Forth Replacement Crossing

Employer's Delivery Team
Construction Vibration Monitoring Report

M9 Junction 1a Contract
(July 2012)

TRANSPORT SCOTLAND

An agency of The Scottish Government

FORTH REPLACEMENT CROSSING

FORTH REPLACEMENT CROSSING

EMPLOYER'S DELIVERY TEAM
CONSTRUCTION VIBRATION MONITORING REPORT

M9 JUNCTION 1A CONTRACT
(JULY 2012)

Revision Status

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FORTH REPLACEMENT CROSSING

EMPLOYER'S DELIVERY TEAM
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1. INTRODUCTION

1.1 This report sets out the results of the construction vibration monitoring undertaken on the M9 Junction 1a Contract in July 2012 as part of the Forth Replacement Crossing project.

2. M9 J1A CONTRACT VIBRATION MONITORING

VIBRATION MONITORING LOCATIONS

2.1 Continuous vibration monitoring was carried out at fixed monitor locations in July 2012 as outlined in Table 2.1 below. The main construction activities carried out adjacent to the monitor locations are also listed.

Monitoring Location	Monitoring Period	Main Construction Activities
93/95 King Edwards Way (CNV02)	July 2012	• Erection of noise barrier • Excavation of quarry area • Earthworks north of Gateside • Drainage works on M9 • Sub-base and pavement on the M9 • Gantry bases for G4
15-17 Buie Rigg (CNV07)	July 2012	• Earthworks over Swineburn culvert • Drainage works at eastbound merge • Newmains Bridge backfilling
8 Kirklands Park Grove (CNV16)	July 2012	• M9 Spur Earthworks • Drainage near on M9 Spur • M908E Newmains Bridge backfilling • Gantry 12 pilecap poured

Table 2.1 Long Term Monitoring Locations - July

VIBRATION MONITORING RESULTS

2.2 The results of the M9 J1a Contract construction vibration monitoring are provided in chart format in Appendix A of this report.

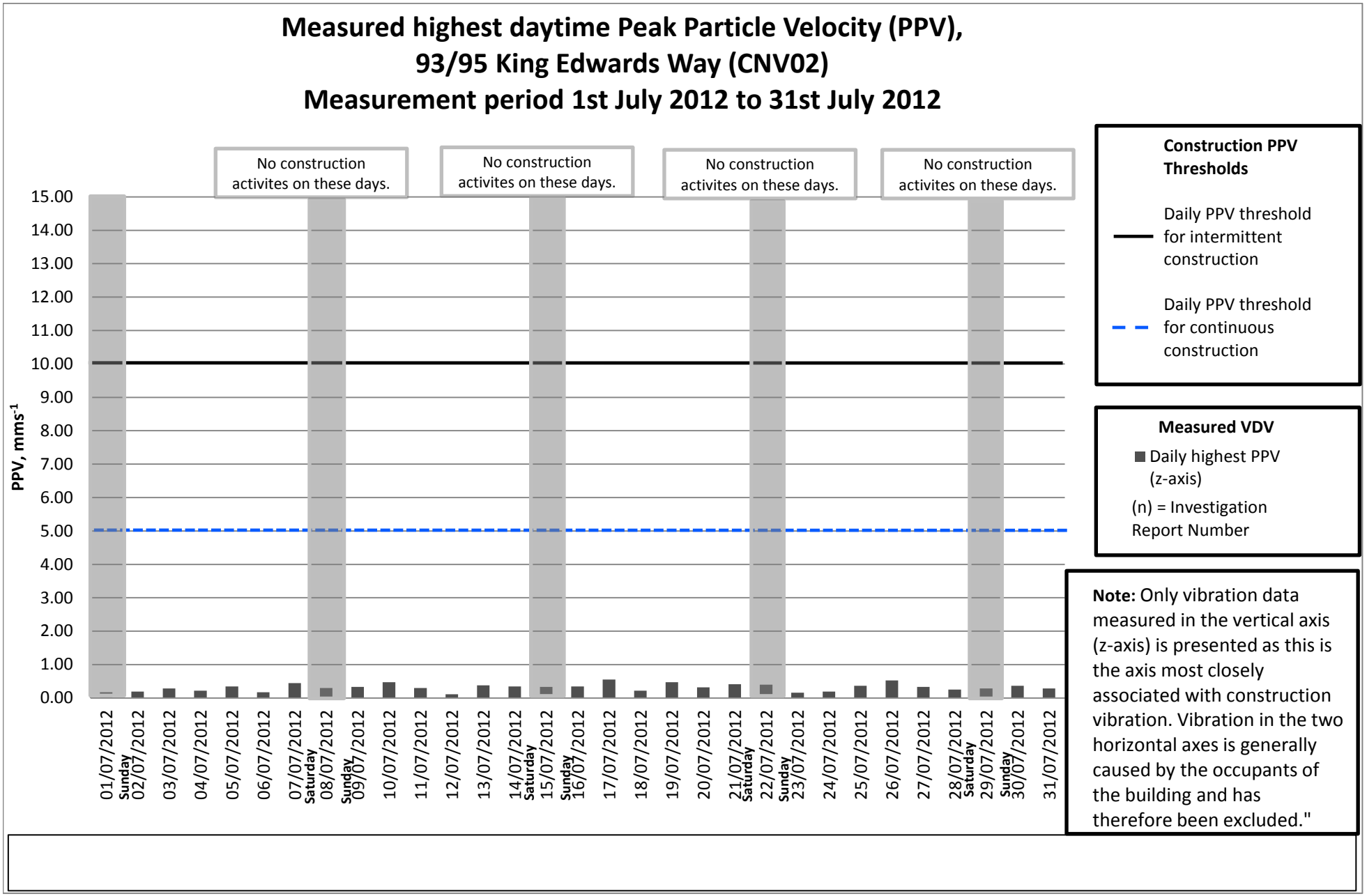
2.3 The charts show the Vibration Dose Values (VDV) and Peak Particle Velocities (PPV) recorded at receptors. VDV levels are recorded in order to monitor the potential for disturbance to the occupants of buildings (as discussed in BS 6472) and PPV values are recorded in order to monitor the potential for damage to buildings (as discussed in BS 7385).

2.4 The charts indicate that all construction activities in the period were carried out in accordance with the vibration thresholds set out in the project Code of Construction Practice.

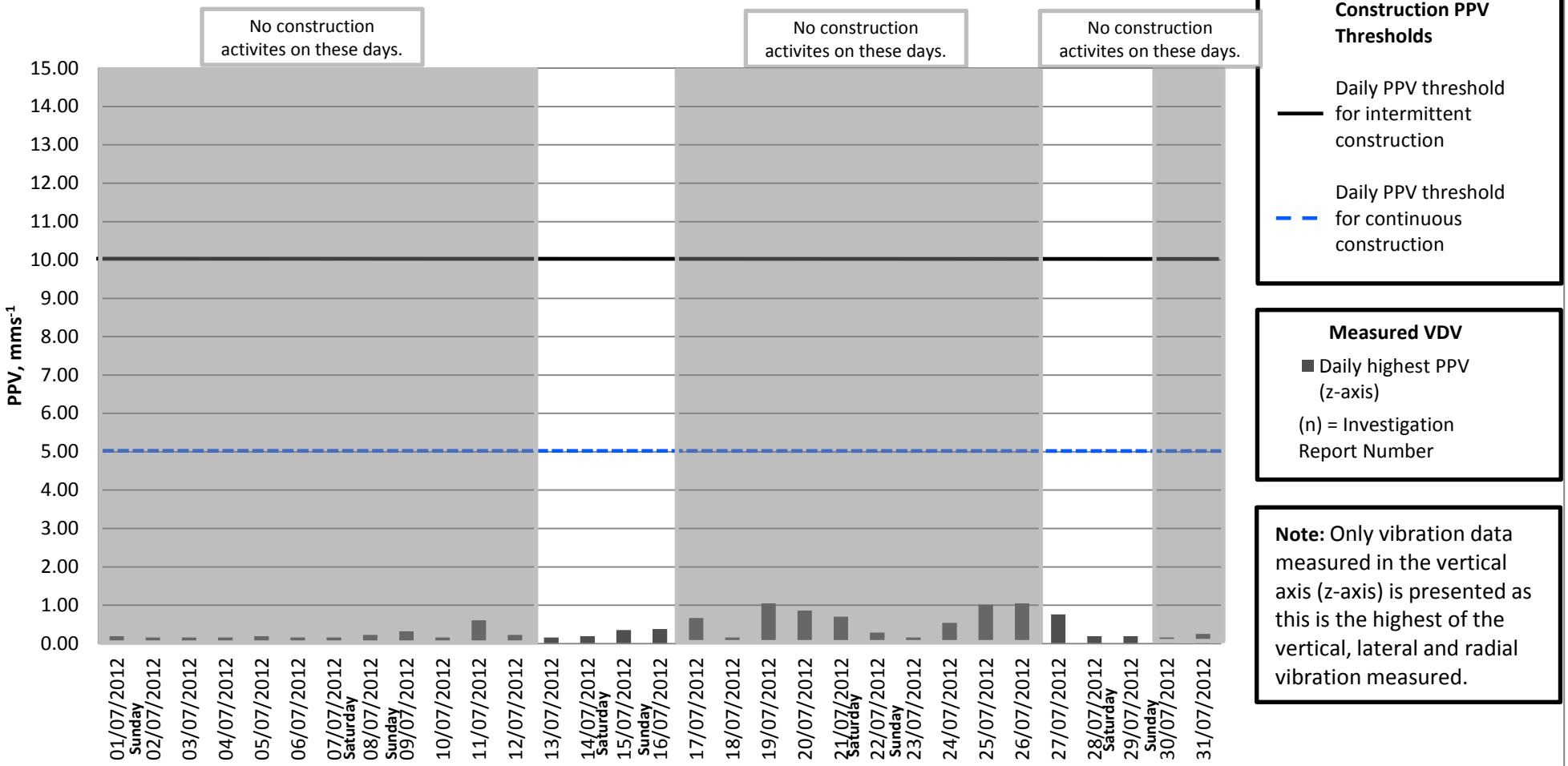
2.5 Three exceedances of the VDV threshold were recorded at King Edwards Way on 19/07/12, 25/07/12 and 26/07/12. However, these exceedances occurred during the night when no activities were being carried out on site and are therefore not attributed to construction works.

APPENDIX A - M9 J1A CONTRACT CONSTRUCTION VIBRATION CHARTS

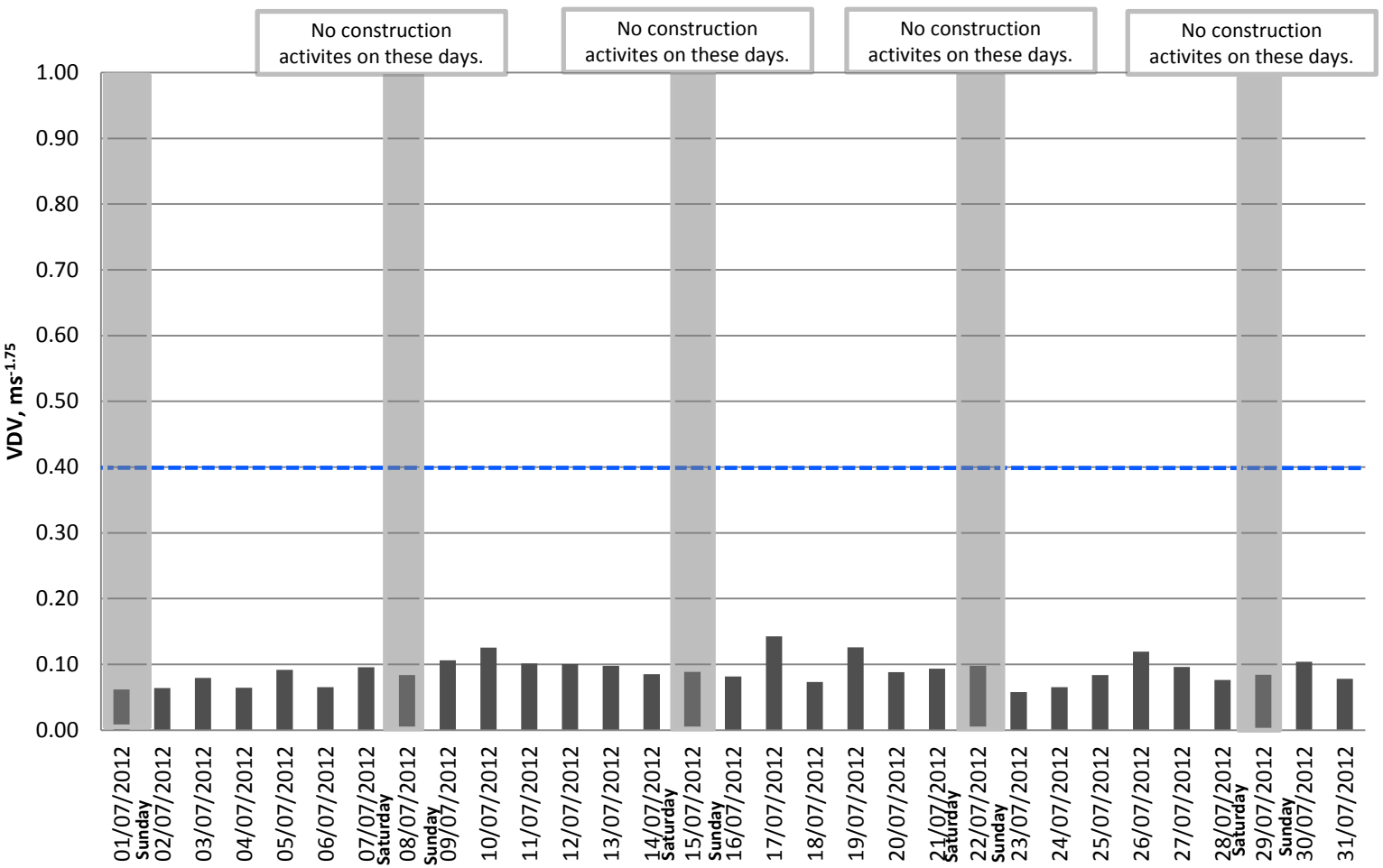
Measured highest daytime Peak Particle Velocity (PPV), 93/95 King Edwards Way (CNV02) Measurement period 1st July 2012 to 31st July 2012



Measured highest night-time Peak Particle Velocity (PPV), 93/95 King Edwards Way (CNV02) Measurement period 1st July 2012 to 31st July 2012



Measured daytime (07:00-23:00) Vibration Dose Values (VDV), 93/95 King Edwards Way (CNV02) Measurement period 1st July 2012 to 31st July 2012



Construction VDV Threshold

Daily daytime VDV threshold for residential dwellings

Measured VDV

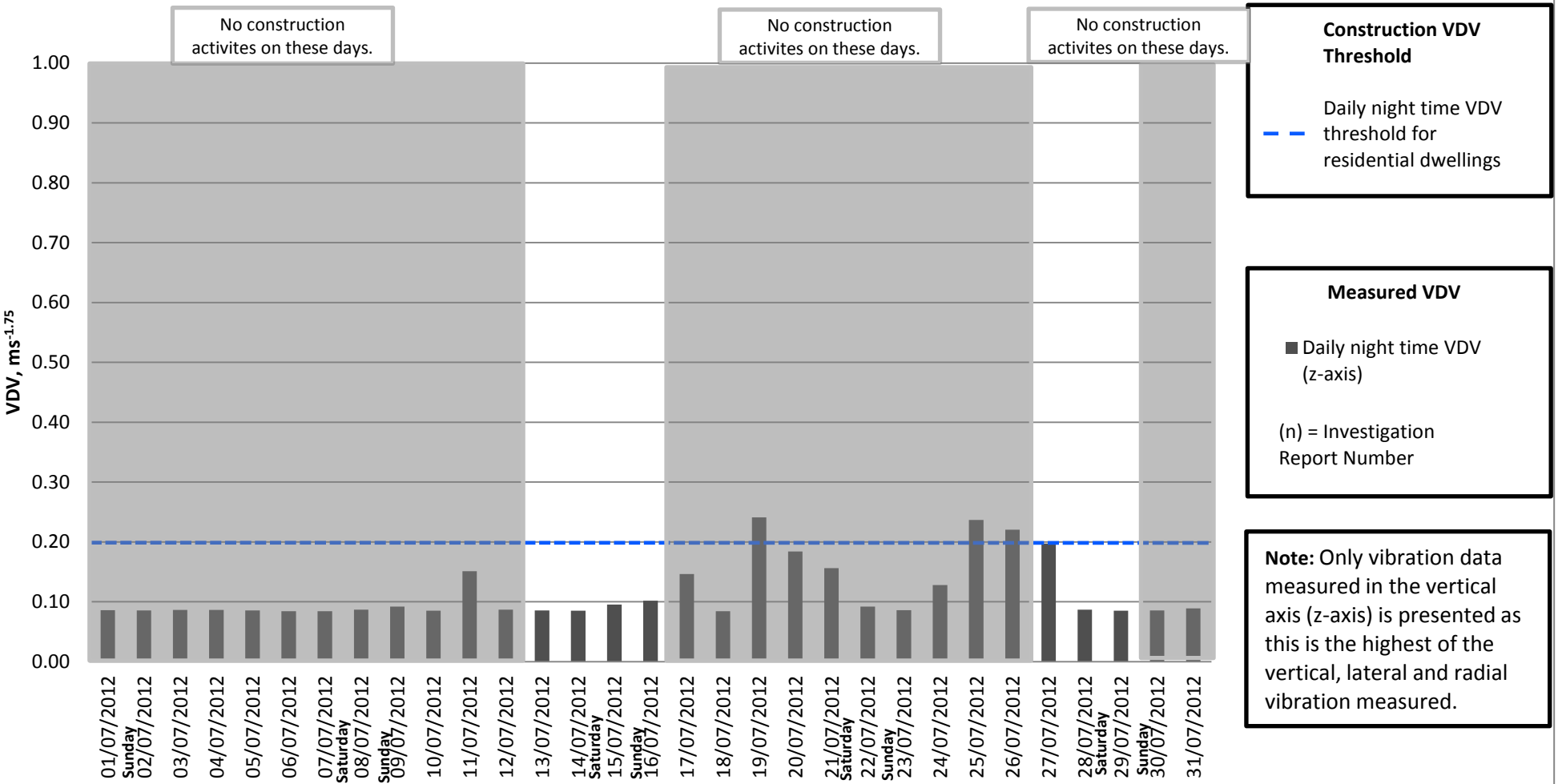
Daily daytime VDV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

VDV threshold for Education establishements, offices and similar is 0.40ms$^{-1.75}$ and Commercial is 0.80ms$^{-1.75}$. Therefore it may be necessary to adjust the threshold displayed on the graph if buildings other than residential dwellings are being assessed.

Measured night time (23:00-07:00) Vibration Dose Values (VDV), 93/95 King Edwards Way (CNV02) Measurement period 1st July 2012 to 31st July 2012



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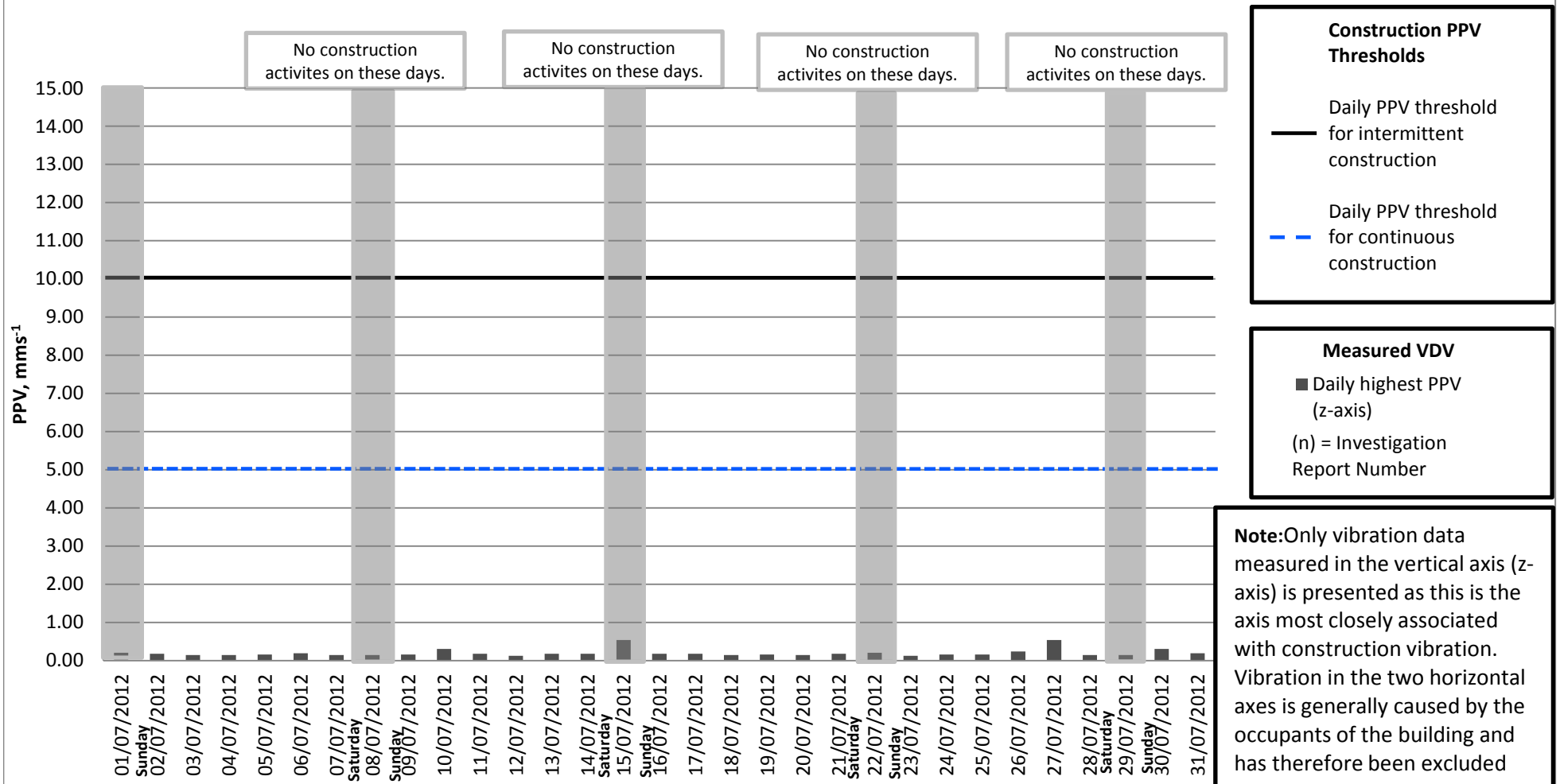
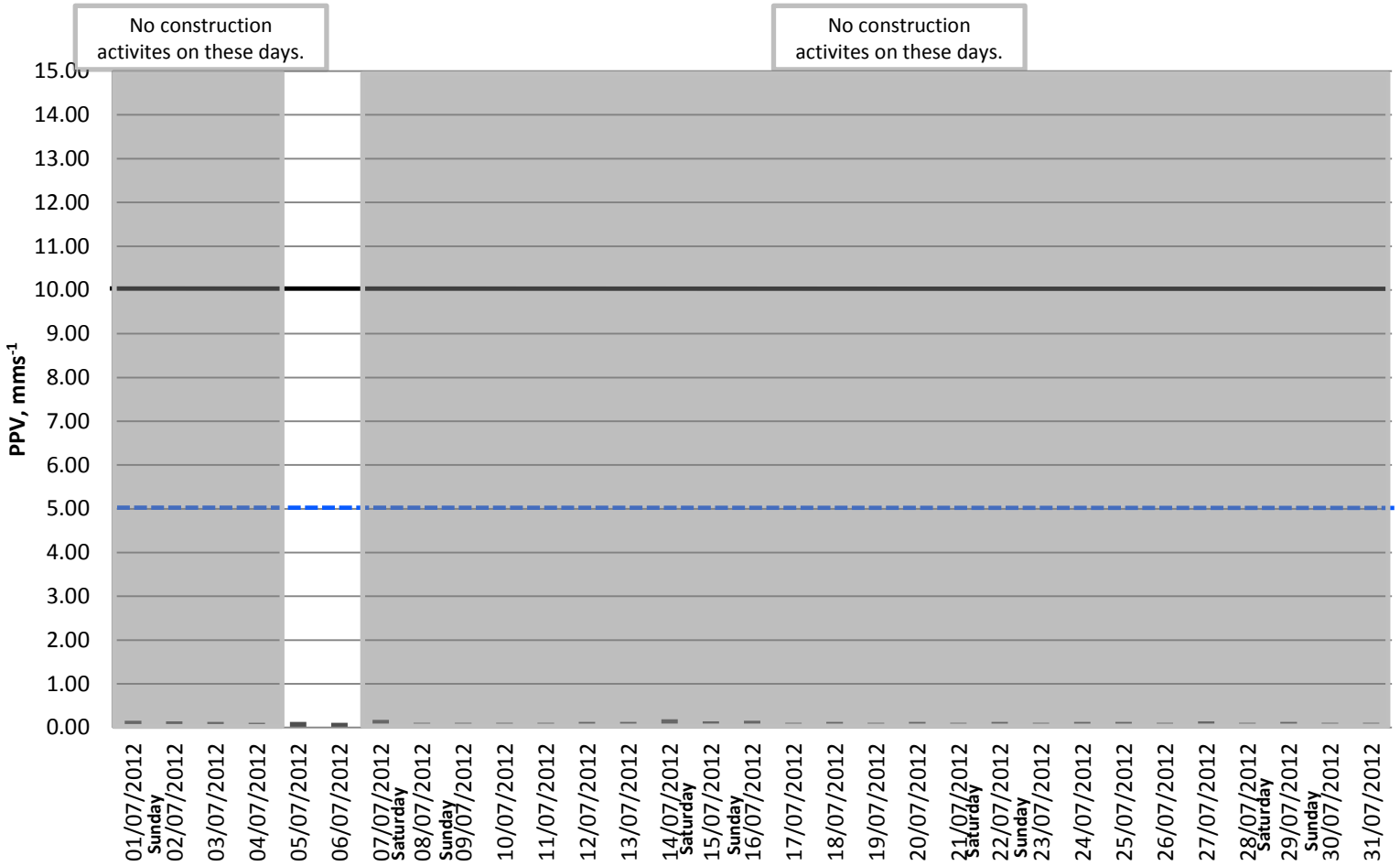
Measured highest daytime Peak Particle Velocity (PPV), 15-17 Buie Rigg (CNV07) Measurement period 1st July 2012 to 31st July 2012



Measured highest night-time Peak Particle Velocity (PPV), 15-17 Buie Rigg (CNV07) Measurement period 1st July 2012 to 31st July 2012



Construction PPV Thresholds

Daily PPV threshold for intermittent construction

Daily PPV threshold for continuous construction

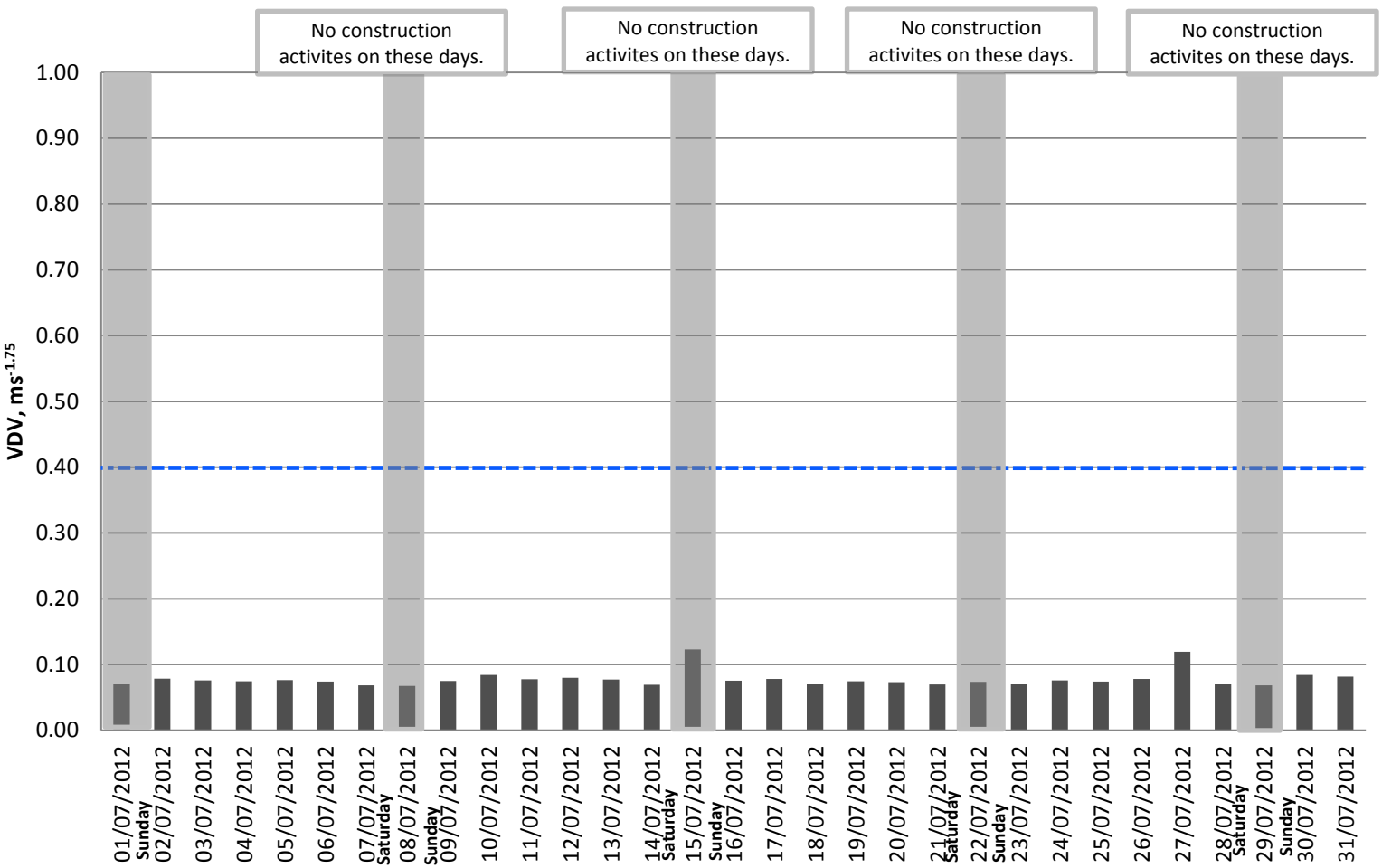
Measured VDV

Daily highest PPV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

Measured daytime (07:00-23:00) Vibration Dose Values (VDV), 15-17 Buie Rigg (CNV07) Measurement period 1st July 2012 to 31st July 2012



Construction VDV Threshold

Daily daytime VDV threshold for residential dwellings

Measured VDV

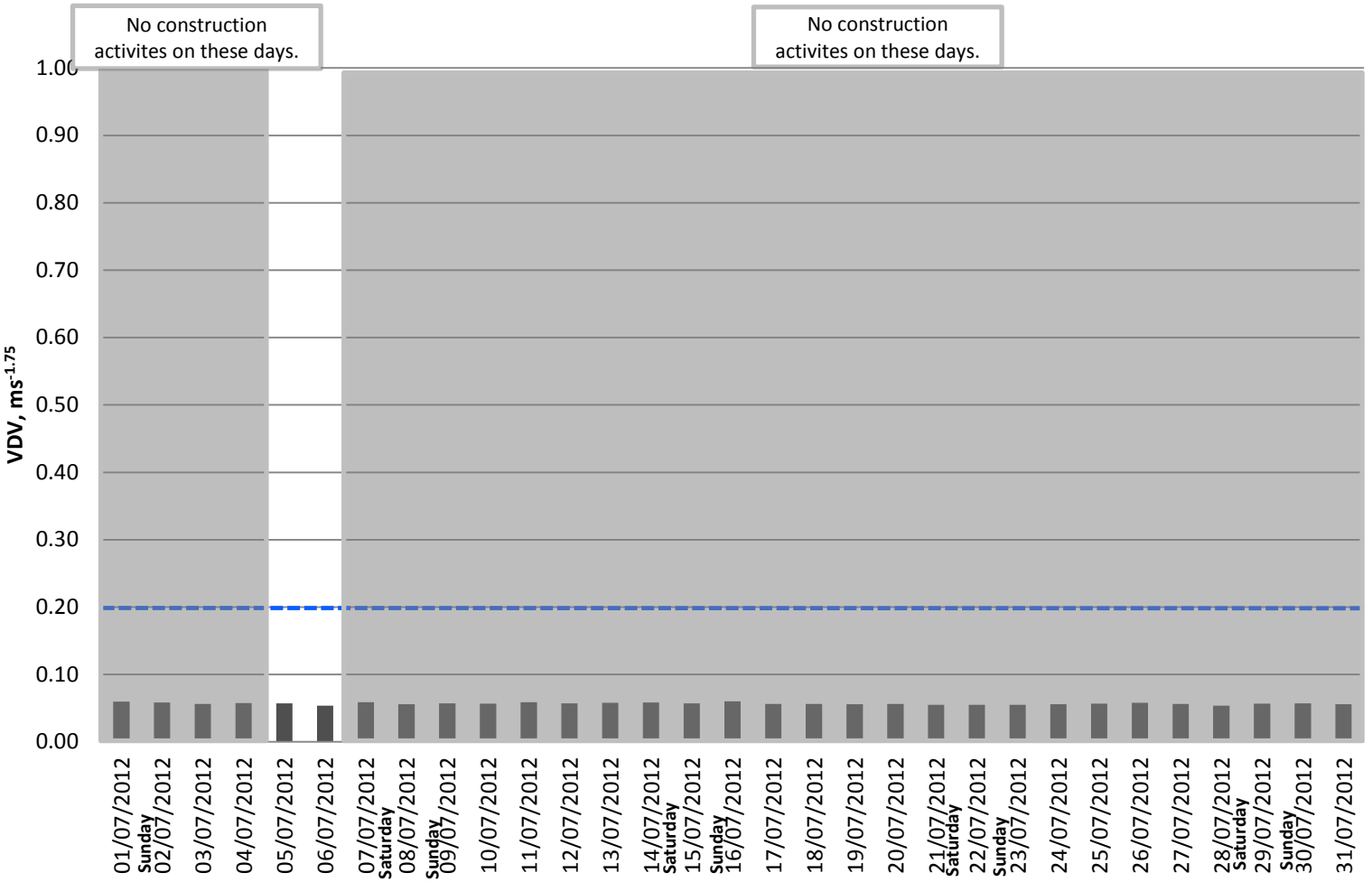
Daily daytime VDV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

VDV threshold for Education establishements, offices and similar is 0.40ms$^{-1.75}$ and Commercial is 0.80ms$^{-1.75}$. Therefore it may be necessary to adjust the threshold displayed on the graph if buildings other than residential dwellings are being assessed.

Measured night time (23:00-07:00) Vibration Dose Values (VDV), 15-17 Buie Rigg (CNV07) Measurement period 1st July 2012 to 31st July 2012



Construction VDV Threshold

Daily night time VDV threshold for residential dwellings

Measured VDV

Daily night time VDV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

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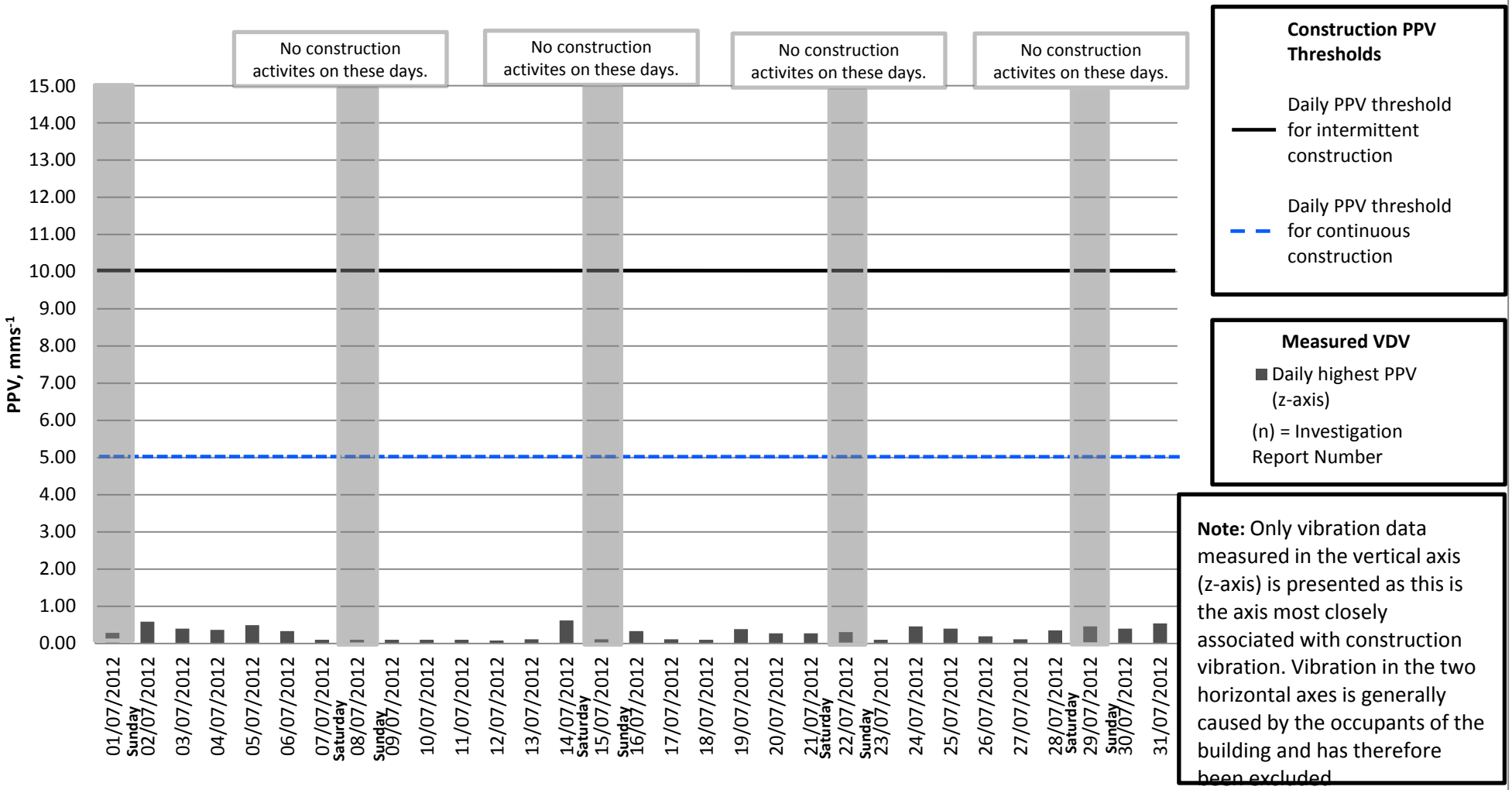
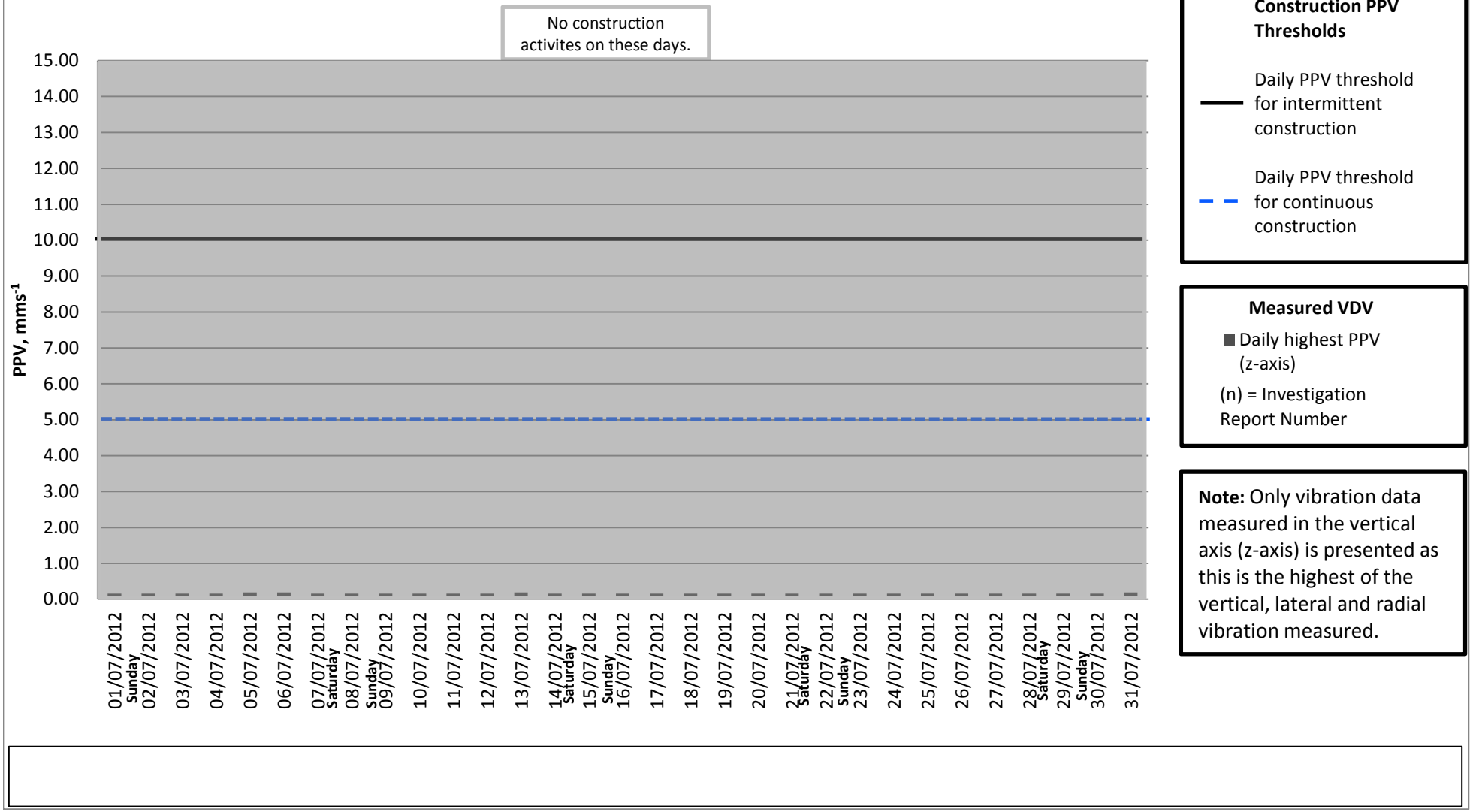
Measured highest daytime Peak Particle Velocity (PPV), 8 Kirklands Park Grove (CNV16) Measurement period 1st July 2012 to 31st July 2012



Measured highest night-time Peak Particle Velocity (PPV), 8 Kirklands Park Grove (CNV16) Measurement period 1st July 2012 to 31st July 2012



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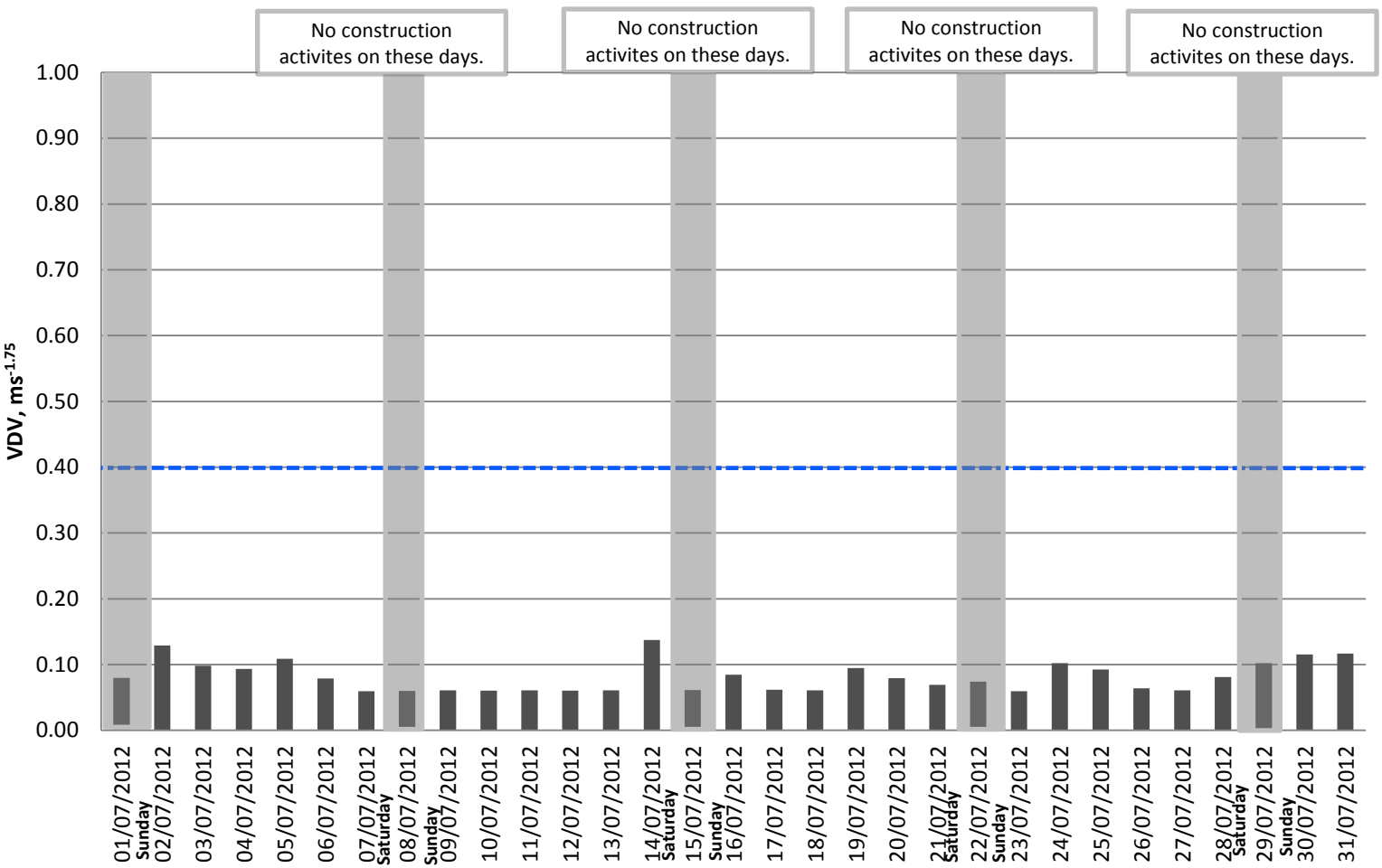

Construction VDV Threshold

Daily daytime VDV threshold for residential dwellings

Measured VDV

Daily daytime VDV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

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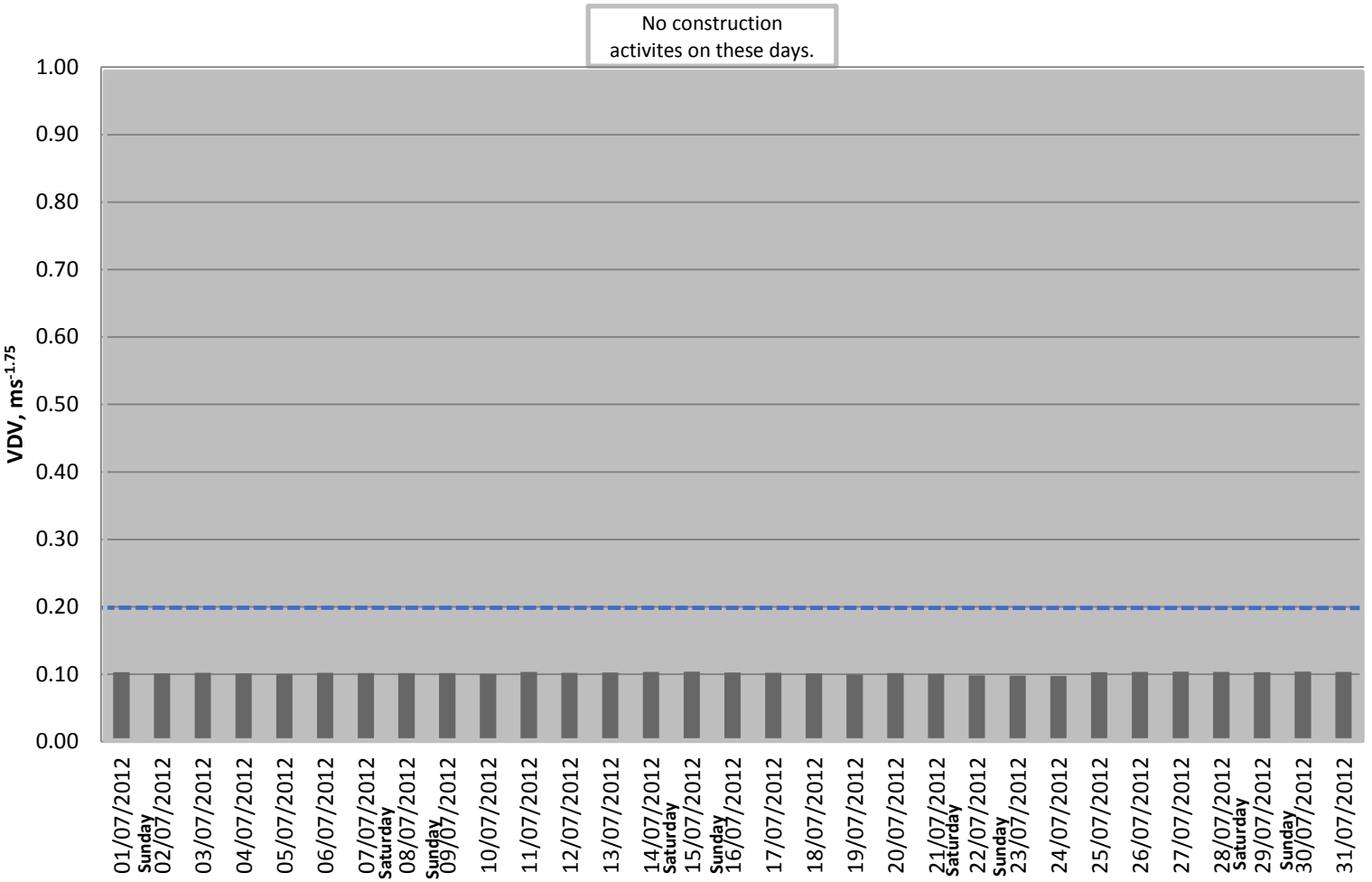

Construction VDV Threshold

Daily night time VDV threshold for residential dwellings

Measured VDV

Daily night time VDV (z-axis)

(n) = Investigation Report Number

Note: Only vibration data measured in the vertical axis (z-axis) is presented as this is the highest of the vertical, lateral and radial vibration measured.

VDV threshold for Education establishements, offices and similar is 0.40ms$^{-1.75}$ and Commercial is 0.80ms$^{-1.75}$. Therefore it may be necessary to adjust the threshold displayed on the graph if buildings other than residential dwellings are being assessed..