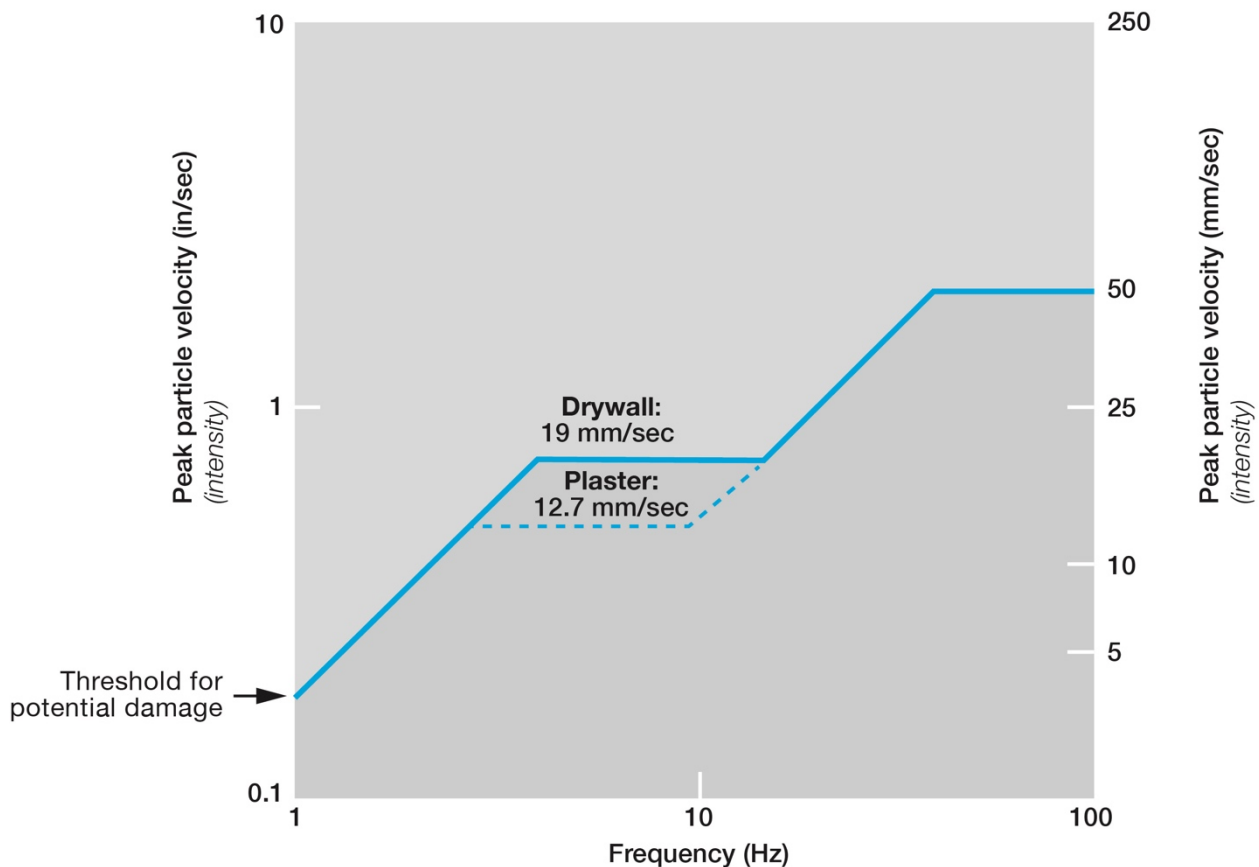


Understanding the Z-Curve

The Z-Curve line establishes a limit above which damage becomes possible, but it is crucial to note that damage does not automatically occur once this limit is breached. Damage would not actually occur in the average residence until ground vibrations reached significantly higher intensities than those outlined by the USBM Z-Curve. If the Z-Curve criteria is exceeded, the probability of damage is merely introduced and will incrementally increase with higher and higher vibration amplitudes.

USBM Z-CURVE (USBM RI 8507)
Threshold damage vibration criteria



Vibrations are occurring around us every day and are highly subjective. Each individual's perception and tolerance will influence the degree to which vibrations are a nuisance or objectionable. Humans and animals are far more sensitive to vibrations than a two-storey timber framed house, bridge or other structures.

Permanent Monitoring Units

West Calgary Ring Road			92 Cougarstone Manor SW, Calgary, AB		9555 2 Avenue SW, Calgary, AB		97 Cougar Ridge Close SW, Calgary, AB		130 Cougarstone Close SW, Calgary, AB		77 Cougar Ridge Close SW, Calgary, AB		128 Cougarstone Manor SW, Calgary, AB		152 Cougarstone Common SW, Calgary, AB		135 Cougarstone Common SW, Calgary, AB	
Blast Date:	Blast no.	Blast time:	PPV	AOP	PPV	AOP	PPV	AOP	PPV	AOP	PPV	AOP	PPV	AOP	PPV	AOP	PPV	AOP
17-Aug-20	WCRR-149	16:01	1.78mm/s	120.2dB(L)	1.27mm/s	117.8dB(L)	4.19mm/s	123.2dB(L)	0.64mm/s	110.2dB(L)	2.03mm/s	121.3dB(L)	2.03mm/s	114.6dB(L)	0.89mm/s	113.3dB(L)	0.89mm/s	109.5dB(L)
18-Aug-20	WCRR-150	16:18	1.91mm/s	120.2dB(L)	1.52mm/s	112.3dB(L)	8.13mm/s	124.7dB(L)	0.51mm/s	120.1dB(L)	5.59mm/s	122.6dB(L)	4.95mm/s	129.0dB(L)	0.89mm/s	114.0dB(L)	0.51mm/s	114.8dB(L)
19-Aug-20	WCRR-151	16:07	2.03mm/s	121.2dB(L)	0.89mm/s	111.8dB(L)	4.19mm/s	124.5dB(L)	0.64mm/s	105.5dB(L)	Communication with monitor interrupted		2.41mm/s	116.3dB(L)	0.89mm/s	113.3dB(L)	0.76mm/s	109.2dB(L)
20-Aug-20	WCRR-152	16:06	1.65mm/s	116.9dB(L)	0.51mm/s	108.4dB(L)	4.83mm/s	118.1dB(L)	0.51mm/s	105.5dB(L)	3.18mm/s	119.4dB(L)	4.83mm/s	116.4dB(L)	0.89mm/s	113.8dB(L)	1.02mm/s	107.5dB(L)

*Click on a highlighted cell to view the seismograph report for the corresponding date and location.

Date/Time Tran At 16:02:25 August 18, 2020
 Trigger Source Geo: 5.00 mm/s
 Range Geo: 254 mm/s
 Sample Rate 5.0 sec. At 1024 Sps
 Job Number 8177

Serial Number BE11251 V 10.72-8.17 MiniMate Plus
 Battery Level 6.6 Volts
 Unit Calibration October 23, 2019 by Instantel
 File Name M251ILFD.W10W

Notes
 Location: 97 Cougar Ridge Close SW, Calgary, AB
 Client: McCaw's Drilling and Blasting
 User Name: Explotech Engineering Ltd.
 General: Sandbagged on ground

Post Event Notes

Extended Notes

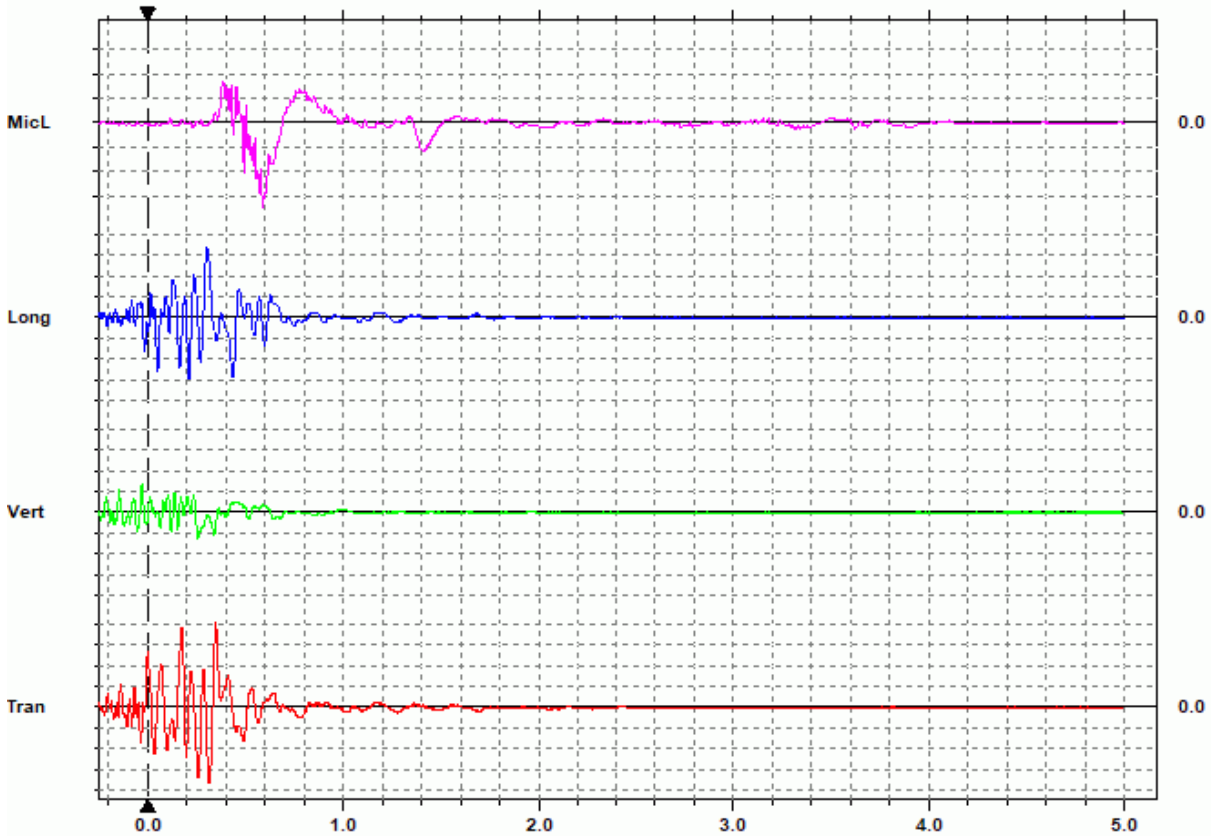
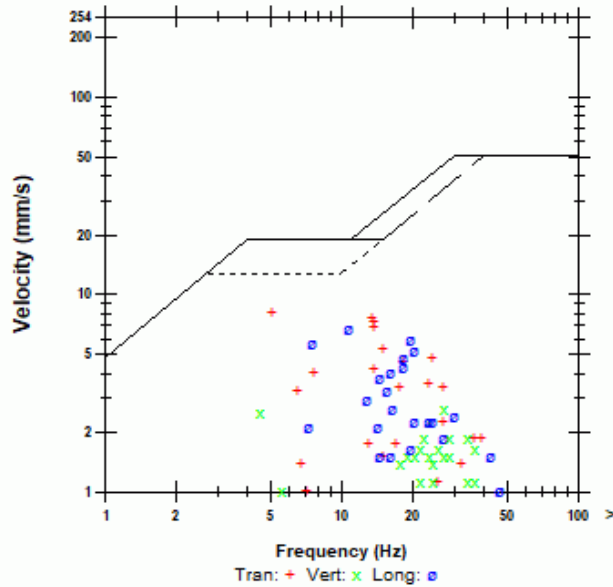
Combo Mode August 18, 2020 05:17:10
 Geophone is sandbagged under the stairs of the backyard deck at 97 Cougar Ridge Close SW adjacent ongoing blasting operations.

Microphone Linear Weighting
 PSPL 124.7 dB(L) at 0.589 sec.
 ZC Freq 2.7 Hz.
 Channel Test Disabled

	Tran	Vert	Long	
PPV	8.13	2.67	6.73	mm/s
ZC Freq	5.1	27	11	Hz
Time (Rel. to Trig)	0.349	-0.028	0.304	sec
Peak Acceleration	0.106	0.0530	0.0663	g
Peak Displacement	0.140	0.0701	0.0982	mm
Sensor Check	Disabled	Disabled	Disabled	

Peak Vector Sum 9.47 mm/s At 0.313 sec.

USBM R18507 And OSMRE



Time(Seconds) 0.20 sec/div Amplitude Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
 Trigger =

Date/Time Tran At 16:02:25 August 18, 2020
Trigger Source Geo: 5.00 mm/s
Range Geo: 254 mm/s
Sample Rate 5.0 sec. At 1024 Sps
Job Number 8177

Serial Number BE11251 V 10.72-8.17 MiniMate Plus
Battery Level 6.6 Volts
Unit Calibration October 23, 2019 by InstanTel
File Name M251ILFD.W10W

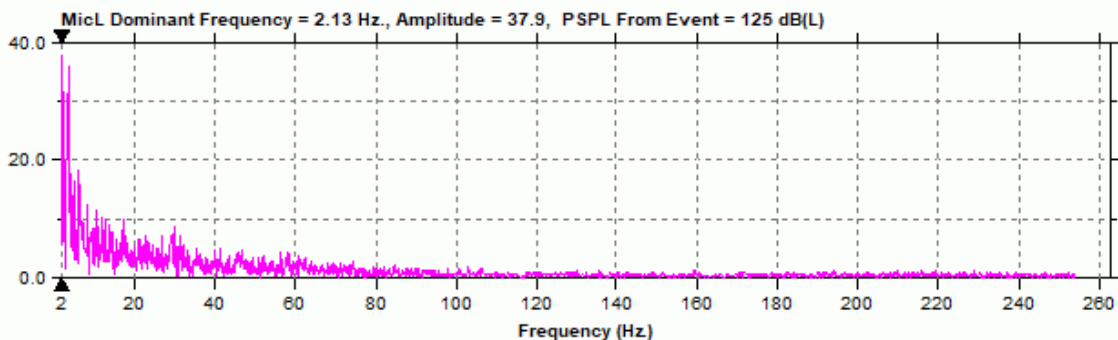
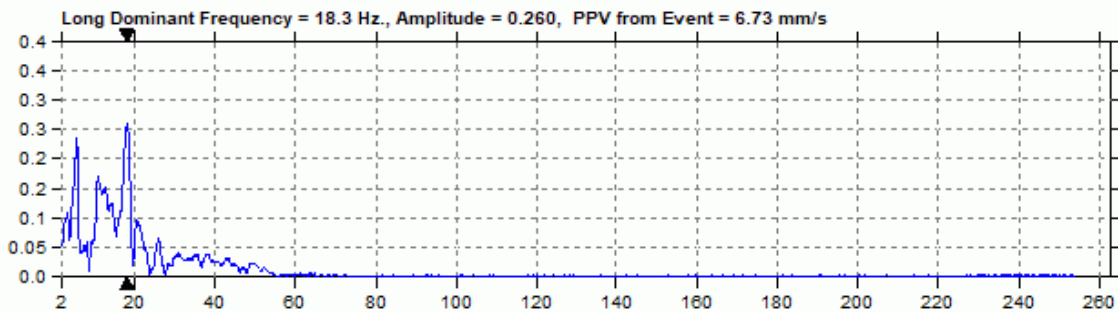
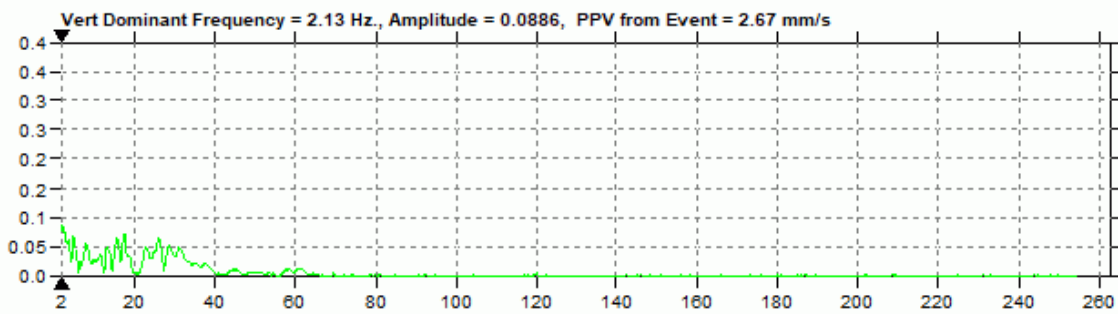
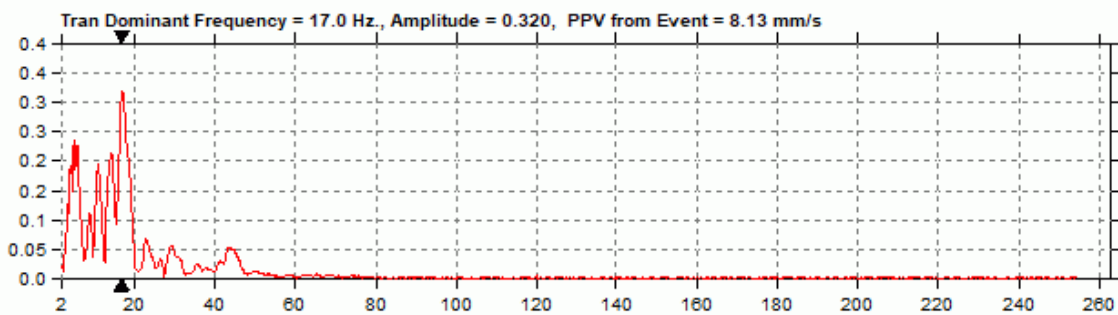
Notes

Location: 97 Cougar Ridge Close SW, Calgary, AB
Client: McCaw's Drilling and Blasting
User Name: Explotech Engineering Ltd.
General: Sandbagged on ground

Extended Notes

Combo Mode August 18, 2020 05:17:10
Geophone is sandbagged under the stairs of the backyard deck at 97 Cougar Ridge Close SW adjacent ongoing blasting operations.

Post Event Notes



Date/Time Tran At 16:02:46 August 18, 2020
 Trigger Source Geo: 5.00 mm/s
 Range Geo: 254 mm/s
 Sample Rate 5.0 sec. At 1024 Sps
 Job Number 8177

Serial Number BE16263 V 10.72-8.17 MiniMate Plus
 Battery Level 6.7 Volts
 Unit Calibration October 23, 2019 by Instantel
 File Name R263ILFD.WM0W

Notes

Location: 77 Cougar Ridge Close SW, Calgary, AB
 Client: McCaw's Drilling and Blasting
 User Name: Explotech Engineering Ltd.
 General: Sandbagged on ground

Post Event Notes

Extended Notes

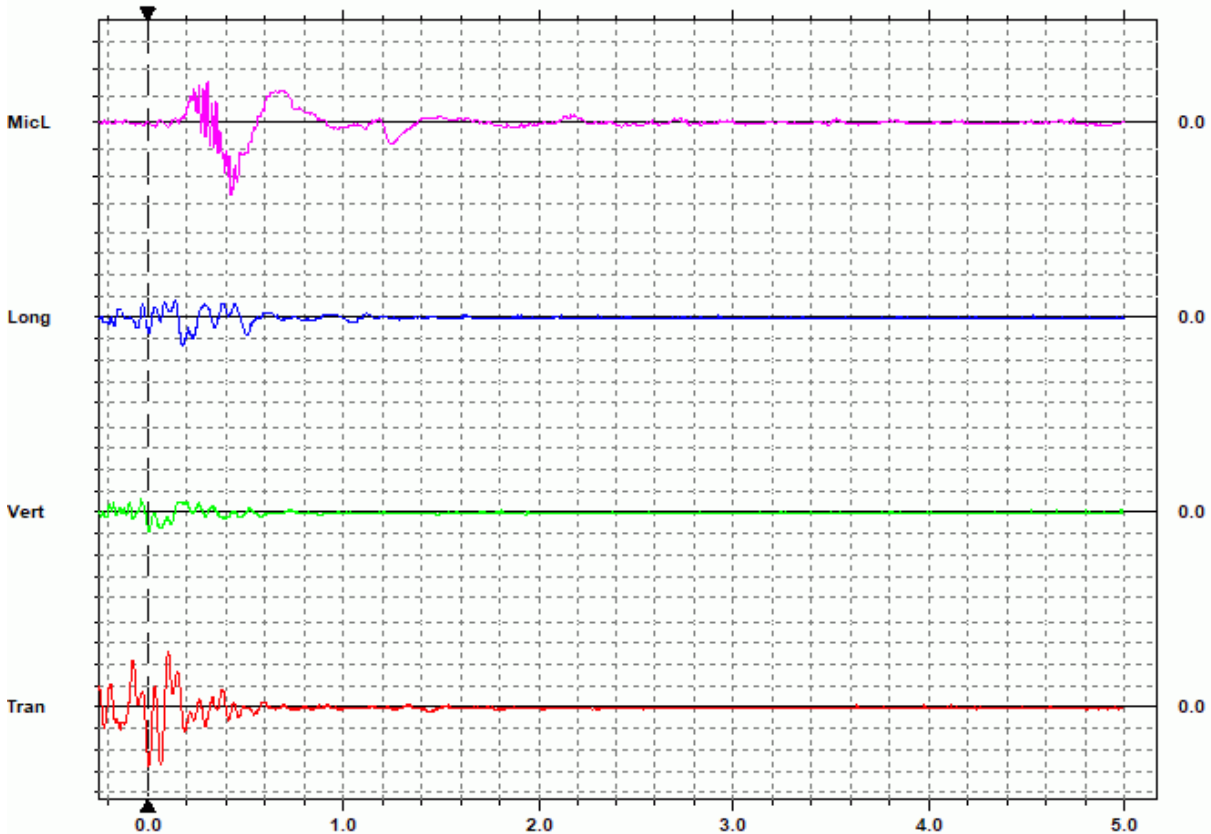
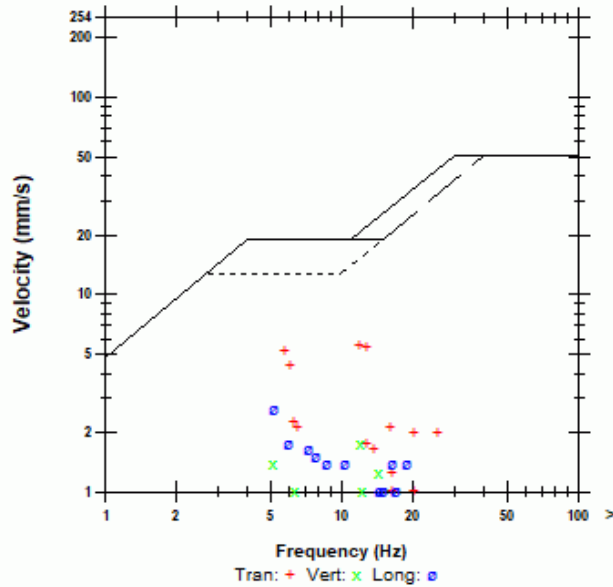
Combo Mode August 18, 2020 05:16:47
 Geophone is sandbagged along the Western wall in the backyard of 77 Cougar Ridge Close SW adjacent ongoing blasting operations.

Microphone Linear Weighting
 PSPL 122.6 dB(L) at 0.425 sec.
 ZC Freq 2.5 Hz
 Channel Test Disabled

	Tran	Vert	Long	
PPV	5.59	1.78	2.67	mm/s
ZC Freq	12	12	5.2	Hz
Time (Rel. to Trig)	0.005	0.004	0.178	sec
Peak Acceleration	0.0530	0.0398	0.0398	g
Peak Displacement	0.118	0.0454	0.0796	mm
Sensor Check	Disabled	Disabled	Disabled	

Peak Vector Sum 6.03 mm/s At 0.005 sec.

USBM R18507 And OSMRE



Time(Seconds) 0.20 sec/div Amplitude Geo: 2.00 mm/s/div Mic: 10.00 pa.(L)/div
 Trigger =

Date/Time Tran At 16:02:46 August 18, 2020
Trigger Source Geo: 5.00 mm/s
Range Geo: 254 mm/s
Sample Rate 5.0 sec. At 1024 Sps
Job Number 8177

Serial Number BE16263 V 10.72-8.17 MiniMate Plus
Battery Level 6.7 Volts
Unit Calibration October 23, 2019 by InstanTel
File Name R263ILFD.WM0W

Notes

Location: 77 Cougar Ridge Close SW, Calgary, AB
Client: McCaw's Drilling and Blasting
User Name: Explotech Engineering Ltd.
General: Sandbagged on ground

Extended Notes

Combo Mode August 18, 2020 05:16:47
Geophone is sandbagged along the Western wall in the backyard of 77 Cougar Ridge Close SW adjacent ongoing blasting operations.

Post Event Notes

