BLAST REPORT **BLAST REPORT #** SN1A

☐ Sanders Construction, Inc. ☒ Western States Drilling & Blasting, Inc.

DATE: 9-29-10 EXACT TIME OF SHOT: 6:08 pm

CUSTOMER: KLB JOB NO.: WS21005

SHOT LOCATION WITH GPS COORDINATES: 1344+00 - 1344+20 Presplit TICKET NO.:

1343+00 - 1343+40 Production CHECK LIST COMPLETED: YES NO

TYPE OF ROCK: Lapilli TUFF FACE HEIGHT: 24' FT. POUNDS PER DELAY: 11 max

TOTAL HOLES: 50

NUMBER OF HOLES: 21 Presplit HOLE DIA: 2.5" BxS - x 12" STEMMING: 2' DEPTH: 24'

NUMBER OF HOLES: 29 Production HOLE DIA: 2.5" BxS 4' x 5' STEMMING: 6' DEPTH: 10'-14'

POWDER FACTOR: LBS. OF EXPLOSIVES: YARDS OF ROCK: 257 yd³ / 504 LF PS

WEATHER: Partly Cloudy 65° WIND: Calm West

EXACT MONITOR LOCATION(GPS): See Seismic Reports DIRECTION OF BLAST: MONITOR TYPE: —

MONITOR: L/R — T — V — PVS — Db — MONITOR SERIAL NO.: —

DISTANCE TO BLAST: — AVERAGE POUNDS PER HOLE: — OPERATOR: —

EXACT MONITOR LOCATION(GPS): — DIRECTION OF BLAST: MONITOR TYPE: —

MONITOR: L/R — T — V — PVS — Db MONITOR SERIAL NO.: —

DISTANCE TO BLAST: — AVERAGE POUNDS PER HOLE: — OPERATOR: —

EXPLOSIVES

DESCRIPTION	QUANTITY USED		DATE CODE	MAGAZINE	REMOVED	RETURNED
LOCATION:						
BULK A/N		Lbs				
BAG ANFO		Bags				
POWDER		ea.				
POWDER 2x16 Fortel	140	ea.	22MA10J1		10cs	3cs/25K
3/4 lb. BOOSTER	28	ea.	01MA10A4		42	14
lb. BOOSTER		ea.				
24' ft. Hand.Delays	29	ea.	29MA10B4		63	34
12 ft. CTD ms 42	1	ea.	25JA10B2		50	49
ft.		ea.				
ft.		ea.				
ft.		ea.				
ft.		ea.				
ft. ms		ea.				
		ft.				
400 GRAIN CORD	82/15	lbs ft.	12MY08T4		1cs	.75cs
50 GRAIN CORD	160	ft./10lbs	31MY10J1		1 Roll	.75 Roll
MISCELLANEOUS						
7/8" Powersplit	5 lbs		100903		1cs	50 lbs
18 GRN Core	25' /	1 lbs	22FE10T4		1 Roll	.95 Roll

COMMENTS: 500 ms/ Delay Production first 500 ms later Presplit Shot well

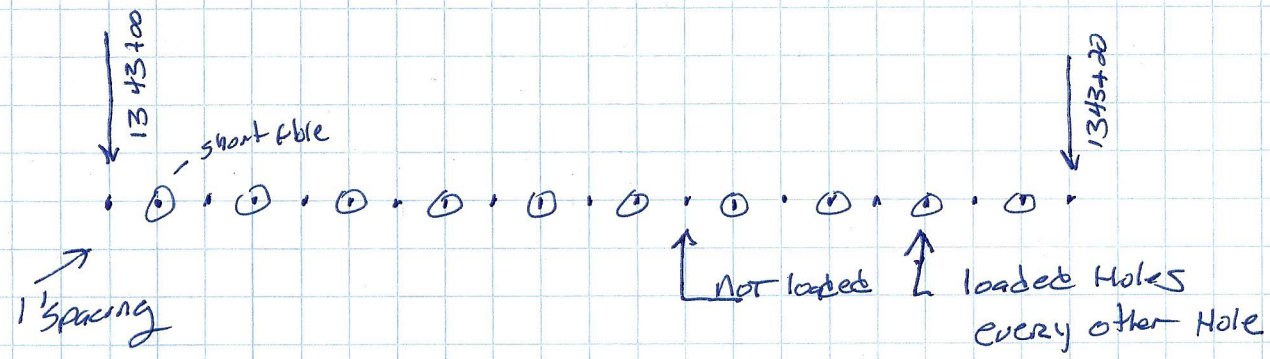
BLASTER'S SIGNATURE: Vic Bronson LICENSE NO.: U 21291

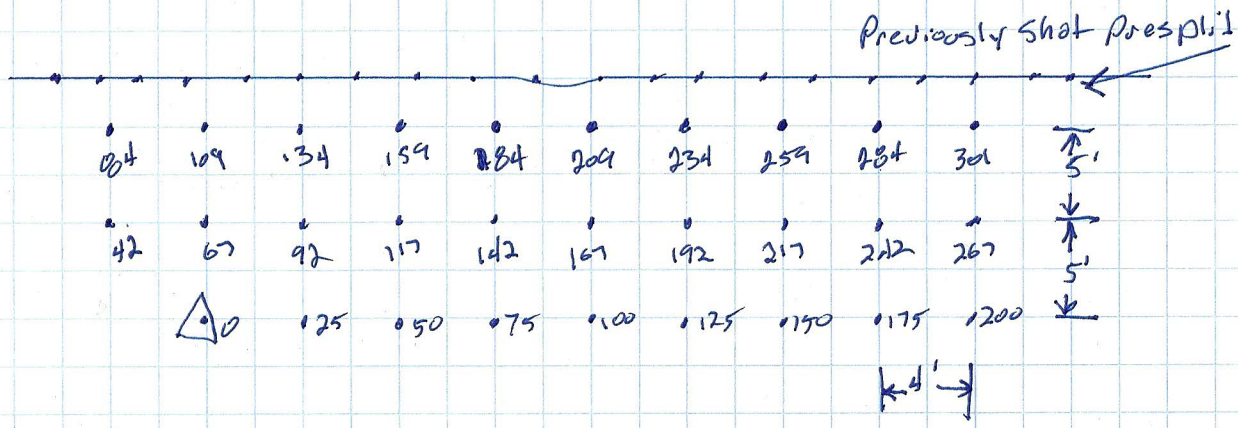
* ATTACH SKETCH OF SHOT

Revised 03/04 THIS FORM MUST BE FILLED OUT COMPLETELY

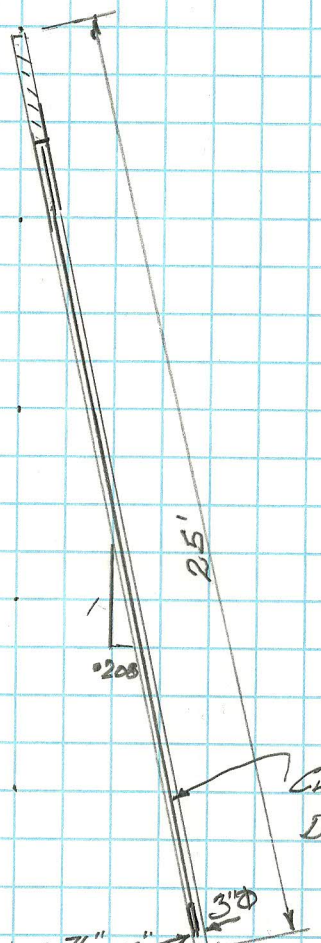
Plan View

Shot SN1A
6:10 pm
Sep. 29. 2010





Vic Bronson

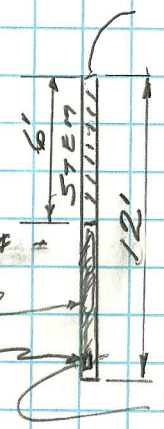


CHARGE 20' 400 GR
DET CORD = 1.31 # CHARGE WT.
BOREHOLE PRESSURE 4,075 PSI

2 STICKS 7/8" x 16"
POWER SPLIT BOTTOM CHARGE

TYPICAL LOADED PRESPLIT HOLE

SCALE 1" = 5'



CHARGE WT 11.# ±
ANFO
3/4# PENTEX BOOSTER
2 1/2" Φ BOREHOLE

IF WET 5 STICKS
2 x 16 = 11 lbs
Same Stemmg.

TYPICAL LOADED PRODUCTION HOLE

SCALE 1" = 5'

SubTerra, Inc.

Civil & Mining Engineering
Engineering Geology
Tunnel Engineering & Construction Management
Rapid Excavation/Support Systems
Active/Abandoned Mine Subsidence
Quality Assurance / Quality Control
Safety Monitoring of Structures
Blast Optimization / Vibration Monitoring
Mine & Quarry Permitting
Material Science / Laboratory Testing

Thursday, September 30, 2010

Mr. Charley Murphy
Western States Drilling & Blasting
Sent via email to charley@blastwest.com
Sent via email to blastervic@gmail.com

Re: I-90 Hyak to Snowshed Blast Monitoring

Dear Charley and Vic:

This letter summarizes the monitoring results for the blast in the vicinity of the soil nail wall at the I-90 widening project for Blast No. FN1A on September 29, 2010. Three seismographs were installed at the locations shown in the attached figure.

Blast FN1A was detonated on September 29, 2010 at 6:07 p.m. All seismographs triggered. Monitoring results are summarized below and Event Reports are attached.

1. Monitoring Point M1 – Seismograph BE9247 with high frequency geophone located 5-ft from nearest blast hole. M1 registered a Peak Particle Velocity of 8.75 in/sec in the vertical direction.
2. Monitoring Point M2 – Seismograph BE9248 with standard geophone located 50-ft from nearest blast hole. M2 registered a Peak Particle Velocity of 2.19 in/sec in the vertical direction.
3. Monitoring Point M3 – Seismograph BE10408 with wall-mount geophone anchored to soil nail wall 154-ft from nearest blast hole. M3 registered a Peak Particle Velocity of 0.325 in/sec in the vertical direction.

If you have any questions please do not hesitate to call us at 425-888-5425.

Sincerely,

Larry Leone
Project Engineer, SubTerra, Inc.

Enc: Blast Event Reports (3 ea).
Figure 1: Seismograph Layout

Post Office Box 520, 218 East North Bend Way, North Bend, WA 98045-0520
Phone (425) 888-5425 Web Site: www.subterra.us Email: info@subterra.us Fax (425) 888-2725

Event Report

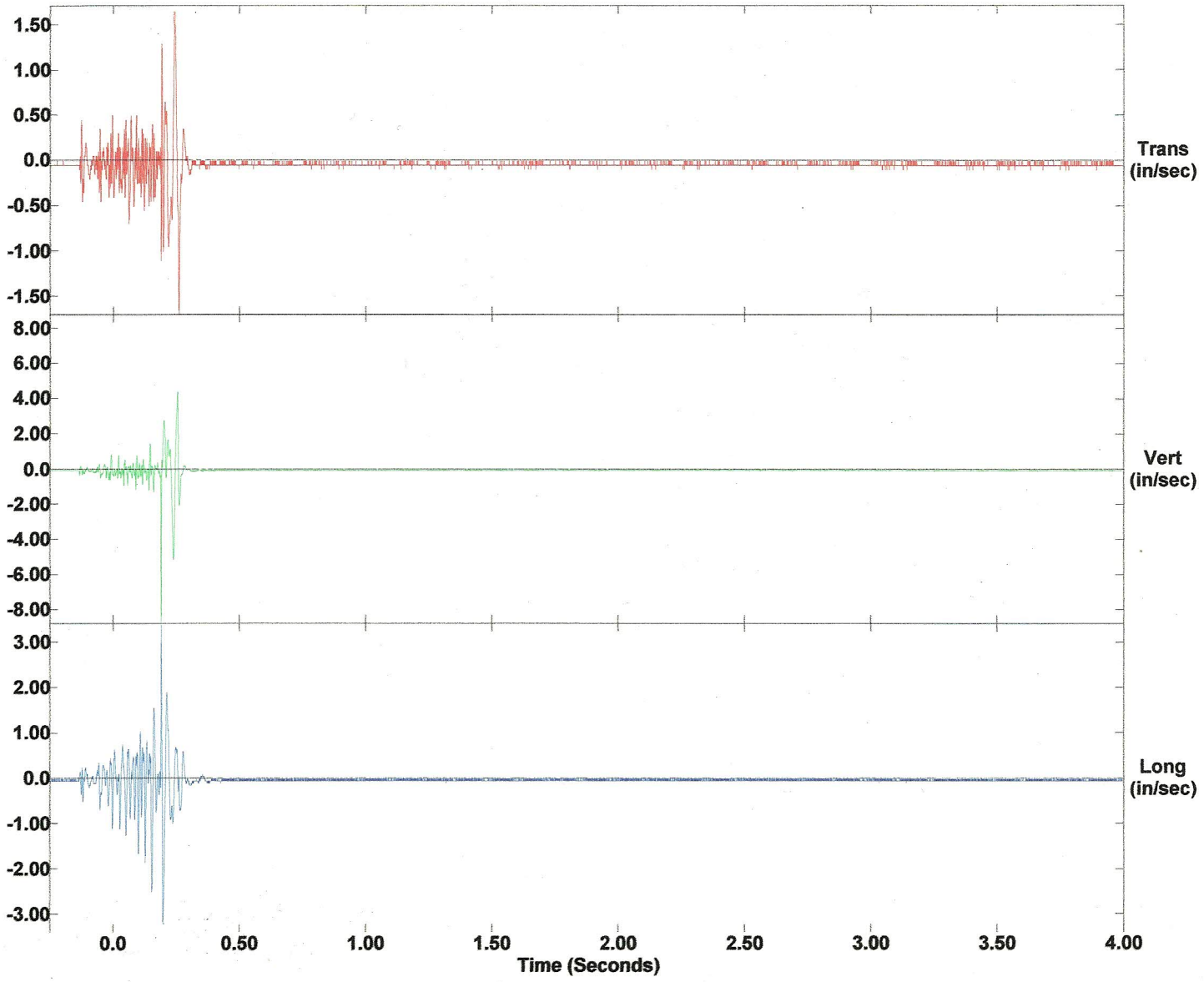
Date/Time Long at 18:07:52 September 29, 2010
Record Time 4.0 sec at 4096 sps

Serial Number BE9247 V 10.10-8.17 MiniMate Plus
Battery Level 6.3 Volts
Unit Calibration July 27, 2010 by Instantel Inc.
File Name K247DFOI.D40

Notes
Location: Snoqualmie Pass
Client: KLB Construction
Monitored By: SubTerra, Inc.
Unit Location: M1 - Near Field

Instal Details:
I-90 Widening Hyak to Snowshed.
Post Event Notes
Geophone was located 5 ft. from nearest blast hole.

Channel	Name	Peak	Time (sec)	Trigger Level	Gain	Range	Units
1	Trans	1.70	0.264	1.000	1x	100	in/sec
2	Vert	8.75	0.194	1.000	1x	100	in/sec
3	Long	3.40	0.194	1.000	1x	100	in/sec



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Event Report

Date/Time	Vert at 18:07:52 September 29, 2010
Trigger Source	Geo: 0.0600 in/s
Range	Geo : 10.00 in/s
Record Time	4.0 sec at 4096 sps
Notes	
Location:	Snoqualmie Pass
Client:	KLB Construction
Monitored By:	SubTerra Inc.
Unit Location:	M2 - 50 ft from blast

Extended Notes::
I-90 Widening Hyak to Snowshed.

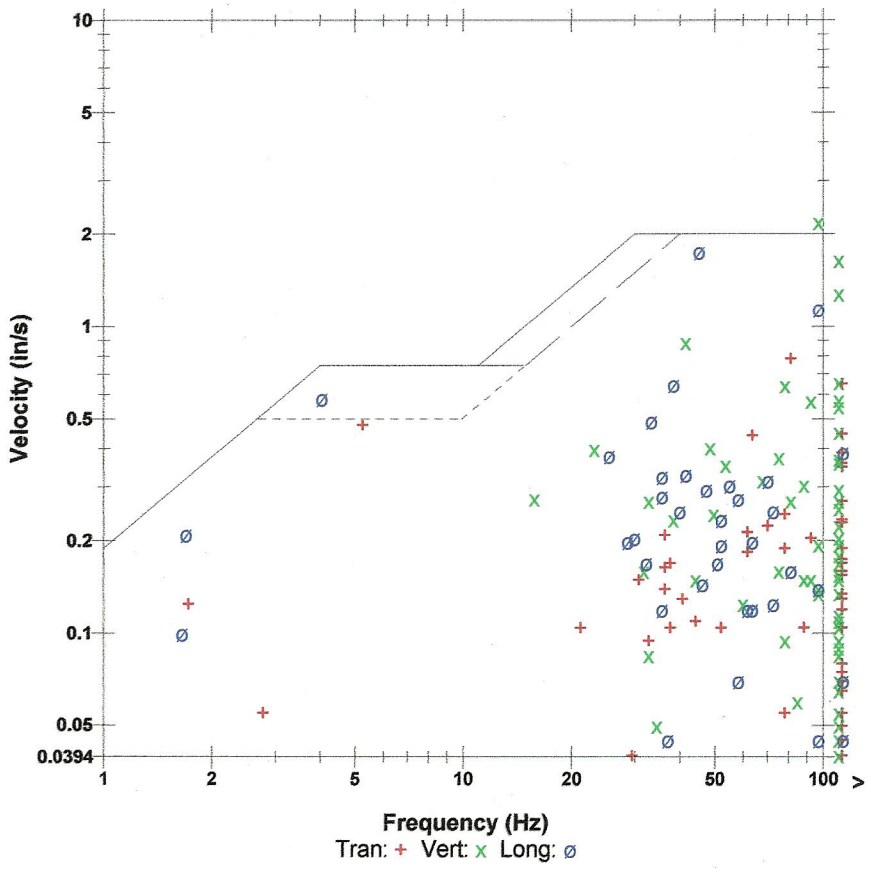
Microphone	Linear Weighting
PSPL	0.0571 psi(L) at 0.359 sec
ZC Freq	32.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 597 mv)

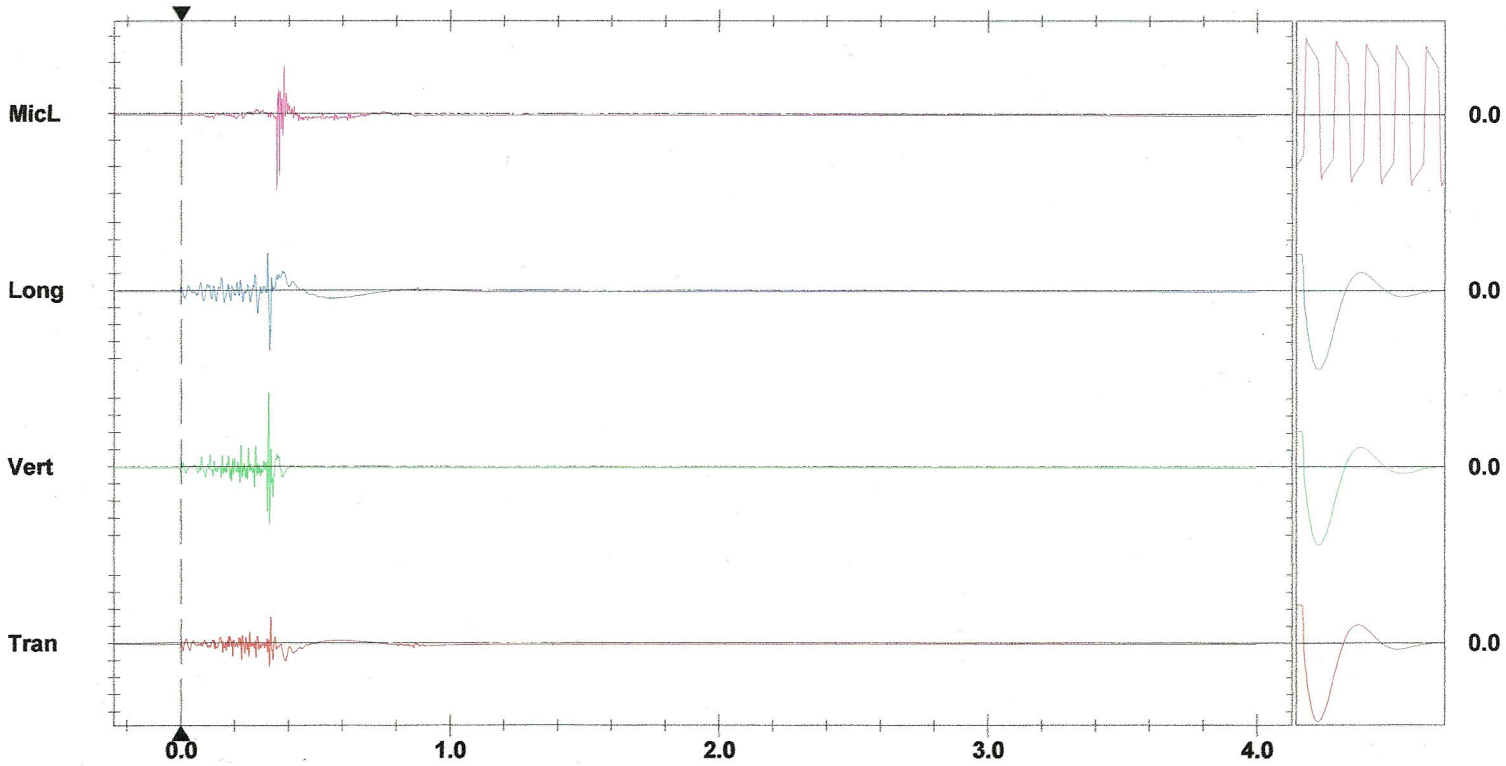
	Tran	Vert	Long	
PPV	0.790	2.19	1.76	in/s
ZC Freq	82	98	46	Hz
Time (Rel. to Trig)	0.338	0.329	0.333	sec
Peak Acceleration	1.27	4.77	2.01	g
Peak Displacement	0.0107	0.00368	0.0191	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.6	7.3	7.2	Hz
Overswing Ratio	4.0	3.8	4.2	

Peak Vector Sum 2.47 in/s at 0.333 sec

Serial Number	BE9248 V 8.12-8.0 MiniMate Plus
Battery Level	6.3 Volts
Unit Calibration	July 30, 2010 by Instantel Inc.
File Name	K248DFOI.D40

USBM RI8507 And OSMRE





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 in/s/div Mic: 0.0200 psi(L)/div Sensorcheck
Trigger = ▶—— ——◀

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Event Report

Date/Time Long at 18:07:53 September 29, 2010
Trigger Source Geo: 0.0600 in/s
Range Geo : 10.00 in/s
Record Time 4.0 sec at 4096 sps
Notes
Location: Snoqualmie Pass
Client: KLB Construction
Monitored By: SubTerra, Inc.
Unit Location: M3 - Soil Nail Wall

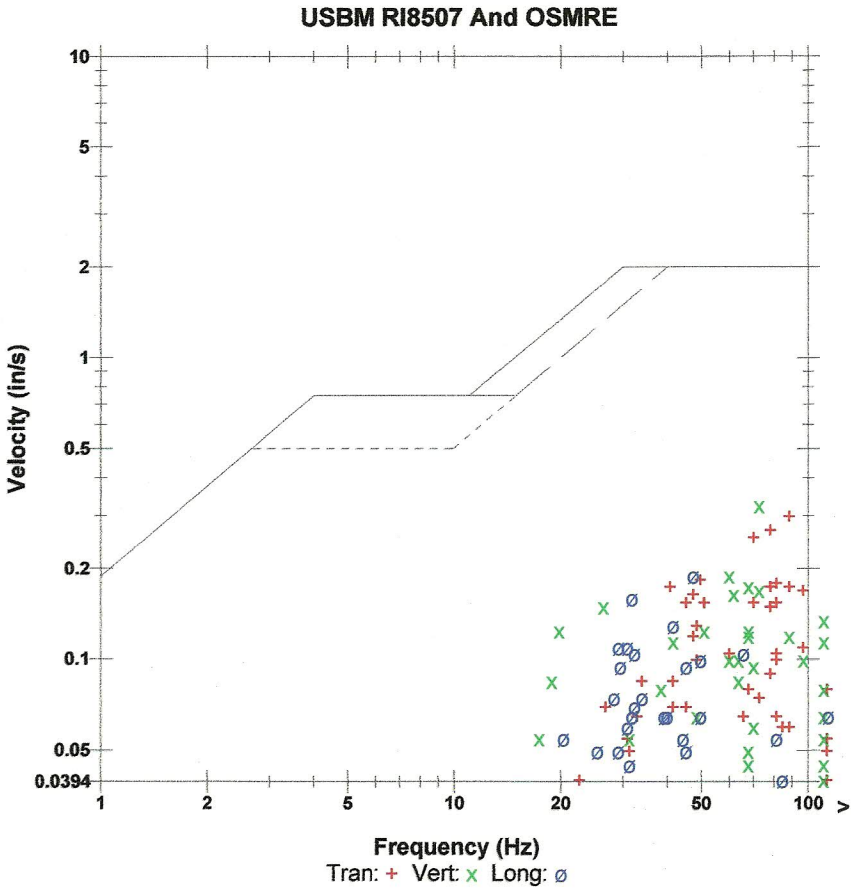
Serial Number BE10408 V 10.10-8.17 MiniMate Plus
Battery Level 6.4 Volts
Unit Calibration September 13, 2010 by Instantel Inc.
File Name L408DFOI.D50
Post Event Notes
Geophone was measured to be 154 ft. from the nearest blast hole.

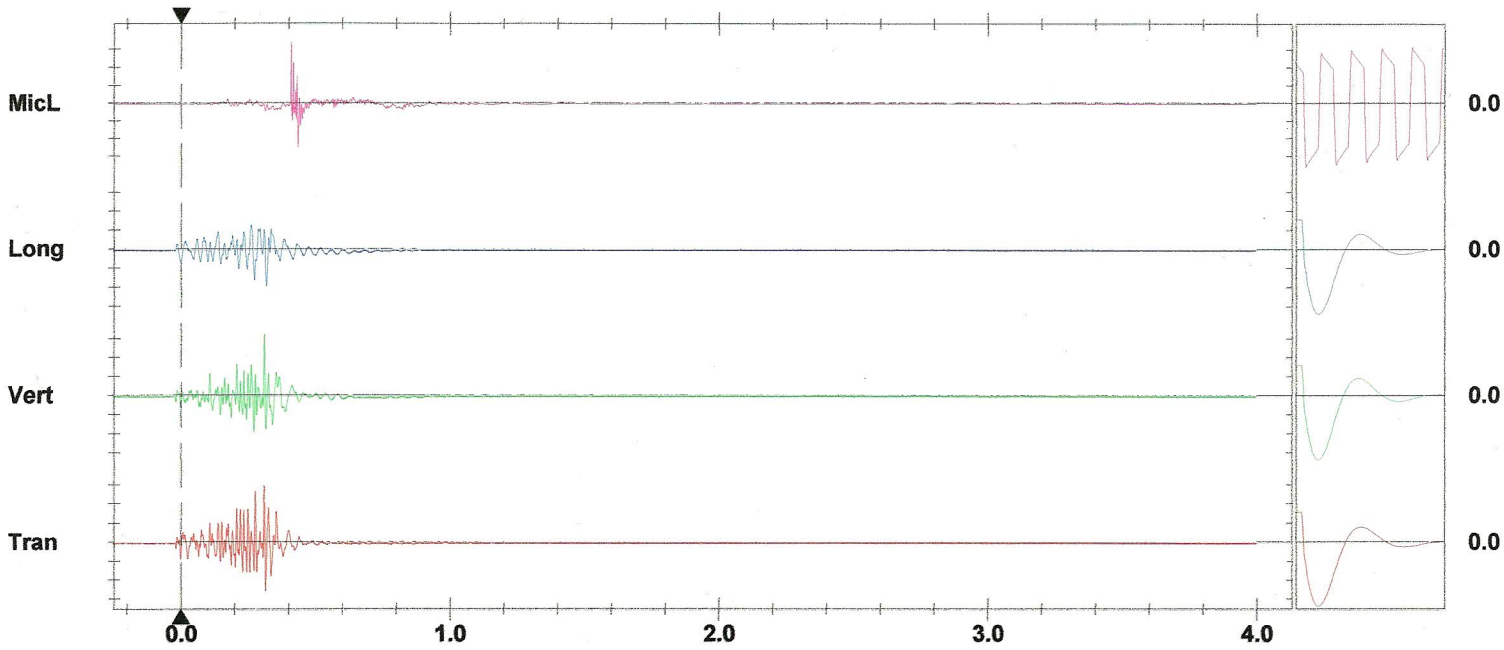
Extended Notes
I-90 Widening Hyak to Snowshed. Geophone attached to bracket on soil nail wall near snowshed.

Microphone Linear Weighting
PSPL 0.0172 psi(L) at 0.412 sec
ZC Freq 79 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 597 mv)

	Tran	Vert	Long	
PPV	0.300	0.325	0.190	in/s
ZC Freq	89	73	48	Hz
Time (Rel. to Trig)	0.313	0.313	0.321	sec
Peak Acceleration	0.477	0.424	0.212	g
Peak Displacement	0.00059	0.00091	0.00065	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.2	7.6	7.3	Hz
Overswing Ratio	4.0	3.6	4.0	

Peak Vector Sum 0.452 in/s at 0.313 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.100 in/s/div Mic: 0.00500 psi(L)/div Sensorcheck
Trigger = ▶—— ——◀

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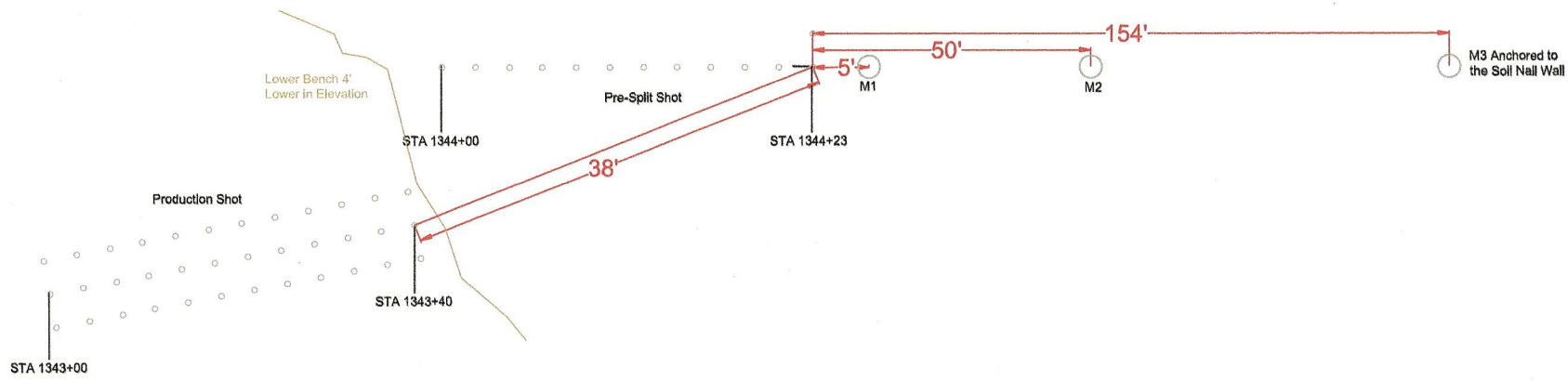

M1 - Near Field, Hi Frequency Unit
M2 - 50' Ft. away from Nearest Drill Hole
M3 - Anchored to Soil Nail Wall

HORIZONTAL SCALE	1"=10'
VERTICAL SCALE	Same
DESIGNED	
DATE	BY
03-03-09	LL
DRAWN	
DATE	BY
03-03-09	KJB

SubTerra, Inc.®
P.O. Box 520, 218 East North Bend Way, North Bend WA 98045
Telephone: (425) 888-5425 E-mail: SubTerra@subterra.us Fax: (425) 888-2725

Seismograph Layout
Blast Monitoring I-90 Hyak
September 29, 2010
Production and Pre-Split Shot
Blast# FN1A

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