Appendix E Noise Calculations

Field Photos



Photograph I. LT-I Looking East



Photograph 2. LT-I Looking North



Photograph 3. LT-I Looking South



Photograph 4. LT-I Looking West



Photograph 5. LT-2 Looking East



Photograph 6. LT-2 Looking North



Photograph 9. ST-I Looking East



Photograph 10. ST-I Looking North



Photograph 7. LT-2 Looking South



Photograph 8. LT-2 Looking West



Photograph II. ST-I Looking South



Photograph 12. ST-I Looking West



Photograph 13. ST-2 Looking East



Photograph 14. ST-2 Looking North



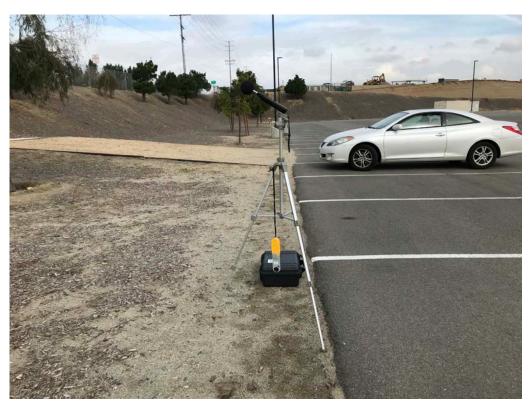
Photograph 15. ST-2 Looking South



Photograph 16. ST-2 Looking West



Photograph 17. ST-3 Looking East



Photograph 18. ST-3 Looking North



Photograph 19. ST-3 Looking South



Photograph 20. ST-3 Looking West



Photograph 21. ST-4 Looking East



Photograph 22. ST-4 Looking North



Photograph 23. ST-4 Looking South



Photograph 24. ST-4 Looking West



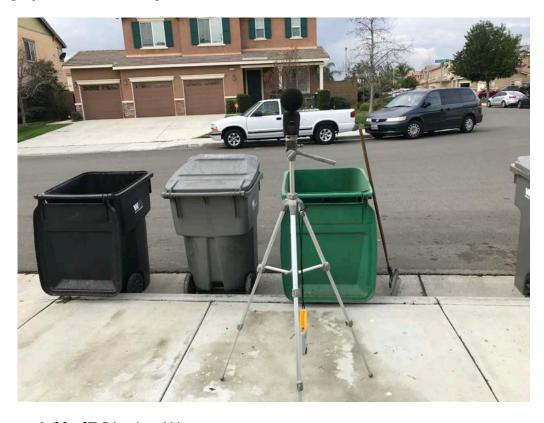
Photograph 25. ST-5 Looking East



Photograph 26. ST-5 Looking North



Photograph 27. ST-5 Looking South



Photograph 28. ST-5 Looking West

Field Sheets

FIELD NOISE MEASUREMENT DATA

PROJECT:	Hamne	•	widen			_PROJ.#	005	20.19	-
SITE IDENTIFICA	TION: ST	•			OBSE	RVER(S):	TC	IR	
ADDRESS:	CLACK Fle	: (d					0	100	3.01.
START DATE / TI		120 .	12:31	<i>f</i>	END D	DATE / TIN	ME: 1/21,	120 1	2:5/pm
METEROLOGICA	I CONDITIO	NS.							
TEMP: 64	UH · F	MIDITY: 49,4	%R.H.		WIND:	CALM JA	GHP MODE	RATE VAI	RIABLE .
WINDSPEED:	2.3 MP	H DIR:	N NE		(S (SVV)	W NW		STEADY	
SKY: SUNNY	CLEAR OY	RCST PRTLY	CLOUDY	FOG	RAIN		OTHER:		
ACOUSTIC MEAS	HIPEMENTS	x	-					501	7/
INSTRUMENT:		73/			TYPE: G) 2	SERIAL	4: 5 F	80
CALIBRATOR:	CAL VE			4.7	_		SERIAL #	4:664	5
CALIBRATION (CHECK, BEF	ORE: 114,0	AFTER	[13.9]	∑WINDS0	CREEN	\rightarrow		
1	•	OW) FAST	FRONTAL	A	OM A	NSP	OTHER:		
SETTINGS: A-W	EIGH IED 3	LOW PAST	INOMIA	- /43342			,	•	
FILE / START	END		:	,	1 05	L i 50	90	99	min
MEAS# TIME	TIME	L _{eq} max		8.33	62.4	•	54.8	<u> </u>	49,2
.027 12:31	1251 61	1.5 74.5	66.7	64.4	02,4	60.1	3910	54.7	97,2
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COMMENTS:									
NOISE SOURCE I PRIMARY NOISE SO ROADWAY OTHER SOURCES: DIST. CHIL	URCE: TRAFF	ET / RUSTI IN	GIFAVES /	DIST. BAR	AMBIEN KING DOGS PING ACTI	/ BRBS	/ DIST. IND	USTRIAL	-
	-								
DESCRIPTION / S	VETCU:							****	
TERRAIN: HARD S	OFT MIXED	FLAT OTHER:							
PHOTOS:									
OTHER COMMENTS	/SKETCH:			10	r · · · · ·	1			·
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FIELD NOISE MEASUREMENT DATA

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SITE IDENTIFICAT	ION: C	t 2	•			OBSE	RVER(S):	JCK	2	
ADDRESS:	Packelan Lo	of new.	4142	1 ACAC	Ta Ave					
START DATE / TIM		11/20		11:59	.bm	END I	DATE / TIM	ME: 1/21	160-1	2:19 Ju
WINDSPEED:	°F .	HUMIDITY:	DIR:	_%R.H. N NE LOUDY	E SE	WIND: S SW RAIN	W NW	OTHER:	RATE VAI	RIABLE . GUSTY .
ACOUSTIC MEASIINSTRUMENT: CALIBRATOR: CALIBRATION CONSETTINGS: A-WE	<i>LD CAL 2</i> HECK, B	831 200	114,0 Fast		113,90 RANE	- WINDS	2 CREEN	SERIAL SERIAL X OTHER:		
FILE / START	END			:	! 0.00	25	L 50	90	99	min
MEAS# TIME	TIME	L _{eq}	max	1.67	8.33		•	56.4	<u> </u>	
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COMMENTS:										
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NOISE SOURCE IN PRIMARY NOISE SOI ROADWAY OTHER SOURCES: DIST. CHILL	URCE: T	SDAET / BI	USTLING	FAVES /	DIST. BAR	KING DOG	S / BIRDS	/ DIST. IND	., DUSTRIAL	-
DESCRIPTION / SH	CETCH.									
DESCRIPTION / ST										
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TERRAIN: HARD SI PHOTOS:			Har	moet sim X	Ave walk		7/			
TERRAIN: HARD SI PHOTOS:			Har	moet moet sim	Ave walk		7/			

FIELD NOISE MEASUREMENT DATA Ave when proj. # 00 520, 19

PROJECT: Humner Ave Widenian

SITE IDENTIFIC	ATION: 51	T3	•			OBSE	RVER(S):	JC1	(
ADDRESS:	Silverla	kes equ	ristian e	E Sports	porc 56	55 Hamo	7414 NATE / TIM	ME: 1/2	1/20	(0:58 pm
START DATE / 7	IME: 1/2	21/20	- 10:	38 Aan		ENDD	AIE / IIIV	III. (1)		(0.5)
METEROLOGIC TEMP: 66 WINDSPEED:	_ °F .	HUMIDITY:	DIR:	N N⊨	E SE	WIND:	WW		RATE VAR	RIABLE .
SKY: SUNNY		OVECST	PRTLY CI	LOUDY	FOG	RAIN		OTHER:		
ACOUSTIC MEA	: LP	831		•		TYPE:	?) 2	SERIAL:	#: 378 #: 66 9	<i>6</i>
CALIBRATOR: CALIBRATION	CHECK B	200 EEORE:	11H ()	AFTER	114,03	WINDSO		SLIVIAL !	. 06	7.5
i	\sim	<i></i>)					(G)	OTHER:		
SETTINGS: A-	NEIGHTED	skow	FAST	FRONTAL	RANDO		NSI	OTHER.		-
FILE / START		,		: 467	8.33	25	L 50	90	99	min
MEAS# TIME	TIME	L _{eq} 54.8	max for	65.2	6.22 8	600	588	54.5		57.6
.024 10:38	10.75	59,8	67.9	105.2	940	1	7012			
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COMMENTS:										
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NOISE SOURCE	INFO:					•				
PRIMARY NOISE S	OURCE: TR	AFFIC All	RCRAFT	RAIL IN	DUSTRIAL	AMBIEN	IT OTHE	ER:	•,-	
ROADW.	AY TYPE:	DAET / DI	ISTI ING I	FAVES / I	DIST. BARK	ING DOGS	/ BIRDS	/ DIST. INC	USTRIAL	•
DIST, CH	IILDREN PLA	YING / DIS	ST, TRAFF	ic / Disi.	LANDSCAL	PING ACT	AIIIE9 /	Officia.		
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DESCRIPTION /	SKETCH:									
TERRAIN: HARD		FLAT	OTHER:							
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	PROJECT	: Ifai	nnes F	1ve	widen	ng		_PROJ.#	00 5	20.19		
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TEMP:	ROLOGICA SPEED: SUNNY	-°F - 1_	ITIONS: HUMIDITY MPH OVEREST	DIR:	N NE	E SE FOG	s (SW	w nw	OTHER:	ERATE VAI STEADY	RIABLE GUSTY	
INSTI	STIC MEA RUMENT: BRATOR: BRATION	<u> </u>	831	114.0	AFTER				SERIAL	#: 378 #: 664	36 5	;
SETTI	NGS: A-W	RIGHTED	SLOW	FAST	FRONTAL	RANE	OM A	NSI	OTHER:		-	_
FILE /	;	TIME	L_{eq}	max	1.67	8.33	25	L 50	90	99	min	
MEAS #	· d - A	10:10	68.0	77.6	74.5	72.4	\$64.5	66.0	53,4	45.3	43.4	
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PROJECT	: Hum	mec	Ave	vide	ning		_PROJ.#	# <u>006</u>	20.1	.
SITE IDENTIFIC	ATION: ST	T 5				OBSE	RVER(S):	Sc/	<	
ADDRESS:	Lituren	7212	\$ 7222	2 EXC	eslor B	In				-
START DATE / T	IME: 1/2,	1/20	, 11:2.	3 AM		END D	ATE / TIM	ME: 1/2	1720	
METEROLOGIC	AL CONDI	TIONS:								
TEMP: 70		HUMIDIT	y: 45	_%R.H.		, WIND:	CALM L	GHT MODE	RATE VA	RIABLE .
WINDSPEED:	1-2	MPH		N NE	E SE FOG	S (SW) (W NW	OTHER:	STEADY	GUSTY
SKY: SUNNY	CLEAR	OVRUST	PRILIC	LOODI	100	7000				
ACOUSTIC MEA	SUREMEN	NTS:		-		TVDE	1) 2	SERIAL	#. 3 <i>7</i> /	86
INSTRUMENT:	<i>UI</i>	931				TYPE:	1/2	SERIAL	#: 664	5
CALIBRATOR: CALIBRATION	CHECK. E	SEFORE:	114.0	AFTER	113.7	WINDSO	CREEN	_X	_	•
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SETTINGS: A-V	VEIGHTED	SLOW	FASI	PRONTAL	, VAIVE				-	
FILE / START	END TIME	1	max	1.67	8.33	25	L ≟ 50	90	99	min
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NOISE SOURCE	INFO:			-						
PRIMARY NOISE S	OURCE: T	RAFFIC A	JRCRAFT	RAIL II	NDUSTRIAL	- AMBIEN	IT OTH	ER:	··	
ROADWA OTHER SOURCES	Y TYPE:	CDAET / E	HISTI ING	FAVES /	DIST. BAR	KING DOGS	BIRDS	/ DIST. INC	USTRIAL	_
DIST. CH	ILDREN PLA	YING / D	IST. TRAFF	IC / DIST.	LANDSCA	PING ACT	VITIES /	OTHER:		
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DESCRIPTION /	SKETCH.									
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PRC	JECT:	Han	MAIC A	ive	Widen. W	1q		PROJ. #	# <u>005</u>	20.19	
SITE IDENT	TIFICAT	ION: U	T I	,	-	J	OBSE	RVER(S):	XK		
ADDRESS:	Row 1	Vecs 7	7292	Exel 5)	ac 01		-				
START DA	TE / TIM	E: 1/	21/20	- 76	0/ Am		END D	ATE / TI	VIE: 1/2	3/20	-8:561
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METEROLO	OGICAL								OUT WODE	DATE VAL	NADI E
TEMP:			HUMIDITY		%R.H.			CALM LI	GHT MODE	STEADY	
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SKY:	SUNNY	CLEAR	OVRCST	PRTLY C	LOUDY	FOG	RAIN		OTHER:		
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INSTR	UMENT:	YiC	720				_ ' ' ' ' - ' '		SERIAL	#: 66 9	15
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N C	ROADWA	Y TYPE:	PAET / R	USTI ING	LFAVES /	DIST. BARI	(ING DOGS	S / BIRDS	/ DIST. INE		
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ERRAIN:	: HARD S	KETCH:	ED FLAT	OTHER:	·		,				
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Calibration Certificates

Calibration Certificate

Certificate Number 2019003009

Customer:

ICF

49 Discovery

Irvine, CA 92618, United States

Model Number

CAL200

Serial Number

6645

Test Results

Pass

Initial Condition

Adjusted

Description

Larson Davis CAL200 Acoustic Calibrator

Procedure Number

mber D0001.8386

DUUC

Technician

Scott Montgomery 8 Mar 2019

Calibration Date Calibration Due

0 Max 2019

Temperature

8 Mar 2020 25 °C

± 0.3 °C

Humidity

33

%RH ±3%RH

Static Pressure

101.3 kPa

ληγη ±3 ληγη κPa ±1 kPa

Evaluation Method

The data is aquired by the insert voltage calibration method using the reference microphone's open

circuit sensitivity. Data reported in dB re 20 µPa.

Compliance Standards

Compliant to Manufacturer Specifications per D0001.8190 and the following standards:

IEC 60942:2017

ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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	Standards Used	1	
Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/06/2018	09/06/2019	001021
Larson Davis Model 2900 Real Time Analyzer	04/10/2018	04/10/2019	001051
Microphone Calibration System	03/04/2019	03/04/2020	005446
1/2" Preamplifier	09/20/2018	09/20/2019	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/07/2018	08/07/2019	006507
1/2 inch Microphone - RI - 200V	05/10/2018	05/10/2019	006510
Pressure Transducer	07/18/2018	07/18/2019	007368







Certificate Number 2019003009

Output Level

Nominal Level	Pressure	Test Result	Lower limit	Upper limit	Expanded Uncertainty	Result
[dB]	[kPa]	[dB]	[dB]	[dB]	[dB]	
114	101.2	114.00	113.80	114.20	0.14	Pass
94	101.3	94.02	93.80	94.20	0.15	Pass
		:	End of measuremen	nt results		

Frequency

Nominal Level	Pressure	Test Result	Lower limit	Upper limit	Expanded Uncertainty Result
[dB]	[kPa]	[Hz]	[Hz]	[Hz]	[Hz]
114	101.2	1,000.18	990.00	1,010.00	0.20 Pass
94	101.3	1,000.20	990.00	1,010.00	0.20 Pass
)	End of measur <mark>e</mark> mer	it results	

Total Harmonic Distortion + Noise (THD+N)

Nominal Level [dB]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
114	101.2	0.39	0.00	2.00	0.25 ‡	Pass
94	101.3	0.51	0.00	2.00	0.25 ‡	Pass
)	End of measuremen	nt results		

Level Change Over Pressure

Tested at: 114 dB, 23 °C, 36 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	108.0	0.04	-0.30	0.30	0.04 ‡	Pass
101.3	101.2	0.00	-0.30	0.30	0.04 ‡	Pass
92.0	92.0	-0.03	-0.30	0.30	0.04 ‡	Pass
83.0	83.0	-0.03	-0.30	0.30	0.04 ‡	Pass
74.0	74.0	0.02	-0.30	0.30	0.04 ‡	Pass
65.0	65.0	0.15	-0.30	0.30	0.04 ‡	Pass
			End of measureme	nt results		

Frequency Change Over Pressure

Tested at: 114 dB, 23 °C, 36 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	108.0	0.00	-10.00	10.00	0.20 ‡	Pass
101.3	101.2	0.00	-10.00	10.00	0.20 ‡	Pass
92,0	92.0	0.00	-10.00	10.00	0.20 ‡	Pass
83.0	83.0	0.00	-10.00	10.00	0.20 ‡	Pass
74.0	74.0	0.00	-10.00	10.00	0.20 ‡	Pass
65.0	65.0	0.00	-10.00	10.00	0.20 ‡	Pass
			End of measuremen	nt results		

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Certificate Number 2019003009

Total Harmonic Distortion + Noise (THD+N) Over Pressure

Tested at: 114 dB, 23 °C, 36 %RH

Nominal Pressure	Pressure	Test Result	Lower limit	Upper limit	Expanded Uncertainty	Result
[kPa]	[kPa]	[%]	[%]	[%]	[%]	Acsun
108.0	108.0	0.41	0.00	2.00	0.25 ‡	Pass
101.3	101.2	0.39	0.00	2.00	0.25 ‡	Pass
92.0	92.0	0.35	0.00	2.00	0.25 ‡	Pass
83.0	83.0	0.31	0.00	2.00	0.25 ‡	Pass
74.0	74.0	0.28	0.00	2.00	0.25 ‡	Pass
65.0	65.0	0.24	0.00	2.00	0.25 ‡	Pass

⁻⁻ End of measurement results--

Signatory: Scott Montgomery

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Calibration Certificate

Certificate Number 2019003011

Customer:

ICF

49 Discovery

Irvine, CA 92618, United States

Model Number

831

Serial Number Test Results 0003786 **Pass**

Initial Condition

Inoperable

Description

Larson Davis Model 831 Class 1 Sound Level Meter

Firmware Revision: 2.314

Evaluation Method

Tested with:

Larson Davis PRM831, S/N 029611

PCB 377B02. S/N 312026 Larson Davis CAL200. S/N 9079 Larson Davis CAL291. S/N 0108

Compliance Standards

Compliant to Manufacturer Specifications and the following standards when combined with

Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1

IEC 60804:2000 Type 1

IEC 61252:2002 IEC 61260:2001 Class 1

IEC 61672:2013 Class 1

ANSI S1.4-2014 Class 1

Procedure Number

Calibration Date

Calibration Due

Static Pressure

Temperature

Humidity

Technician

ANSI S1.4 (R2006) Type 1

D0001.8384

Ron Harris

8 Mar 2019

8 Mar 2020

84.61 kPa

Data reported in dB re 20 µPa.

± 0.25 °C

± 0.13 kPa

%RH ± 2.0 %RH

23.59 °C

48.8

ANSI S1.11 (R2009) Class 1 ANSI S1.25 (R2007)

ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.

Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Correction data from Larson Davis Model 831 Sound Level Meter Manual, 1831.01 Rev O, 2016-09-19

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to

LARSON DAVIS - A PCB PIEZOTRONICS DIV. 1681 West 820 North Provo,UT 84601,United States 716-684-0001







Certificate Number 2019003011

1/2" adaptor is used with the preamplifier.

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa; Reference Range: 0 dB gain

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2016-02-24 certificate number DE-15-M-PTB-0056.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used						
Description	Cal Date	Cal Due	Cal Standard			
Larson Davis CAL291 Residual Intensity Calibrator	2018-09-19	2019-09-19	001250			
SRS DS360 Ultra Low Distortion Generator	2018-06-21	2019-06-21	006311			
Hart Scientific 2626-H Temperature Probe	2018-08-19	2019-08-19	006798			
Larson Davis CAL200 Acoustic Calibrator	2018-07-24	2019-07-24	007027			
Larson Davis Model 831	2019-02-22	2020-02-22	007182			
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2019-03-06	2020-03-06	007185			

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.00	113.80	114.20	0.14	Pass

As Received Level: 112.20 Adjusted Level: 114.00

-- End of measurement results--

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using slow time-weighted sound level for compliance to IEC 61672-1:2013 5.5; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	-0.19	-0.20	-1.20	0.80	0.23	Pass
1000	0.17	0.00	-0.70	0.70	0.23	Pass
8000	-2.90	-3.00	-5.50	-1.50	0.32	Pass

-- End of measurement results--

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Self-generated Noise

Measured according to IEC 61672-3:2013 11.1 and ANSI S1.4-2014 Part 3: 11.1

Measurement

Test Result [dB]

A-weighted, 20 dB gain

40.13

-- End of measurement results--

-- End of Report--

Signatory: Ron Harris

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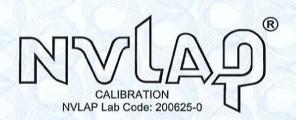






Scantek, Inc.

CALIBRATION LABORATORY ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1 ACCREDITED by NVLAP (an ILAC MRA signatory)



Calibration Certificate No. 42405

Instrument:

Sound Level Meter

Model:

Piccolo (SLM-P3)

Manufacturer: Serial number: Soft dB 140513018

ID number:

Tested with:

Microphone

Customer:

ICF International

Phone/Fax:

949-333-6619

Date Calibrated:

2/27/2019 Due: Received

Sent

X

Status:

In tolerance: Out of tolerance:

See comments:

Contains non accredited tests: Yes X No Calibration service:

X Basic Standard

Address:

49 Discovery, Suite 250

Irvine, CA 92618

Tested in accordance with the following procedures and standards:

 Calibration of SLM & Dosimeters - Acoustical Tests, Scantek, Inc. Rev.7/6/2011

Instrumentation used for calibration:

Instrument - Manufacturer	Donatation	COL	Cal Data	Traceability evidence:	C.I.D.	
Instrument - Manufacturer	Description	on S/N	Cal. Date	Cal. Lab / Accreditation	Cal. Due	
1253 - Norsonic	Calibrator	25726	Nov 11, 2018	Scantek Inc. / NVLAP	Nov 11, 2019	
4226 Bruel & Kjaer	Multifunction Calibrator	2305103	Sep 18, 2018	Bruel & Kjaer / A2LA	Sep 18, 2019	
HM30-Thommen	Meteo Station	1040170/39633	Nov 13, 2018	ACR Env./ A2LA	Nov 13, 2019	

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA), and NPL (UK).

Environmental conditions

Temperature [°C]	Barometric Pressure [kPa]	Relative Humidity [%]
23.0	100.82	38.2

Calibrated by:	Jeremy Gotwalt	Authorized signatory:	
Signature	MARTEN	Signature (Streng Marshall
Date	2/27/19	Date	2/5/2019

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory,

This Calibration Certificate or Test Report shall not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government

Results summary: Device was tested and complies with following clauses of mentioned specifications:

CLAUSES / METHODS FROM PROCEDURES:	MET 1, 2	NOT MET 1, 2	NOT TESTED
Accuracy test: calibration w/ acoustical calibrator	x		
Level linearity test	X		
Differential linearity test	Х		
Weighting network tests (A)	X		
Weighting network tests (C)	X		
Fast/Slow time constant test	X		
RMS crest factor test	X		, , , ,
Steady state response test	X		5
Integrating Functions Test (Leq/SEL Linearity):	X		

¹ The results of this calibration apply only to the instrument type with serial number identified above.

Comments: The instrument was submitted to the selection of tests listed in the table above, and met the manufacturer specifications.

Measured Data: in Test Report # 42405 of three pages.

Place of Calibration: Scantek, Inc. 6430 Dobbin Road, Suite C Columbia, MD 21045 USA Phone/Fax: 410-290-7726/ -9167

callab@scantekinc.com

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This Calibration Certificate or Test Report shall not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government

² Parameters are certified at actual environmental conditions.

Scantek, Inc.

CALIBRATION LABORATORY ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1 ACCREDITED by NVLAP (an ILAC MRA signatory)



Calibration Certificate No. 42404

Instrument:

Sound Level Meter

Model:

Piccolo (SLM-P3)

Manufacturer: Serial number: Soft dB 140513015

ID number:

Tested with:

Microphone

Customer:

ICF International

Phone/Fax:

949-333-6619

Date Calibrated:

2/27/2019 Due: 2/27/2020

Received

Sent

Status:

In tolerance: Out of tolerance:

See comments:

Contains non accredited tests: Yes X No Calibration service:

X Basic Standard

Address:

49 Discovery, Suite 250

Irvine, CA 92618

Tested in accordance with the following procedures and standards:

 Calibration of SLM & Dosimeters - Acoustical Tests, Scantek, Inc. Rev.7/6/2011

Instrumentation used for calibration:

		COM	Cal Data	Traceability evidence:	G-I D-s
Instrument - Manufacturer	Description	S/N	Cal. Date	Cal. Lab / Accreditation	Cal. Due
1253 - Norsonic	Calibrator	25726	Nov 11, 2018	Scantek Inc. / NVLAP	Nov 11, 2019
4226 Bruel & Kjaer	Multifunction Calibrator	2305103	Sep 18, 2018	Bruel & Kjaer / A2LA	Sep 18, 2019
HM30-Thommen	Meteo Station	1040170/39633	Nov 13, 2018	ACR Env./ A2LA	Nov 13, 2019

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA), and NPL (UK).

Environmental conditions

Temperature [°C]	Barometric Pressure [kPa]	Relative Humidity [%]
22.8	100.84	36.7

Calibrated by:	Jeremy Gotwalt	Authorized signatory:	Steven E. Marshall
Signature	anx thate	Signature	Steven Walshall
Date	2/27/19	Date	3/8/2019

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Document stored as: Z:\Calibration Lab\2019 Certs\Piccolo ICF 42404-140513015.xlsx

Page 1 of 2

Results summary: Device was tested and complies with following clauses of mentioned specifications:

CLAUSES / METHODS FROM PROCEDURES:	MET 1, 2	NOT MET 1, 2	NOT TESTED
Accuracy test: calibration w/ acoustical calibrator	х		
Level linearity test	Х		
Differential linearity test	X		
Weighting network tests (A)	х		
Weighting network tests (C)	X		
Fast/Slow time constant test	х		
RMS crest factor test	X		1,
Steady state response test	X		
Integrating Functions Test (Leq/SEL Linearity):	X		

¹ The results of this calibration apply only to the instrument type with serial number identified above.

Comments: The instrument was submitted to the selection of tests listed in the table above, and met the manufacturer specifications.

Measured Data: in Test Report # 42404 of three pages.

Place of Calibration: Scantek, Inc. 6430 Dobbin Road, Suite C Columbia, MD 21045 USA Phone/Fax: 410-290-7726/ -9167

callab@scantekinc.com

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.

This Calibration Certificate or Test Report shall not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government

² Parameters are certified at actual environmental conditions.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 5/8/2020 Case Description: Site Prep

com

---- Receptor #1 ----

Baselines (dBA)

Daytime Evening Night Description Land Use Commercial

10 10 10

Equipment

			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Tractor-1	No	43		84	50	0
Excacator-delete	No	38		80.	7 50	0
Excacator-delete	No	38		80.	7 50	0

Results

		Calculate	d (dBA)		Noise Lim	nits (dBA)					Noise Lim	nit Exceedar	ice (dBA)		
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor-1		8	4	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excacator-delete		80	7	76.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excacator-delete		80	.7	76.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	8	4	83 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

 Receptor	#2	

		Baselines (dBA	١)	
Description	Land Use	Daytime Eve	ening Nig	ht
res	Residential	10	10	10
			Fau	inment

		Equipn	nent			
		Spec	Actual	Receptor	Estimated	
Impact		Lmax	Lmax	Distance	Shielding	
Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)	

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)			Shielding (dBA)	
Tractor-1	No	43		84		50	0	J
Excacator-delete	No	38			80.7	50	0	J
Excacator-delete	No	38			80.7	50	0	ı

		Results											
	Calculated (dBA))	Noise Li	mits (dBA)					Noise Li	mit Exceeda	nce (dBA)		
		Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor-1	84	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excacator-delete	80.7	76.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excacator-delete	80.7	76.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84	83 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	*Calculated Lma	x is the Loudes	value.										

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 5/8/2020 Case Description: Grading

---- Receptor #1 ----

Baselines (dBA)

Description Land Use Daytime Evening Night com Commercial 10 10 10

Equipment

			Spec	Actual		Receptor	Estimated
	Impact		Lmax	Lmax		Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)		(feet)	(dBA)
Grader-delete	No	41		85		50	0
Compressot (Air)-Delete	No	48			77.7	50	0
Compactor (ground) - delete	No	43			83.2	50	0
Generator	No	50			80.6	50	0
Pump - delete	No	74			80.9	50	0
Scraper-delete	No	48			83.6	50	0
Tractor-1	No	43		84		50	0
backhoe1	No	37			77.6	50	0

		Calculate	ed (dBA	.)	Noise L	imits (dBA)					Noise L	imit Exceeda	ance (dBA)		
				Day		Evening	:	Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader-delete		8	35	81.1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressot (Air)-Delete		77	.7	74.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground) - delete		83	.2	79.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		80	.6	77.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pump - delete		80	.9	79.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper-delete		83	.6	80.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor-1		8	34	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
backhoe1		77	.6	73.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	8	35	88 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		* C - I I		and a site of the contra-	and the same										

^{*}Calculated Lmax is the Loudest value.

Receptor #2	
-------------	--

Baselines (dBA)

Equipment

		Spec	Actua	al	Receptor	Estimated	
Impact		Lmax	Lmax		Distance	Shielding	
Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)	
No	41		85		50	0	
No	48	3		77.7	50	0	
No	43	}		83.2	50	0	
No	50)		80.6	50	0	
No	74	ļ		80.9	50	0	
No	48	3		83.6	50	0	
No	43	;	84		50	0	
No	37	,		77.6	50	0	
	Device No No No No No No	Device Usage(%) No 41 No 48 No 50 No 74 No 48 No 44 No 48 No 43	Impact	Impact	Impact	Impact Lmax Lmax Distance (feet) Device Usage(%) (dBA) (dBA) (feet) No 41 85 50 50 No 43 83.2 50 No 50 80.6 50 No 74 80.9 50 No 48 83.6 50 No 48 84 50	Impact Usage(%) (dBA) (dBA) (dBA) (dBA) (feet) (dBA) (DEA) (DE

R		

		Calculated (dBA)			Noise L	imits (dBA)		Noise Limit Exceedance (dBA)							
				Day		Evening		Night	Night		Day			Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader-delete		8	35	81.1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressot (Air)-Delete		77	.7	74.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground) - delete		83	.2	79.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		80	.6	77.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pump - delete		80	.9	79.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper-delete		83	.6	80.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor-1		8	34	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
backhoe1		77	.6	73.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	8	35	88 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^{*}Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 5/8/2020

Case Description: Grading

---- Receptor #1 ----

Baselines (dBA)

Description Land Use Daytime Evening Night com Commercial 10 10

Equipment

			Spec	Actua	I	Receptor	Estimated
	Impact		Lmax	Lmax		Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)		(feet)	(dBA)
Grader-delete	No	41		85		50	0
Compressot (Air)-Delete	No	48			77.7	50	0
Compactor (ground) - delete	No	43			83.2	50	0
Generator	No	50			80.6	50	0
Pump - delete	No	74			80.9	50	0
Scraper-delete	No	48			83.6	50	0
Tractor-1	No	43		84		50	0
backhoe1	No	37			77.6	50	0

		Calculated (dBA)			Noise Li	mits (dBA)		Noise Limit Exceedance (dBA)							
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader-delete		8	5	81.1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressot (Air)-Delete		77.	7	74.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground) - delete		83.	2	79.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		80.	6	77.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pump - delete		80.	9	79.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper-delete		83.	6	80.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor-1		8	4	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
backhoe1		77.	6	73.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	8	5	88 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^{*}Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Baselines	(dRA

Description Land Use Daytime Evening Night

res Residential 10 10 10

Equipment

			-quipii				
			Spec	Actua	I	Receptor	Estimated
	Impact		Lmax	Lmax		Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)		(feet)	(dBA)
Grader-delete	No	41		85		50	0
Compressot (Air)-Delete	No	48			77.7	50	0
Compactor (ground) - delete	No	43			83.2	50	0
Generator	No	50			80.6	50	0
Pump - delete	No	74			80.9	50	0
Scraper-delete	No	48			83.6	50	0
Tractor-1	No	43		84		50	0
backhoe1	No	37			77.6	50	0

		Calculated (dBA)			Noise Li	Noise Limits (dBA)						Noise Limit Exceedance (dBA)			
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader-delete		8	5	81.1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressot (Air)-Delete		77.	7	74.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground) - delete		83.	2	79.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		80.	6	77.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pump - delete		80.	9	79.6 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper-delete		83.	5	80.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor-1		8	4	80.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
backhoe1		77.	5	73.3 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	8	5	88 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
*Calculated Lmax is the Loudest v				t value.											

Roadway Construction Noise Model (RCNM), Version 1.1

5/8/2020 Report date:

Case Description: Paving

---- Receptor #1 ----

Baselines (dBA)

Daytime Evening Night

Land Use Description com Commercial 10 10

Equipment

Spec Actual Receptor Estimated Impact Lmax Distance Shielding (feet) (dBA) Description Device Usage(%) (dBA) (dBA) 50 Paver - delete No 42 77.2 0 Roller-delete No 38 80 50 0 Pavement Scarafier No 20 89.5 50 0

		Calculated (dBA	.)	Noise Limits (dBA)						Noise Limit Exceedance (dBA)				
			Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver - delete		77.2	73.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller-delete		80	75.8 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier		89.5	82.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	89.5	83.8 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^{*}Calculated Lmax is the Loudest value.

Receptor	

Baselines	ADA
baseimes	luba

Description Land Use Daytime Evening Night res Residential 10 10 10 10

Equipment

			Spec	Spec Actual		Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Paver - delete	No	42	2	77.2	50	0
Roller-delete	No	38	3	80	50	0
Pavement Scarafier	No	20)	89.5	50	0

	Calculated (dBA	Noise Li	Noise Limits (dBA)						Noise Limit Exceedance (dBA)				
		Day	Evening			Night		Day		Evening		Night	
Equipment	*Lmax Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver - delete	77.2	73.4 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller-delete	80	75.8 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	89.5	82.5 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.5	84.1 N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^{*}Calculated Lmax is the Loudest value.