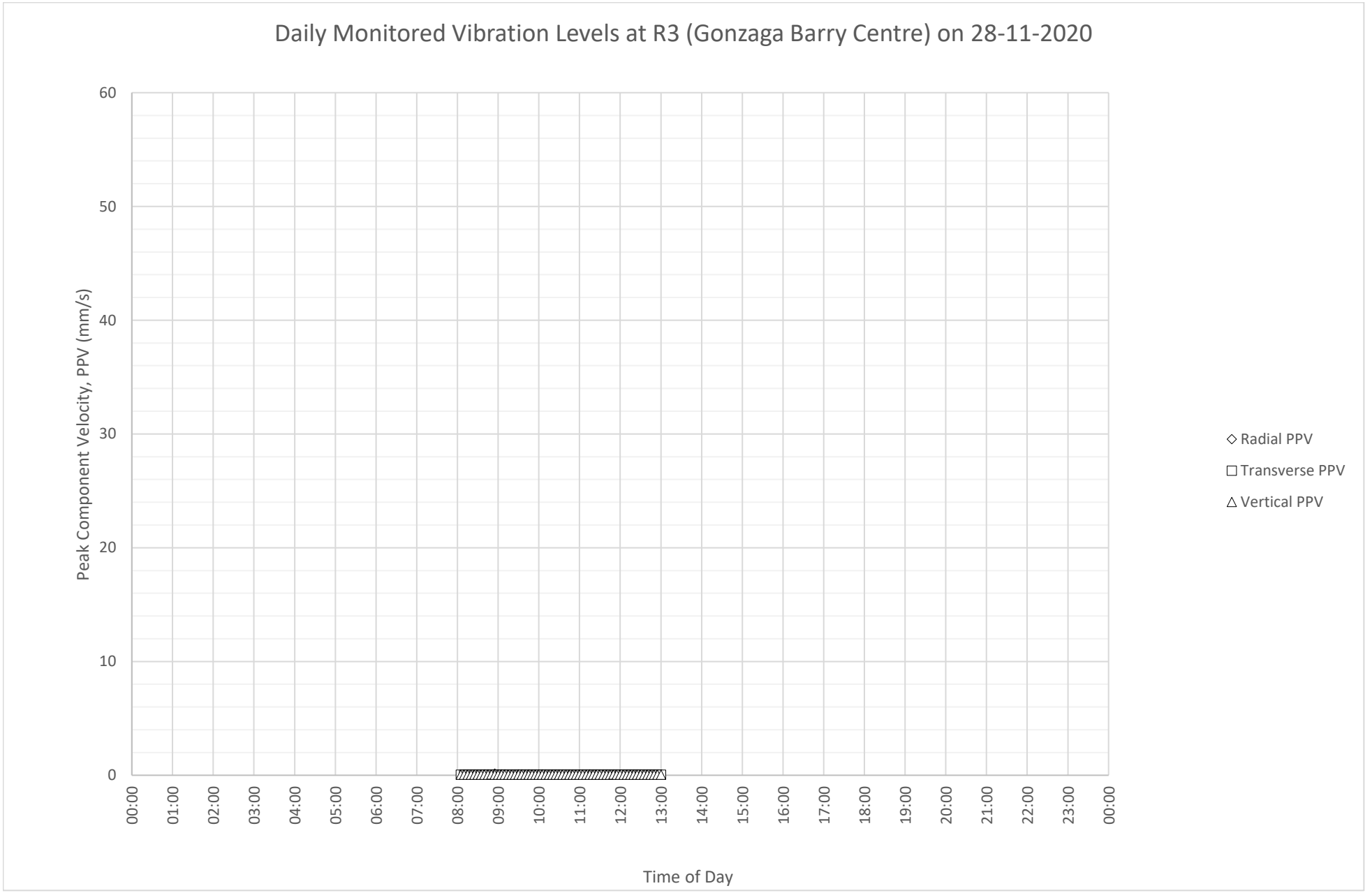
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 27-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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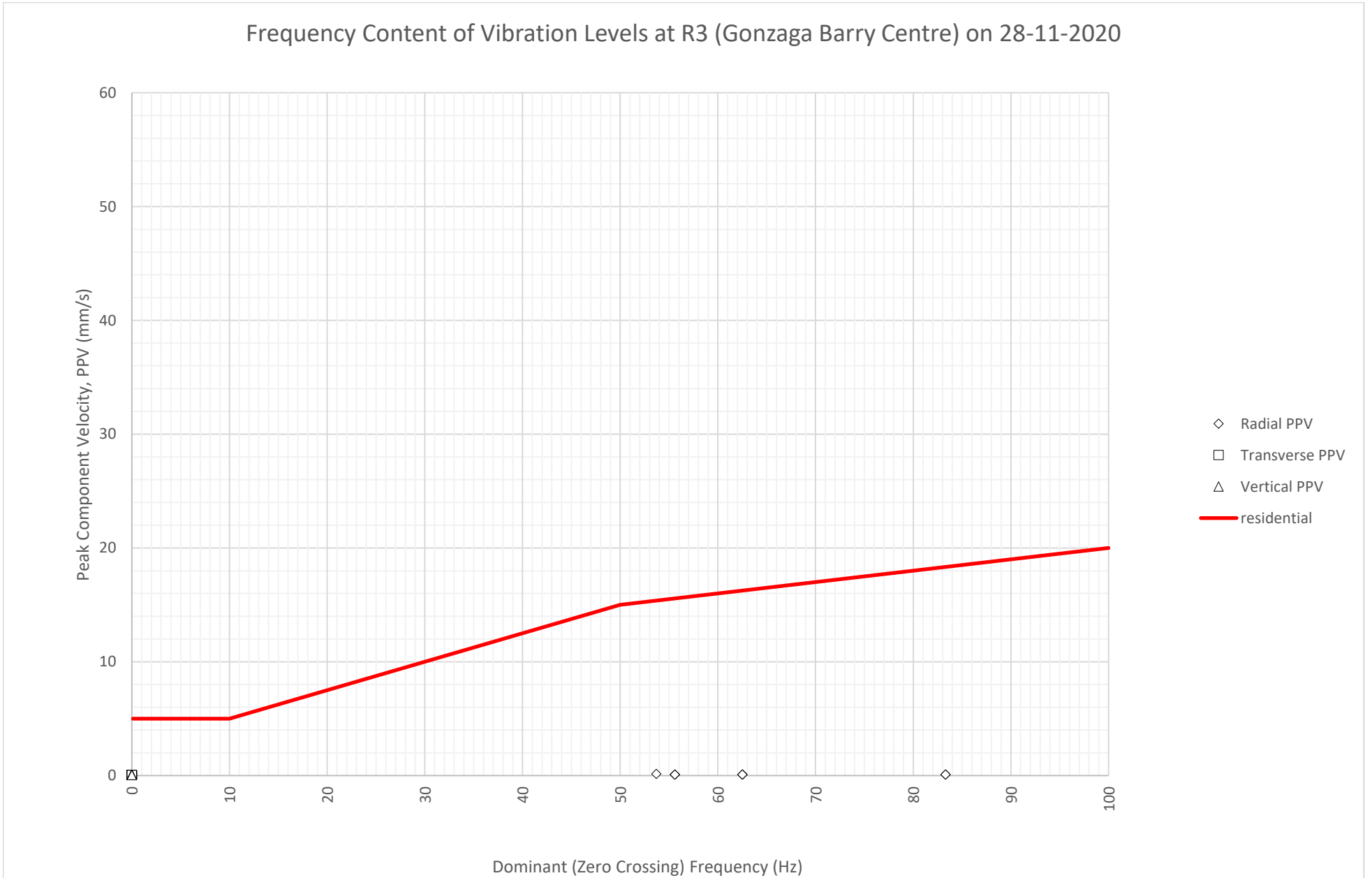
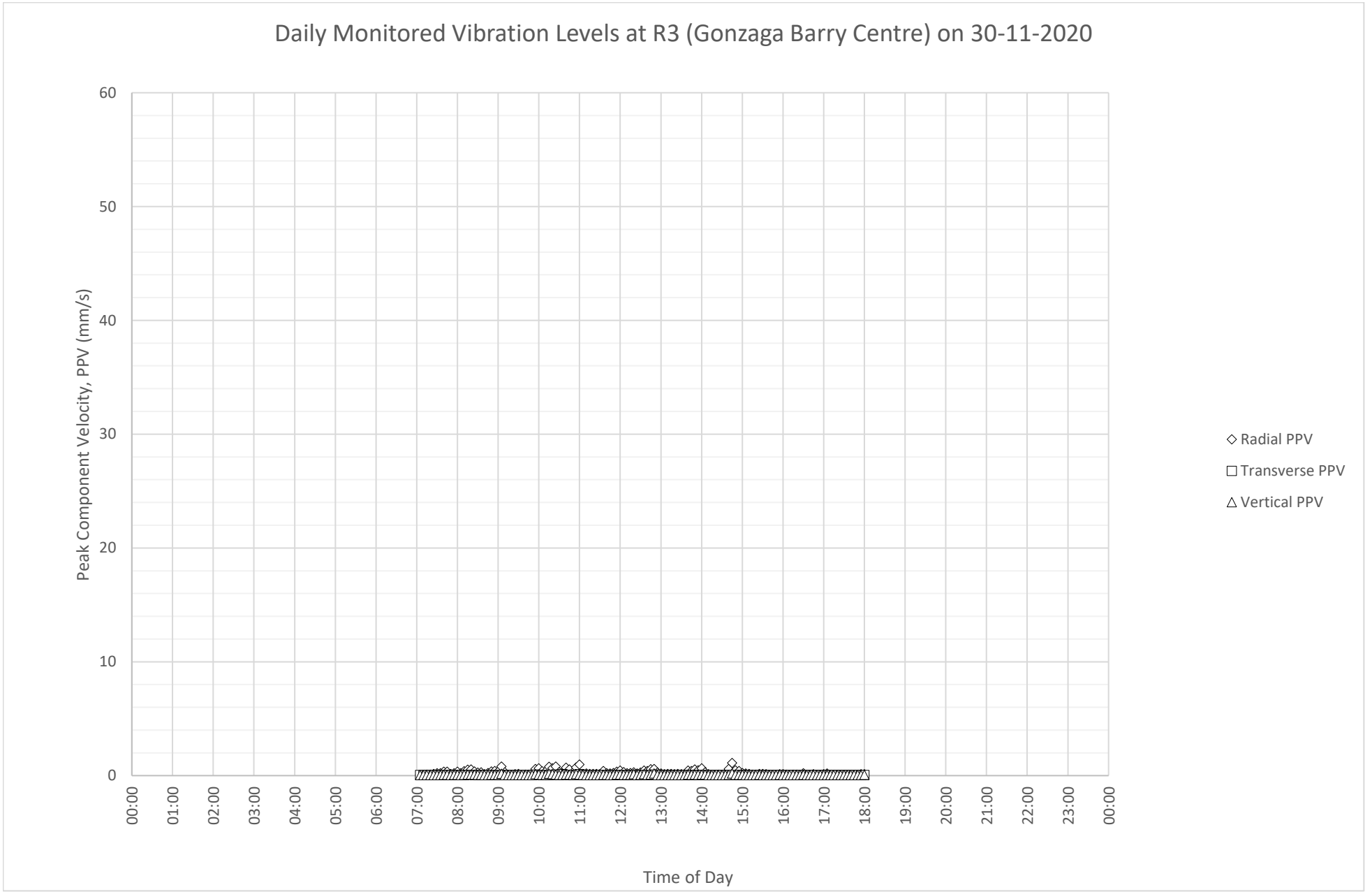
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 28-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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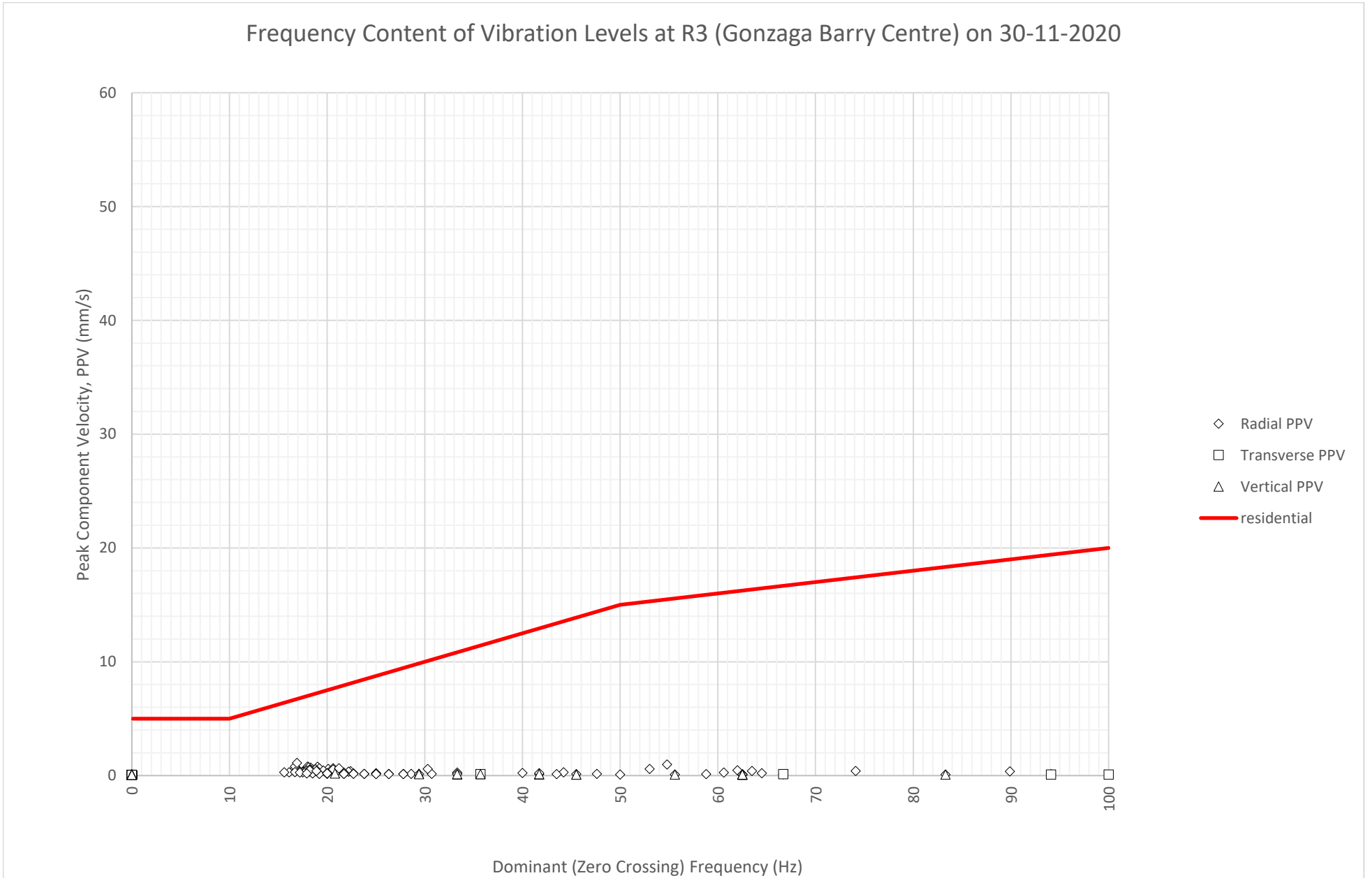
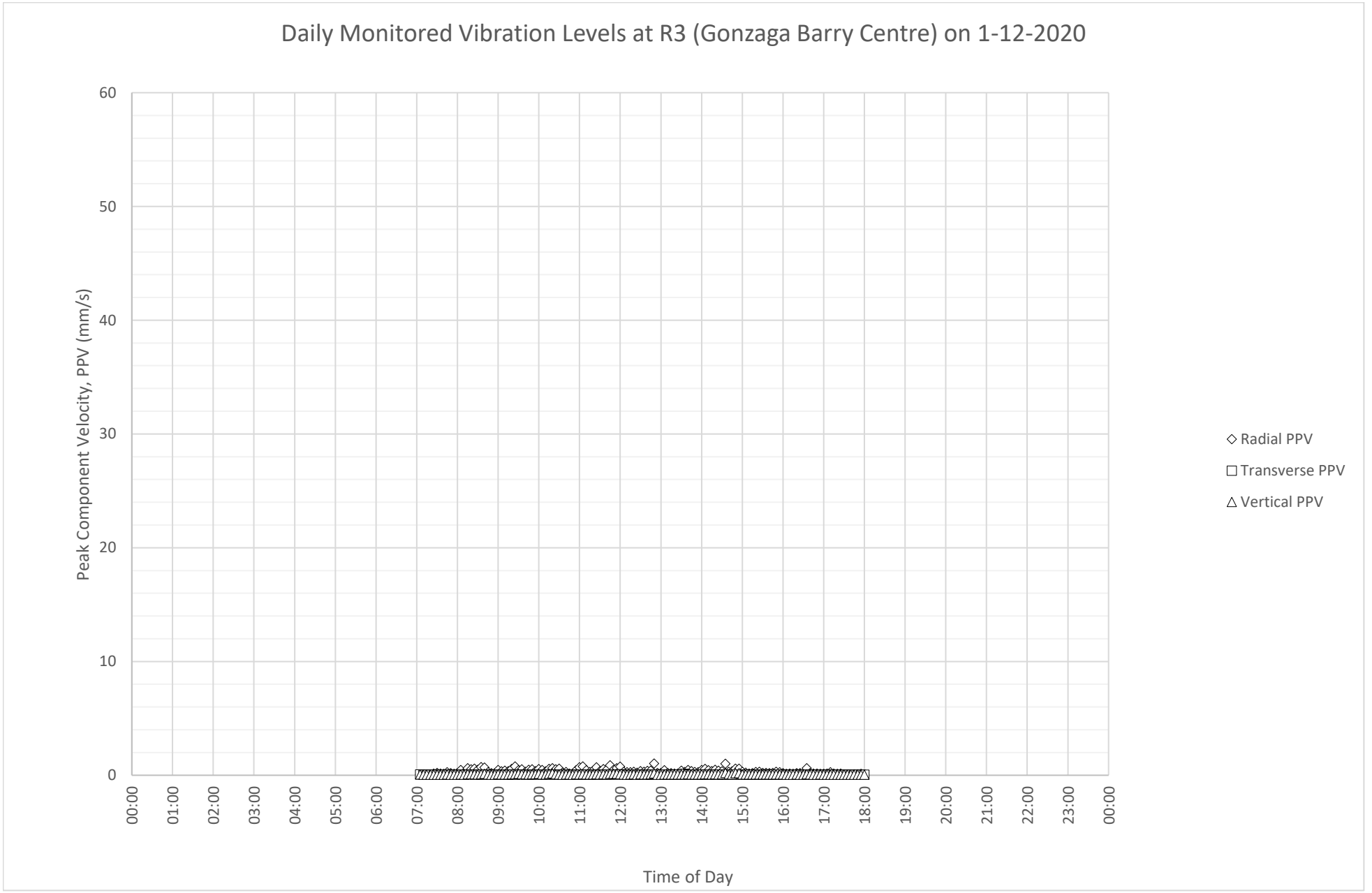
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 30-11-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 1-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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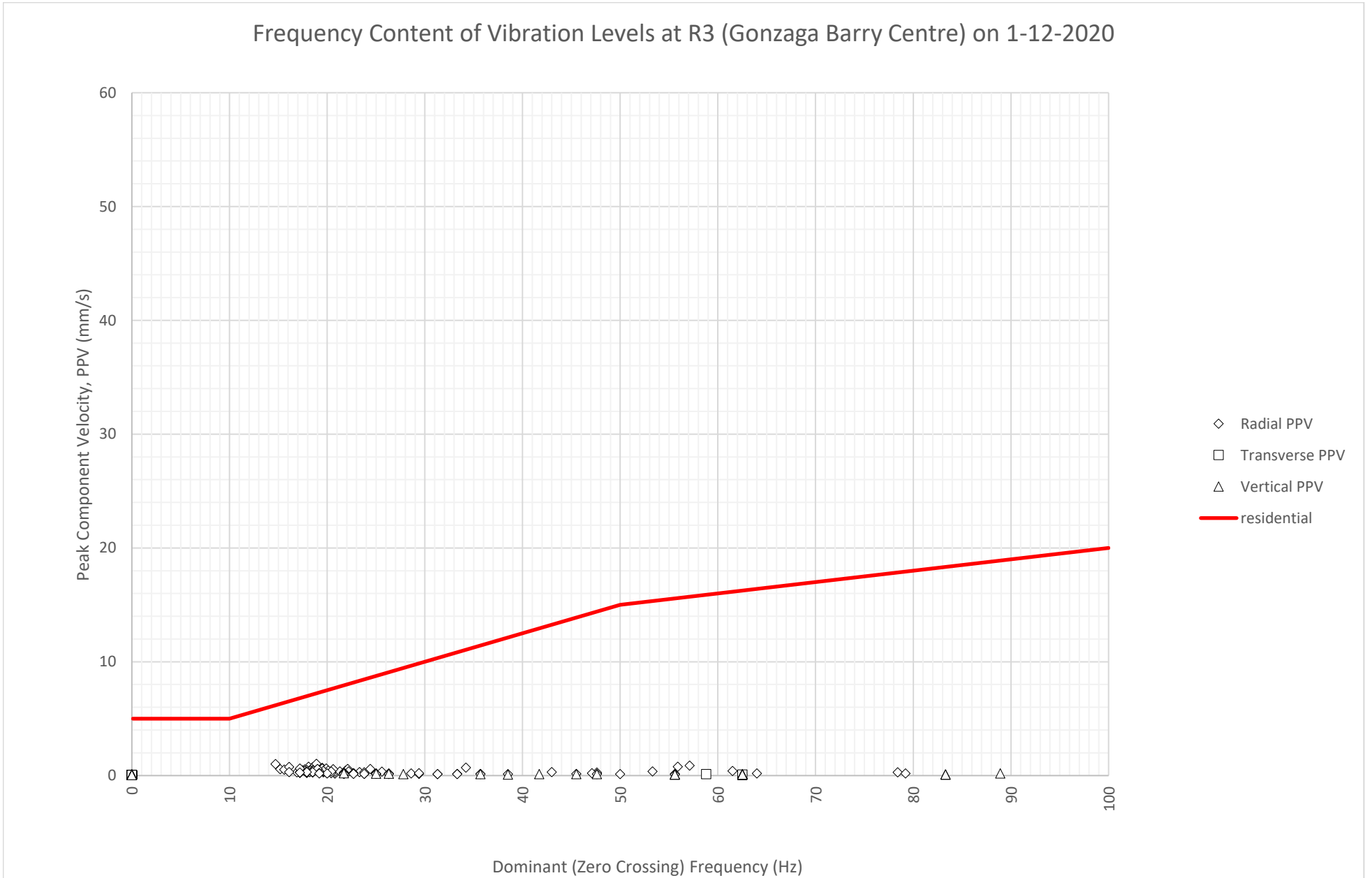
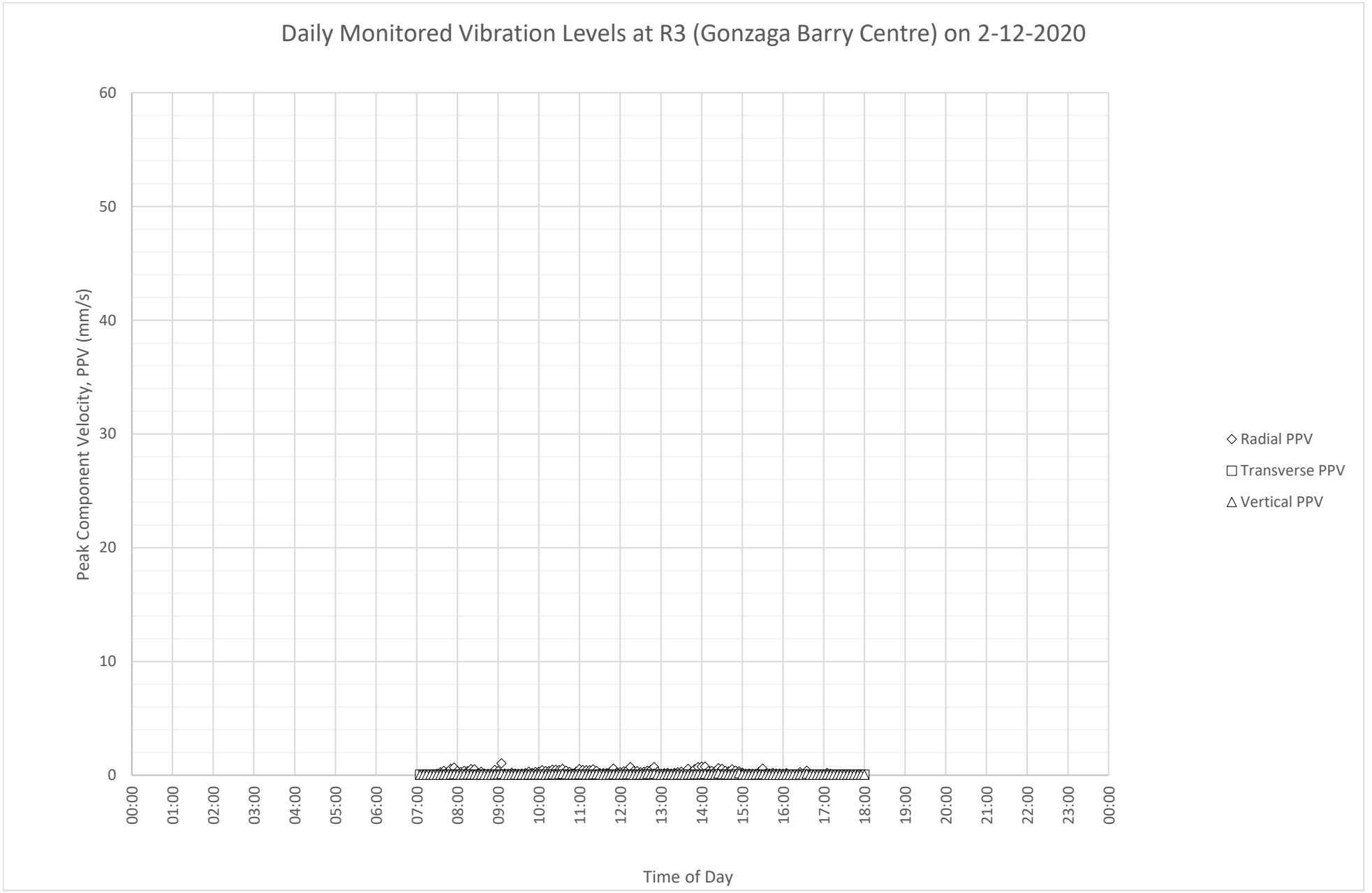
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 1-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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13:00
14:00
15:00
16:00
17:00
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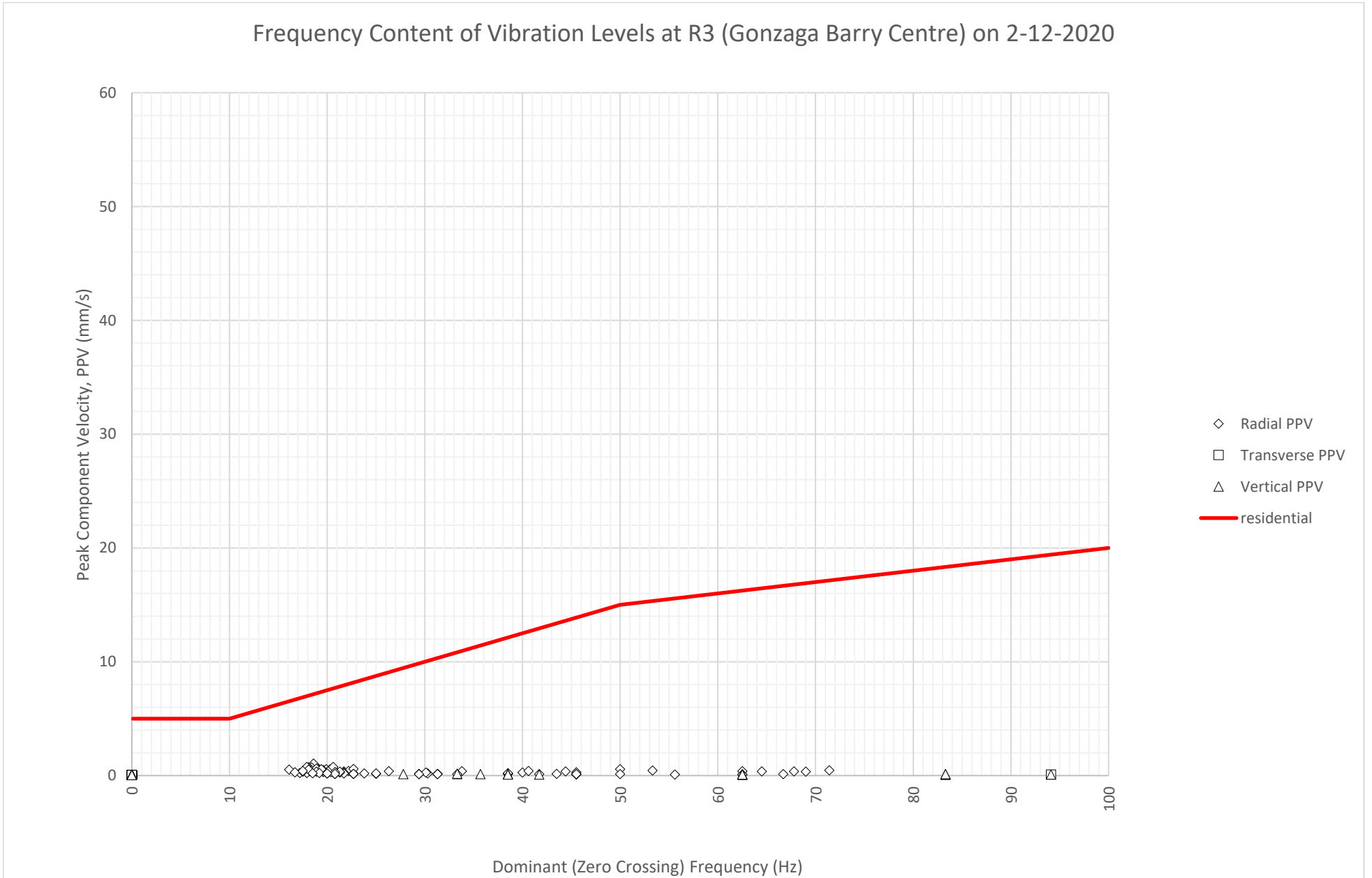
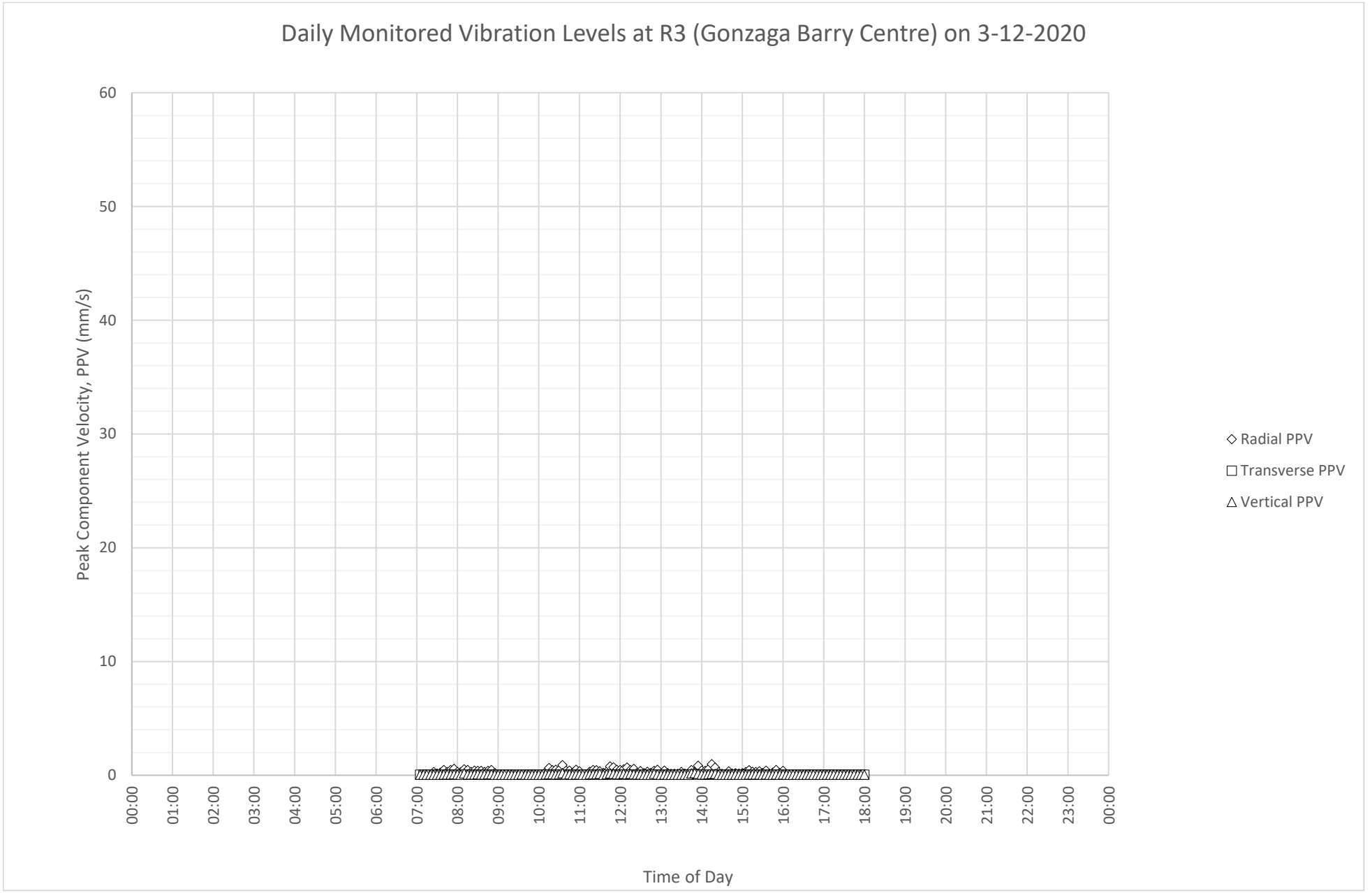
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 2-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
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13:00
14:00
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16:00
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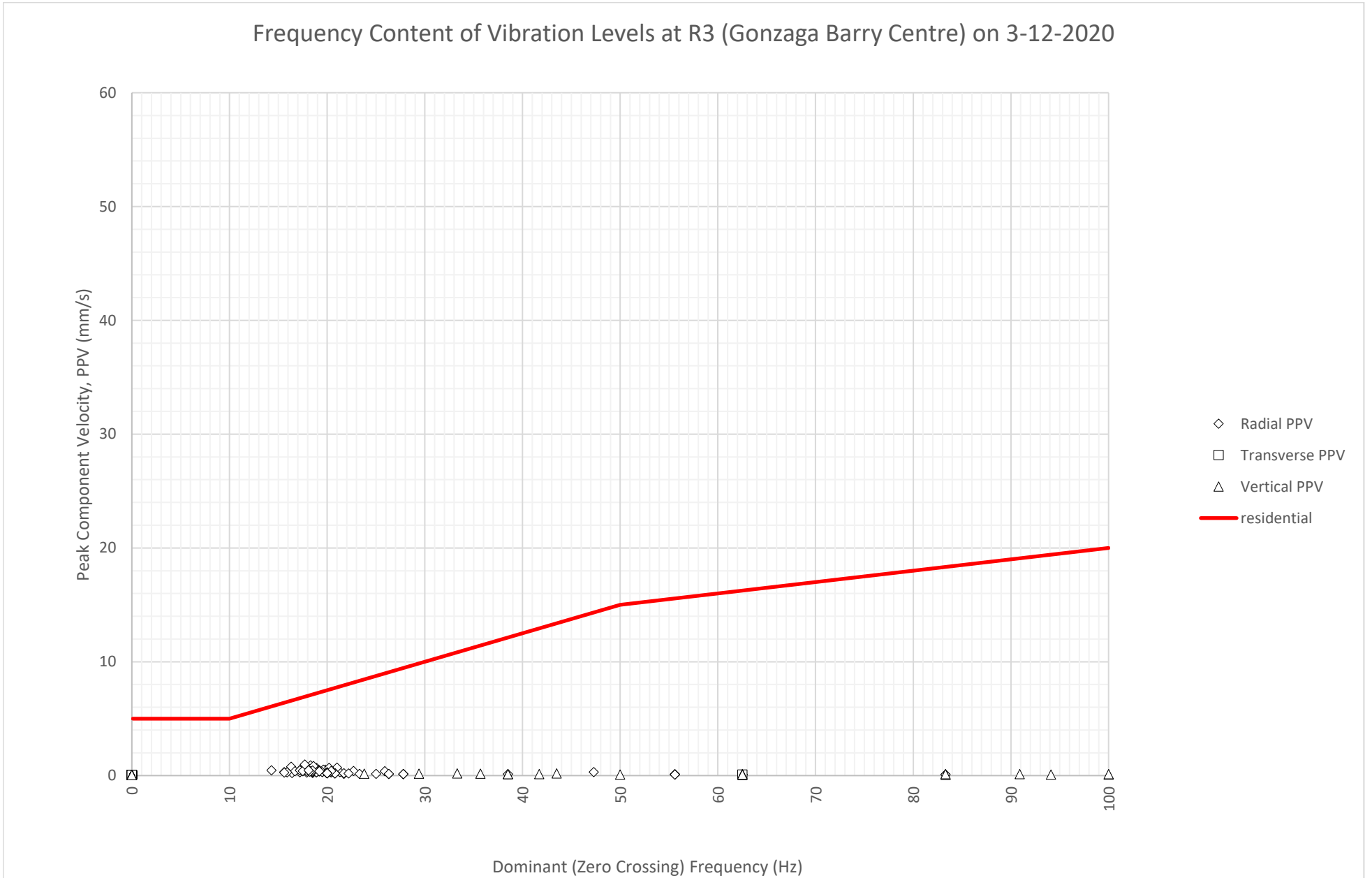
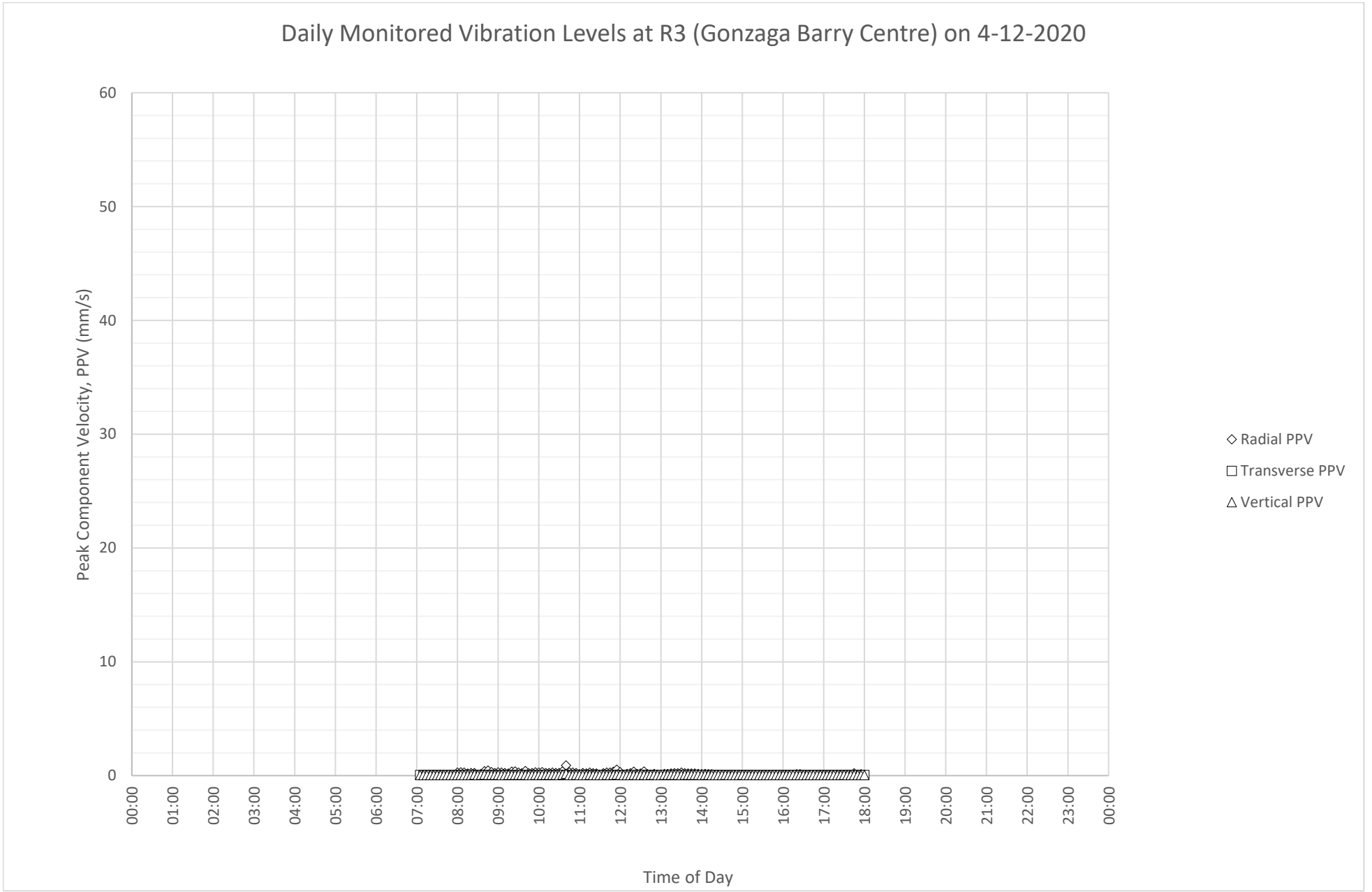
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 3-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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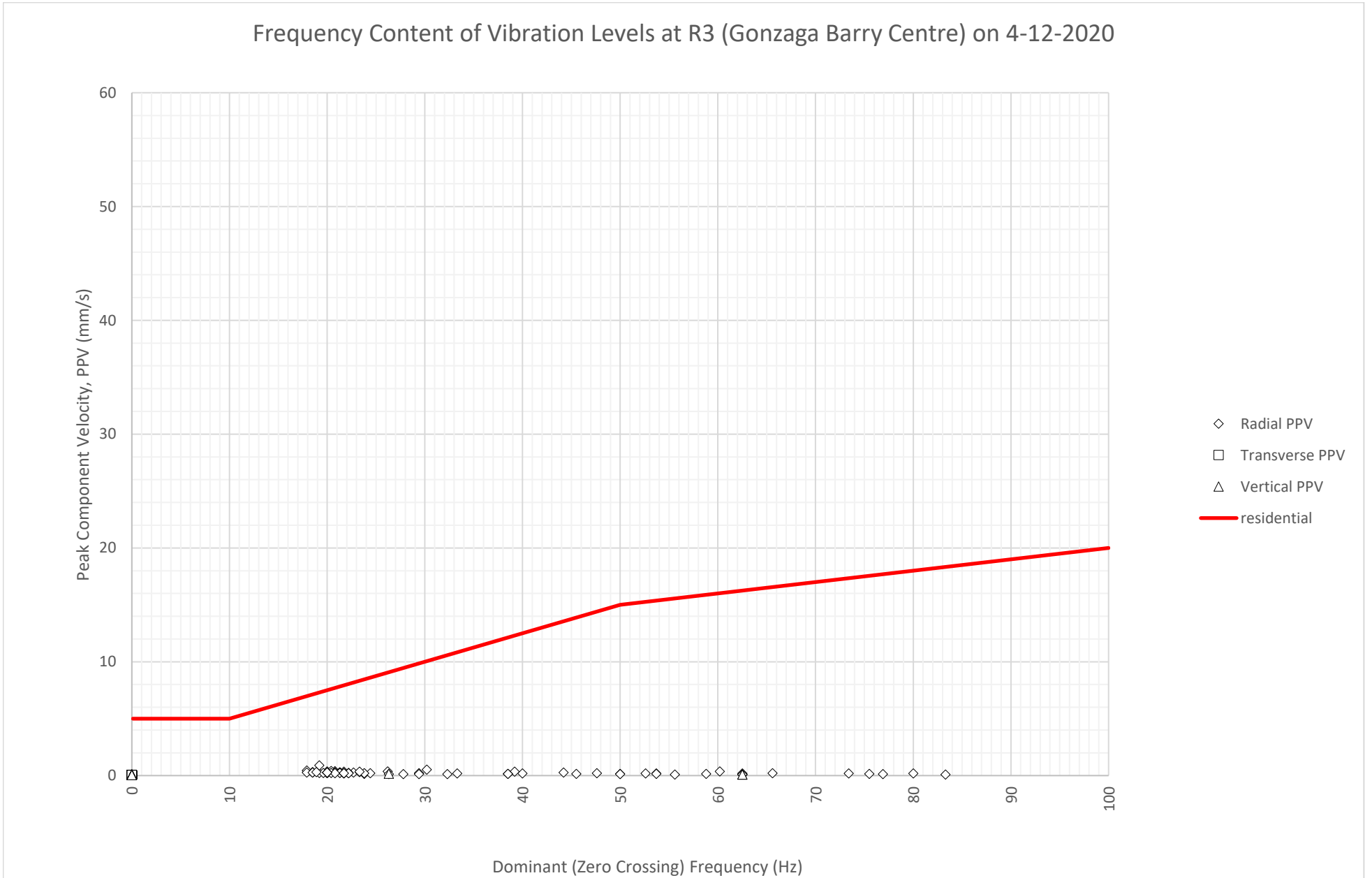
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 4-12-2020
Peak Component Velocity, PPV (mm/s)
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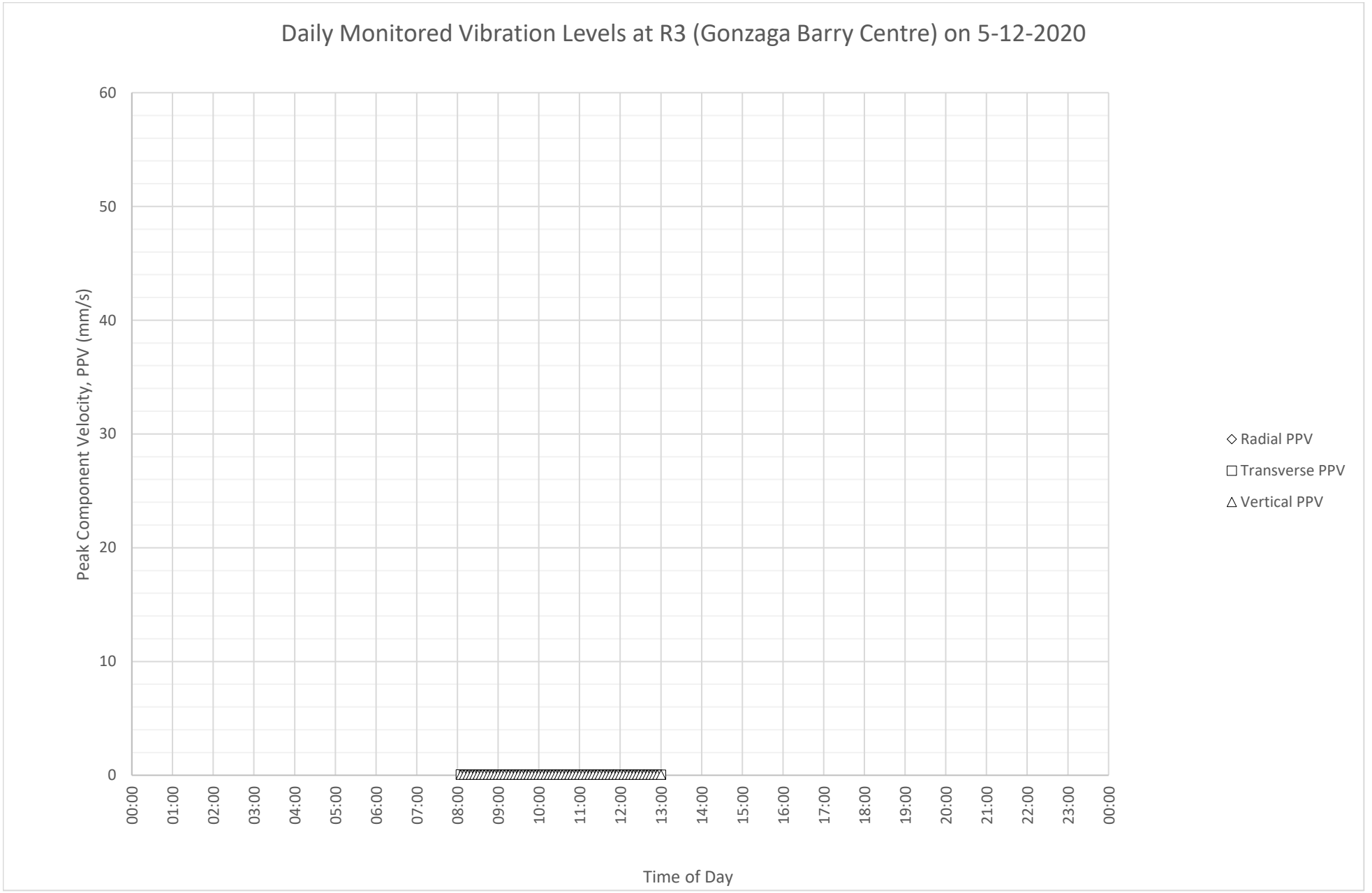
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
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13:00
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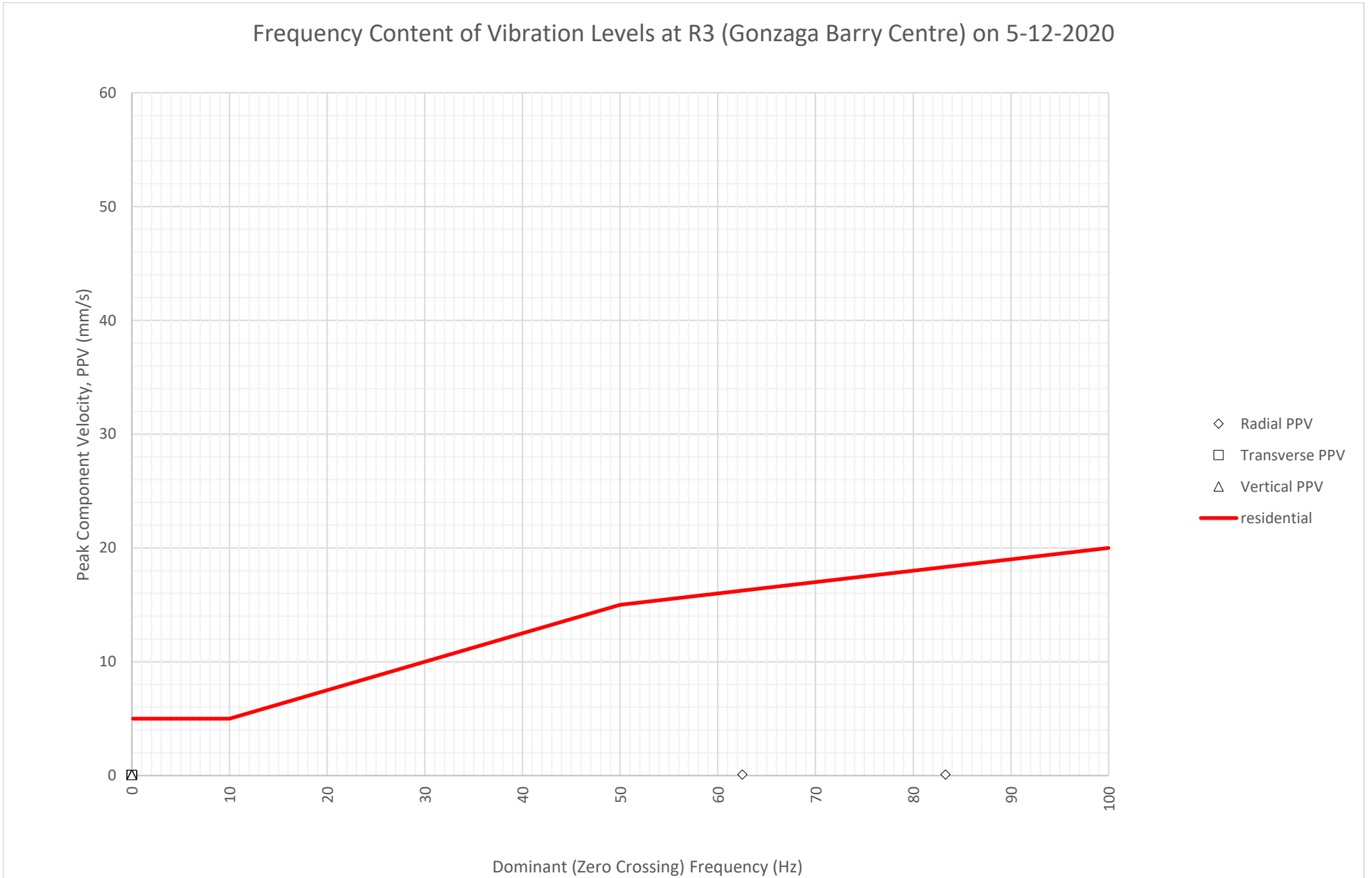
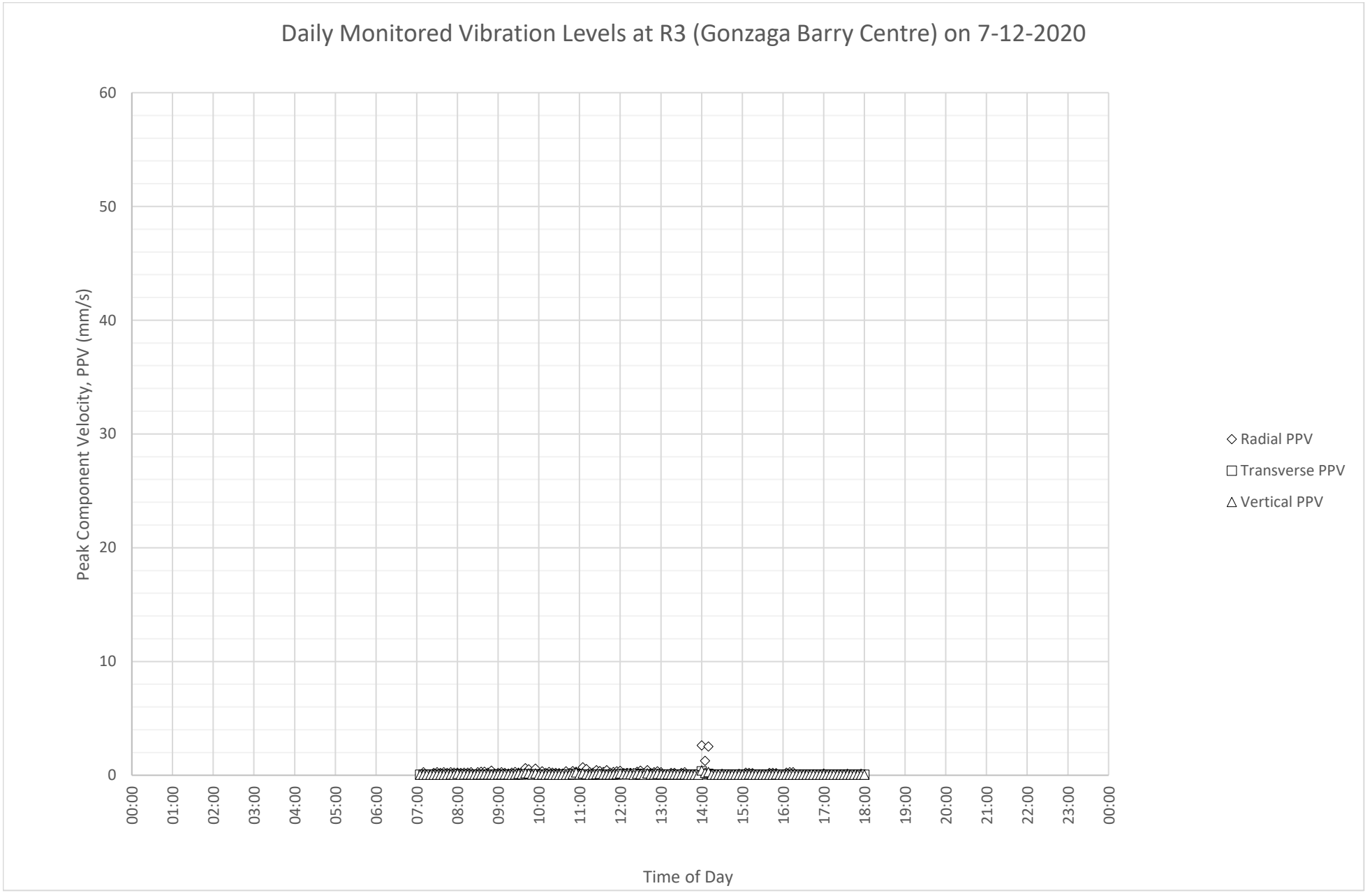
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 5-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
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50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
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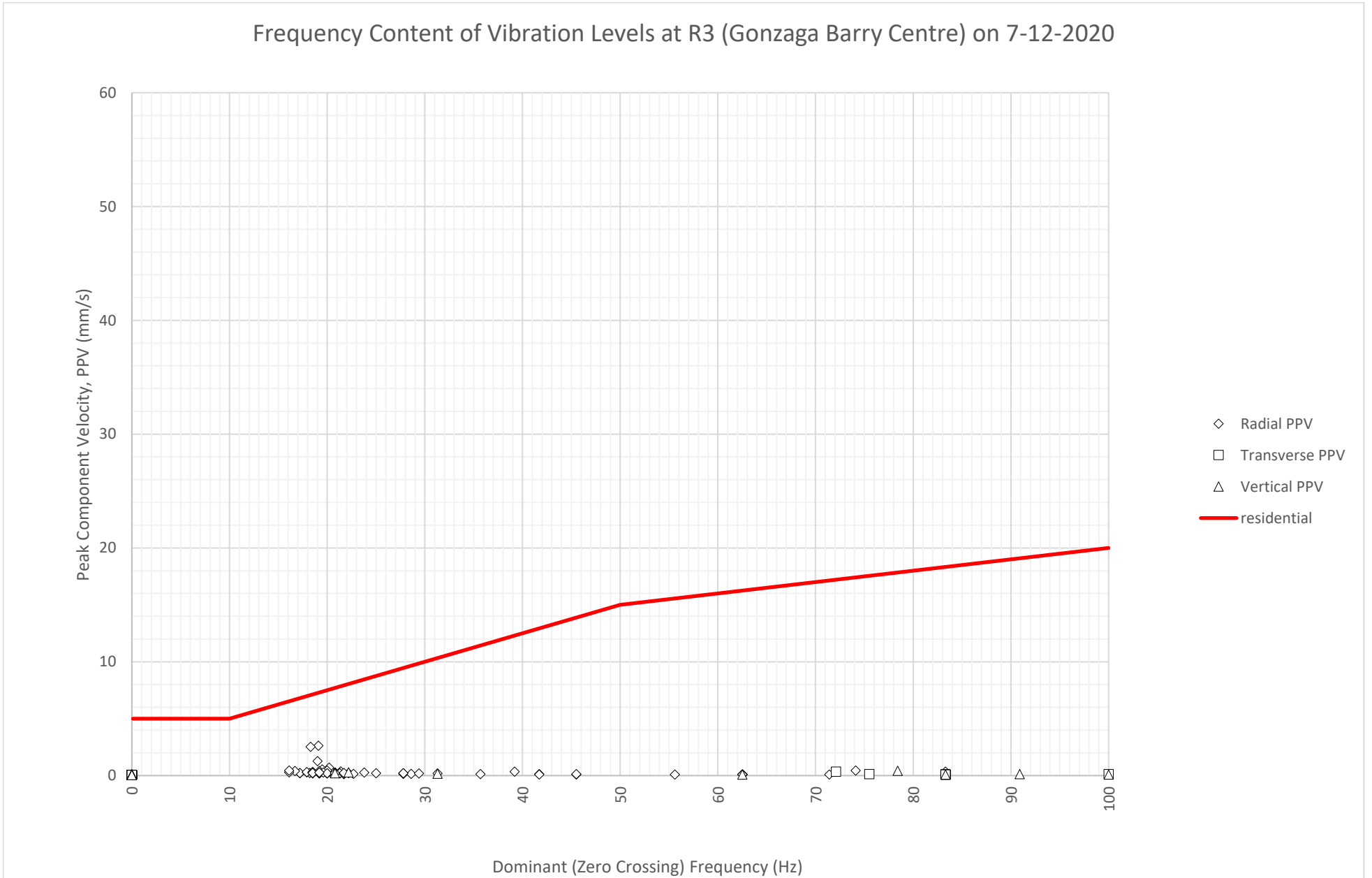
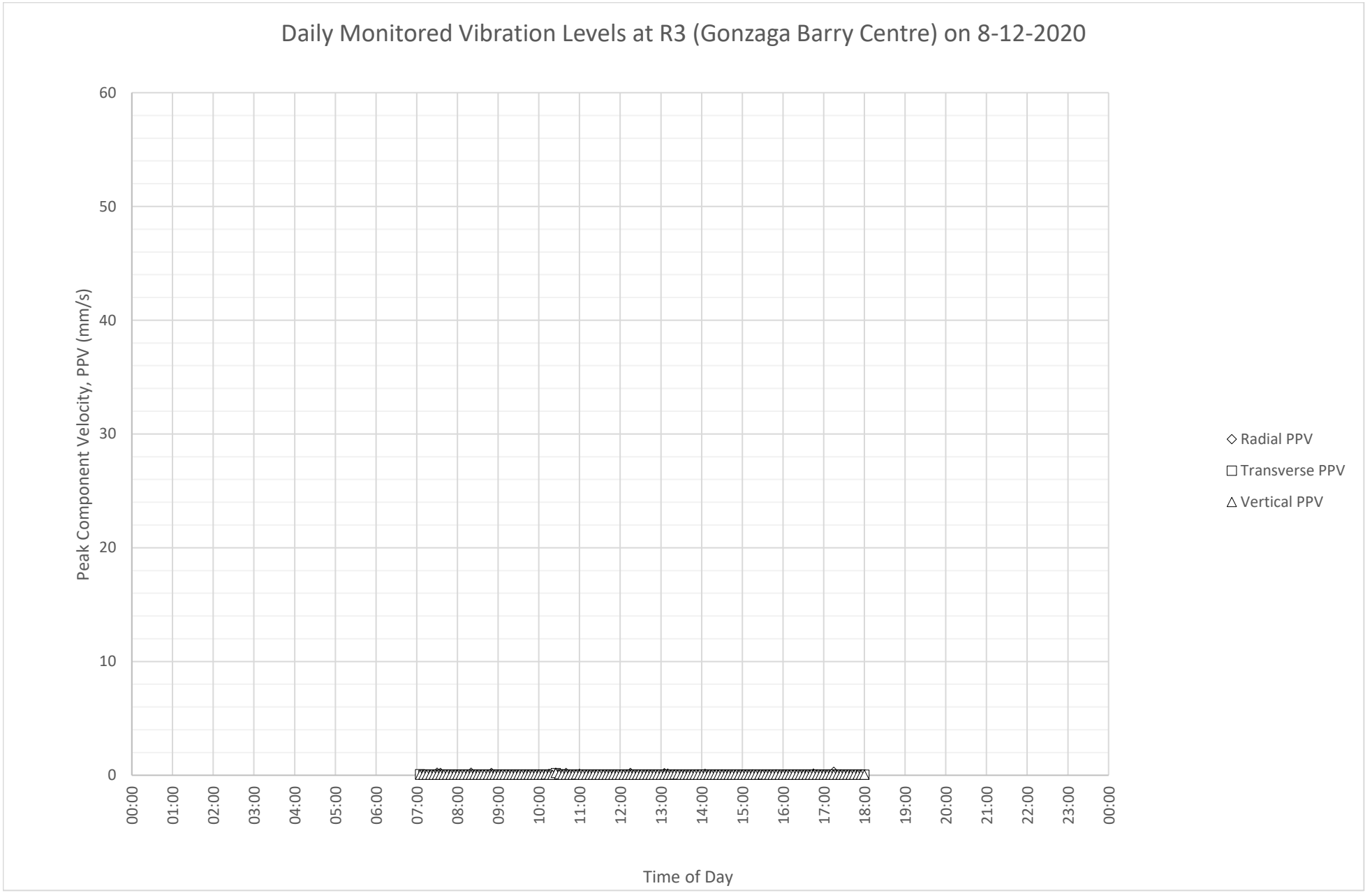
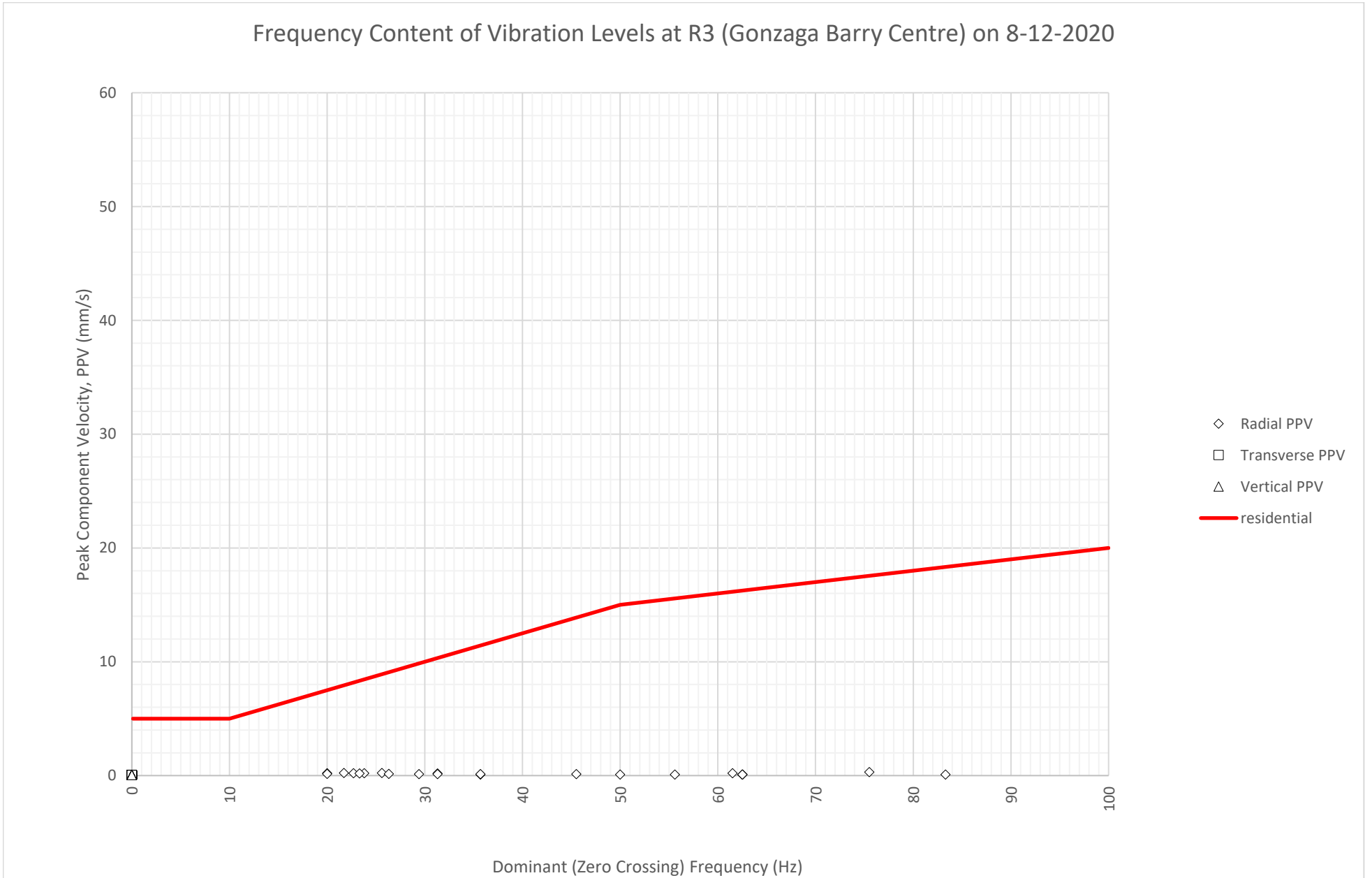
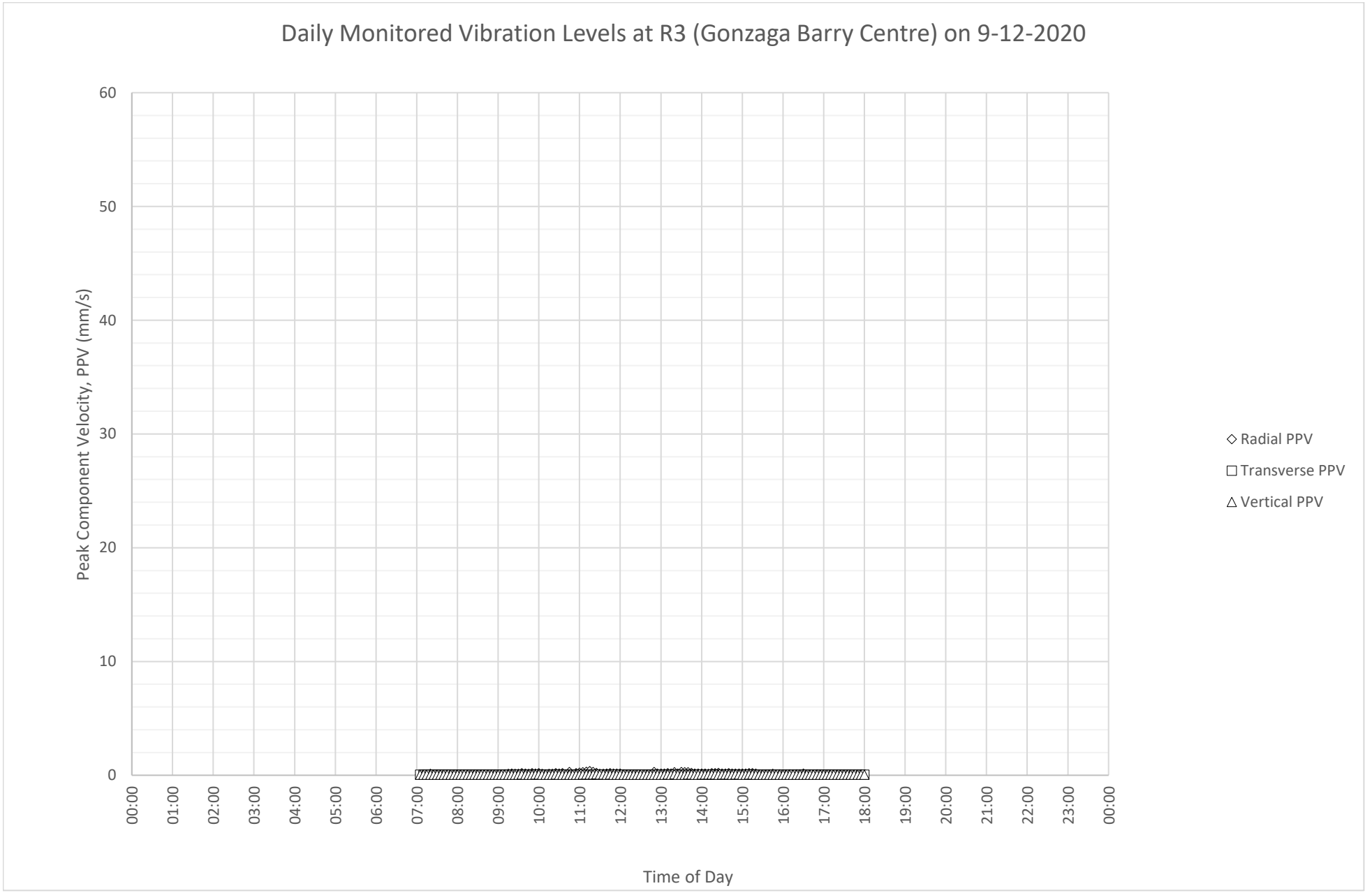
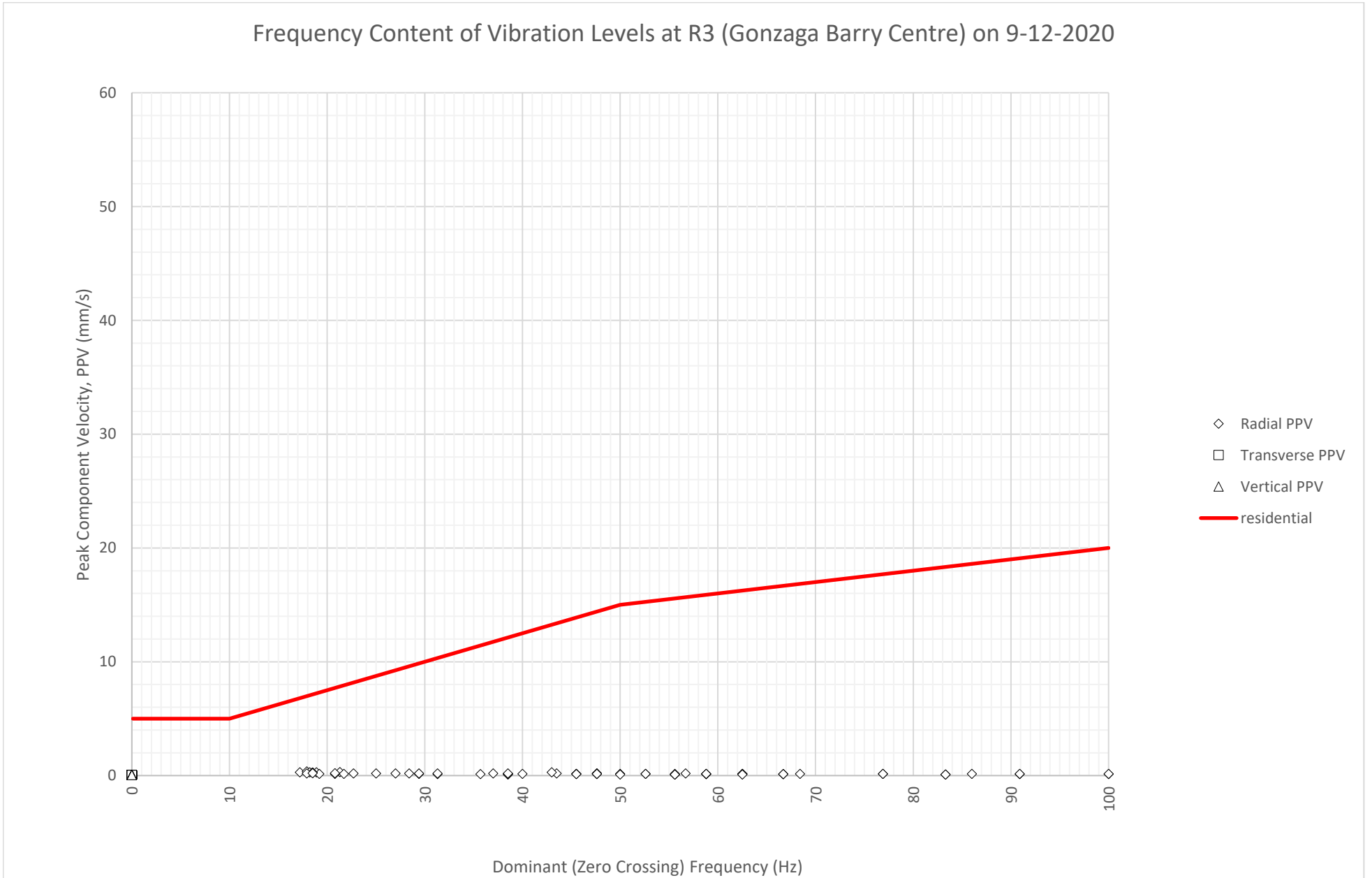
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 7-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 8-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential


Daily Monitored Vibration Levels at R3 (Gonzaga Barry Centre) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Time of Day
Radial PPV
Transverse PPV
Vertical PPV


Frequency Content of Vibration Levels at R3 (Gonzaga Barry Centre) on 9-12-2020
Peak Component Velocity, PPV (mm/s)
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Dominant (Zero Crossing) Frequency (Hz)
Radial PPV
Transverse PPV
Vertical PPV
residential