BLAST REPORT **BLAST REPORT #** 50

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

DATE: OCT 5, 2010 EXACT TIME OF SHOT:

CUSTOMER: KLB JOB NO.: WS21005

SHOT LOCATION WITH GPS COORDINATES: PROD. 1342 - 1342+75 TICKET NO.:

PRESPLIT 1342 - 1343 CHECK LIST COMPLETED: (YES) NO

TYPE OF ROCK: LAPILLI TUFF FACE HEIGHT: 24 FT. POUNDS PER DELAY:

TOTAL HOLES:

NUMBER OF HOLES: 41 PRESPLIT HOLE DIA: 3 BxS 30"c/c STEMMING: 5' DEPTH: 27' 110# WE

NUMBER OF HOLES: 18 HOLE DIA: 3 BxS 6 x 6 STEMMING: 6 DEPTH: 26

POWDER FACTOR: .93 LBS. OF EXPLOSIVES: 584# 275# PRESPLIT YARDS OF ROCK: 624

WEATHER: CLEAR WIND: CALM

EXACT MONITOR LOCATION(GPS): SEE ATTACHED 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	AMEX 8 Bags	08SEP10		20	12
POWDER POWERSTP 1/8	5Cs ea.	10/09/03		5Cs	0
POWDER MFRAC 1/4 x 8	14 ea.			1Cs	152 ST
3/4 lb. BOOSTER	7 ea.	01MA10A4		17	10
lb. BOOSTER	ea.				
24 ft. H. DET	8 ea.	29MA10A4		63	55
40 ft. H. DET	12 ea.	12JY10B4		31	19
12 ft. CTO 42	3 ea.	25JA10B4		102	99
MSC ft. 17	5 ea.	12JA09B4		5	0
ft.	~~5~~ ea.	#		~~5~~	~~0~~
ft.	ea.				
ft. ms	ea.				
FORTEX 2x16	3Cs+9ST ft.	22MA10J1			
50 GRAIN CORD	~~22FE~~ 300' ft.	22FE06T4		1RL	300'
25 GRAIN CORD	50 ft.	31MY06T4		1RL	1RL - 50'
MISCELLANEOUS					

COMMENTS: 2 40' HANDIDETS USED TO SHOOT PRESPLIT LINE

BLASTER'S SIGNATURE: [signature] LICENSE NO.: UP 21262

Revised 03/04 **ATTACH SKETCH OF SHOT** THIS FORM MUST BE FILLED OUT COMPLETELY

PROPOSED BLASTING PLAN

Hyak Wa. I 90

Company KLB Date Oct 5, 2010 Shot # 50

Location of Blast Production 1342 - 1342+75 Presplit 1342 - 1343

Date of Blast Planned Oct 5, 20 Time of Blast 6:00 Rock Type Lapilli Tuff

Name of Blaster Vic Bronson License Number UR1291

Direction N Distance 110 Feet From I-90 Westbound

# of Pre-Split Holes 41 Spacing 30" Depth 27 Slope .25/1 Charge WT 7# LF Drilled 1107 Stem 5'

Holes 25 Burden 6 ft Spacing 6 ft Depth 26 Diameter 3" Stemming 6½

Holes____ Burden____ ft Spacing____ ft Depth____ Diameter____ Stemming____

Holes____ Burden____ ft Spacing____ ft Depth____ Diameter____ Stemming____

Rows____ Bench Height____ ft Yield____ cu/yds Subdrilling____

Type Stemming Crushed Stone Max Weight of Explosives per Delay Max 53#

Explosives Type and Estimated Quantity's

Anfo 1200 lbs Primer's 3/4 lbs/ea Pre-Split Powder 250# lbs

Stick Powder Type 2" Fortel Amount ? lbs

Stick Powder Type____ Amount____ lbs

Stick Powder Type____ Amount____ lbs

Hole to Hole Delay____ MS Row to Row Delay____ MS

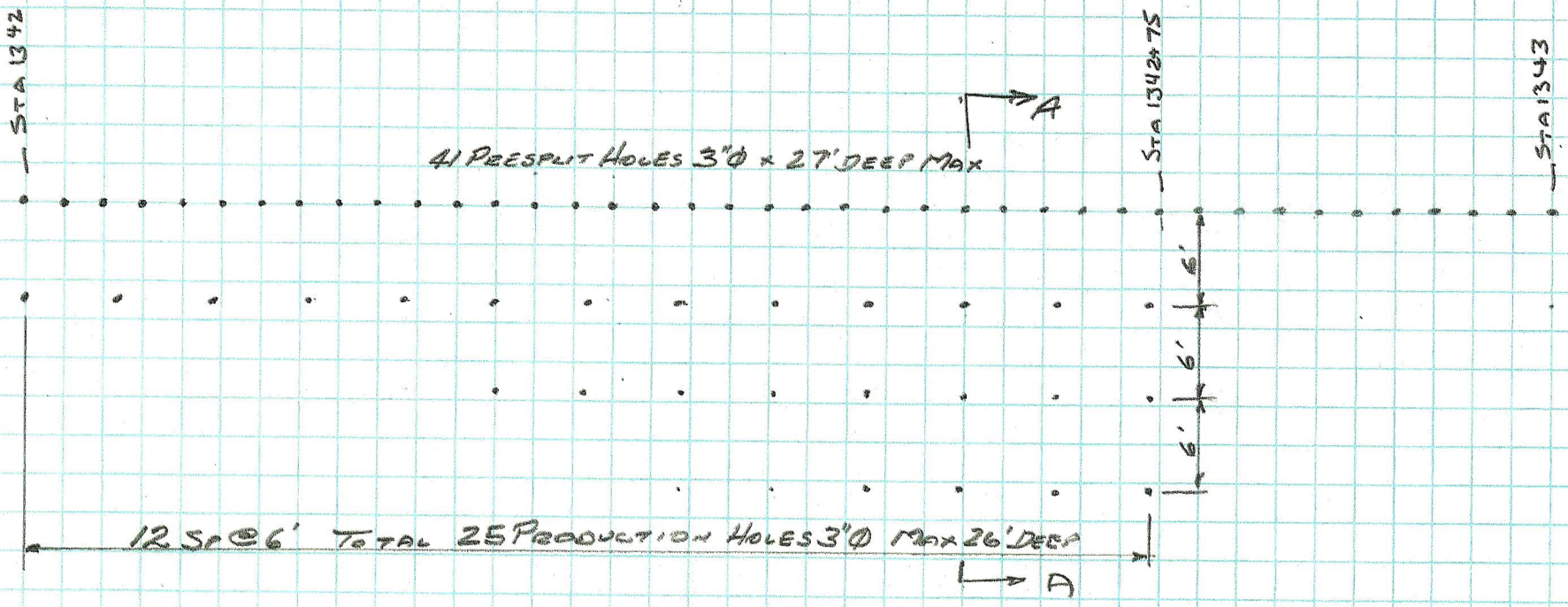
Total Weight of Explosives 1450 lbs Estimated Powder Factor ≈ 1 lbs cu/yd

Method of Initation Non Elec Type of Detonator & Delay 25/500 Handi Det

Notes:

Plan Submitted By Charles Murphy Date Oct 5, 2010

Note: Production blast holes will only be fired if pre-split line is blasted in combination or prior to the blast for a distance of 30 feet at the beginning and end of production blasting.



PROPOSED BLAST # 50

SECTION A
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

Wednesday, October 06, 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 the blast on October 5, 2010. Three seismographs were installed at the locations shown in the attached figure.

The blast was detonated on October 5, 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 presplit blast hole. M1 registered a Peak Particle Velocity of 27.6 in/sec in the longitudinal direction. PLS NOTE THIS READING IS 5' IN FRONT OF THE PRESPLIT LINE (NOT BEHIND)
2. Monitoring Point M2 – Seismograph BE9248 with standard geophone located 50-ft from nearest presplit blast hole. M2 registered a Peak Particle Velocity of 1.74 in/sec in the vertical direction.
3. Monitoring Point M3 – Seismograph BE10408 with wall-mount geophone anchored to soil nail wall 222-ft from nearest presplit blast hole. M3 registered a Peak Particle Velocity of 0.340 in/sec in the transverse 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

SubTerra, Inc.

Blast Vibration Report

SubTerra, Inc.
North Bend, WA
425.888.5425

Date: 10/5/2010 Time of Blast: 6:07pm am / (pm) Blast Number:
Client: KLB / Sanders Project Number: 2010-24
Project: I-90 Hyak City, State, Zip:
Shot Location: Snoqualmie Pass

PreSplit Pattern 1 - No. Holes: 33 Burden-Ft: 1 row Spacing-Ft: 3 No. Decks: Max.W-Lbs: 38 lbs
Production Pattern 2 - No. Holes: 63 Burden-Ft: 5 Spacing-Ft: 3 No. Decks: Max.W-Lbs: 50 lbs
Pattern 3 - No. Holes: Burden-Ft: Spacing-Ft: No. Decks: Max.W-Lbs:
Distance to Nearest Structure-Ft: 222' Identify Structure: Soil nail Wall
Weather Conditions - Temperature-°F: mid 50s Wind: Clouds: Partly

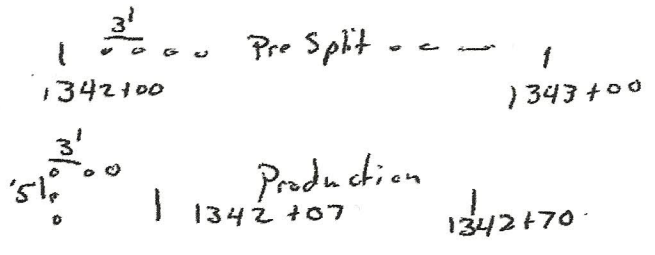
Instrument Setup Summary

Unit Location	Seismograph Serial Number	Calibration Date	Sampling Rate	Geo Trigger Level (in/s)	Maximum Range (in/s)	Record Time (sec)	Geophone Orientation
M1	9247	7/27/11	~~1024~~ 4096	1 in/sec	100	4	North
M2	9248	7/30/11	4096	.06 in/sec	10.0	4	West
M3	10408	09/13/11	4096	.06	10.0	4	Wall Mount
M4							
M5							
M6							

Vibration Record Summary

Unit Location	Recording Date	Recording Time	Time Rel. to Trigger	PPV (in/s)	Peak Long Chan	Freq. (Hz)	Distance to Shot (ft)	Max. Lbs. per Delay	SD
M1	10/5/10	6:06	.046 sec	—	~~27.6~~	—	5'	38/50	0.7
M2	10/5/10	6:06	.133 sec	1.74	Vert	36.6	50'	38/50	7.1
M3	10/5/10	6:06	.071 sec	0.34	Trans	22	222'	38/50	31
M4									
M5									
M6									

Layout Sketch



Robert Biggs
Seismograph Operator, Print.

Seismograph Operator, Sign.

10/5/2010
Date Signed.

Instantel

Event Report

t

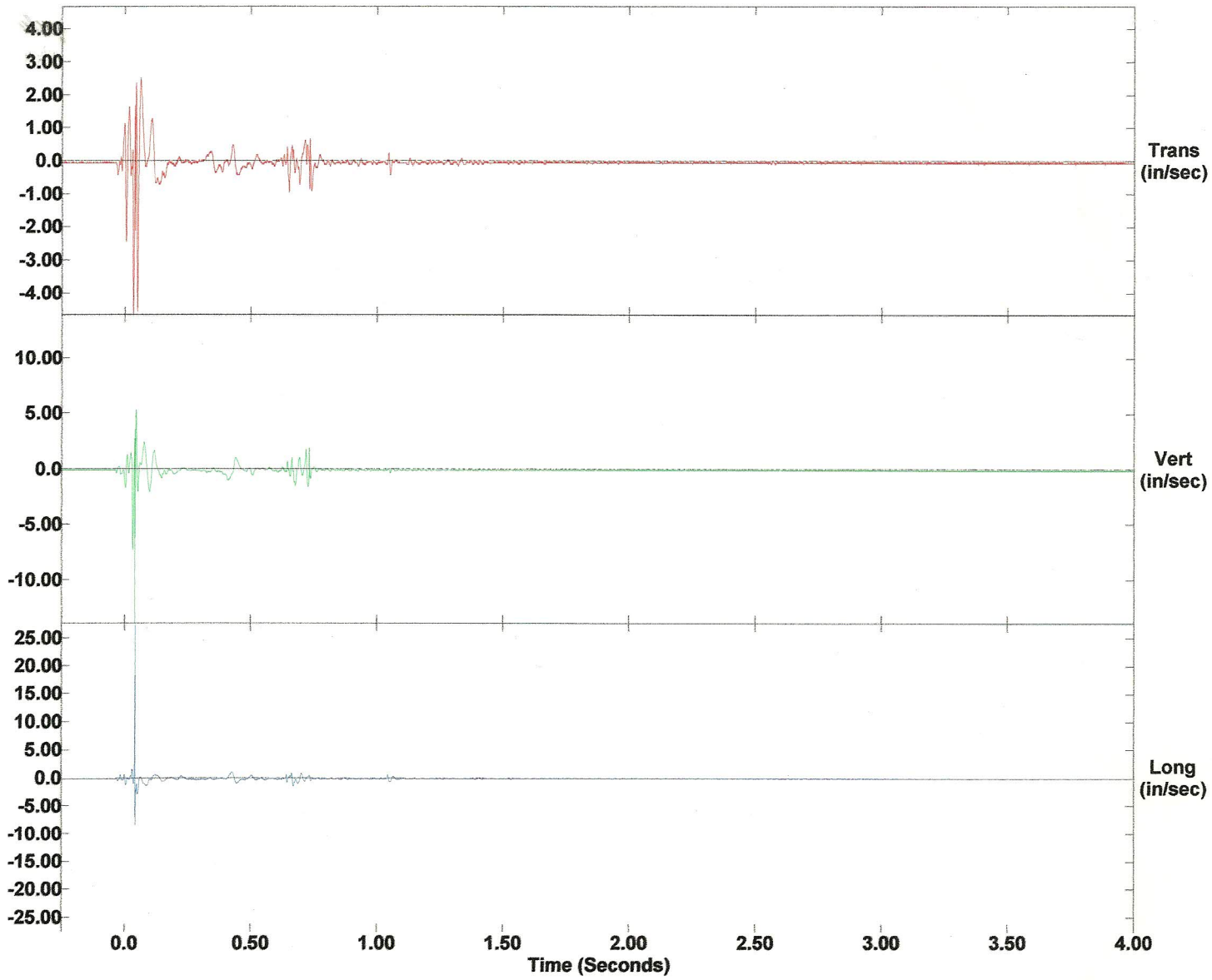
Date/Time Trans at 18:06:53 October 5, 2010
Record Time 4.0 sec at 4096 sps

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 K247DFZM.BH0

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 the nearest blast hole.

Channel	Name	Peak	Time (sec)	Trigger Level	Gain	Range	Units
1	Trans	4.65	0.036	1.000	1x	100	in/sec
2	Vert	13.9	0.044	1.000	1x	100	in/sec
3	Long	27.6	0.046	1.000	1x	100	in/sec



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Event Report

Date/Time	Vert at 18:06:50 October 5, 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.

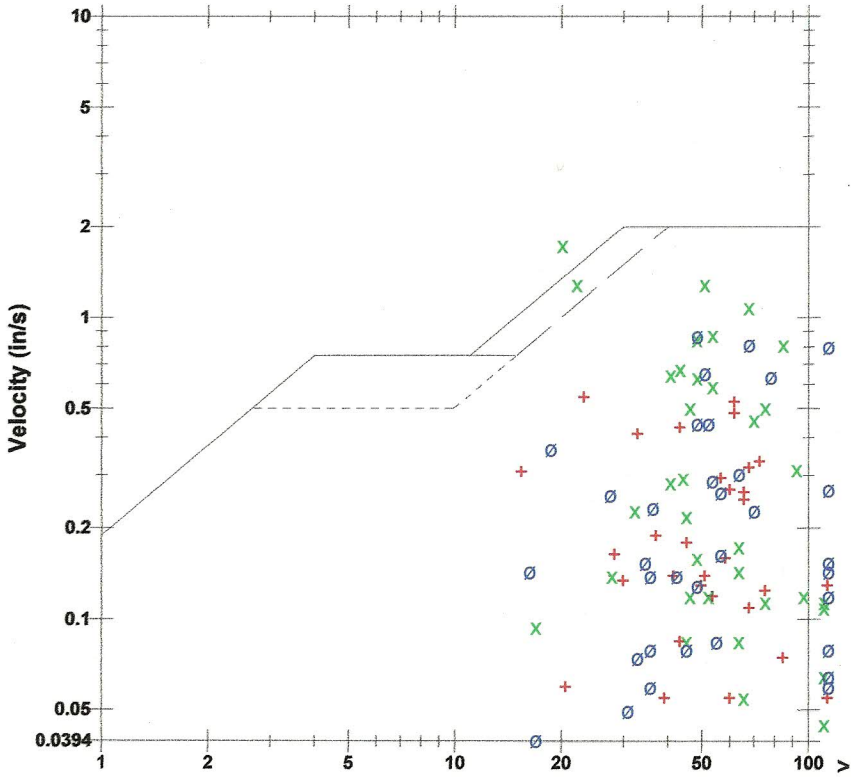
Microphone	Linear Weighting
PSPL	*** psi(L) at 0.114 sec
ZC Freq	36.6 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 652 mv)

	Tran	Vert	Long	
PPV	0.550	1.74	0.875	in/s
ZC Freq	23.3	20.3	49	Hz
Time (Rel. to Trig)	0.117	0.133	0.083	sec
Peak Acceleration	0.583	1.96	1.54	g
Peak Displacement	0.00335	0.00936	0.00293	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.5	7.4	7.2	Hz
Overswing Ratio	4.2	3.8	4.3	

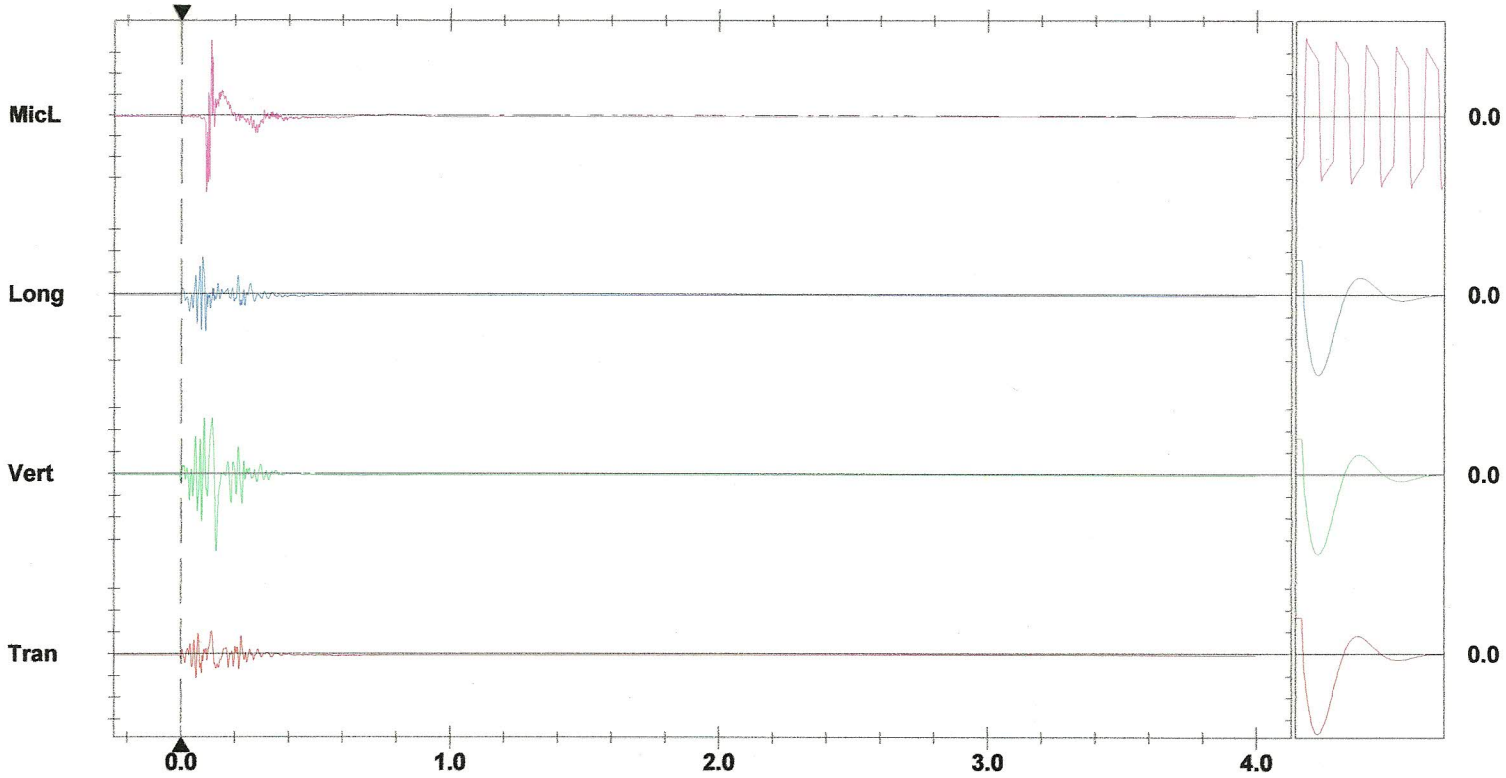
Peak Vector Sum 1.77 in/s at 0.134 sec
***** : Out of Range**

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	K248DFZM.BE0

USBM RI8507 And OSMRE



Tran: + Vert: x Long: ø



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 18:06:56 October 5, 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

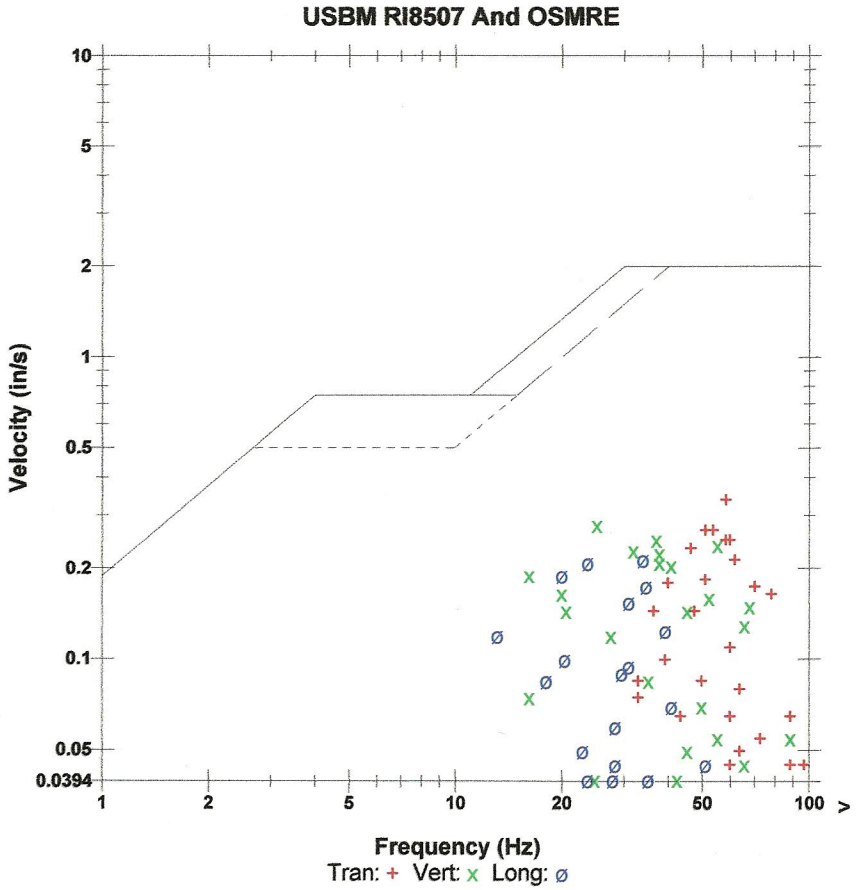
Serial Number BE10408 V 10.10-8.17 MiniMate Plus
Battery Level 6.4 Volts
Unit Calibration September 13, 2010 by Instantel Inc.
File Name L408DFZM.BK0
Post Event Notes
Geophone was measured to be 222' from the nearest blast hole.

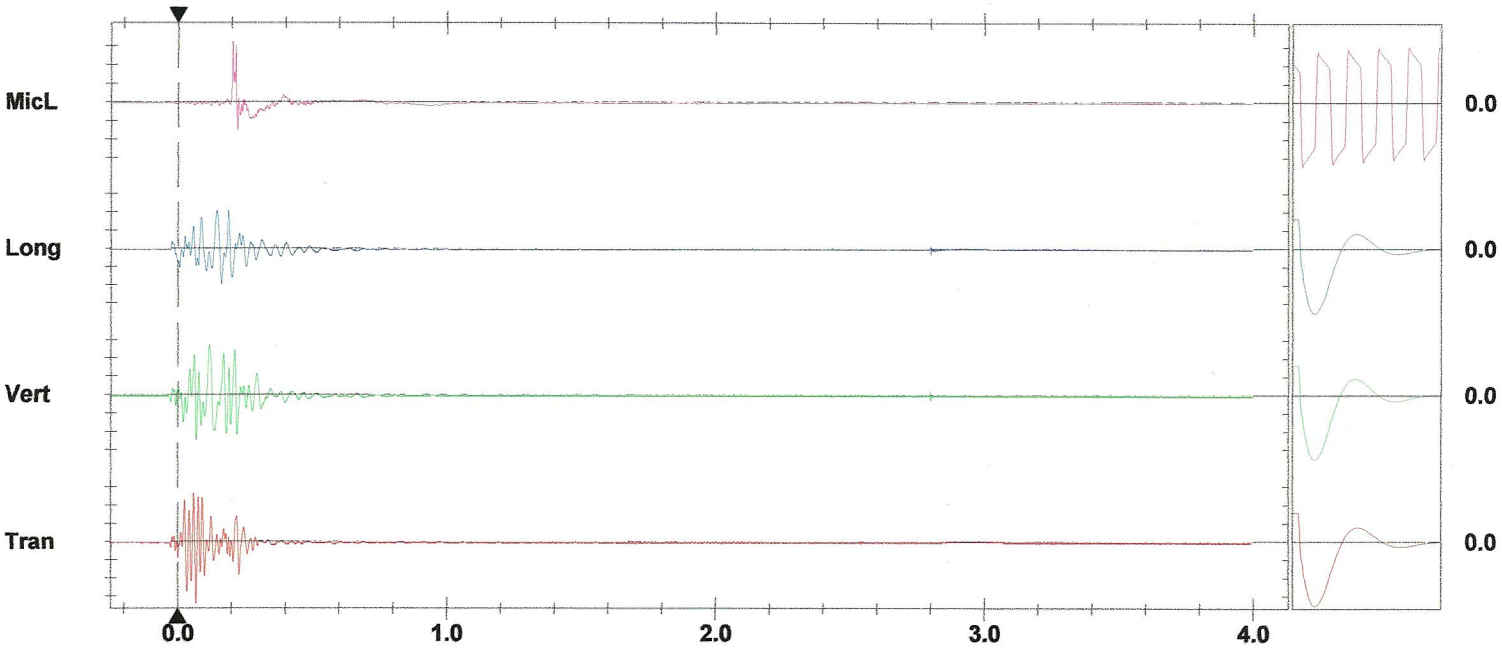
Extended Notes
I-90 Widening Hyak to Snowshed. Geophone attached to bracket on soil nail wall near snowshed.

Microphone Linear Weighting
PSPL 0.0165 psi(L) at 0.208 sec
ZC Freq 22.0 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 626 mv)

	Tran	Vert	Long	
PPV	0.340	0.280	0.215	in/s
ZC Freq	59	25.3	34.1	Hz
Time (Rel. to Trig)	0.071	0.121	0.192	sec
Peak Acceleration	0.318	0.265	0.159	g
Peak Displacement	0.00091	0.00173	0.00137	in
Sensorcheck	Passed	Passed	Passed	
Frequency	7.2	7.6	7.3	Hz
Overswing Ratio	4.1	3.6	4.0	

Peak Vector Sum 0.423 in/s at 0.072 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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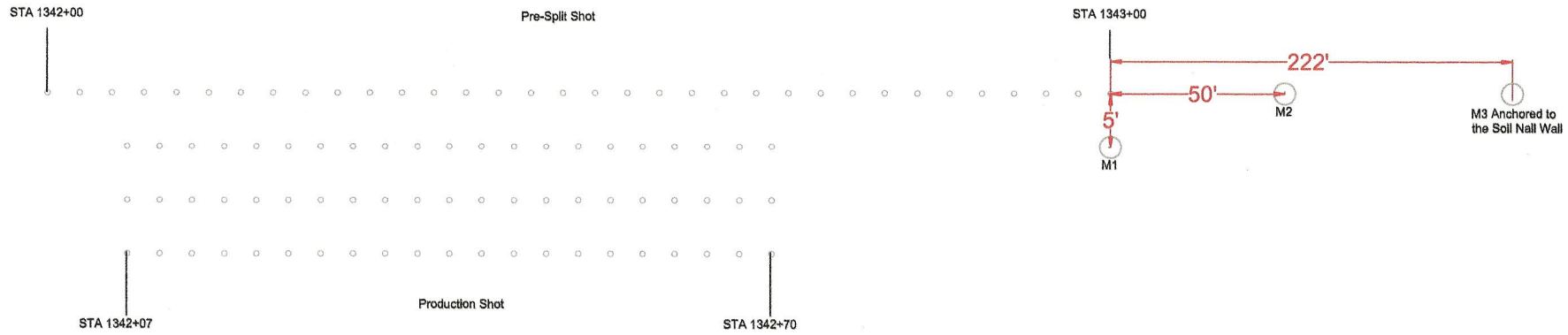

M1 - Near Field, Hi Frequency Unit
M2 - 50' Ft. away from Nearest Drill Hole
M3 - Anchored to Soil Nail Wall

HORIZONTAL SCALE	1"=10'
VERTICAL SCALE	Same
DESIGNED	
DATE	BY
00-00-00	LL
DRAWN	
DATE	BY
00-00-00	RJB

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
October 5th, 2010
Production and Pre-Split Shot

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