Appendix A Receptor Locations and Evaluated Noise Barrier Locations

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SOAPSTONE CONNECTOR, Fairfax County Project Number: 2G40-078







- Noise Measurement Site
- Impacted and Benefited
- Impacted and Not Benefited
- Not Impacted and Benefited
- Not Impacted and Not Benefited
- **---** Evaluated Barrier-Feasible and Not Reasonable
- Evaluated Barrier-Feasible and Reasonable
- 66 dBA L_{eq(h)} Noise Contour
- --- Common Noise Environment (CNE) Areas

Proposed Roadway Pavement

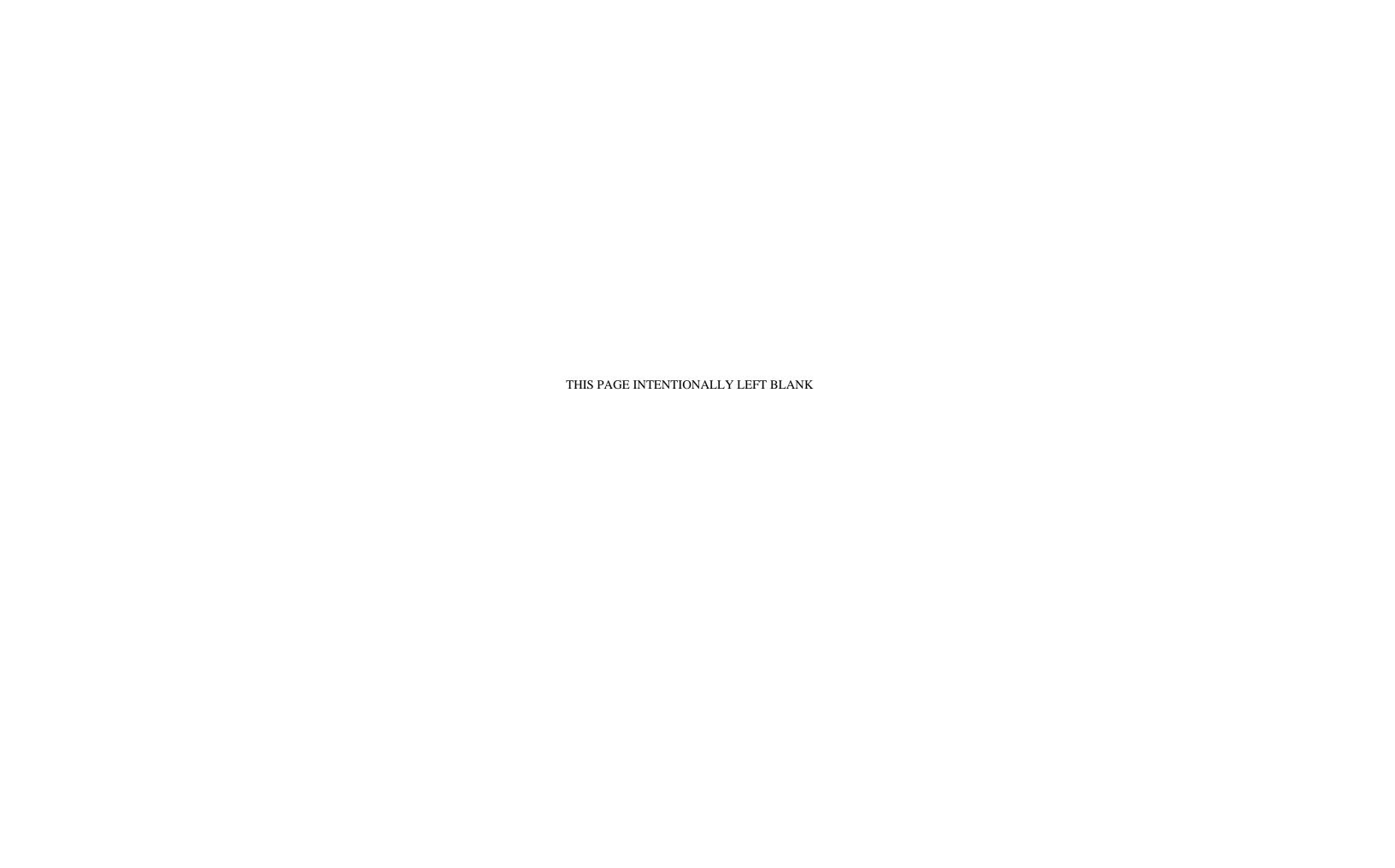
Proposed Bridge

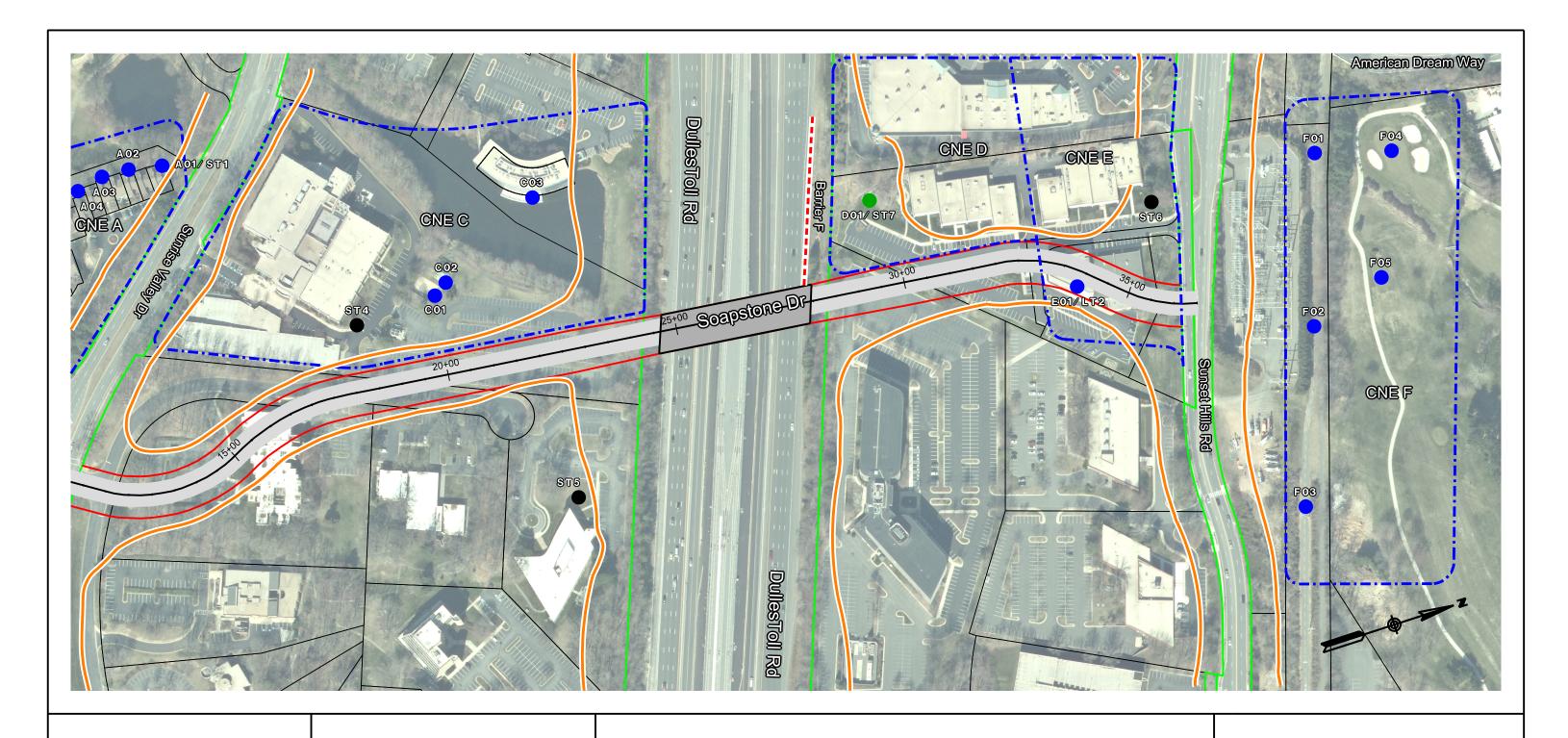
Parcels

Existing Right-of-Way

Propsed Right-of-Way

Figure 1
Build Alternative Noise Prediction
Locations/Category and Potential
Noise Barriers
Alternatives 1 & 2





SOAPSTONE CONNECTOR, Fairfax County Project Number: 2G40-078







- Noise Measurement Site
- Impacted and Benefited
- Impacted and Not Benefited
- Not Impacted and Benefited
- Not Impacted and Not Benefited
- **---** Evaluated Barrier-Feasible and Not Reasonable
- Evaluated Barrier-Feasible and Reasonable
- 66 dBA L_{eq(h)} Noise Contour
- --- Common Noise Environment (CNE) Areas

Proposed Roadway Pavement

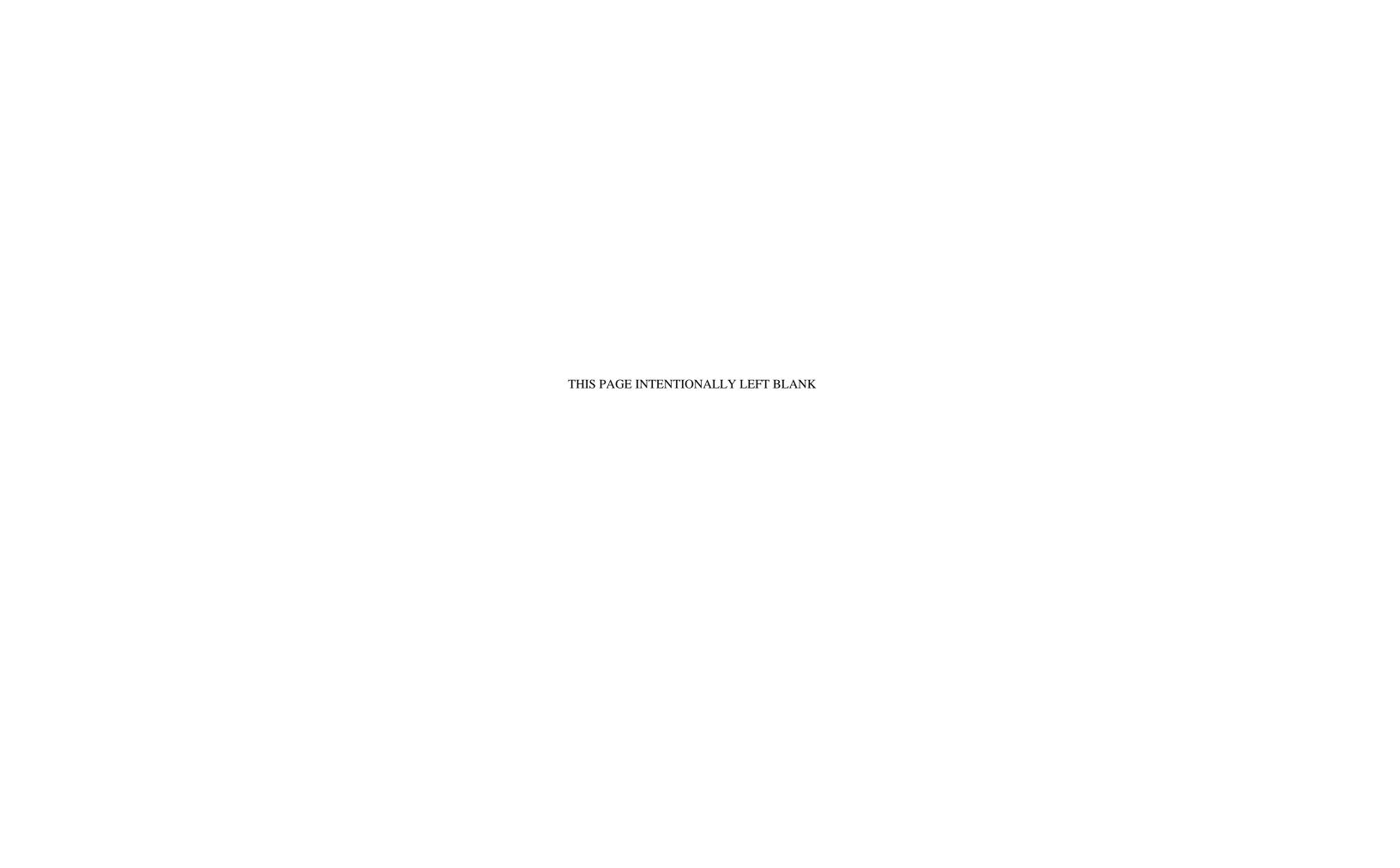
Proposed Bridge

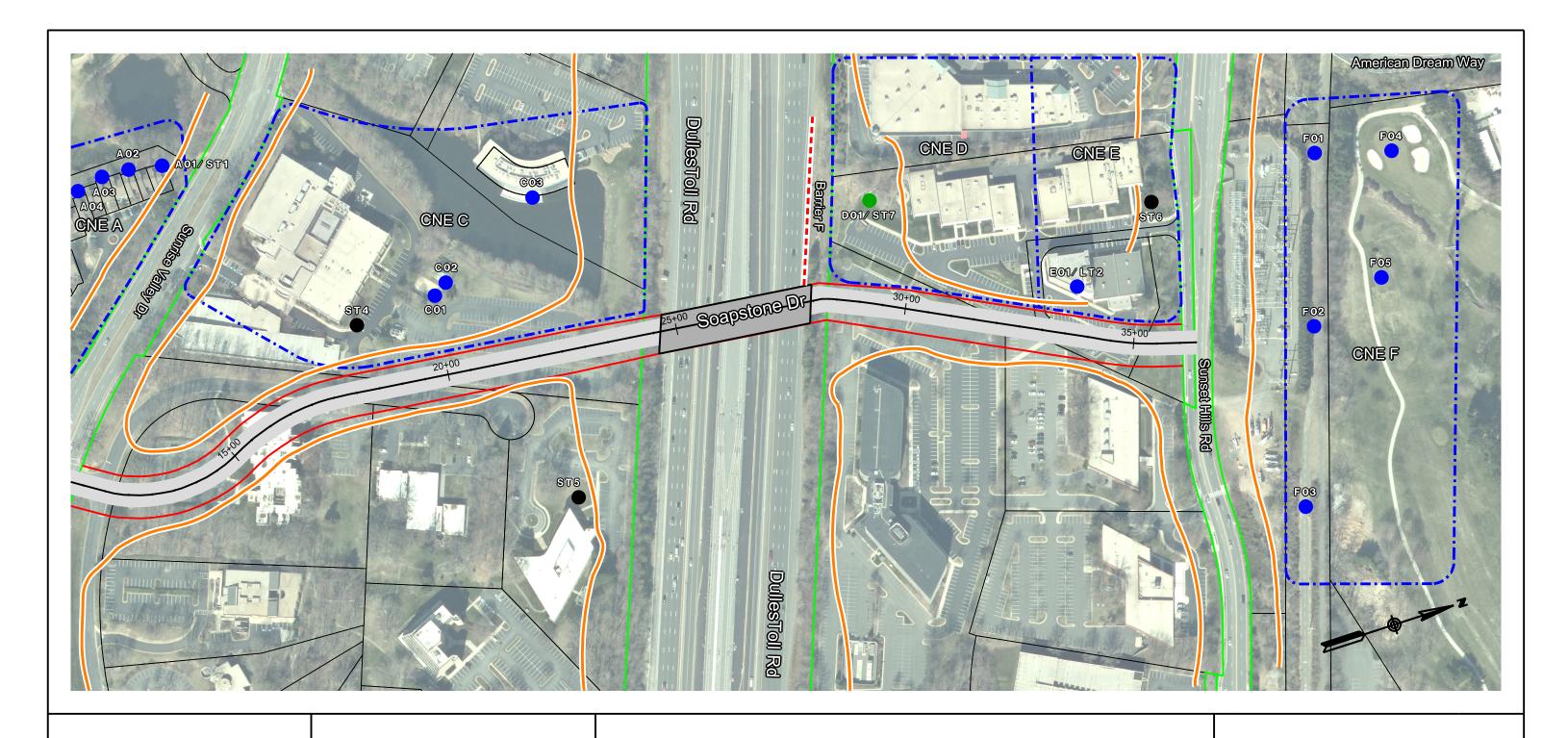
- Parcels

Existing Right-of-Way

Propsed Right-of-Way

Figure 2
Build Alternative Noise Prediction
Locations/Category and Potential
Noise Barriers
Alternative 1





SOAPSTONE CONNECTOR, Fairfax County Project Number: 2G40-078







- Noise Measurement Site
- Impacted and Benefited
- Impacted and Not Benefited
- Not Impacted and Benefited
- Not Impacted and Not Benefited
- **---** Evaluated Barrier-Feasible and Not Reasonable
- Evaluated Barrier-Feasible and Reasonable
- 66 dBA L_{eq(h)} Noise Contour
- --- Common Noise Environment (CNE) Areas

Proposed Roadway Pavement

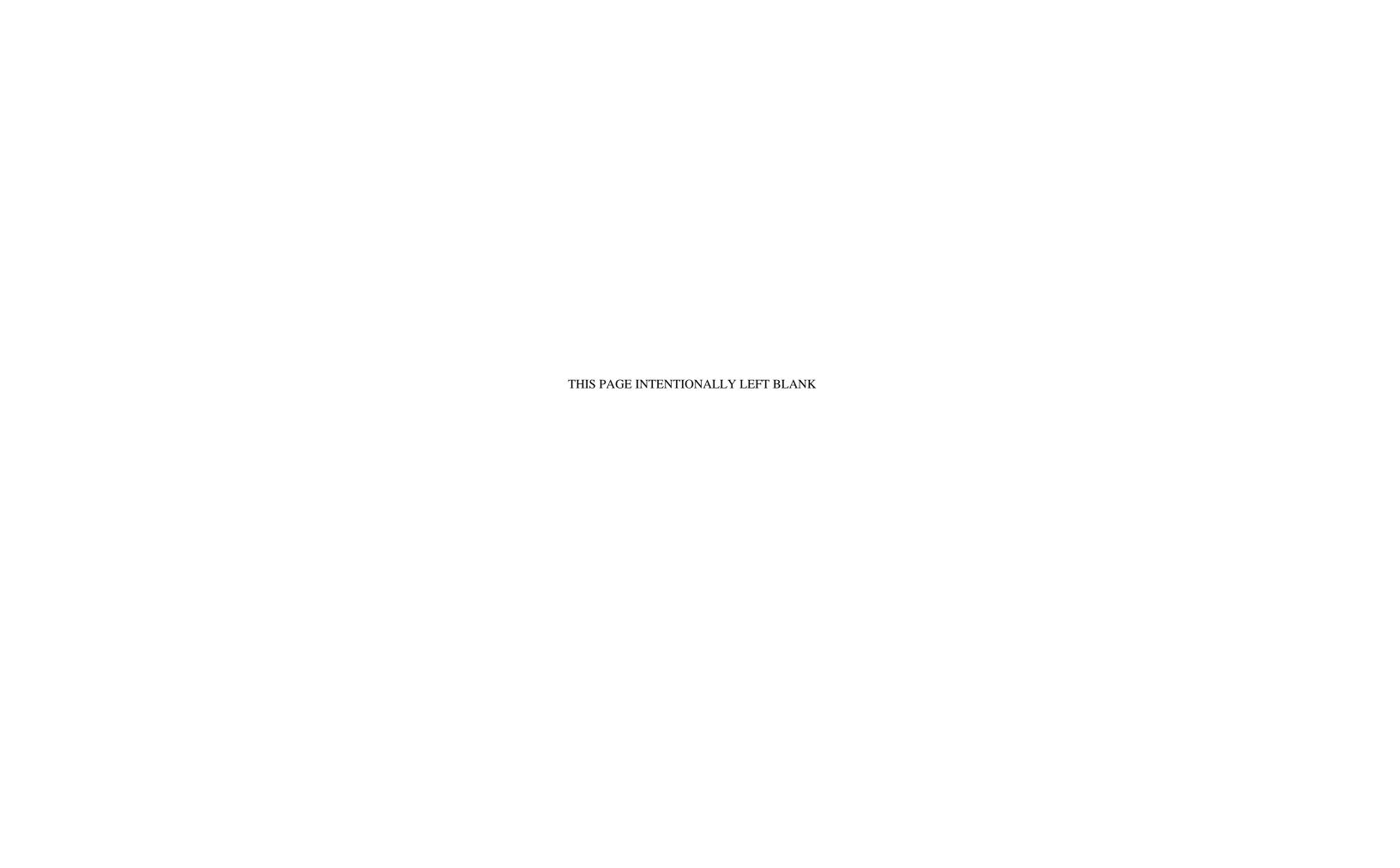
Proposed Bridge

— Parcels

Existing Right-of-Way

Propsed Right-of-Way

Figure 3
Build Alternative Noise Prediction
Locations/Category and Potential
Noise Barriers
Alternative 2



Appendix B Noise Measurement Data, Site Photographs, and Equipment Calibration Records

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Project No. 2G40-078 B-3

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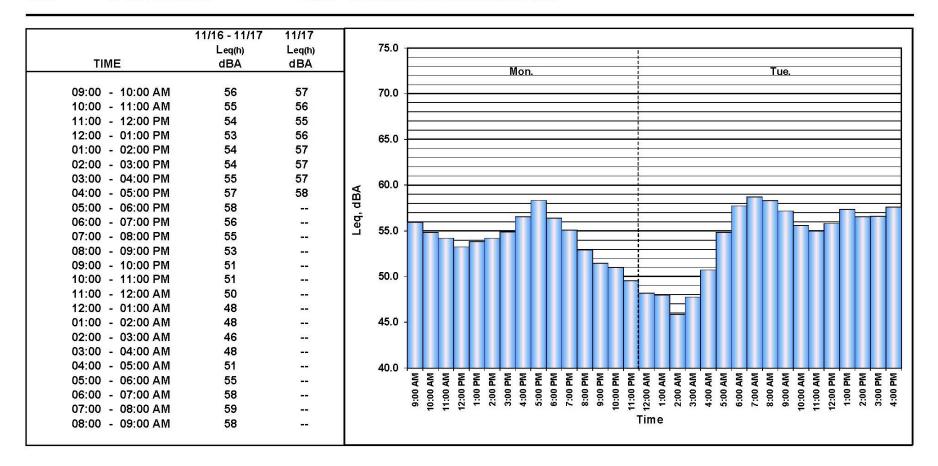
Site LT1 Hourly Noise Levels, Leq(h)

Location: 11604 Hunters Green Court

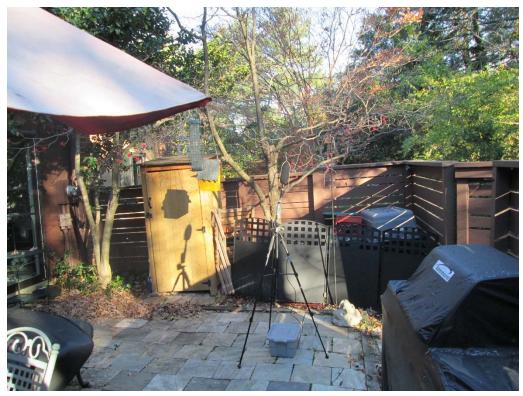
Position: Patio

Sources: Sunrise Valley Drive Date: 11/16/15 to 11/17/15

ate: 11/16/15 to 11/17/15 Notes: See attached Noise Measurement Form.



Project No. 2G40-078



(Facing North)



(Facing South)

LONG-TERM MEASUREMENT SITE LT1

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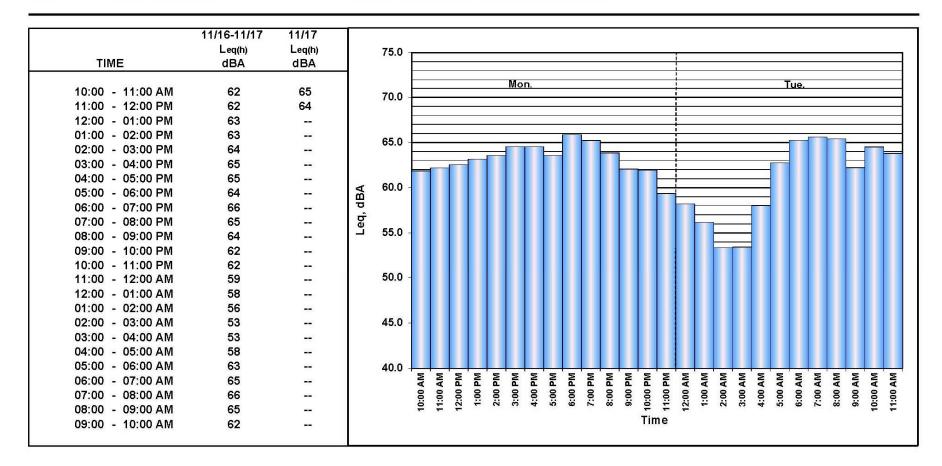
Site LT2 Hourly Noise Levels, Leq(h)

Location: 11501 Sunset Hills Road

Position: Deck

Sources: Dulles Toll Road/Sunset Hills Road

Date: 11/16/15 to 11/17/15 **Notes:** See attached Noise Measurement Form.





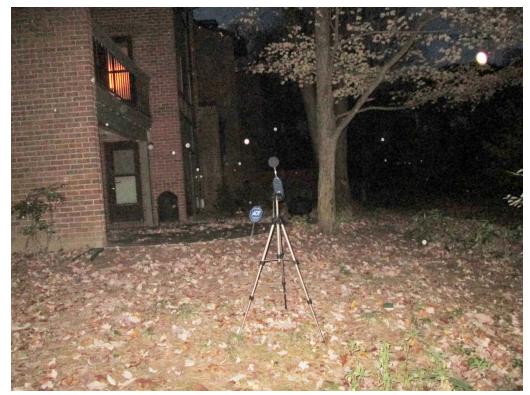


(Facing North)

LONG-TERM MEASUREMENT SITE LT2

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PROJECT: Soapstone Cor	nnector					ENGIN	EER:	14 11	DATE:		
MEASUREMENT ADDRESS:			CITY:				ngle-Fan	nily	Recreational SITE NO.:		
11639 Hunter	s Green	· Ct	Re	ston, V	Α)28° M	ulti-Fami chool		□ Commercial ST		
SOUND LEVEL METER:	MICRO	PHONE:			PRE AN			NOTES	S:		
□ LD-870 □ LD-820 □ B&K	2238 ⊠ NON	-POLAR [□ POLA □ FREE			900 🗆 Z					
□ LD-824)	ACCORDING TO SECURE		RANI	RANDOM				SYSTEM PWR: BAT AC			
SERIAL #: 0638	SERIAL	#337	SERIAL	#1939	გ	1	vations at start of measurement)				
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V:	Freq, Hz.		Input.	dB / Read	na. dB/C	Offset. dE	/ Time	WIND S	SPEED:MPH		
LD CA250 LD CA200	250 1000	Bafara		,114.	- >			TOWA	RD (DIR):		
□ B&K 4231 □ S/N ⋜ 27	□ 84	100.01000000000000000000000000000000000		, 114.	5,990,000			İ			
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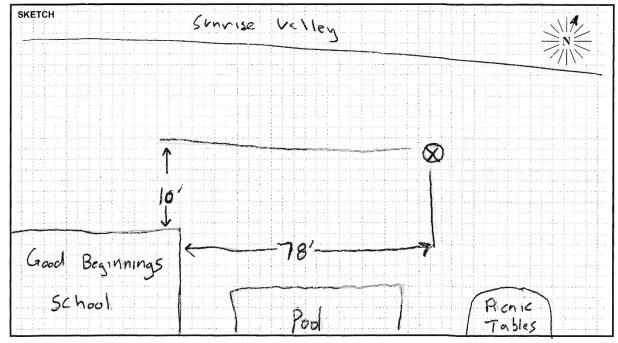
(Facing Southeast)



(Facing North)

			
	FIELD SURV	EY FORM	
PROJECT: Soapstone Connector		ENGINEER:	ca Bera 11/18/15
MEASUREMENT ADDRESS:	CITY:	☐ Single-Fam	nily Recreational SITE NO.:
11501 Sunrise Valle	Reston, V		
	CROPHONE:	PRE AMP:	NOTES:
□ LD-824 ★\$\$\text{\$\exititt{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\	NON-POLAR ☐ POLARIZED 1/2-INCH ☐ FREEFIELD 1-INCH ☐ RANDOM MOWIND SCREEN	□ LD-900 □ ZC-0030 ☑ LD-828 □ ZC-0032 □ LD-902 □	SYSTEM PWR: DBAT DAC (observations at start of measurement)
SERIAL #: 0639 SEF	RIAL#: 3155	SERIAL #:	
		2330	TEMP: 63 °F R.H.: 74 %
CALIBRATOR:	CALIBRATION RECORD:		4
Freq, Hz.	. Input dR / Paadi	ing, dB / Offset, dB / Time	WIND SPEED:MPH
☐ LD CA250 ☐ LD CA200 ☐ 250			
□ B&K 4231 □ □ 1000	Before 114,0, 114,	,0,1,0,16:12	TOWARD (DIR):
S/N 2127 - 84	After //4.0///4.	0, - ,17:03	SKIES: Cloudy
METER SETTINGS:			CAMERA
DO A-WTD □ LINEAR DO SLOW	☐ 1/1 OCT 🔯 INTERVA	ALS <u>ZO</u> - MINUTE	
C-WTD IMPULSE FAST	☐ 1/3 OCT ☐ L _N PERCE	ENTILE VALUES	PHOTO NOs.
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NOTES:											deo Idar	MEAS. TYPE:
												☐ Long Term - ☑ Short Term
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PARSONS

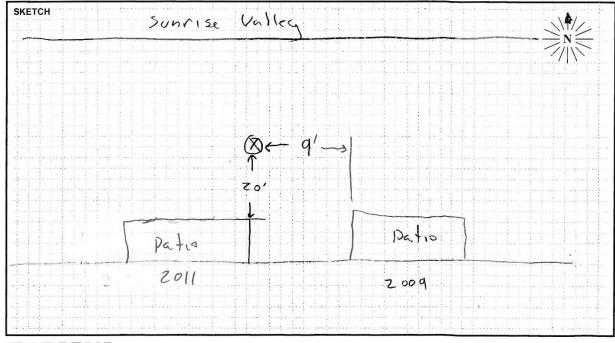




(Facing South)

FIELD SURVEY FORM											
PROJECT: Soapstone Connect	or	ENGINEER:	ca Bera	DATE: (1/20/15							
MEASUREMENT ADDRESS:		CITY:		☐ Single-Fan	nily Recreational	SITE NO.:					
2011 Approach	ln	Reston, V	Α	Multi-Fami □ School	ly Commercial	573					
SOUND LEVEL METER:	MICROPHONE:		PRE AM	MP:	NOTES:						
□ LD-870 □ LD-820 □ B&K-2238	NON-POLAR		□ LD-9	000 🗆 ZC-0030							
□ LD-824 ½ 7LD-812 □ B&K-2250	☑ 1/2-INCH ☐ 1-INCH	☐ FREEFIELD ☐ RANDOM		328 🗆 ZC-0032	SYSTEM PWR: ABAT	□ AC					
□ LD-2900 □	ØWIND S	□ LD-9	002 🗆	(a.b.,							
SERIAL #: 0639	SERIAL#: 31	55 SERIAL #: 7Z30			(observations at start of mea						
					TEMP: 46 °F R.H.:	100 %					
CALIBRATOR:		ATION RECORD:			WIND SPEED:						
Freq, □ LD CA250 □ LD CA200 ☑ 25		Input, dB / Read	ing, dB / C	Offset, dB / Time	WIND SPEED:N	IPH					
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□ B&K 4231 □ □ 84	177	W 17 - 18 ST, - WHE									
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PARSONS



(Facing North)



(Facing South)

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SOUND	LEVEL ME	TER:		MICKOR	PHONE:	□ POLA	DIZED	PRE AN			NOTES	:			
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	SN \$ 177 0 84 114.0										SKIES:	Cloudy			
	SETTINGS:				Aiter						1	iA			
₩ A-V		INEAR	⊠ SLC		<u>>_</u> - ми	NUTE									
□ C-V	VTD 🗆 II	MPULSE	□ FAS	т 🗆	1/3 OCT	7	L _N PERC	ENTILE V	ALUES		РНОТО	NOs.			
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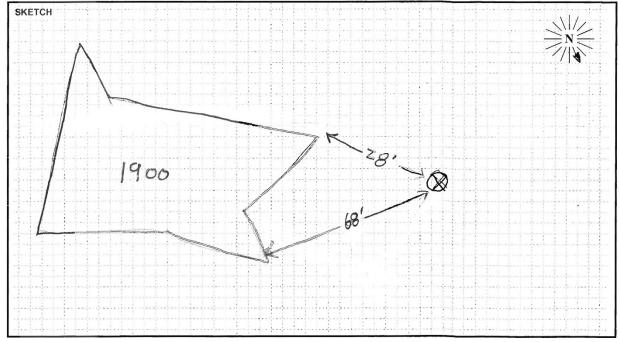
(Facing South)



(Facing North)

FIELD SURVEY FORM											
PROJECT: Soapstone Connector	engineer: Grea Bera 11/8)										
MEASUREMENT ADDRESS:	CITY:		☐ Single-Fam	nily Recreational SITE NO.:							
1900 Association Dr	Reston, V	A	☐ Multi-Fami ☐ School	ly Commercial ST5							
SOUND LEVEL METER: MICROPHONE:		PRE AM	MP:	NOTES:							
	☐ FREEFIELD ☐ RANDOM	⊠ LD-8	000 □ ZC-0030 328 □ ZC-0032 002 □	SYSTEM PWR: MBAT □ AC							
SERIAL #: 0639 SERIAL #: 33	78 SERIAL #:2330			(observations at start of measurement) TEMP: 50 °F R.H.: 78 %							
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Freq, Hz. 12√LD CA250 □ LD CA200 ★ 250	Input, dB / Readi	_		WIND SPEED:MPH							
□ B&K 4231 □ □ 1000 Before	B&K 4231										
S/N 2127	- 18:49	SKIES: Cloudy									
METER SETTINGS:		-		CAMERA							
To A-WTD □ LINEAR TO SLOW □ 1/1 OCT	INTERV										
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT	L _N PERCE	ENTILE V	/ALUES	PHOTO NOs.							

NOTES:				7.25		16				□ Vi	deo dar	MEAS. TYPE:
					e.							☐ Long Term ☐ Short Term
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11/18	7:40	8:00	60.6	_	615	62.8	63.5	63.9		68.4	6Z,9	



PARSONS



(Facing North)



(Facing Southeast)

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□ LD-87		820 □ B&	B&K-2238							MP: NOTES: 900 □ ZC-0030 828 □ ZC-0032 902 □ □ (observations at start of meas)				
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CALIBRAT		7 7 1	-			ATION RE	ECORD:		<i>L</i> >>		1	51_ °F R.H.:		
			Freq	Hz.		Innut	dP / Pond	ling, dB / C	Affect dB	l Timo	WIND S	SPEED:I	ИРН	
⊒ LD CA ⊐ B&K 4	231 🗆 _	_D CA200	□ 25 □ 10 □ 84	00		1.0,6	.7 , 0	5:48		RD (DIR):				
S/N _	2127	_			After	114,0	1114	,0 , -		3:49	SKIES:	Cloudy		
	SETTINGS:					~		7 6			CAMER	A		
□ C-V		LINEAR MPULSE	SLC □ FAS		1/1 OC			ALS ZC			РНОТО	NOs.		
	,,,,				.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-N							
NOTES:	-									₽ VI		MEAS. TYPE:	4.7	
										∭⊠° Ra	adar	☐ Long Ter 爲 Short Te		
DATE	START TIME	STOP TIME	L _{MIN}	L ₉₉	L ₉₀	L ₅₀	L ₂₅	L ₁₀	L ₀₁	L _{MAX}	L _{EQ}	NOTE	S:	
1/18	8:20	8:40	53.6	_	56.5	62,9	65.5	67.2	1	83,7	64.7			
SKETCH											1-1-1		. \ / ,	
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			1 15	19										
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		AND DESCRIPTION OF THE PERSON												
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PARSONS



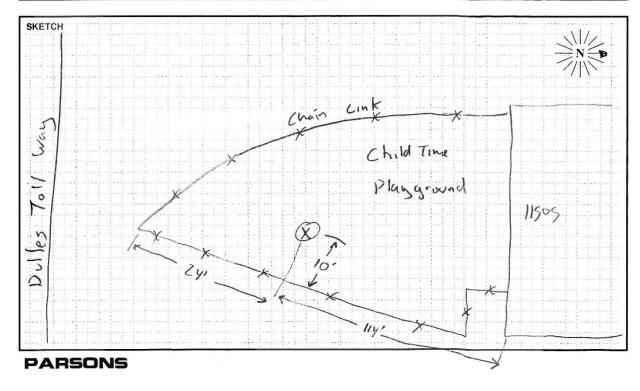
(Facing North)



(Facing Southwest)

FIELD SURVEY FORM											
PROJECT: Soapstone Connector	ENGINEER: DATE: 11/20/15										
MEASUREMENT ADDRESS: CITY:	☐ Single-Family ☐ Recreational SITE NO.:										
11505 Sunset Hills Reston, VA	□ Multi-Family □ Commercial ≤7.7										
SOUND LEVEL METER: MICROPHONE: PRE	AMP: NOTES:										
□ LD-824	0-900 □ ZC-0030 0-828 □ ZC-0032 0-902 □ SYSTEM PWR: ØBAT □ AC										
SERIAL #: 0639 SERIAL #: 3155	(observations at start of measurement) TEMP: 50 °F R.H.: 48 %										
CALIBRATOR: CALIBRATION RECORD:	12Mr. 5 1 Kili. 10 %										
Freq, Hz. Input, dB / Reading, dB.											
□ B&K 4231 □ □ 1000 Before 114.0, 114.0	6.8 , 6.48 TOWARD (DIR):										
S/N 2/27	The state of the s										
METER SETTINGS:	CAMERA										
MA-WTD □ LINEAR MS SLOW □ 1/1 OCT MS INTERVALS C □ C-WTD □ IMPULSE □ FAST □ 1/3 OCT MS L _N PERCENTILE	Company Control Company Compan										

NOTES	:									□ Vi	deo dar	MEAS. TYPE:
												☐ Long Term Æ⊝Short Term
DATE	START TIME	STOP TIME	L _{MIN}	L ₉₉	L ₉₀	L ₅₀	L ₂₅	L ₁₀	L ₀₁	L _{MAX}	L _{EQ}	NOTES:
11/20	7.40	8:00	60.0	-	65.6	68.7	69.9	70.9	-	75.7	69.0	





(Facing South)



(Facing North)

CERTIFICATE OF CALIBRATION # 21898-4

FOR LARSON DAVIS PRECISION INTEGRATING AND LOGGING SOUND LEVEL METER

Model 812 Serial No. 0638
ID No. N/A
With Microphone Model 2560 Serial No. 3159
With Preamplifier Model PRM828 Serial No. 1891

Customer: Parsons

Pasadena, CA 91124 P.O. No. Verbal/J. Ogden

was tested and met Larson Davis specifications at the points tested and as outlined in ANSI S1.4-1983 Type 1; IEC 651-1979 Type 1

on 13 OCT 2015

atentendence par par par par par par for encentence northie for tar par carbate an tarban tarban tarban tarban

BY HAROLD LYNCH Service Manager As received condition: Within Specification. Re-calibration due on: 13 OCT 2016

Certifi	ed References*			
Mfg.	Type	Serial No.	Cal Date	Due Date
B&K	1049	1288946	04 NOV 2014	04 NOV 2015
B&K	2636	1601487	18 MAY 2015	18 MAY 2016
B&K	4226	1774068	17 MAR 2015	17 MAR 2016
B&K	4231	2094472	23 FEB 2015	23 FEB 2016
HP	34401A	US36071531	10 JUN 2015	10 JUN 2016
HP	3458A	2823A17713	30 JUL 2015	30 JUL 2016
	Performed in Complia	ance with ANSI, NO	CSL Z-540-1, 1994	
	and ISO 17025, ISO 9	9001:2008 Certific	ation NQA No. 11252	
	*References are traceab	le to NIST (National 1	Institute of Standards and Tech	nology).

Note: For calibration data see enclosed pages.

The data represent both "as found" and "as left" condition.

Reference Test Procedure: ACCT Procedure 812-820 Version 3.5.1.

Temperature	Relative Humidity	Barometric Pressure
23°C	36 %	991.04 hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.

Signed: Hand Such

ODIN METROLOGY, INC.

CALIBRATION OF SOUND & VIBRATION INSTRUMENTATION 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320 PHONE: (805) 375-0830 FAX: (805) 375-0405

Doc. Rev. 09 Jun 2014 Page 1 of 10

CERTIFICATE OF CALIBRATION # 21898-7

recreating the control of the contro

FOR LARSON DAVIS PRECISION INTEGRATING AND LOGGING SOUND LEVEL METER

Model 812 Serial No. 0639

ID No. N/A

With Microphone Model 2560 Serial No. 3155
With Preamplifier Model PRM828 Serial No. 1891

Customer: Parsons

Pasadena, CA 91124

P.O. No. Verbal/J. Ogden

was tested and met Larson Davis specifications at the points tested and as outlined in ANSI S1.4-1983 Type 1; IEC 651-1979 Type 1

on 14 OCT 2015

as tale and and and all sandands and tale
BY HAROLD LYNCH Service Manager

As received condition: Within Specification.

Re-calibration due on: 14 OCT 2016

		Re-cambration due of	1. 14 OCT 2010	
Certified	References*			
Mfg.	Type	Serial No.	Cal Date	Due Date
B&K	1049	1288946	04 NOV 2014	04 NOV 2015
B&K	2636	1601487	18 MAY 2015	18 MAY 2016
B&K	4226	1774068	17 MAR 2015	17 MAR 2016
B&K	4231	2094472	23 FEB 2015	23 FEB 2016
HP	34401A	US36071531	10 JUN 2015	10 JUN 2016
HP	3458A	2823A17713	30 JUL 2015	30 JUL 2016
Pe	erformed in Comp	liance with ANSI, NCS	SL Z-540-1, 1994	
an	id ISO 17025, ISO	9001:2008 Certificat	tion NQA No. 11252	
*8	References are traces	able to NIST (National In	stitute of Standards and Tec	hnology).

Note: For calibration data see enclosed pages.

The data represent both "as found" and "as left" condition.

Reference Test Procedure: ACCT Procedure 812-820 Version 3.5.1.

Temperature Relative Humidity Barometric Pressure 23°C 39 % 989.54 hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.

Signed: Haras of

ODIN METROLOGY, INC.

CALIBRATION OF SOUND & VIBRATION INSTRUMENTATION
3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320
PHONE: (805) 375-0830 FAX: (805) 375-0405

Doc. Rev. 09 Jun 2014 Page 1 of 10

CERTIFICATE OF CALIBRATION # 21898-1

FOR LARSON DAVIS PRECISION INTEGRATING AND LOGGING SOUND LEVEL METER

Model **812** Serial No. **0659** ID No. **N/A**

With Microphone Model **2560** Serial No. **3378** With Preamplifier Model **PRM828** Serial No. **1901**

Customer: Parsons

Pasadena, CA 91124 P.O. No. Verbal/J. Ogden

was tested and met Larson Davis specifications at the points tested and as outlined in ANSI S1.4-1983 Type 1; IEC 651-1979 Type 1

on 13 OCT 2015

BY HAROLD LYNCH Service Manager As received condition: Within Specification.

Re-calibration due on: 13 OCT 2016

Certifi	ed References*			300 300 300
Mfg.	<u>Type</u>	Serial No.	Cal Date	Due Date
B&K	1049	1288946	04 NOV 2014	04 NOV 2015
B&K	2636	1601487	18 MAY 2015	18 MAY 2016
B&K	4226	1774068	17 MAR 2015	17 MAR 2016
B&K	4231	2094472	23 FEB 2015	23 FEB 2016
HP	34401A	US36071531	10 JUN 2015	10 JUN 2016
HP	3458A	2823A17713	30 JUL 2015	30 JUL 2016
ļ	Performed in Compli	ance with ANSI, NC	SL Z-540-1, 1994	
	and ISO 17025, ISO	9001:2008 Certifica	tion NQA No. 11252	74 1E 045
	*References are traceal	le to NIST (National In	stitute of Standards and Tecl	nnology).

Note: For calibration data see enclosed pages.

The data represent both "as found" and "as left" condition.

Reference Test Procedure: ACCT Procedure 812-820 Version 3.5.1.

Temperature	Relative Humidity	Barometric Pressure
23°C	36 %	991.04 hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.

Signed: Have June

ODIN METROLOGY, INC.

CALIBRATION OF SOUND & VIBRATION INSTRUMENTATION 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320 PHONE: (805) 375-0830 FAX: (805) 375-0405

Doc. Rev. 09 Jun 2014 Page 1 of 10

Odin Metrology, Inc. Calibration of Sound & Vibration Instruments

Certificate Number: 21653-5

Certificate of Calibration for Larson Davis 1/2" Random Incidence Microphone

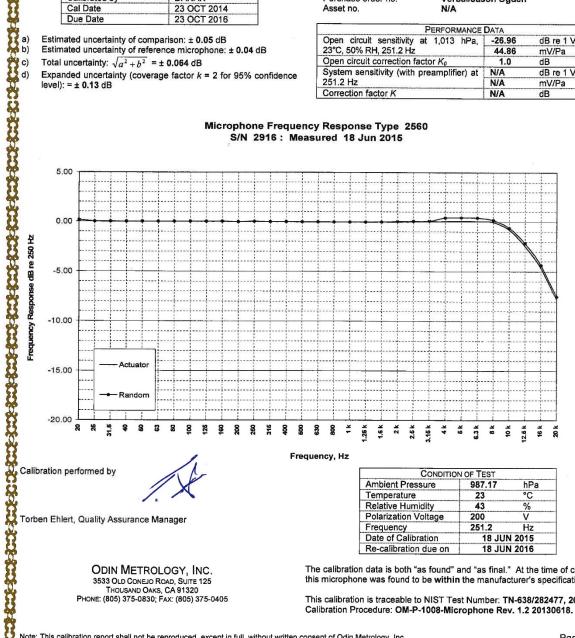
This calibration is performed by comparison with measurement reference standard microphone:

REFERENCE STANDARDS				
Type No.	4134/UA0825			
Serial No.	1866523			
Calibrated by	DANAK			
Cal Date	23 OCT 2014			
Due Date	23 OCT 2016			

- Estimated uncertainty of comparison: ± 0.05 dB
- Estimated uncertainty of reference microphone: ± 0.04 dB
- Total uncertainty: $\sqrt{a^2+b^2} = \pm 0.064 \text{ dB}$
- Expanded uncertainty (coverage factor k = 2 for 95% confidence level): = ± 0.13 dB

Type no. Serial no. With preamplifier type no. Preamplifier Serial no. Submitted by	2560 2916 N/A N/A Parsons Pasade	na, CA			
Purchase order no. Asset no.	Verbal/ N/A	Jason	Ogden		
	RFORMAN		4		
Open circuit sensitivity at 23°C, 50% RH, 251.2 Hz	1,013 hP		5.96 4.86	dB re	e 1 V/Pa
Open circuit correction facto	r Ko		1.0	dB	-a
System sensitivity (with pres	amplifier)				e 1 V/Pa
251.2 Hz Correction factor K		N/		mV/F dB	² а
				-	
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800 14 1 1.25 k 1.6 k 1.6 k 3.4 k 3.4 s 3.4 s		~ ق	10 k	\$ \$	r.
y, Hz					
	NDITION OF		fraktururan bibrony		
Ambient Pressure Temperature	- -	987.17 23	hl °C	Pa	
Relative Humidity		43	%		
Polarization Volta Frequency		200 251.2	V		
Date of Calibratio	n	18 J	UN 201	5	
Re-calibration du	e on	18 J	UN 201	6	

Microphone Frequency Response Type 2560 S/N 2916: Measured 18 Jun 2015



Calibration performed by

Torben Ehlert, Quality Assurance Manager

Frequency, Hz

CONDITION	N OF TEST	
Ambient Pressure	987.17	hPa
Temperature	23	°C
Relative Humidity	43	%
Polarization Voltage	200	٧
Frequency	251.2	Hz
Date of Calibration	18 JUN	V 2015
Re-calibration due on	18 JUN	2016

ODIN METROLOGY, INC. 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS, CA 91320 PHONE: (805) 375-0830; FAX: (805) 375-0405

The calibration data is both "as found" and "as final." At the time of calibration this microphone was found to be within the manufacturer's specifications.

This calibration is traceable to NIST Test Number: TN-638/282477, 2012. Calibration Procedure: OM-P-1008-Microphone Rev. 1.2 20130618.

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

Page 1 of 3

Project No. 2G40-078

Odin Metrology, Inc.

Calibration of Sound & Vibration Instruments

Certificate Number: 21898-8

Certificate of Calibration for Larson Davis 1/2" Random Incidence Microphone

This calibration is performed by comparison with measurement This calibration is performed reference standard microphone:

REFEREN	ICE STANDARDS
Type No.	4134/UA0825
Serial No.	1866523
Calibrated by	DANAK
Cal Date	23 OCT 2014
Due Date	23 OCT 2016

- Estimated uncertainty of comparison: ± 0.05 dB
- Estimated uncertainty of reference microphone: ± 0.04 dB
- Total uncertainty: $\sqrt{a^2 + b^2} = \pm 0.064 \text{ dB}$
- Expanded uncertainty (coverage factor k = 2 for 95% confidence level): = ± 0.13 dB

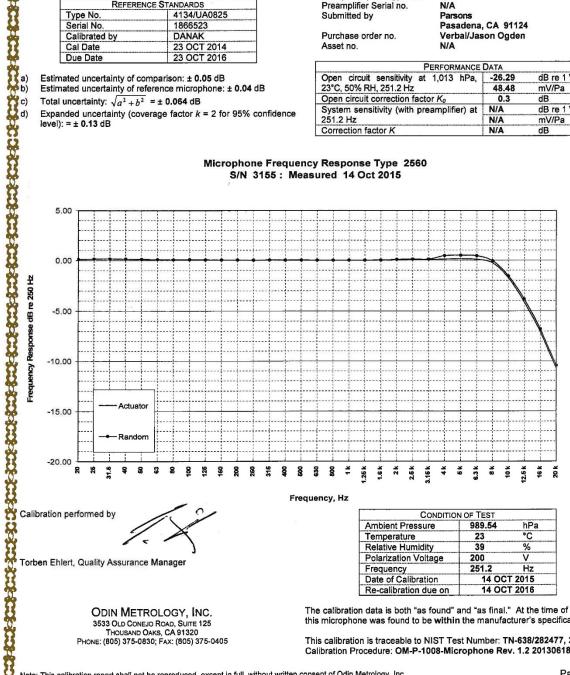
Type no. 2560 Serial no. With preamplifier type no. Preamplifier Serial no. 3155 N/A N/A Submitted by Parsons

Purchase order no. Asset no.

Pasadena, CA 91124 Verbal/Jason Ogden

PERFORMANCE	DATA	
Open circuit sensitivity at 1,013 hPa,	-26.29	dB re 1 V/Pa
23°C, 50% RH, 251.2 Hz	48.48	mV/Pa
Open circuit correction factor K ₀	0.3	dB
System sensitivity (with preamplifier) at	N/A	dB re 1 V/Pa
251.2 Hz	N/A	mV/Pa
Correction factor K	N/A	dB

Microphone Frequency Response Type 2560 S/N 3155: Measured 14 Oct 2015



Frequency, Hz

Calibration performed by

Torben Ehlert, Quality Assurance Manager

CONDITION OF TEST Ambient Pressure 989.54 °C Temperature Relative Humidity Polarization Voltage 200 Frequency
Date of Calibration 251.2 Hz 14 OCT 2015 14 OCT 2016 Re-calibration due on

ODIN METROLOGY, INC. 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS, CA 91320 PHONE: (805) 375-0830; FAX: (805) 375-0405 The calibration data is both "as found" and "as final." At the time of calibration this microphone was found to be within the manufacturer's specifications.

This calibration is traceable to NIST Test Number: TN-638/282477, 2012. Calibration Procedure: OM-P-1008-Microphone Rev. 1.2 20130618.

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

Page 1 of 3

Odin Metrology, Inc.

Calibration of Sound & Vibration Instruments

Certificate of Calibration for Larson Davis 1/2" Random Incidence Microphone

This calibration is performed by comparison with measurement reference standard microphone:

REFEREN	ICE STANDARDS
Type No.	4134/UA0825
Serial No.	1866523
Calibrated by	DANAK
Cal Date	23 OCT 2014
Due Date	23 OCT 2016

- Estimated uncertainty of comparison: ± 0.05 dB Estimated uncertainty of reference microphone: ± 0.04 dB
- Total uncertainty: $\sqrt{a^2 + b^2} = \pm 0.064 \text{ dB}$
- Expanded uncertainty (coverage factor k = 2 for 95% confidence

3378 Serial no. With preamplifier type no. N/A Preamplifier Serial no. N/A Submitted by Parsons

Purchase order no. Asset no.

Pasadena, CA 91124 Verbal/Jason Ogden

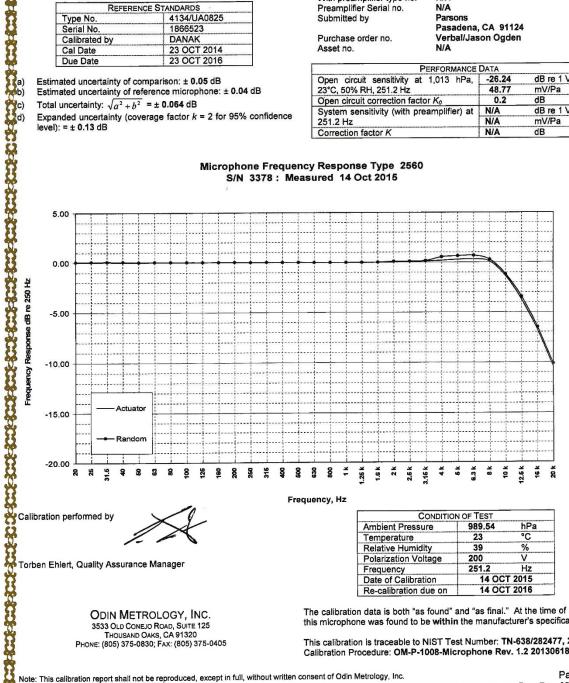
1000									
RFOR	MANCE	ANCE DATA							
1,013	hPa,	-26.24	dB re 1 V/Pa						
100.00		48.77	mV/Pa						

Certificate Number: 21898-3

Open circuit sensitivity at 1,013 hPa,	-26.24	dB re 1 V/Pa
23°C, 50% RH, 251.2 Hz	48.77	mV/Pa
Open circuit correction factor Ko	0.2	dB
System sensitivity (with preamplifier) at	N/A	dB re 1 V/Pa
251.2 Hz	N/A	mV/Pa
Correction factor K	N/A	ďΒ

PE

Microphone Frequency Response Type 2560 S/N 3378: Measured 14 Oct 2015





Torben Ehlert, Quality Assurance Manager

Frequency, Hz

CONDITION	NOF TEST	
Ambient Pressure	989.54	hPa
Temperature	23	°C
Relative Humidity	39	%
Polarization Voltage	200	V
Frequency	251.2	Hz
Date of Calibration	14 OCT 2015	
Re-calibration due on	14 00	T 2016

ODIN METROLOGY, INC. 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS, CA 91320 PHONE: (805) 375-0830; FAX: (805) 375-0405 The calibration data is both "as found" and "as final." At the time of calibration this microphone was found to be within the manufacturer's specifications.

This calibration is traceable to NIST Test Number: TN-638/282477, 2012. Calibration Procedure: OM-P-1008-Microphone Rev. 1.2 20130618.

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

Page 1 of 3

B-28 Project No. 2G40-078

CERTIFICATE OF CALIBRATION # 20928-2 FOR LARSON DAVIS 1/2" MICROPHONE PREAMPLIFIER

Model PRM828

Serial No. 1891

ID No. N/A

Customer: Parsons

Pasadena, CA 91124

P.O. No. Verbal

was tested and met factory specifications at the points tested according to the Referenced Test Procedure

on 30 JUL 2014

BY HAROLD LYNCH Service Manager

As received condition: Within Specification.

Re-calibration due on: 30 JUL 2015

			2. 1.416.7				
Certified	References*	***					
Mfg.	Type	Serial No.	Cal Date	Due Date			
B&K	4155	1424163	27 MAR 2014	27 MAR 2015			
B&K	1049	1288946	04 NOV 2013	04 NOV 2014			
B&K	2636	1601487	19 MAY 2014	19 MAY 2015			
B&K	4226	1774068	17 MAR 2014	17 MAR 2015			
B&K	4231	2094472	26 FEB 2014	26 FEB 2015			
HP	34401A	US36071531	11 JUN 2014	11 JUN 2015			
HP	3458A	2823A17713	16 JUL 2014	16 JUL 2015			
	Performed in Compliance with ANSI, NCSL Z-540-1, 1994						
		9001:2008 Certificati					
*F	References are tracea	ble to NIST (National Ins	titute of Standards and Tech	mology).			

Note: For calibration data see enclosed pages. The data represent both "as found" and "as left."

Reference Test Procedure: ACCT Procedure PRM828 Version 0.0.1.

Temperature Relative Humidity Barometric Pressure 23°C 45 % 988.11 hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.

Signed Hand

ODIN METROLOGY, INC.

CALIBRATION OF SOUND AND VIBRATION INSTRUMENTATION 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320 PHONE: (805) 375-0830 FAX: (805) 375-0405

Page 1 of 2

CERTIFICATE OF CALIBRATION # 21299-7 FOR LARSON DAVIS 1/2" MICROPHONE PREAMPLIFIER

Model PRM828

Serial No. 1938

ID No. N/A

Customer: Parsons

Pasadena, CA 91124

P.O. No. Verbal

was tested and met factory specifications at the points tested according to the Referenced Test Procedure

on 20 JAN 2015

BY HAROLD LYNCH Service Manager As received condition: Within Specification.

Re-calibration due on: 20 JAN 2016

	20			- Control of the Cont			
Certified I	References*						
Mfg.	Type	Serial No.	Cal Date	Due Date			
B&K	4155	1424163	27 MAR 2014	27 MAR 2015			
B&K	1049	1314996	12 JUN 2014	12 JUN 2015			
B&K	2636	1423390	05 JAN 2015	05 JAN 2016			
B&K	4226	2141942	02 DEC 2014	02 DEC 2015			
B&K	4231	1770857	17 SEP 2014	17 SEP 2015			
HP	34401A	MY45023668	08 FEB 2014	08 FEB 2015			
HP	3458A	2823A07179	09 JUL 2014	09 JUL 2015			
Per	Performed in Compliance with ANSI, NCSL Z-540-1, 1994						
and	d ISO 17025, ISO	9001:2008 Certification	on NQA No. 11252				
*Re	eferences are tracea	ble to NIST (National Inst	titute of Standards and Tech	mology).			

Note: For calibration data see enclosed pages. The data represent both "as found" and "as left."

Reference Test Procedure: ACCT Procedure PRM828 Version 0.0.1.

Temperature	Relative Humidity	Barometric Pressure
23°C	36 %	989.91 hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.

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ODIN METROLOGY, INC.

CALIBRATION OF SOUND AND VIBRATION INSTRUMENTATION 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320 PHONE: (805) 375-0830 FAX: (805) 375-0405

Page 1 of 2

CERTIFICATE OF CALIBRATION # 21299-8 FOR LARSON DAVIS 1/2" MICROPHONE PREAMPLIFIER

Model PRM828

Serial No. 2330 ID No. N/A

Customer: Parsons

Pasadena, CA 91124

P.O. No. Verbal

was tested and met factory specifications at the points tested according to the Referenced Test Procedure

on 20 JAN 2015

BY HAROLD LYNCH Service Manager As received condition: Within Specification. Re-calibration due on: 20 JAN 2016

427							
Certifi	ed References*						
Mfg.	<u>Type</u>	Serial No.	Cal Date	Due Date			
B&K	4155	1424163	27 MAR 2014	27 MAR 2015			
B&K	1049	1314996	12 JUN 2014	12 JUN 2015			
B&K	2636	1423390	05 JAN 2015	05 JAN 2016			
B&K	4226	2141942	02 DEC 2014	02 DEC 2015			
B&K	4231	1770857	17 SEP 2014	17 SEP 2015			
HP	34401A	MY45023668	08 FEB 2014	08 FEB 2015			
HP	3458A	2823A07179	09 JUL 2014	09 JUL 2015			
	Performed in Compliance with ANSI, NCSL Z-540-1, 1994						
	and ISO 17025, ISO	9001:2008 Certificati	on NQA No. 11252				
	*References are traceal	ole to NIST (National Inst	itute of Standards and Tech	nology).			

Note: For calibration data see enclosed pages. The data represent both "as found" and "as left."

Reference Test Procedure: ACCT Procedure PRM828 Version 0.0.1.

Temperature	Relative Humidity	Barometric Pressure	
23°C	36 %	989.91 hPa	

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc.
Signed

ODIN METROLOGY, INC.

CALIBRATION OF SOUND AND VIBRATION INSTRUMENTATION
3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320
PHONE: (805) 375-0830 FAX: (805) 375-0405

Page 1 of 2

Odin Metrology, Inc.
Calibration of Sound & Vibration Instruments

Certificate of Calibration for Larson Davis Calibrator

This calibration is performed by comparison with measurement reference standard pistonphone:

Type No.	4220	4228	
Serial No.	1048473	1504084	
Calibrated by	TE	TE	
Cal Date	05 NOV 2014	05 NOV 2014	
Due Date	05 NOV 2015	05 NOV 2015	

- Estimated uncertainty of comparison: ± 0.05 dB
- Estimated uncertainty of calibration service for standard pistonphone: ± 0.06 dB
- Total uncertainty: $\sqrt{a^2 + b^2} = \pm 0.08 \text{ dB}$
- Expanded uncertainty (coverage factor k = 2 for 95% confidence level): = ± 0.16 dB

This acoustic calibrator has been calibrated using standards with values traceable to the National Institute of Standards and Technology. This calibration is traceable to NIST Test Number TN-638/282477, 2012.

CONDITIO	ON OF TEST	
Ambient Pressure	989.91	hPa
Temperature	23	°C
Relative Humidity	36	%
Date of Calibration	20 JAN	2015
Re-calibration due on	20 JAN	2016

The calibration of this acoustic calibrator was performed using a test system conforming to the requirements of ANSI/NCSLZ540-1, 1994. ISO 17025, ISO 9001-2008, Certification NQA No. 11252.

Calibration performed by fund Synd

Harold Lynch, Service Manager

ODIN METROLOGY, INC. 3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS, CA 91320 PHONE: (805) 375-0830; FAX: (805) 375-0405

SPL produced in coupler terminated by a loading volume of a ½" microphone	114 ± 0.2 dB
Frequency	250 Hz ± 1%
Distortion	< 3%
At 1.013 hPa 20°C and 6	5% relative humidity

PERFORM	ANCE AS RECEIVED)	
Frequency	251.2	Hz	***************************************
SPL	114.01	dB	
Distortion	0.7	%	
Battery Voltage	9.0	V	

Calibrator type Serial no. Submitted by Purchase order no. Asset no.	CA250 2127 Parson Pasade Verbal N/A	is ena, CA 9	1124	
This calibrator has specifications listed stated.	been foun below at tl	d to perfo ne normal	orm with ized con	nin the
SPL produced in terminated by a volume of a ½" micro	loading	114 ± 0.	2 dB	
Frequency	PHONE	250 Hz ±	: 1%	
Distortion		< 3%		
At 1,013 hPa, 20	0°C, and 6	5% relativ	e humid	ity
		D		
Frequency	RMANCE AS	251.2	Hz	
SPL		114.01	dB	
Distortion		0.7	%	
Battery Voltage		9.0		
Was adjustment perf Were batteries replace	ced?			No Yes
	IAL PERFOR			aran bahasan ket bilat per ter t
Frequency		251.2	Hz	
SPL Distortion		114.01 0.7	dB %	
Distortion		0.7	70	
Note: This calibrator specifications as reco				

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

Page 1 of 2

Table C-1. Noise Model Validation Traffic Counts

	Number	Total Peak	Travel	Volumes	by Vehicle	е Туре
Description of Traffic Lane	of Lanes	Hour Traffic Volumes		Cars	Medium Trucks	Heavy Trucks
Hourly Traffic Counts for Measurements	ST1 dat	ted 11/18/20	015 from 1	6:40 to 1	7:00	
Sunrise Valley Drive - Eastbound	2	522	34	507	15	0
Sunrise Valley Drive - Westbound	2	1,179	31	1,134	45	0
Hourly Traffic Counts for Measurement ST2 dated 11/18/2015 from 16:40 to 17:00						
Sunrise Valley Drive - Eastbound	2	609	34	588	21	0
Sunrise Valley Drive - Westbound	2	1,593	31	1,548	45	0
Hourly Traffic Counts for Measurement S	ST3 date	ed 11/20/20	15 from 7:	00 to 7:20)	
Sunrise Valley Drive - Eastbound	2	792	30	768	21	3
Sunrise Valley Drive - Westbound	2	480	29	429	48	3
Hourly Traffic Counts for Measurement S	ST6 date	ed 11/18/20	15 from 8:1	20 to 8:40)	
Sunset Hills Road - Eastbound	2	1,395	32	1,350	42	3
Sunset Hills Road - Westbound	2	972	31	957	15	0

Table C-2. Existing (2015) Modeled Traffic Volumes

	Number	Total Peak	Travel	Volumes	/olumes by Vehicle Type			
Description of Traffic Lane	of Lanes	Hour Traffic Volumes	Speeds, mph	Cars	Medium Trucks	Heavy Trucks		
Soapstone Drive - South of Sunrise Valley Drive								
Northbound	1	473	40	459	11	3		
Southbound	1	272	40	251	20	1		
Sunrise Valley Drive - West of Soapstone D)rive							
Eastbound	2	965	40	936	23	6		
Westbound	2	553	40	511	40	2		
Sunrise Valley Drive - East of Soapstone Drive								
Eastbound	2	1,098	40	1,066	26	6		
Westbound	2	630	40	582	46	2		
Dulles Toll Road								
Eastbound Inside Lanes	2	1,747	62	1,686	61	0		
Eastbound Outside Lanes	2	1,747	62	1,624	61	62		
Westbound Inside Lanes	2	1,473	62	1,415	58	0		
Westbound Outside Lanes	2	1,473	62	1,333	59	81		
Dulles Access Road								
Eastbound	2	517	62	515	1	1		
Westbound	2	503	62	501	1	1		
Sunset Hills Road								
Eastbound	2	850	42	754	79	17		
Westbound	2	858	42	824	28	6		

Project No. 2G40-078

Table C-3. Build (2046) Modeled Traffic Volumes

	Normale	Total Peak	Travel	Volumes	by Vehicle	e Type
Description of Traffic Lane	Number of Lanes	Hour Traffic Volumes	Speeds, mph	Cars	Medium Trucks	Heavy Trucks
Soapstone Drive - South of Sunrise Valley L	Drive					
Northbound	1	686	40	666	16	4
Southbound	1	394	40	364	29	1
Soapstone Drive - Sunrise Valley Drive to S	Sunset Hi	lls Road				
Northbound	1	637	40	590	37	10
Southbound	1	585	40	553	27	5
Sunrise Valley Drive - West of Soapstone D	rive					
Eastbound	2	1,210	40	1,174	29	7
Westbound	2	694	40	641	51	2
Sunrise Valley Drive - East of Soapstone Dr	rive					
Eastbound	2	1,349	40	1,309	32	8
Westbound	2	775	40	715	57	3
Dulles Toll Road						
Eastbound Inside Lanes	2	2,435	56	2,350	85	0
Eastbound Outside Lanes	2	2,436	56	2,265	85	86
Westbound Inside Lanes	2	1,980	56	1,902	78	0
Westbound Outside Lanes	2	1,980	56	1,792	79	109
Dulles Access Road						
Eastbound	2	1,100	56	1,098	1	1
Westbound	2	1,032	56	1,030	1	1
Sunset Hills Road - West of Soapstone Driv	'e					
Eastbound	2	1,256	40	1,114	117	25
Westbound	2	1,269	40	1,218	42	9
Sunset Hills Road - East of Soapstone Drive	9					
Eastbound	2	917	40	813	86	18
Westbound	2	925	40	888	30	7

Project No. 2G40-078

Appendix D Worst Noise Hour Determination Data

Table D-1. Worst Noise Hour Determination Data - Existing (2015) Noise Levels

			Existing	g				Existin	3
		ЕВ	WB	200 ft			ЕВ	WB	200 ft
		Leq	Leq	Combined			Leq	Leq	Combined
	6:00	58.7	54.6	60.1		6:00	58.7	54.6	60.1
Zone 1	7:00	61.6	58.0	63.2	Zone 2	7:00	61.6	58.0	63.2
	8:00	62.1	60.1	64.2		8:00	62.1	60.1	64.2
	9:00	61.1	60.1	63.6		9:00	61.1	60.1	63.6
	10:00	59.5	59.1	62.3		10:00	59.5	59.1	62.3
	11:00	59.9	60.6	63.3		11:00	59.9	60.6	63.3
	12:00	60.9	60.9	63.9		12:00	60.9	60.9	63.9
Sunset Hills -	13:00	60.5	59.8	63.2	Sunset Hills -	13:00	60.5	59.8	63.2
West of	14:00	59.8	59.5	62.7	East of	14:00	59.8	59.5	62.7
Soapstone	15:00	60.1	60.3	63.2	Soapstone	15:00	60.1	60.3	63.2
Soapstone	16:00	60.2	61.2	63.8	Soapstone	16:00	60.2	61.2	63.8
	17:00	61.2	61.2	64.2		17:00	61.2	61.2	64.2
	18:00					18:00			
	19:00	58.1	59.1	61.6		19:00	58.1	59.1	61.6
	20:00	56.4	56.9	59.7		20:00	56.4	56.9	59.7
			Existing	g				Existing	3
		WB		200 ft			WB		200 ft
	0.00	Leq		Combined			Leq		Combined
70	6:00	64.8		64.8	7	6:00	54.4		54.4
Zone 3	7:00	66.0		66.0	Zone 4	7:00	56.3		56.3
	8:00	66.1		66.1		8:00	57.7		57.7
	9:00	66.1		66.1		9:00	57.2		57.2
	10:00	66.0		66.0		10:00	55.8		55.9
	11:00	65.8		65.8		11:00	55.0		55.0
	12:00	66.2		66.2		12:00	55.1		55.1
Dullog Tell Dd	13:00	66.6		66.6	Dulles Access	13:00	55.4		55.4
Dulles Toll Rd -		67.0		67.0	Rd -	14:00	56.1		56.1
Westbound	15:00	66.6		66.6	Westbound	15:00	57.4		57.4
	16:00	66.0		66.0		16:00	58.3		58.3
	17:00	65.7		65.7		17:00	58.2		58.2
		66.0	I	66.0		18:00	57.4	l	57.4
	18:00								
	19:00 20:00	66.1		66.1		19:00 20:00	56.1 54.3		56.1 54.3

Table D-1. Worst Noise Hour Determination Data - Existing (2015) Noise Levels (Cont'd)

	·		Existing	3				Existing	3
		ЕВ		200 ft			ЕВ		200 ft
		Leq		Combined			Leq		Combined
	6:00	56.7		56.7		6:00	66.5		66.5
Zone 5	7:00	58.2		58.2	Zone 6	7:00	66.2		66.2
	8:00	57.4		57.4		8:00	66.2		66.2
	9:00	57.3		57.3		9:00	66.5		66.5
	10:00	56.3		56.3		10:00	66.3		66.3
	11:00	55.6		55.6		11:00	66.3		66.3
	12:00	55.6		55.6		12:00	66.0		66.0
	13:00	55.3		55.3		13:00	65.8		65.8
Dulles Access	14:00	55.8		55.8	Dulles Toll Rd -	14:00	65.8		65.8
Rd - Eastbound	15:00	56.4		56.4	Eastbound	15:00	65.9		65.9
	16:00	56.9		56.9		16:00	65.6		65.6
	17:00	57.3		57.3		17:00	65.6		65.6
	18:00	56.3		56.3		18:00	65.1		65.1
	19:00	54.9		54.9		19:00	64.6		64.6
	20:00	53.1		53.1		20:00	63.8		63.8
			Existing	3				Existing	3
		ЕВ	WB	200 ft			ЕВ	WB	200 ft
		Leq	Leq	Combined			Leq	Leq	Combined
	6:00	57.8	55.9	60.0		6:00	58.4	56.5	60.5
Zone 7	7:00	60.7	58.1	62.6	Zone 8	7:00	61.2	58.7	63.2
	8:00	64.4							
		61.4	59.0	63.4		8:00			
	9:00	60.4	59.0 58.6	63.4 62.6		8:00 9:00	61.0	59.1	63.2
	9:00 10:00						61.0 58.2	59.1 57.9	63.2 61.1
	10:00 11:00	60.4	58.6	62.6		9:00			
	10:00 11:00 12:00	60.4 57.7	58.6 57.3	62.6 60.5		9:00 10:00	58.2	57.9	61.1
Suprise Valley	10:00 11:00 12:00 13:00	60.4 57.7 57.4	58.6 57.3 57.9	62.6 60.5 60.7	Suprise Valley	9:00 10:00 11:00	58.2 58.0	57.9 58.4	61.1 61.2
Sunrise Valley	10:00 11:00 12:00	57.7 57.4 58.0	58.6 57.3 57.9 58.8	62.6 60.5 60.7 61.4	Sunrise Valley -	9:00 10:00 11:00 12:00	58.2 58.0 58.5	57.9 58.4 59.4	61.1 61.2 62.0
West of	10:00 11:00 12:00 13:00	60.4 57.7 57.4 58.0 58.0	58.6 57.3 57.9 58.8 58.4	62.6 60.5 60.7 61.4 61.2	East of	9:00 10:00 11:00 12:00 13:00	58.2 58.0 58.5 58.6	57.9 58.4 59.4 59.0	61.1 61.2 62.0 61.8
_	10:00 11:00 12:00 13:00 14:00 15:00 16:00	57.7 57.4 58.0 58.0 57.8	58.6 57.3 57.9 58.8 58.4 58.5	62.6 60.5 60.7 61.4 61.2 61.1		9:00 10:00 11:00 12:00 13:00 14:00	58.2 58.0 58.5 58.6 58.3	57.9 58.4 59.4 59.0 59.0	61.1 61.2 62.0 61.8 61.7
West of	10:00 11:00 12:00 13:00 14:00 15:00	60.4 57.7 57.4 58.0 58.0 57.8	58.6 57.3 57.9 58.8 58.4 58.5 59.9	62.6 60.5 60.7 61.4 61.2 61.1 62.0	East of	9:00 10:00 11:00 12:00 13:00 14:00 15:00	58.2 58.0 58.5 58.6 58.3 58.3	57.9 58.4 59.4 59.0 59.0 60.5	61.1 61.2 62.0 61.8 61.7 62.5
West of	10:00 11:00 12:00 13:00 14:00 15:00 16:00	60.4 57.7 57.4 58.0 58.0 57.8	58.6 57.3 57.9 58.8 58.4 58.5 59.9	62.6 60.5 60.7 61.4 61.2 61.1 62.0	East of	9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00	58.2 58.0 58.5 58.6 58.3 58.3	57.9 58.4 59.4 59.0 59.0 60.5	61.1 61.2 62.0 61.8 61.7 62.5
West of	10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00	60.4 57.7 57.4 58.0 58.0 57.8 57.8	58.6 57.3 57.9 58.8 58.4 58.5 59.9 61.0	62.6 60.5 60.7 61.4 61.2 61.1 62.0 63.0	East of	9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00	58.2 58.0 58.5 58.6 58.3 59.3	57.9 58.4 59.4 59.0 59.0 60.5 61.6	61.1 61.2 62.0 61.8 61.7 62.5 63.6

Table D-1. Worst Noise Hour Determination Data - Existing (2015) Noise Levels (Cont'd)

		Existing					
		NB	SB	200 ft			
		Leq	Leq	Combined			
	6:00	54.7	52.8	56.9			
Zone 9	7:00	57.6	55.0	59.5			
	8:00						
	9:00	57.4	55.5	59.5			
	10:00	54.6	54.2	57.4			
	11:00	54.3	54.8	57.6			
	12:00	54.9	55.7	58.3			
Soonatana Dr	13:00	54.9	55.3	58.1			
Soapstone Dr - South of	14:00	54.7	55.4	58.0			
Sunrise Valley	15:00	54.7	56.8	58.9			
Summer valley	16:00	55.6	57.9	59.9			
	17:00						
	18:00	54.7	57.9	59.6			
	19:00	53.0	55.7	57.5			
	20:00	51.0	54.1	55.8			

Table D-2. Worst Noise Hour Determination Data - Future (2046) Noise Levels

			Future					Future	
		ЕВ	WB	200 ft			ЕВ	WB	200 ft
	•	Leq	Leq	Combined			Leq	Leq	Combined
	6:00	60.4	56.3	61.8		6:00	59.0	54.9	60.5
Zone 1	7:00				Zone 2	7:00	61.9	58.3	63.5
	8:00					8:00	62.4	60.5	64.5
	9:00	62.7	61.8	65.3		9:00	61.4	60.4	63.9
	10:00	61.2	60.8	64.0		10:00	59.8	59.5	62.7
	11:00					11:00	60.2	61.0	63.6
	12:00					12:00	61.3	61.2	64.3
Sunset Hills -	13:00	62.2	61.5	64.9	Sunset Hills -	13:00	60.9	60.1	63.5
West of	14:00	61.5	61.2	64.4		14:00	60.2	59.8	63.0
Soapstone	15:00				Soapstone	15:00	60.4	60.6	63.5
- Soapstone	16:00					16:00	60.6	61.5	64.1
	17:00					17:00	61.5	61.6	64.6
	18:00					18:00	60.1	61.7	64.0
	19:00	59.8	60.8	63.3		19:00	58.4	59.4	61.9
	20:00	58.1	58.6	61.4		20:00	56.7	57.3	60.0
			Future	•				Future	
		WB		200 ft			WB		200 ft
		Leq		Combined			Leq		Combined
	6:00	66.1		66.1		6:00	57.6		57.6
Zone 3	7:00	67.3		67.3	Zone 4	7:00	59.4		59.4
	8:00	67.4		67.4		8:00	60.8		60.8
	9:00	67.4		67.4		9:00	60.3		60.3
	10:00	67.2		67.2		10:00	59.0		59.0
	11:00	67.1		67.1		11:00	58.1		58.2
	12:00	67.5		67.5		12:00	58.2		58.2
	13:00	67.9		67.9	Dulles Access	13:00	58.5		58.5
Dulles Toll Rd -	14:00	68.3		68.3	Rd -	14:00	59.3		59.3
Westbound	15:00	67.9		67.9	Westbound	15:00	60.5		60.5
	16:00	67.3		67.3	Westbound	16:00	61.5		61.5
	17:00	67.0		67.0		17:00	61.3		61.3
	18:00	67.3		67.3		18:00	60.5		60.6
	19:00	67.4		67.4		19:00	59.3		59.3
	20:00	66.6		66.6		20:00	57.4		57.4

Table D-2. Worst Noise Hour Determination Data - Future (2046) Noise Levels (Cont'd)

			Future	:		· 		Future	
		ЕВ		200 ft			ЕВ		200 ft
•		Leq		Combined			Leq		Combined
	6:00	59.9		59.9		6:00	67.9		67.9
Zone 5	7:00	61.5		61.5	Zone 6	7:00	67.7		67.7
	8:00	60.7		60.7		8:00	67.7		67.7
	9:00	60.6		60.6		9:00	68.0		68.0
	10:00	59.6		59.6		10:00	67.7		67.7
	11:00	58.9		58.9		11:00	67.7		67.7
	12:00	58.9		58.9		12:00	67.5		67.5
	13:00	58.6		58.6		13:00	67.2		67.2
Dulles Access	14:00	59.1		59.1	Dulles Toll Rd -	14:00	67.3		67.3
Rd - Eastbound	15:00	59.7		59.7	Eastbound	15:00	67.3		67.3
	16:00	60.2		60.2		16:00	67.1		67.1
	17:00	60.6		60.6		17:00	67.1		67.1
	18:00	59.6		59.6		18:00	66.6		66.6
	19:00	58.2		58.2		19:00	66.0		66.0
	20:00	56.4		56.4		20:00	65.2		65.2
			Future	:				Future	
		ЕВ	WB	200 ft			ЕВ	WB	200 ft
		Leq	Leq	Combined			Leq	Leq	Combined
	6:00	58.8	56.9	61.0		6:00	59.3	57.4	61.4
Zone 7	7:00	61.7	59.1	63.6	Zone 8	7:00	62.1	59.6	64.1
	8:00					8:00			
	9:00	61.4	59.5	63.6		9:00	61.9	60.0	64.1
	10:00	58.6	58.3	61.5		10:00	59.1	58.7	61.9
	11:00	58.4	58.9	61.6		11:00	58.9	59.3	62.1
	12:00	59.0	59.8	62.4		12:00	59.4	60.2	62.9
Sunrise Valley	13:00	59.0	59.4	62.2	Sunrise Valley -	13:00	59.5	59.8	62.7
West of	14:00	58.7	59.5	62.1	East of	14:00	59.2	59.9	62.6
Soapstone	15:00	58.8	60.9	63.0	Soapstone	15:00	59.2	61.3	63.4
	16:00	59.7	62.0	64.0		16:00			
	17:00					17:00			
	18:00					18:00			
	19:00	57.1	59.8	61.6		19:00	57.5	60.2	62.1
	20:00	55.1	58.1	59.9		20:00	55.6	58.6	60.4

Table D-2. Worst Noise Hour Determination Data - Future (2046) Noise Levels (Cont'd)

			Future					Future	
		NB	SB	200 ft			NB	SB	200 ft
		Leq	Leq	Combined			Leq	Leq	Combined
	6:00	56.3	54.4	58.5		6:00	57.1	55.6	59.4
Zone 9	7:00				Zone 10	7:00			
	8:00					8:00			
	9:00					9:00			
	10:00	56.2	55.8	59.0		10:00	57.7	57.2	60.5
	11:00	55.9	56.4	59.2		11:00	58.0	57.4	60.7
	12:00	56.5	57.3	59.9		12:00			
Coonstone Dr	13:00	56.5	56.9	59.7		13:00	57.8	58.4	61.1
Soapstone Dr -	14:00	56.3	57.0	59.7	Soapstone Dr -	14:00	58.0	58.1	61.0
South of	15:00	56.3	58.4	60.5	Sunset Hills to	15:00			
Sunrise Valley	16:00				Sunrise Valley	16:00			
	17:00					17:00			
	18:00					18:00			
	19:00	54.6	57.3	59.2		19:00	56.9	57.9	60.4
	20:00	52.7	55.7	57.4		20:00	54.9	56.6	58.8

Table D-3. Worst Noise Hour Determination Data - Existing (2015) Noise Levels - Dulles Toll Roads / Access Roads Combined

		Existing			Existing			Existing			Existing			Existing Combined
	6:00	64.8		6:00	54.4	_	6:00	56.7	_	6:00			6:00	
Zone 3	7:00	66.0	Zone 4	7:00	56.3	Zone 5	7:00	58.2	Zone 6	7:00	66.2	Zones 3-6	7:00	69.7
	8:00	66.1		8:00	57.7		8:00	57.4		8:00	66.2		8:00	69.7
	9:00	66.1		9:00	57.2		9:00	57.3		9:00	66.5		9:00	69.8
	10:00	66.0	10:00 11:00 12:00 Dulles	55.9		10:00	56.3		10:00	66.3		10:00	69.6	
	11:00	65.8					11:00	55.6	Dulles Toll Rd	11:00	66.3	Full Dulles	11:00	69.4
	12:00	66.2					12:00	55.6		12:00	66.0		12:00	69.5
	13:00			13:00	55.4	Dulles	13:00	55.3		13:00	65.8		13:00	69.6
Dulles Toll Rd	14:00	67.0	Access Rd -	14:00	56.1	Access Rd -	14:00	55.8		14:00	65.8		14:00	69.8
- Westbound	15:00	66.6	Westbound	15:00	57.4	Eastbound	15:00	56.4	- Eastbound	15:00	65.9	Facility	15:00	69.8
	16:00	66.0	Westboullu	16:00	58.3	Eastboullu	16:00	56.9		16:00	65.6		16:00	69.4
	17:00	65.7		17:00	58.2		17:00	57.3		17:00	65.6		17:00	69.3
	18:00	66.0		18:00	57.4		18:00	56.3		18:00	65.1		18:00	69.1
	19:00	66.1	19:00	56.1		19:00	54.9		19:00	64.6		19:00	68.8	
	20:00	65.3		20:00	54.3		20:00	53.1		20:00	63.8		20:00	67.9

Project No. 2G40-078

Table D-3. Worst Noise Hour Determination Data - Future (2046) Noise Levels - Dulles Toll Roads / Access Roads Combined

		Future			Future			Future			Future			Future Combined
	6:00	66.1		6:00	57.6		6:00	59.9		6:00	67.9		6:00	70.7
Zone 3	7:00	67.3	Zone 4	7:00	59.4	Zone 5	7:00	61.5	Zone 6	7:00	67.7	Zones 3-6	7:00	71.3
	8:00	67.4		8:00	60.8		8:00	60.7		8:00	67.7		8:00	71.4
	9:00	67.4		9:00	60.3		9:00	60.6		9:00	68.0		9:00	71.4
	10:00	67.2	10:00 11:00 12:00 13:00	59.0		10:00	59.6		10:00	67.7		10:00	71.1	
	11:00	67.1		11:00	58.2		11:00	58.9	Dulles Toll Rd	11:00	67.7	Full Dulles Facility	11:00	71.0
	12:00	67.5					12:00	58.9		12:00	67.5		12:00	
	13:00					Dulles	13:00	58.6		13:00	67.2		13:00	71.1
Dulles Toll Rd	14:00	68.3	Access Rd -	14:00	59.3	Access Rd -	14:00	59.1		14:00	67.3		14:00	71.4
- Westbound	15:00	67.9	Westbound	15:00	60.5	Eastbound	15:00	59.7	- Eastbound	15:00	67.3		15:00	71.3
	16:00	67.3	Westboullu	16:00	61.5	Lastboullu	16:00	60.2		16:00	67.1		16:00	71.1
	17:00	67.0		17:00			17:00	60.6		17:00	67.1		17:00	71.0
	18:00	67.3		18:00	60.6		18:00	59.6		18:00	66.6		18:00	70.8
	19:00	67.4		19:00	59.3		19:00	58.2		19:00	66.0		19:00	70.4
	20:00	66.6		20:00	57.4		20:00	56.4		20:00	65.2		20:00	69.5

Project No. 2G40-078

Appendix E Proposed Barrier Top of Wall Elevations

Table E-1. Proposed Top of Barrier Elevations

Easting, ft	Northing, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation ¹ , ft	Barrier Height, ft					
Eastbound	l Sunrise Valley	Barrier A Drive and South	nbound Soapsto	one Drive					
11810552.0	7029689.5	427.5	439.5	12					
11810572.0	7029666.0	428.0	440.0	12					
11810584.0	7029644.0	428.0	440.0	12					
11810594.0	7029626.5	428.5	440.5	12					
11810651.0	7029575.5	428.0	440.0	12					
11810696.0	7029535.5	428.0	440.0	12					
11810698.0	7029478.0	430.0	442.0	12					
11810698.0	7029478.0	430.0	440.0	10					
11810667.0	7029433.0	432.0	442.0	10					
11810620.0	7029357.0	432.0	442.0	10					
	Appro	ximate Length: 4	14 ft						
	Approxima	ate Surface Area:	4,684 ft ²						
	Westbo	Barrier D ound Dulles Toll	Road						
11810928.0	7031198.5	384.0	396.0	12					
11810870.0	7031222.0	385.0	397.0	12					
11810812.0	7031245.5	386.0	398.0	12					
11810753.0	7031269.0	387.0	399.0	12					
11810695.0	7031292.5	388.0	400.0	12					
11810642.0	7031314.0	389.5	401.5	12					
11810589.0	7031336.0	391.0	403.0	12					
	Appro	ximate Length: 3	66 ft						
	Approximate Surface Area: 4,392 ft ²								

Notes:

^{1 -} Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.

Project No. 2G40-078

Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Da	te:		03/02/2017		
Pro	ject	No. and UPC:	Fairfax County Project No.: 2G40-	078	
Co	unty	······	Fairfax		
Fac	cility	<i>7</i> :	Soapstone Connector		
Ba	rrier	System ID:	Barrier A		
		Abatement Category(s)	Category B		
Co	mmı	unity Name and/or CNE#	CNE A		
De	sign	phase:	✓ Preliminary Design	Final Design	
Wa	arra	nted			
1.	Co	mmunity Documentation (i			
	a.		nitted. (Per 23CFR 772 this is	N 1.4	
	1.	the date the building perm	· · · · · · · · · · · · · · · · · · ·	NA	
	D.	* *	Categorical Exclusion (CE), o, or Finding of No Significant		
		Impact (FONSI):	y, or I maing of No Significant	NA	
	c.	Does the date in 1.a prece	de the date in 1.b? If yes,	-	-
			2. If no, consideration of noise		
			d. Proceed to "Decision" block		
			nted question. As the reason for	☐ Yes	∐ No
			Community was permitted after f CE, ROD, or FONSI, as		
		appropriate."	T CE, ROD, OF PONSI, as		
		ирргоргии.			
2.	Cr	iteria requiring consideration	n of noise abatement		
	a.		noise levels to approach or	✓ Yes	□ No
		exceed the Noise Abateme		V 103	110
	b.	•	l noise increase of 10 dBA or	Yes	✓ No
		more?		_	
Fea	asibi	ility			
1.	Im	pacted receptor units			
		Number of impacted recep		6	
	b.		ptor units receiving 5 dBA or		
		more insertion loss (IL):		6	
	c.	Percentage of impacted re or more IL	ceptor units receiving 5 dB(A)	100%	
	.1		otar?		□ No
	d.	Is the percentage 50 or gre	alti !	✓ Yes	∐ No

2	Will placement of the noise barrier cause e.g. drainage or site distance issues?	e engineering or safety conflicts,	Yes	✓ No
3	Will placement of the noise barrier restripedestrian travel?	ict access to vehicular or	Yes	✓ No
4	Will placement of the noise barrier confi	lict with existing utility locations?	Yes	✓ No
Rea	asonableness Cost-Benefit Factors			
1.	a. Surface Area (Total square foot) of the	he proposed noise barrier. (ft²)	4,684 ft ²	
	b. Impacted noise sensitive receptor(s) in	· · · · · · · · · · · · · · · · · ·	6	
	c. Non-impacted noise sensitive receptor			
	more. d. Total number of benefited recentors		2 8	
	d. Total number of benefited receptors.e. Surface Area per benefited receptor		8 586 ft²/BR	
	f. Is (1e) less than or equal to the maxim	` '	אטרוו מסכ	
	receptor (MaxSF/BR) value of 1600?	?	Yes	
	g. Does the barrier provide an IL of at le impacted receptor in the design year?	` /	Yes	
2.	Community Desires Related to the Barria. Do at least 50 percent of the benderenters desire the noise barrier? If you no, the barrier can be considered rudecision" block and answer "no" to reason for this decision, state that receptor unit owners do not desire the	refited receptor unit owner(s) and ves, continue to "decision" block. If not to be reasonable. Proceed to be reasonableness question. As the cut "The majority of the impacted	☐ Yes	□ No
3.	Additional Noise Barrier Details			
	a. Length of the proposed noise barrier		414 ft	
	b Height range of the proposed noise be		10 - 12 ft	
	 c. Average height of the proposed noise d Cost per square foot. (\$/ft²) 	barrier	11 ft \$42 / ft2	
	d Cost per square foot. (\$/ft²) e. Total Barrier Cost (\$)		\$42 / ft ² \$196 728	
	f. Additional comments (if applicable)		\$196,728	
	g. Barrier material		Absorptive	Reflective
		Decision		
Is th	he Noise Barrier(s) WARRANTED? he Noise Barrier(s) FEASIBLE? he Noise Barrier(s) REASONABLE?	✓ Ye ✓ Ye □ Ye	es 🔲	No No No
Ado	ditional Reasons for Decision:	Barrier is reasonable based on cost effect	tiveness and ach	ieving the
		design goal; however, viewpoints of the be	enefited receptor	s is not
		known at this time.		

Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Date:		03/02/2017		
Project No. and UPC:		Fairfax County Project No.: 2G40-	078	
County:		Fairfax		
Facility:		Soapstone Connector		
Barrier System ID:		Barrier D		
Noise Abatement Category(s)		Category C		
Community Name and/or CNE#		CNE D		
Design phase:		✓ Preliminary Design	Final Design	
Wa	arranted			
1.	Community Documentation (i			
		mitted. (Per 23CFR 772 this is	NIA	
	the date the building perm	The state of the s	NA	
	b. Date of approval for the), or Finding of No Significant		
	Impact (FONSI):), or i manig or two significant	NA	
	- · · · · · · · · · · · · · · · · · · ·	de the date in 1.b? If yes,		
	proceed to Warranted Iten	n 2. If no, consideration of noise		
		d. Proceed to "Decision" block		
		nted question. As the reason for	☐ Yes	∐ No
		Community was permitted after of CE, ROD, or FONSI, as		
	appropriate."	of CL, ROD, of TONSI, as		
	PP P			
2.	Criteria requiring consideratio	n of noise abatement		
		noise levels to approach or	✓ Yes	□ No
	exceed the Noise Abateme		103	110
	b. Project causes a substantia more?	al noise increase of 10 dBA or	☐ Yes	✓ No
	more?			
Fea	asibility			
1.	Impacted receptor units			
	a. Number of impacted recep	otor units:	1	
	b. Number of impacted receptor units receiving 5 dBA or			
	more insertion loss (IL):		1	
c. Percentage of impacted record more IL		eptor units receiving 5 dB(A)	100%	
		ontor?		□ No
	d. Is the percentage 50 or gre	CAUL!	✓ Yes	☐ No

2	Will placement of the noise barrier cause engineering or safety conflicts, e.g. drainage or site distance issues?	Yes	✓ No	
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	Yes	✓ No	
4	Will placement of the noise barrier conflict with existing utility locations?	Yes	✓ No	
Rea	asonableness Cost-Benefit Factors			
1.	a. Surface Area (Total square foot) of the proposed noise barrier. (ft²)	4,392 ft ²		
	b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1		
	c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or			
	more.	0		
	d. Total number of benefited receptors.	1 4 202 ft2/PP		
	e. Surface Area per benefited receptor unit. (ft²/BR)	4,392 ft²/BR		
	f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No		
	g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes		
2.	Community Desires Related to the Barrier a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the impacted receptor unit owners do not desire the barrier."	☐ Yes	□ No	
3.	Additional Noise Barrier Details			
	a. Length of the proposed noise barrier	366 ft		
	b Height range of the proposed noise barrier	12 ft		
	c. Average height of the proposed noise barrier d Cost per square foot. (\$/ft²)	12 ft \$42 / ft ²		
	d Cost per square foot. (\$/ft²) e. Total Barrier Cost (\$)	\$42 / 11 ² \$184,464		
	f. Additional comments (if applicable)	Φ104,4υ4		
	g. Barrier material	Absorptive	Reflective	
	Decision			
Is th	he Noise Barrier(s) FEASIBLE?	es [ses	No No No	
Ado	ditional Reasons for Decision: Barrier is not reasonable based on cost	Barrier is not reasonable based on cost effectiveness.		